



File Path: canvas-editor/.editorconfig

root = true

[\*]

charset = utf-8

indent\_style = space

indent\_size = 2

end\_of\_line = lf

trim\_trailing\_whitespace = true

insert\_final\_newline = false

File Path: canvas-editor/.eslintrc

```
{
  "parser": "@typescript-eslint/parser",
  "plugins": ["@typescript-eslint"],
  "parserOptions": {
    "ecmaVersion": 6,
    "sourceType": "module"
  },
  "extends": [
    "eslint:recommended",
    "plugin:@typescript-eslint/eslint-recommended",
    "plugin:@typescript-eslint/recommended"
  ],
  "env": {
    "browser": true
  },
  "globals": {
    "process": true
  },
  "rules": {
    "linebreak-style": 0,
    "no-console": 0,
    "no-debugger": 0,
    "no-useless-escape": "off",
    "@typescript-eslint/no-explicit-any": 0,
    "@typescript-eslint/no-empty-interface": 0,
    "@typescript-eslint/no-this-alias": 0,
    "@typescript-eslint/ban-ts-comment": 0,
    "@typescript-eslint/explicit-module-boundary-types": 0,
    "@typescript-eslint/no-non-null-assertion": 0,
    "@typescript-eslint/ban-types": [1, {
      "types": {
        "Function": false,
        "{}": false
      }
    }],
    "extendDefaults": true
  },
  "no-constant-condition": ["error", {
    "checkLoops": false
  }],
  "semi": [1, "never"],
  "quotes": [1, "single", {
    "allowTemplateLiterals": true
  }],
  "ignorePatterns": ["node_modules", "dist", "index.html"]
}
```

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File Path: canvas-editor/.github/FUNDING.yml  
github: Hufe921

File Path: canvas-editor/.github/ISSUE\_TEMPLATE/bug\_report.yml

name: "\U0001F41E Bug report"

description: Create a report to help us improve

body:

- type: markdown

attributes:

value: |

**\*\*Before You Start...\*\***

This form is only for submitting bug reports. If you have a usage question or are unsure if this is really a bug, make sure to:

- Read the [docs](https://hufe.club/canvas-editor-docs/)

Also try to search for your issue - it may have already been answered or even fixed in the development branch.

However, if you find that an old, closed issue still persists in the latest version,

you should open a new issue using the form below instead of commenting on the

old issue.

- type: input

id: version

attributes:

label: version

validations:

required: true

- type: input

id: reproduction-link

attributes:

label: Link to minimal reproduction

description: |

Provide a link address that can reproduce the bug. The following link is recommended:

<https://codesandbox.io/>

<https://codepen.io/>

<https://stackblitz.com/>

placeholder: Reproduction Link

- type: textarea

id: steps-to-reproduce

attributes:

label: Steps to reproduce

description: |

What do we need to do after opening your repro in order to make the bug happen?

Clear and concise reproduction instructions are important for us to be able to triage

your issue in a timely manner. Note that you can use [Markdown](https://

guides.github.com/features/mastering-markdown/) to format lists and code.

placeholder: Steps to reproduce

validations:Ð  
 required: trueÐ  
- type: textareaÐ  
 id: expectedÐ  
 attributes:Ð  
 label: What is expected?Ð  
 validations:Ð  
 required: trueÐ  
- type: textareaÐ  
 id: actually-happeningÐ  
 attributes:Ð  
 label: What is actually happening?Ð  
 validations:Ð  
 required: trueÐ  
- type: textareaÐ  
 id: system-infoÐ  
 attributes:Ð  
 label: System InfoÐ  
 description: Output of `npx envinfo --system --binaries --browsers`Ð  
 render: shellÐ  
 placeholder: System, Binaries, BrowsersÐ  
- type: textareaÐ  
 id: additional-commentsÐ  
 attributes:Ð  
 label: Any additional comments?Ð  
 description: e.g. some background/context of how you ran into this bug.

File Path: canvas-editor/.github/ISSUE\_TEMPLATE/config.yml  
blank\_issues\_enabled: true  
contact\_links:  
- name: docs  
 url: <https://hufe.club/canvas-editor-docs/>  
 about: Official documents



File Path: canvas-editor/.github/ISSUE\_TEMPLATE/feature\_request.yml

name: "\U0001F680 New feature proposal"

description: Suggest an idea for this project

labels: [":sparkles: feature request"]

body:

- type: markdown

attributes:

value: |

**Before You Start...**

This form is only for submitting feature requests. If you have a usage question or are unsure if this is really a bug, make sure to:

- Read the [docs](https://hufe.club/canvas-editor-docs/)

Also try to search for your issue - another user may have already requested something similar!

- type: textarea

id: problem-description

attributes:

label: What problem does this feature solve?

description: |

Explain your use case, context, and rationale behind this feature request. More importantly, what is the **end user experience** you are trying to build that led to the need for this feature?

placeholder: Problem description

validations:

required: true

- type: textarea

id: proposed-API

attributes:

label: What does the proposed API look like?

description: |

Describe how you propose to solve the problem and provide code samples of how the API would work once implemented. Note that you can use [Markdown](https://guides.github.com/features/mastering-markdown/) to format your code blocks.

placeholder: Steps to reproduce

validations:

required: true

File Path: canvas-editor/.github/workflows/build.yml

name: build

on:

push:

branches:

paths:

- 'src/\*\*'
- 'index.html'
- 'package.json'
- 'vite.config.ts'

jobs:

build:

runs-on: ubuntu-latest

steps:

- uses: actions/checkout@v2
- name: Use Node.js \${{ matrix.node-version }}
- uses: actions/setup-node@v1
- with:
  - node-version: \${{ matrix.node-version }}
- run: npm i yarn -g
- run: yarn
- run: yarn run build
- run: mv dist canvas-editor
- name: Copy folder content recursively to remote
- uses: garygrossgarten/github-action-scp@release
- with:
  - local: canvas-editor
  - remote: \${{ secrets.PATH }}
  - host: \${{ secrets.HOST }}
  - username: \${{ secrets.USERNAME }}
  - password: \${{ secrets.PASSWORD }}
  - rmRemote: true
- name: Executing remote ssh commands
- uses: appleboy/ssh-action@master
- with:
  - host: \${{ secrets.HOST }}
  - username: \${{ secrets.USERNAME }}
  - password: \${{ secrets.PASSWORD }}
  - script: sed -i 's/<\body>/\${{ secrets.SCRIPT }}<\body>/g' \${{ secrets.PATH }}

index.html

File Path: canvas-editor/.github/workflows/cypress.yml

name: cypress

on:

push:

branches:

paths:

- '.github/workflows/\*'
- 'cypress/\*\*'
- 'src/\*\*'
- 'index.html'
- 'package.json'
- 'vite.config.ts'

jobs:

cypress:

runs-on: ubuntu-latest

container: cypress/browsers:node16.17.0-chrome106

steps:

- uses: actions/checkout@v2

- name: Use Node.js \${{ matrix.node-version }}

uses: actions/setup-node@v1

with:

node-version: \${{ matrix.node-version }}

- run: npm i yarn serve@14.0.1 -g

- run: yarn

- run: yarn run build

- run: mv dist canvas-editor

- run: serve . -l 3000 &

- run: yarn run cypress:run

File Path: canvas-editor/.github/workflows/docs.yml

name: docs

on:

push:

branches: [main]

paths:

- 'docs/\*\*'

jobs:

build:

runs-on: ubuntu-latest

steps:

- uses: actions/checkout@v2

- name: Use Node.js \${{ matrix.node-version }}

uses: actions/setup-node@v1

with:

node-version: \${{ matrix.node-version }}

- run: npm i yarn -g

- run: yarn

- run: yarn run docs:build

- run: mv ./docs/.vitepress/dist ./docs/.vitepress/canvas-editor-docs

- name: Copy folder content recursively to remote

uses: garygrossgarten/github-action-scp@release

with:

local: ./docs/.vitepress/canvas-editor-docs

remote: \${{ secrets.DOCS\_PATH }}

host: \${{ secrets.HOST }}

username: \${{ secrets.USERNAME }}

password: \${{ secrets.PASSWORD }}

rmRemote: true

File Path: canvas-editor/.gitignore

node\_modules

.DS\_Store

dist

dist-ssr

\*.local

cache

.temp

File Path: canvas-editor/.prettierrc

```
{  
  "semi": false,  
  "singleQuote": true,  
  "printWidth": 80,  
  "trailingComma": "none",  
  "arrowParens": "avoid",  
  "endOfLine": "lf"  
}
```

File Path: canvas-editor/CHANGELOG.md

## [0.9.40](https://github.com/Hufe921/canvas-editor/compare/v0.9.39...v0.9.40)  
(2023-07-21)

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#### Bug Fixes

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\* disable partial contextmenu in readonly mode ([3f03d88](https://github.com/Hufe921/canvas-editor/commit/3f03d88443c2d5c746ba3c77f6e5fc69464c7c3c))

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#### Performance Improvements

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\* cursor drawing when page visible ([9c2bd33](https://github.com/Hufe921/canvas-editor/commit/9c2bd33b7a3cd7b557723e9c18870dcd8d7bba6b))

\* cursor position at the beginning of a line ([1bd2e45](https://github.com/Hufe921/canvas-editor/commit/1bd2e455a5f5c0bd53cb51d30e8205cd6a148e7c))

\* print quality #185 ([842b4fc](https://github.com/Hufe921/canvas-editor/commit/842b4fca0723bf764c8fb05f04a5511c443169db)), closes [#185](https://github.com/Hufe921/canvas-editor/issues/185)

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#### Refactor

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\* add prettier and format ([d464c50](https://github.com/Hufe921/canvas-editor/commit/d464c5043508c63b29174ae05bc37ec66c87d45f))

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## [0.9.39](https://github.com/Hufe921/canvas-editor/compare/v0.9.38...v0.9.39)  
(2023-07-14)

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#### Documentation

✎

\* add clean mode remark #214 ([abcc241](https://github.com/Hufe921/canvas-editor/commit/abcc2417966dfa6a43246e3b33dfc39fc65595be)), closes [#214](https://github.com/Hufe921/canvas-editor/issues/214)

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#### Features

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\* add table row and col size option #214 ([8d1100c](https://github.com/Hufe921/canvas-editor/commit/8d1100cdb1646bf8822112993c00881cf9e39a5e)), closes [#214](https://github.com/Hufe921/canvas-editor/issues/214)

\* get range context info ([09c4d53](https://github.com/Hufe921/canvas-editor/commit/09c4d53bca9744b115b5e7c94a42ebe81da487b8))

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## [0.9.38](https://github.com/Hufe921/canvas-editor/compare/v0.9.37...v0.9.38)  
(2023-07-12)Ð

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#### Bug FixesÐ

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\* limit word break element type #212 ([d7424f8](https://github.com/Hufe921/canvas-editor/commit/d7424f8b8798cc889df3b54748523c1367af2776)), closes [#212](https://github.com/Hufe921/canvas-editor/issues/212)Ð

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#### ChoresÐ

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\* add plugin tip ([8c6eee1](https://github.com/Hufe921/canvas-editor/commit/8c6eee1a57f5130919d1bdfa6a1067615f3a95e3))Ð

\* update README.md ([ccb1aa7](https://github.com/Hufe921/canvas-editor/commit/ccb1aa70abacd9398f9ff0e5b066ad51cfc27274))Ð

\* update release script ([4d1ad65](https://github.com/Hufe921/canvas-editor/commit/4d1ad650746ff2c4aa58dde2b725704ab9e7a639))Ð

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#### FeaturesÐ

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\* add word break option #212 ([d471165](https://github.com/Hufe921/canvas-editor/commit/d471165430e27e5322160e22da5a5f53fc969b0f)), closes [#212](https://github.com/Hufe921/canvas-editor/issues/212)Ð

\* get page value and append element api #211 ([85a9dcb](https://github.com/Hufe921/canvas-editor/commit/85a9dcbcf29a2fc0e1f89293c4f3ecbc976868b7)), closes [#211](https://github.com/Hufe921/canvas-editor/issues/211)Ð

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## [0.9.37](https://github.com/Hufe921/canvas-editor/compare/v0.9.36...v0.9.37)  
(2023-07-02)Ð

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#### ChoresÐ

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\* add plugin demo ([107c4b8](https://github.com/Hufe921/canvas-editor/commit/107c4b86a8703bd1ab01ab7fc9d3cc8a1078591d))Ð

\* update next features roadmap ([ca28454](https://github.com/Hufe921/canvas-editor/commit/ca284540493b985081c86623b569eeef4bf9dcdc))Ð

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#### ### DocumentationÐ

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\* add plugin ([d0e1c9b](https://github.com/Hufe921/canvas-editor/commit/d0e1c9b5267e15c0afa94bbd400502735846050b))Ð

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#### ### FeaturesÐ

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\* add fallback placeholder image ([366374e](https://github.com/Hufe921/canvas-editor/commit/366374eb105a49360f7ddecfdb63420e48254698))Ð

\* add plugin interface ([ad0bb32](https://github.com/Hufe921/canvas-editor/commit/ad0bb32b70cd2a7b8cf2c25a83091e92cc13f53b))Ð

\* add setValue command api #210 ([193bd21](https://github.com/Hufe921/canvas-editor/commit/193bd21f7049a565abddd3ae9be761d95d49fea1)), closes [#210](https://github.com/Hufe921/canvas-editor/issues/210)Ð

\* smooth signature drawing ([c328778](https://github.com/Hufe921/canvas-editor/commit/c3287783abfb27670e3572db8c431f23cc04c6ce))Ð

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## [0.9.36](https://github.com/Hufe921/canvas-editor/compare/v0.9.35...v0.9.36) (2023-06-16)Ð

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#### ### Bug FixesÐ

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\* close toolbar menu when click outside #192 ([9c39c54](https://github.com/Hufe921/canvas-editor/commit/9c39c540ff4a2a2f3806f8cea6b053bc6f2e7279)), closes [#192](https://github.com/Hufe921/canvas-editor/issues/192)Ð

\* copy highlight element #193 ([88ebfd2](https://github.com/Hufe921/canvas-editor/commit/88ebfd2f74b4cb1f3686478d0bba6a8231020ccb)), closes [#193](https://github.com/Hufe921/canvas-editor/issues/193)Ð

\* inability to select list pasted into table #206 ([53dd962](https://github.com/Hufe921/canvas-editor/commit/53dd9628caa8de064f6e87bef905113947273d84)), closes [#206](https://github.com/Hufe921/canvas-editor/issues/206)Ð

\* multiple editor instances conflict #205 ([68bea13](https://github.com/Hufe921/canvas-editor/commit/68bea13333a2ea10ec537700a8fd6e9295d963fb)), closes [#205](https://github.com/Hufe921/canvas-editor/issues/205)Ð

\* not allow change zone in continuous mode #201 ([16c2e9a](https://github.com/Hufe921/canvas-editor/commit/16c2e9a6d7d325aa33a8e8b5aec518f9e9d3861a)), closes [#201](https://github.com/Hufe921/canvas-editor/issues/201)Ð

\* prevent page auto scroll when no selection #204 ([183e644](https://github.com/Hufe921/canvas-editor/commit/183e644089f6ec471a9ad26a037873e4b132911d)), closes [#204](https://github.com/Hufe921/canvas-editor/issues/204)Ð

\* remove header and footer in continuous mode ([b92bd40](https://github.com/Hufe921/

canvas-editor/commit/b92bd407ddc64e5663c24a63a1fb7dadd15bf58))

### Chores

\* update mock data ([2120780](https://github.com/Hufe921/canvas-editor/commit/21207808a3987136f18f3a49b55b909facce54b9))

\* update README.md ([7594942](https://github.com/Hufe921/canvas-editor/commit/759494272a64129533f6f74da2ea8760657f0044))

### Documentation

\* add editor placeholder ([3a371e6](https://github.com/Hufe921/canvas-editor/commit/3a371e6ee312b7bff8bf8091a42a7ce5df1623bb))

\* add word tool ([e4ea580](https://github.com/Hufe921/canvas-editor/commit/e4ea580263443cbc9cb978272d11bf35c8423d11))

### Features

\* add editor placeholder ([5ded5c3](https://github.com/Hufe921/canvas-editor/commit/5ded5c3428fc70e6074d9c9101ba34ef7eeb7d19))

\* add history max record option #203 ([c467505](https://github.com/Hufe921/canvas-editor/commit/c46750557ad14ec2625d8aaef8a5ae08eb10ac96)), closes [#203](https://github.com/Hufe921/canvas-editor/issues/203)

\* add word tool ([2a3c2e2](https://github.com/Hufe921/canvas-editor/commit/2a3c2e2ec674beed8b20f28764e4d1bb636ce83c))

### Performance Improvements

\* cursor selection at the beginning of a line #202 ([a133585](https://github.com/Hufe921/canvas-editor/commit/a1335850a3f0ce1b90a2bf13ad8532f0ccf06cff)), closes [#202](https://github.com/Hufe921/canvas-editor/issues/202)

\* range style callback and inactive cursor style #204 ([7628eee](https://github.com/Hufe921/canvas-editor/commit/7628eee283da7236961f61c48c42625442ae02ed)), closes [#204](https://github.com/Hufe921/canvas-editor/issues/204)

## [0.9.35](https://github.com/Hufe921/canvas-editor/compare/v0.9.34...v0.9.35) (2023-05-31)

### Chores

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\* add CRDT CSpell word ([ef31552](https://github.com/Hufe921/canvas-editor/commit/ef315526be244c210b2a2a220dd3bed986660d75)))Ð

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### DocumentationÐ

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\* starting page number option ([618cb47](https://github.com/Hufe921/canvas-editor/commit/618cb47f77f2aed05d4ca72135ea5312b6d26b00)))Ð

\* table cell background color ([9225bef](https://github.com/Hufe921/canvas-editor/commit/9225bef99192d8c4848536d973bb2467ea205f27)))Ð

\* update next features ([c6ea0a6](https://github.com/Hufe921/canvas-editor/commit/c6ea0a655c997645cda6df7ced4377707973680f)))Ð

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### FeaturesÐ

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\* copy and paste sub and sup elements ([a500402](https://github.com/Hufe921/canvas-editor/commit/a500402dd401c6eac55222a366f5fc596c27d7c3)))Ð

\* copy and paste table cell background color ([c97c6ef](https://github.com/Hufe921/canvas-editor/commit/c97c6eff4047a91e68079cc9b228f41e02bef1ab)))Ð

\* optimize paste title ([bf52e25](https://github.com/Hufe921/canvas-editor/commit/bf52e2588b3af426382334d45d16d1a33510fde1)))Ð

\* starting page number option ([bfc61a8](https://github.com/Hufe921/canvas-editor/commit/bfc61a8a06b6c2c09fd968767f2a6ccbe280fe55)))Ð

\* table cell background color ([dbcab3b](https://github.com/Hufe921/canvas-editor/commit/dbcab3b48557f5a4ba77b9e6ec40b7ac8d36cc40)))Ð

\* unordered list default style ([c8b2a7e](https://github.com/Hufe921/canvas-editor/commit/c8b2a7e59fdd97ac268b0a38e80bac98dfd797ce)))Ð

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## [0.9.34](https://github.com/Hufe921/canvas-editor/compare/v0.9.33...v0.9.34) (2023-05-16)Ð

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### DocumentationÐ

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\* get catalog api ([c2cc8d9](https://github.com/Hufe921/canvas-editor/commit/c2cc8d98d29a472ccbe35aa39893e1dfc8df74e0)))Ð

\* location catalog api ([402e448](https://github.com/Hufe921/canvas-editor/commit/402e448559a5e2a1d2dd6399889758172651bcef)))Ð

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### FeaturesÐ

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\* add catalog demo ([9343afe](https://github.com/Hufe921/canvas-editor/commit/9343afe83136b4e1a23bad813adb5f9cf813604a))  
\* get catalog api ([237c0f2](https://github.com/Hufe921/canvas-editor/commit/237c0f22cbd26ac737187b8a195bc08665dcc450))  
\* location catalog api ([535562e](https://github.com/Hufe921/canvas-editor/commit/535562e396ce150916456a0ed791edc4ff208de4))

### Performance Improvements

\* optimize cursor blink ([7ad4ba3](https://github.com/Hufe921/canvas-editor/commit/7ad4ba3a2664744bbcee200775028a009fec5b4))

## [0.9.33](https://github.com/Hufe921/canvas-editor/compare/v0.9.32...v0.9.33) (2023-05-02)

### Bug Fixes

\* get range paragraph boundary error ([84b236f](https://github.com/Hufe921/canvas-editor/commit/84b236fe224e48002f7991abefda0c9c646447e2))

\* some IME position error #184 ([c5699bc](https://github.com/Hufe921/canvas-editor/commit/c5699bcb4cad9c9dcd7dad9eba00e0dd6d60cf3a)), closes [#184](https://github.com/Hufe921/canvas-editor/issues/184)

### Documentation

\* update list schema and shortcut ([98ea30e](https://github.com/Hufe921/canvas-editor/commit/98ea30e203003f5336911a4cb52d5bce6b8e08e5))

### Features

\* wrap within list item ([69750a1](https://github.com/Hufe921/canvas-editor/commit/69750a115a5adcc5ab61c69846fcde402d1019b3))

## [0.9.32](https://github.com/Hufe921/canvas-editor/compare/v0.9.31...v0.9.32) (2023-04-26)

### Bug Fixes

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- \* not wrap when exceeding container width #177 ([e8f61d9](https://github.com/Hufe921/canvas-editor/commit/e8f61d9d15c1aa5e3179e3565f956382dca9cace)), closes [#177](https://github.com/Hufe921/canvas-editor/issues/177)Ð
- \* delete list element boundary error ([9a37179](https://github.com/Hufe921/canvas-editor/commit/9a37179c748af63d652735f0ad9e4c5dd65f7e23))Ð
- \* error when selecting table cells #174 ([f0b6014](https://github.com/Hufe921/canvas-editor/commit/f0b6014daa4ac3ac1d88acb941aa92e183eef6fa)), closes [#174](https://github.com/Hufe921/canvas-editor/issues/174)Ð
- \* header and footer compute position list error ([3b66b26](https://github.com/Hufe921/canvas-editor/commit/3b66b26c85c59468a5a5c0bfeed39d7bef793239))Ð
- \* image element row margin error ([3daacc6](https://github.com/Hufe921/canvas-editor/commit/3daacc6cb80506aefd25069f8960766b85e2d88a))Ð
- \* inline image ascent value ([59065bb](https://github.com/Hufe921/canvas-editor/commit/59065bb29e9e7e85cca83eb6dd5ccdd99533a183))Ð
- \* paste and format element boundary error ([86569f5](https://github.com/Hufe921/canvas-editor/commit/86569f51d3a32a7c148dbd6f06b5734a98836e68))Ð
- \* paste list element boundary error ([5935eb7](https://github.com/Hufe921/canvas-editor/commit/5935eb77d04824c60a4e1ffe6149097045188336))Ð
- \* set paper size error #181 ([10ada8c](https://github.com/Hufe921/canvas-editor/commit/10ada8cf542e8b8f5ddd9e619637c4d22d66f0b6)), closes [#181](https://github.com/Hufe921/canvas-editor/issues/181)Ð
- \* tslint error ([8202c1c](https://github.com/Hufe921/canvas-editor/commit/8202c1c67b2ff18feee09223f3f2eea4c8fc7bac))Ð
- \* unset list error ([c02a96c](https://github.com/Hufe921/canvas-editor/commit/c02a96cb8a24514f8d3aa8386d915e5e9e42050f))Ð

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### ### ChoresÐ

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- \* add git pre commit hook ([ef9ee07](https://github.com/Hufe921/canvas-editor/commit/ef9ee07a55b17111011c970adc5f67ee02a93eff))Ð

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### ### DocumentationÐ

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- \* add list command ([a5b5f87](https://github.com/Hufe921/canvas-editor/commit/a5b5f8785d598ee632b3fb14ce2bcff93a497ce9))Ð
- \* update schema, shortcut, option ([2f64395](https://github.com/Hufe921/canvas-editor/commit/2f64395cbdd6b0d4ab04bf40c2e113af7a0fa4c5))Ð

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### ### FeaturesÐ

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- \* adaptive list style during page scaling ([e53c0c5](https://github.com/Hufe921/canvas-editor/commit/e53c0c5d3b1f6e83482ed470d09bb6851600e368))Ð

- \* add list and title shortcuts ([bb28755](https://github.com/Hufe921/canvas-editor/commit/bb2875516c1339d334068462905e96f28895da6f))
- \* add list element ([c2330a8](https://github.com/Hufe921/canvas-editor/commit/c2330a8c11d83568f406cbecc8dbad2396d0df40))
- \* enable keyboard event when image resizer (#179) ([fb78f0a](https://github.com/Hufe921/canvas-editor/commit/fb78f0a0aa4e19e156a09dc530e84bf86e5b861a)), closes [#179](https://github.com/Hufe921/canvas-editor/issues/179)
- \* handle boundary when dragging elements ([8fba929](https://github.com/Hufe921/canvas-editor/commit/8fba929fb8c0567e195ca9ecdd90f9d677c0aa3e))
- \* handle list boundary ([406fca3](https://github.com/Hufe921/canvas-editor/commit/406fca359034991fbde568ee3a6f981dac3f73d1))
- \* header, footer, page number disabled option #180 ([797b9a1](https://github.com/Hufe921/canvas-editor/commit/797b9a14dffa5e3fcdff8bbc5dd9ebc41cc5c7c8)), closes [#180](https://github.com/Hufe921/canvas-editor/issues/180)
- \* insert table in list element ([3ec7d71](https://github.com/Hufe921/canvas-editor/commit/3ec7d71f2e597841fe063cdd955c36a9d0187339))
- \* recursion format element context ([9f84285](https://github.com/Hufe921/canvas-editor/commit/9f8428576302a00d182aa3c469def0b6d3d0e708))
- \* set title at paragraph level ([8a56a49](https://github.com/Hufe921/canvas-editor/commit/8a56a49a0ae23fc59d2edd9ec7894756d36542c7))

## [0.9.31](https://github.com/Hufe921/canvas-editor/compare/v0.9.30...v0.9.31) (2023-04-07)

### Bug Fixes

- \* lose line break when set title ([722a910](https://github.com/Hufe921/canvas-editor/commit/722a91014508d9a8d65a30ab7d71b23924fa9b91))

### Performance Improvements

- \* range style anchor element ([d9eec5b](https://github.com/Hufe921/canvas-editor/commit/d9eec5b9be6cbb545c57cf8816b197a214c70f3e))

## [0.9.30](https://github.com/Hufe921/canvas-editor/compare/v0.9.29...v0.9.30) (2023-04-07)

### Bug Fixes

\* set defaultTrMinHeight option invalid #168 ([045e2ff](https://github.com/Hufe921/canvas-editor/commit/045e2ffe4ece76d46a8a579fad267f14a6778b1e)), closes [#168] (https://github.com/Hufe921/canvas-editor/issues/168)Đ

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### ChoresĐ

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\* add image accept values ([189ca73](https://github.com/Hufe921/canvas-editor/commit/189ca73c3213cb9b76fa84df400f9b3624ec0d42))Đ

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### DocumentationĐ

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\* add page number format option ([72e97b7](https://github.com/Hufe921/canvas-editor/commit/72e97b7883f0f84961afd7ed93b740d1915f731c))Đ

\* add title api and option ([a9b4438](https://github.com/Hufe921/canvas-editor/commit/a9b44387bd174cbd1bab8c308bb732f68800ef34))Đ

\* add zone change listener ([3cba30b](https://github.com/Hufe921/canvas-editor/commit/3cba30bcf969a9b777885a4ca6daca3019afd9d0))Đ

\* improve editor options ([51d4a03](https://github.com/Hufe921/canvas-editor/commit/51d4a036a0e1c99e48a02b326ab459319536ab7b))Đ

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### FeaturesĐ

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\* add page number format option ([4987723](https://github.com/Hufe921/canvas-editor/commit/4987723f27684a3f4ba4e9952b75c16926f4a07b))Đ

\* add title element ([9701b21](https://github.com/Hufe921/canvas-editor/commit/9701b2153e4de71697776765081f39bbfda82eb7))Đ

\* add zone change listener ([86871c3](https://github.com/Hufe921/canvas-editor/commit/86871c310be1402f03831ca182698e7ba78a7912))Đ

\* format title element value ([1fc276f](https://github.com/Hufe921/canvas-editor/commit/1fc276fbae6a0dd7c8cff39a5c5ca6aa7d7f47ed))Đ

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### Performance ImprovementsĐ

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\* copy title and table element ([03cd85f](https://github.com/Hufe921/canvas-editor/commit/03cd85f423d207eea7f88c4267552f4af6945030))Đ

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### TestsĐ

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\* add title test case ([c275216](https://github.com/Hufe921/canvas-editor/commit/c275216fb4626e811d702c7f72f1e987823c4787))Đ

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## [0.9.29](https://github.com/Hufe921/canvas-editor/compare/v0.9.28...v0.9.29)  
(2023-04-01)Ð

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#### Bug FixesÐ

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\* delete rowFlex when row position change #164 ([5c3ce57](https://github.com/Hufe921/canvas-editor/commit/5c3ce57c24253cfe9b16ddc682f0f75aaab653fd)), closes [#164]  
(https://github.com/Hufe921/canvas-editor/issues/164)Ð

\* failed to execute 'toDataURL' #163 ([f11d5c8](https://github.com/Hufe921/canvas-editor/commit/f11d5c806ea5cc308b59df4eaa58bf82998a3c50)), closes [#163](https://github.com/Hufe921/canvas-editor/issues/163)Ð

\* render composing text error ([310e0e9](https://github.com/Hufe921/canvas-editor/commit/310e0e91fbc4ef64343b5cc746ec4e7d471df974))Ð

\* table cell text render position error #166 ([266915a](https://github.com/Hufe921/canvas-editor/commit/266915af09be90a1a12092fdff2d266d62f3c90d)), closes [#166]  
(https://github.com/Hufe921/canvas-editor/issues/166)Ð

\* table cell vertical align error after page scaled #165 ([1fa1d10](https://github.com/Hufe921/canvas-editor/commit/1fa1d10fc9c279eb1d91b804484019d02fec945d)),  
closes [#165](https://github.com/Hufe921/canvas-editor/issues/165)Ð

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#### DocumentationÐ

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\* update snapshot ([e0791cf](https://github.com/Hufe921/canvas-editor/commit/e0791cf5f74341547a86809e80c647a3f0fa5a2a))Ð

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#### FeaturesÐ

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\* avoid punctuation at the beginning of a row ([29a988a](https://github.com/Hufe921/canvas-editor/commit/29a988a1d4d57a98068a299986ddbe38a52d80a4))Ð

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## [0.9.28](https://github.com/Hufe921/canvas-editor/compare/v0.9.27...v0.9.28)  
(2023-03-27)Ð

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#### Bug FixesÐ

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\* drag table border to change size #160 ([fda18d9](https://github.com/Hufe921/canvas-editor/commit/fda18d968e7f54c11726dcd11a9d3536bca33d9a)), closes [#160](https://github.com/Hufe921/canvas-editor/issues/160)Ð



\* extra blank row appear when insert table #162 ([2f8c6b7](https://github.com/Hufe921/canvas-editor/commit/2f8c6b71d2787e85a677073ca41832c4b00f6c41)), closes [#162](https://github.com/Hufe921/canvas-editor/issues/162)Ð

\* position header and footer zone ([ca5c4be](https://github.com/Hufe921/canvas-editor/commit/ca5c4be9c39f374ccbb1bb6ea126b06fa978c885))Ð

\* table cell height adaptation #162 ([a2090c8](https://github.com/Hufe921/canvas-editor/commit/a2090c82fc2c09ed28a40064094cbca0b9bd1431)), closes [#162](https://github.com/Hufe921/canvas-editor/issues/162)Ð

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### DocumentationÐ

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\* add page footer ([45a17ba](https://github.com/Hufe921/canvas-editor/commit/45a17ba756eb822060aa66370821434d1167be55))Ð

\* update editor options ([6351b95](https://github.com/Hufe921/canvas-editor/commit/6351b95646d80dab45cc517c223561aa0e8fc725))Ð

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### FeaturesÐ

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\* add page footer ([21626cc](https://github.com/Hufe921/canvas-editor/commit/21626cc41b24f72c28694881a8aba92fddcccf35))Ð

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## [0.9.27](https://github.com/Hufe921/canvas-editor/compare/v0.9.26...v0.9.27) (2023-03-24)Ð

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### ChoresÐ

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\* verify release package ([4773c03](https://github.com/Hufe921/canvas-editor/commit/4773c0363ccb15b4ca9b406bb2c888a53c9af777))Ð

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## [0.9.26](https://github.com/Hufe921/canvas-editor/compare/v0.9.25...v0.9.26) (2023-03-24)Ð

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### ChoresÐ

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\* add release script ([caa2c34](https://github.com/Hufe921/canvas-editor/commit/caa2c3463d6306b49fbfb893dec6caf6a9f16f0d))Ð

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## [0.9.25](https://github.com/Hufe921/canvas-editor/compare/v0.9.24...v0.9.25)  
(2023-03-24)Ð

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### Bug FixesÐ

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\* table elements position when zooming ([3ff0eea](https://github.com/Hufe921/canvas-editor/commit/3ff0eea9482d5ab868b09940d3ebbb3864c71a2b))Ð

\* table tool render option ([4a022a2](https://github.com/Hufe921/canvas-editor/commit/4a022a2724521d842f72f679a3bc8ca2b0e244ea))Ð

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### ChoresÐ

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\* add eslint global variable ([70f3d17](https://github.com/Hufe921/canvas-editor/commit/70f3d17ff0e4a4477e5d83f0b9b422f91aee1226))Ð

\* add verify git commit message script ([0582da5](https://github.com/Hufe921/canvas-editor/commit/0582da56dde70e1f023f8cd3d8aad64b0e163cc8))Ð

\* update .editorConfig ([4c48c79](https://github.com/Hufe921/canvas-editor/commit/4c48c79f71256449a82d50052216c22914b72afe))Ð

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### DocumentationÐ

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\* delete headerTop option ([756c706](https://github.com/Hufe921/canvas-editor/commit/756c706b9f5321b67f47be99ec04232339b6fdb5))Ð

\* table border type #152 ([9521d59](https://github.com/Hufe921/canvas-editor/commit/9521d59fafe8a5b5a2e66db97128720bc0206d48)), closes [#152](https://github.com/Hufe921/canvas-editor/issues/152)Ð

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### FeaturesÐ

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\* table border tool ([5c529b7](https://github.com/Hufe921/canvas-editor/commit/5c529b76ca8184bed118955fdae36b8f1717dbb9))Ð

\* table border type #152 ([48ad18b](https://github.com/Hufe921/canvas-editor/commit/48ad18bccb16e1a7751680103ac52a20320861d8)), closes [#152](https://github.com/Hufe921/canvas-editor/issues/152)Ð

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## [0.9.24](https://github.com/Hufe921/canvas-editor/compare/v0.9.23...v0.9.24)  
(2023-03-22)Ð

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### ### Bug Fixes

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\* table cell auto height #150 ([e68c0be](https://github.com/Hufe921/canvas-editor/commit/e68c0bebc380f9dd9e870677eac888a7b04c56cb)), closes [#150](https://github.com/Hufe921/canvas-editor/issues/150)

\* cannot copy table element when it in the first position ([73457cb](https://github.com/Hufe921/canvas-editor/commit/73457cb2e8cc693138e4785c382ae4c025d8fedd))

\* compute only the main body word count ([4306d44](https://github.com/Hufe921/canvas-editor/commit/4306d44ed62a0233fdb0fe9b3c3f7d00423ba4da))

\* some IME position error #155 ([b6dfcb5](https://github.com/Hufe921/canvas-editor/commit/b6dfcb5f08f42790395059963b16a57d20367978)), closes [#155](https://github.com/Hufe921/canvas-editor/issues/155)

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### ### Documentation

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\* table cell vertical align ([47918db](https://github.com/Hufe921/canvas-editor/commit/47918db3bbcf78d4af60e43e7ed1183c5525a758))

\* page number options ([c753a9d](https://github.com/Hufe921/canvas-editor/commit/c753a9d00dd3a5bda0b75df7e6237448bd16f21f))

\* font size setting api ([690aa1b](https://github.com/Hufe921/canvas-editor/commit/690aa1b96d185ca7d80b9af884d23a39dac9a2bf))

\* next features road map ([0e8c5fd](https://github.com/Hufe921/canvas-editor/commit/0e8c5fd388a81fabe28a66cf1239348930ae5346))

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### ### Features

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\* table cell vertical align contextmenu i18n ([32643a5](https://github.com/Hufe921/canvas-editor/commit/32643a5573660e66fd7084fa33ae599521457ced))

\* table cell vertical align ([665e201](https://github.com/Hufe921/canvas-editor/commit/665e2018aaae38aacd6ec9d32980fba245f12ddd))

\* page number set row flex ([0a9f44e](https://github.com/Hufe921/canvas-editor/commit/0a9f44eed8fd72ff3318a34222ff91d4f140de9b))

\* add fontSize settings API ([d951532](https://github.com/Hufe921/canvas-editor/commit/d95153299880ef7139d3a2d64d7d3dc16fbef615))

\* fontSize setting Example ([3f218f6](https://github.com/Hufe921/canvas-editor/commit/3f218f698bd361ae73eac9043f31585c97058963))

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### ### Performance Improvements

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\* font size setting api ([84e2fc9](https://github.com/Hufe921/canvas-editor/commit/84e2fc95699adf81fd361ff7a76b900abfd2b164))

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### ### Tests

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\* font size setting ([89012b7](https://github.com/Hufe921/canvas-editor/commit/89012b7183327f3a5e6497ad96741e6f5badc699))⌘

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## [0.9.23](https://github.com/Hufe921/canvas-editor/compare/v0.9.22...v0.9.23) (2023-03-19)⌘

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### ### Bug Fixes

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\* set editor zone method ([9de29ed](https://github.com/Hufe921/canvas-editor/commit/9de29ed934ffb9556e473911fdb715524f1d2fad))⌘

\* table cursor position in page header ([85a2bbe](https://github.com/Hufe921/canvas-editor/commit/85a2bbea60867d4314b571586785ad03dfd716da))⌘

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### ### Documentation

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\* next features road map ([debc6c1](https://github.com/Hufe921/canvas-editor/commit/debc6c128383a45791763b230d6802b6219d6d8d))⌘

\* add page header ([6d47ce0](https://github.com/Hufe921/canvas-editor/commit/6d47ce0a67144a891a3cb16850bfc25396ba3b55))⌘

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### ### Features

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\* add header indicator ([86707ca](https://github.com/Hufe921/canvas-editor/commit/86707cad47381e8f807aece3ffc76e34f8cfa24))⌘

\* zoom page header ([c0fee3e](https://github.com/Hufe921/canvas-editor/commit/c0fee3ea143412928650aa44f4954fe8209ab264))⌘

\* export page header type ([23b6cd2](https://github.com/Hufe921/canvas-editor/commit/23b6cd28ad80bf8dc4ecf5968e53909681307c6d))⌘

\* paging cursor position ([7b4b33b](https://github.com/Hufe921/canvas-editor/commit/7b4b33b5c5d4b1c27224f7ee25d78f4ba3fe9619))⌘

\* page header boundary value ([ed79d25](https://github.com/Hufe921/canvas-editor/commit/ed79d2587ca2932e0c6e1229c72ac24d71d953fc))⌘

\* edit page header ([6082ab2](https://github.com/Hufe921/canvas-editor/commit/6082ab26d110d5c90e2742ee51688cdf3e4a41fa))⌘

\* render header element ([da2dfd3](https://github.com/Hufe921/canvas-editor/commit/da2dfd3a16d8e87689ea92aae9907cb4f9e21d50))⌘

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### ### Tests

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\* update get editor value ([436d1de](https://github.com/Hufe921/canvas-editor/commit/436d1de2845599e5767833648ffc836647d7e292))Ð

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## [0.9.22](https://github.com/Hufe921/canvas-editor/compare/v0.9.21...v0.9.22)  
(2023-03-15)Ð

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#### Bug FixesÐ

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\* init page context when paper change ([bb63eeb](https://github.com/Hufe921/canvas-editor/commit/bb63eeb335e45899cf5b6906f26fc1bb7599356e))Ð

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#### DocumentationÐ

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\* set paper direction api ([0963fc1](https://github.com/Hufe921/canvas-editor/commit/0963fc1adfed7e3938bf7f7be2bfab1433f401d5))Ð

\* update command execute api ([82b5256](https://github.com/Hufe921/canvas-editor/commit/82b525649fea0793fc54897e9befba1b91efe782))Ð

\* next features roadmap ([dd7a768](https://github.com/Hufe921/canvas-editor/commit/dd7a7686af40b0a99f388961ff302ea41de4c905))Ð

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#### FeaturesÐ

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\* adjust background when paper direction change ([f076f2b](https://github.com/Hufe921/canvas-editor/commit/f076f2bd00eae6f3adf56559e40807898a8de229))Ð

\* adjust margins when paper direction change ([1eefa57](https://github.com/Hufe921/canvas-editor/commit/1eefa570b23a3330971c595dde8cef0e6ec2f530))Ð

\* add paper direction ([9aeb928](https://github.com/Hufe921/canvas-editor/commit/9aeb928b35c90c0a5a6040b34b77e2d6b91343d5))Ð

\* drag and drop date element ([780a40c](https://github.com/Hufe921/canvas-editor/commit/780a40caae3cabd9ceea347ae796ccfda9e9b3ef))Ð

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## [0.9.21](https://github.com/Hufe921/canvas-editor/compare/v0.9.20...v0.9.21)  
(2023-03-11)Ð

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#### Bug FixesÐ

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\* reset canvas context properties that can be overwritten by css #144 ([a3664a2](https://

github.com/Hufe921/canvas-editor/commit/a3664a2012ea0ef8bcaa58bd41acd7a6bcd17968)), closes [#144](https://github.com/Hufe921/canvas-editor/issues/144))

\* hyperlink popup max width ([1cad605](https://github.com/Hufe921/canvas-editor/commit/1cad605d4f672b8dd01a59ccb55526353e611242))

### Documentation

\* next features roadmap ([d86a155](https://github.com/Hufe921/canvas-editor/commit/d86a155159b9f0e768954d3c18a5fccf3c7aba22))

\* fix usage errors ([74447a1](https://github.com/Hufe921/canvas-editor/commit/74447a1c5cadaee9fdb9df0116b97cc5e294e016))

### Features

\* drag and drop element ([9b9a0a0](https://github.com/Hufe921/canvas-editor/commit/9b9a0a09aeb36c1ae50641cdc8585615a06c28e4))

\* render checkbox control with style ([9f64a06](https://github.com/Hufe921/canvas-editor/commit/9f64a068b13b0789dc2974e443ad000655a2c929))

## [0.9.20](https://github.com/Hufe921/canvas-editor/compare/v0.9.19...v0.9.20) (2023-03-08)

### Bug Fixes

\* near highlight elements render error ([17b469b](https://github.com/Hufe921/canvas-editor/commit/17b469be6b95621b635383c9fc20c9c0adcb8d2b))

### Chores

\* add CHANGELOG.md ([367a247](https://github.com/Hufe921/canvas-editor/commit/367a24730a739514d24d7c882524f8ded479fb38))

\* add issue template ([7a26819](https://github.com/Hufe921/canvas-editor/commit/7a268199b3607a8c629fc5bc0242be89abbbac90))

### Features

\* signature adapt to high-resolution screen ([4acf243](https://github.com/Hufe921/canvas-editor/commit/4acf243fed01b0b41ebbcc46c4b6603cabf6c825))

\* open hyperlink shortcut ([3295e37](https://github.com/Hufe921/canvas-editor/commit/3295e3711ae92f5503064691c5558afea99e3f0c))

\* copy and paste highlight element ([0493ae2](https://github.com/Hufe921/canvas-editor/commit/0493ae2d5e10daf917e39a9deb4e29c90e096420))

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## [0.9.19](https://github.com/Hufe921/canvas-editor/compare/v0.9.18...v0.9.19) (2023-03-03)

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#### Bug Fixes

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\* continuity page render error in lazy mode ([ff06e50](https://github.com/Hufe921/canvas-editor/commit/ff06e50138697ef61ce308e78a7e873046664e30))

\* format paste table data ([909096b](https://github.com/Hufe921/canvas-editor/commit/909096bd0d9d6e845ccecbee815ddebe35e6f021))

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#### Performance Improvements

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\* improve:control element input ([dc54622](https://github.com/Hufe921/canvas-editor/commit/dc54622258872630ff39309f2b1da3baee1f508f))

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## [0.9.18](https://github.com/Hufe921/canvas-editor/compare/v0.9.17...v0.9.18) (2023-03-02)

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#### Bug Fixes

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\* scrollbar scroll automatically ([8b5c41b](https://github.com/Hufe921/canvas-editor/commit/8b5c41bd58008a2945574ea178058638b64c0ffb))

\* paper remove error in lazy render mode ([8aac99d](https://github.com/Hufe921/canvas-editor/commit/8aac99d5c3a984d8c89b251e53dd393e73c66327))

\* cannot paste html at the end of the control #133 ([0694bf0](https://github.com/Hufe921/canvas-editor/commit/0694bf0bec5da94d800affbf60b79a16c7d4d0e1)), closes [#133](https://github.com/Hufe921/canvas-editor/issues/133)

\* cannot delete control when it is first element #131 ([45ef8b6](https://github.com/Hufe921/canvas-editor/commit/45ef8b69540ee28f3d4c3b7cada5fbb44c26a023)), closes [#131](https://github.com/Hufe921/canvas-editor/issues/131)

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#### Features

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\* add lazy render mode ([f428f56](https://github.com/Hufe921/canvas-editor/commit/f428f566e9e92c7d4cc2affe73b4fc01eaaa56dd))

### Performance Improvements

\* improve:position compute separate from draw row ([8910c7c](https://github.com/Hufe921/canvas-editor/commit/8910c7cf0a5d74f6ec46615bbc106773b3147cdc))

## [0.9.17](https://github.com/Hufe921/canvas-editor/compare/v0.9.16...v0.9.17) (2023-02-28)

### Bug Fixes

\* composing input not save history ([c4f2687](https://github.com/Hufe921/canvas-editor/commit/c4f268772646f91d63c224cf72d5e23278ff2f5e))

\* visible page computing method ([fcb96a6](https://github.com/Hufe921/canvas-editor/commit/fcb96a6f561d315945c1069b4a47d4f788212556))

### Documentation

\* next features road map ([6e99d8a](https://github.com/Hufe921/canvas-editor/commit/6e99d8ad93a7a907fd97a201186b51539980ba55))

\* cursor style option ([92d65da](https://github.com/Hufe921/canvas-editor/commit/92d65da7d80e0e312d053006d0690d1f9a258ef4))

### Features

\* set the cursor style when dragging text ([2977183](https://github.com/Hufe921/canvas-editor/commit/29771838f0bdc5aef1f5714fd9d6110f482f3f64))

## [0.9.16](https://github.com/Hufe921/canvas-editor/compare/v0.9.15...v0.9.16) (2023-02-21)

### Features

\* render composing text ([63487d4](https://github.com/Hufe921/canvas-editor/commit/63487d4f90332be68cb07f3eacfa3a0d04f8eff))



\* redraw when device pixel ratio change ([4c370ae](https://github.com/Hufe921/canvas-editor/commit/4c370aec1adbc4056f394d2faf370327fd544e22))

\* support mac os shortcut remark ([189e88c](https://github.com/Hufe921/canvas-editor/commit/189e88c5601b2a99b032ae966f945986b8acf8b1))

#### Tests

\* optimize the method of get editor value ([708d578](https://github.com/Hufe921/canvas-editor/commit/708d57812e6ab145113e3fbab047970d155b515c))

## [0.9.15](https://github.com/Hufe921/canvas-editor/compare/v0.9.14...v0.9.15)

(2023-02-16)

#### Bug Fixes

\* draw multi-segment richtext element in one row ([c522c22](https://github.com/Hufe921/canvas-editor/commit/c522c225b1c26d16abcccd74c0d2573fbeb88595))

#### Documentation

\* mac os shortcut ([df8096e](https://github.com/Hufe921/canvas-editor/commit/df8096ebfb8259d02f19b1926457d96af574bda2))

\* update next features ([338a67c](https://github.com/Hufe921/canvas-editor/commit/338a67c6e7baf38097f1ec801d8292000e94742b))

\* update next features ([4cb8d2a](https://github.com/Hufe921/canvas-editor/commit/4cb8d2adf6aa25c7734f3a544e6bbb8a78fe5892))

\* add i18n ([c912563](https://github.com/Hufe921/canvas-editor/commit/c9125635eae8cecf4bdeda56455b66221c2f1db3))

#### Features

\* support mac os shortcut ([ef4bda2](https://github.com/Hufe921/canvas-editor/commit/ef4bda2a46fec7c901fe62abee4e4315e740643))

\* support mac os shortcut ([0d6e0cf](https://github.com/Hufe921/canvas-editor/commit/0d6e0cf4124ddbcb1333a3955acf6aa7b4e159cc))

\* support partial fields to set i18n lang ([7287b57](https://github.com/Hufe921/canvas-editor/commit/7287b576e86447ebde026117d0e6068a3dfaf8f6))

## [0.9.14](https://github.com/Hufe921/canvas-editor/compare/v0.9.13...v0.9.14)  
(2023-02-08)ð

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### Bug Fixesð

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- \* get rowFlex when line breaks ([34799d7](https://github.com/Hufe921/canvas-editor/commit/34799d7cb90a5ed2161c219121ca7b4fcd692558))ð

- \* paste table data format judgment ([8ff0d01](https://github.com/Hufe921/canvas-editor/commit/8ff0d01dde6f66a5ecdabb89703618f16b86ac75))ð

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### Featuresð

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- \* add i18n ([82b8d2c](https://github.com/Hufe921/canvas-editor/commit/82b8d2c5a965386720e029d52689f97b5c62f0bc))ð

- \* paste html with textAlign info ([eb0086a](https://github.com/Hufe921/canvas-editor/commit/eb0086a4b81cd87fdb558e89e92c304f16169cb6))ð

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## [0.9.13](https://github.com/Hufe921/canvas-editor/compare/v0.9.12...v0.9.13)  
(2023-02-03)ð

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### Bug Fixesð

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- \* remove style sheet when paste html ([5bf7029](https://github.com/Hufe921/canvas-editor/commit/5bf7029f0ada5a370f1dfdf6c09b2f977a08609a))ð

- \* copy table width colspan and rowspan info ([0f46db1](https://github.com/Hufe921/canvas-editor/commit/0f46db1f8addca04510c683855840770abde69a9))ð

- \* adjust selection boundary ([4865eb5](https://github.com/Hufe921/canvas-editor/commit/4865eb5d5a0ded64215a98651ab23dc6404681c2))ð

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### Documentationð

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- \* add algolia search ([8177c11](https://github.com/Hufe921/canvas-editor/commit/8177c11c2b4225196aa2a387dcf814fd5af73007))ð

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### Featuresð

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- \* paste table element ([db51a27](https://github.com/Hufe921/canvas-editor/commit/db51a27666e21a942ecabc9c6d5f926ce473fedb))ð

- \* paste image element ([0c07db7](https://github.com/Hufe921/canvas-editor/commit/0c07db7a5d53db47117e6fdd11bec995f0a3616b))ð

\* paste separator element ([77d546f](https://github.com/Hufe921/canvas-editor/commit/77d546f476b0009f6925d660cdcbefd5150b6c2))

\* paste checkbox element ([e37da11](https://github.com/Hufe921/canvas-editor/commit/e37da11a79dd5e226f954833b102a8c01a19fef9))

\* shrink the contextmenu scope ([64f5ff1](https://github.com/Hufe921/canvas-editor/commit/64f5ff15aa25aaede301277580be0770cec593b0))

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## [0.9.12](https://github.com/Hufe921/canvas-editor/compare/v0.9.11...v0.9.12) (2023-01-20)

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#### Bug Fixes

␣

\* adjust selection by shortcut #111 ([a19a0a1](https://github.com/Hufe921/canvas-editor/commit/a19a0a1126f5d8521cde7d53d1042d4fa67ade89)), closes [#111](https://github.com/Hufe921/canvas-editor/issues/111)

\* compatible with browsers that do not support ClipboardItem #108 ([196f638](https://github.com/Hufe921/canvas-editor/commit/196f63831849e555d1c24daa78d69e187e642214)), closes [#108](https://github.com/Hufe921/canvas-editor/issues/108)

\* line thickness of rendered margin ([e8f3b2a](https://github.com/Hufe921/canvas-editor/commit/e8f3b2a6da725feb014d83ff96ab3c6a68b50655))

\* cannot cut whole line except the first page ([ca13a3b](https://github.com/Hufe921/canvas-editor/commit/ca13a3b268791e18d7bc6b0b3297ef0ca5c76387))

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#### Documentation

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\* adjust selection by direction key ([01353ad](https://github.com/Hufe921/canvas-editor/commit/01353ad59e208d1db1810f43f868201090273d02))

\* adjust selection by shortcut ([81ac4d8](https://github.com/Hufe921/canvas-editor/commit/81ac4d8dc0177090ef11098c9916d156415b5db9))

\* add global api ([3678b7f](https://github.com/Hufe921/canvas-editor/commit/3678b7f34b692e9e56141101e2c9e8b2d627a677))

\* add docs url to README.md ([a369adb](https://github.com/Hufe921/canvas-editor/commit/a369adbe32c9f0779725a68b3f6b20cc9cfbe5b2))

\* update index page ([38cb302](https://github.com/Hufe921/canvas-editor/commit/38cb302fa3a62d5db600ed2df3e8794497a59c52))

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#### Features

␣

\* adjust selection by direction key ([1dfdd9a](https://github.com/Hufe921/canvas-editor/commit/1dfdd9a057f20c0fc512f869b3c914317c0fed85))

- \* adjust range by shortcut ([4a11bca](https://github.com/Hufe921/canvas-editor/commit/4a11bcacd94a6a0f1340b1741e8ce77d1c6d7e84))
- \* update server host ([bf93c29](https://github.com/Hufe921/canvas-editor/commit/bf93c2991ad7e657ea63f2ccb84d0ea803609125))
- \* add docs workflow ([f2374a1](https://github.com/Hufe921/canvas-editor/commit/f2374a14f562d25e9498b4ec0c96da9927849ebb))
- \* add docs workflow ([7fd0792](https://github.com/Hufe921/canvas-editor/commit/7fd07928b340e3a9795bc4c10d41820d5daffb61))
- \* add docs ([db52ab8](https://github.com/Hufe921/canvas-editor/commit/db52ab815d708b5f66df0f6661b17e1227067181))
- \* add font selection and font wysiwyg ([72d6174](https://github.com/Hufe921/canvas-editor/commit/72d6174d7b0b61be8db42dcf7a21512fafbc1f2d))

## [0.9.11](https://github.com/Hufe921/canvas-editor/compare/v0.9.10...v0.9.11) (2022-12-25)

### Features

- \* optimize event code structure ([f63affc](https://github.com/Hufe921/canvas-editor/commit/f63affc1c4219ee4d65485d11299dbfee47a8be2))
- \* add isPointInRange function to Range ([5e9c1ce](https://github.com/Hufe921/canvas-editor/commit/5e9c1ce57774012cb1903c2e97ac87ff42d1e245))
- \* drag text to editor ([4cf4ea5](https://github.com/Hufe921/canvas-editor/commit/4cf4ea5e45e0ee94a20b53f5e775bba0ef9bacca))
- \* use selection text when searching ([bcd234](https://github.com/Hufe921/canvas-editor/commit/bcd2340ae87dd72831d23b5ac83e984d09842e3))
- \* add cut row feature to contextmenu ([172cb6d](https://github.com/Hufe921/canvas-editor/commit/172cb6d88cf3069452c012b8a52b18d5dba1ff99))
- \* cut a whole line when no selection ([2c38f13](https://github.com/Hufe921/canvas-editor/commit/2c38f13113afb0889a3907a825f397de6a877181))

File Path: canvas-editor/README.md

<h1 align="center">canvas-editor</h1>

<p align="center"> a rich text editor by canvas/svg</p>

## tips

1. [docs](https://hufe.club/canvas-editor-docs/)

2. [canvas-editor-plugin](https://github.com/Hufe921/canvas-editor-plugin)

3. The render layer by svg is under development, see [feature/svg](https://github.com/Hufe921/canvas-editor/tree/feature/svg)

4. The export pdf feature is available now, see [feature/pdf](https://github.com/Hufe921/canvas-editor/tree/feature/pdf)

## usage

```bash

npm i @hufe921/canvas-editor --save

```

```html

<div class="canvas-editor"></div>

```

```javascript

import Editor from "@hufe921/canvas-editor"

new Editor(document.querySelector(".canvas-editor"), [

{

value: "Hello World"

}

])

```

## next features

1. improve performance

2. control rules

3. table paging

4. [CRDT](https://github.com/Hufe921/canvas-editor/tree/feature/CRDT)

## snapshot

![image](https://github.com/Hufe921/canvas-editor/blob/main/src/assets/snapshots/main\_v0.9.35.png)

## install

```
`yarn`  
`  
## dev  
`  
`npm run dev`  
`  
## build  
`  
#### app  
`npm run build`  
`  
#### lib  
`npm run lib`
```

File Path: canvas-editor/cypress/fixtures/test.png



```
File Path: canvas-editor/cypress/global.d.ts
/// <reference types="cypress" />
{
  declare namespace Editor {
    import('../src/editor/index')
    // eslint-disable-next-line @typescript-eslint/no-unused-vars
    import Editor from '../src/editor/index'
  }
}
{
  declare namespace Cypress {
    {
      interface Chainable {
        {
          getEditor(): Chainable<Editor>
        }
      }
    }
  }
}
```



File Path: canvas-editor/cypress/integration/control/checkbox.spec.ts

```
import Editor, { ControlType, ElementType } from '../../src/editor'
```

```
describe('c$Nö-Y • hF', () => {
```

```
  beforeEach(() => {
```

```
    cy.visit('http://localhost:3000/canvas-editor/')
  })
```

```
  const elementType: ElementType = <ElementType>'control'
```

```
  const controlType: ControlType = <ControlType>'checkbox'
```

```
  it('Y • hF', () => {
```

```
    cy.getEditor().then((editor: Editor) => {
```

```
      editor.command.executeSelectAll()
```

```
      editor.command.executeBackspace()
```

```
      editor.command.executeInsertElementList([
```

```
        {
```

```
          type: elementType,
```

```
          value: '',
```

```
          control: {
```

```
            code: '98175',
```

```
            type: controlType,
```

```
            value: null,
```

```
            valueSets: [
```

```
              {
```

```
                value: 'g ',
```

```
                code: '98175'
```

```
              }, {
```

```
                value: 'eà',
```

```
                code: '98176'
```

```
              ]
```

```
            }]
```

```
          ]
```

```
    })
```

```
    const data = editor.command.getValue().data.main[0]
```

```
    expect(data.control!.code).to.be.eq('98175')
```

```
  })
```

```
})
```

```

File Path: canvas-editor/cypress/integration/control/select.spec.ts
import Editor, { ControlType, ElementType } from '../src/editor'
describe('control', () => {
  beforeEach(() => {
    cy.visit('http://localhost:3000/canvas-editor')
    cy.get('canvas').first().as('canvas').should('have.length', 1)
  })
  const text = `g`
  const elementType: ElementType = <ElementType>'control'
  const controlType: ControlType = <ControlType>'select'
  it('control', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      editor.command.executeInsertElementList([
        {
          type: elementType,
          value: "",
          control: {
            type: controlType,
            value: null,
            placeholder: 'control',
            valueSets: [
              {
                value: 'g',
                code: '98175'
              },
              {
                value: 'eà',
                code: '98176'
              }
            ]
          }
        }
      ])
    })
    cy.get('@canvas').type(`${leftArrow}`)
    cy.get('.ce-select-control-popup li')
      .eq(0)
      .click()
      .then(() => {
        const data = editor.command.getValue().data.main[0]
      })
  })
})

```

```
    expect(data.control!.value![0].value).to.be.eq(text)␣  
␣  
    expect(data.control!.code).to.be.eq('98175')␣  
  })␣  
})␣  
})␣  
␣  
})␣
```

```

File Path: canvas-editor/cypress/integration/control/text.spec.ts
import Editor, { ControlType, ElementType } from '../src/editor'
describe('c$Nö-e±g,W', () => {
  beforeEach(() => {
    cy.visit('http://localhost:3000/canvas-editor')
    cy.get('canvas').first().as('canvas').should('have.length', 1)
  })
  const text = `canvas-editor`
  const elementType: ElementType = <ElementType>'control'
  const controlType: ControlType = <ControlType>'text'
  it('e±g,W', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      editor.command.executeInsertElementList([
        {
          type: elementType,
          value: "",
          control: {
            type: controlType,
            value: null,
            placeholder: 'e±g,W'
          }
        }
      ])
      cy.get('@canvas').type(`${leftArrow}`)
      cy.get('.ce-inputarea')
        .type(text)
        .then(() => {
          const data = editor.command.getValue().data.main[0]
          expect(data.control!.value![0].value).to.be.eq(text)
        })
    })
  })
})

```

File Path: canvas-editor/cypress/integration/editor.spec.ts

```
import Editor from '../src/editor'
describe('Wúx@RŸ€ý', () => {
  beforeEach(() => {
    cy.visit('http://localhost:3000/canvas-editor')
    cy.get('canvas').first().as('canvas').should('have.length', 1)
  })
  const text = 'canvas-editor'
  it('••OÝ[X', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      cy.get('@canvas')
        .type(text)
        .then(() => {
          const data = editor.command.getValue().data.main
          expect(data[0].value).to.eq(text)
        })
    })
  })
  it('j!_ R cb', () => {
    cy.get('@canvas').click()
    cy.get('.ce-cursor').should('have.css', 'display', 'block')
    cy.get('.editor-mode').click().click()
    cy.get('.editor-mode').contains('Sêˆu')
    cy.get('@canvas').click()
    cy.get('.ce-cursor').should('have.css', 'display', 'none')
  })
  it('u—b•e>', () => {
    cy.get('.page-scale-add').click()
  })
})
```

```

    cy.get('.page-scale-percentage').contains('110%')
  })
  cy.get('.page-scale-minus').click().click()
  cy.get('.page-scale-percentage').contains('90%')
})
it('["Wep~ß<|', () => {
  cy.getEditor().then(async (editor: Editor) => {
    editor.command.executeSelectAll()
    editor.command.executeBackspace()
    editor.command.executeInsertElementList([
      {
        value: 'canvas-editor 2022 ••'
      }
    ])
    cy.get('.word-count').contains('7')
  })
})
})

```

File Path: canvas-editor/cypress/integration/menus/block.spec.ts

```
import Editor from '../src/editor'
describe('fÜSU-Q...[1WW', () => {
  const url = 'http://localhost:3000/canvas-editor/'
  beforeEach(() => {
    cy.visit(url)
  })
  it('Q...[1WW', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      cy.get('.menu-item__block').click()
      cy.get('.dialog-option__item [name="width"]').type('500')
      cy.get('.dialog-option__item [name="height"]').type('300')
      cy.get('.dialog-option__item [name="value"]').type(url)
      cy.get('.dialog-menu button')
        .eq(1)
        .click()
        .then(() => {
          const data = editor.command.getValue().data.main
          expect(data[0].type).to.eq('block')
          expect(data[0].block?.iframeBlock?.src).to.eq(url)
        })
    })
  })
})
```

File Path: canvas-editor/cypress/integration/menus/checkbox.spec.ts

```
import Editor, { ElementType } from '../src/editor'
describe('fÜSU-Y • hF', () => {
  beforeEach(() => {
    cy.visit('http://localhost:3000/canvas-editor')
    cy.get('canvas').first().as('canvas').should('have.length', 1)
  })
  const type: ElementType = <ElementType>'checkbox'
  it('Nãx WW', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      editor.command.executeInsertElementList([
        type,
        value: "",
        checkbox: {
          value: true
        }
      ])
      const data = editor.command.getValue().data.main[0]
      expect(data.checkbox?.value).to.eq(true)
    })
  })
})
```



File Path: canvas-editor/cypress/integration/menus/codeblock.spec.ts

```
import Editor from '../src/editor'
describe('fÜSU-Nãx WW', () => {
  beforeEach(() => {
    cy.visit('http://localhost:3000/canvas-editor')
    cy.get('canvas').first().as('canvas').should('have.length', 1)
  })
  const text = `console.log('canvas-editor')`
  it('Nãx WW', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      cy.get('.menu-item__codeblock').click()
      cy.get('.dialog-option [name="codeblock"]').type(text)
      cy.get('.dialog-menu button')
        .eq(1)
        .click()
        .then(() => {
          const data = editor.command.getValue().data.main[2]
          expect(data.value).to.eq('log')
          expect(data.color).to.eq('#b9a40a')
        })
    })
  })
})
```

File Path: canvas-editor/cypress/integration/menus/date.spec.ts

```
import Editor from '../src/editor'
describe('fÜSU-eåg • béVh', () => {
  beforeEach(() => {
    cy.visit('http://localhost:3000/canvas-editor')
    cy.get('canvas').first().as('canvas').should('have.length', 1)
  })
  it('LaTeX', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      cy.get('.menu-item__date').click()
      cy.get('.menu-item__date li')
        .first()
        .click()
        .then(() => {
          const data = editor.command.getValue().data.main
          expect(data[0].type).to.eq('date')
        })
    })
  })
})
```

File Path: canvas-editor/cypress/integration/menus/format.spec.ts

```
import Editor from '../src/editor'
describe('föSU-n -dh<_ ', () => {
  beforeEach(() => {
    cy.visit('http://localhost:3000/canvas-editor')
    cy.get('canvas').first().as('canvas').should('have.length', 1)
  })
  const text = 'canvas-editor'
  const textLength = text.length
  it('n -dh<_ ', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      editor.command.executeInsertElementList([
        {
          value: text,
          bold: true,
          italic: true
        }
      ])
      editor.command.executeSetRange(0, textLength)
      cy.get('.menu-item__format')
        .click()
        .then(() => {
          const data = editor.command.getValue().data.main
          expect(data[0].italic).to.eq(false)
          expect(data[0].bold).to.eq(false)
        })
    })
  })
})
```

File Path: canvas-editor/cypress/integration/menus/hyperlink.spec.ts

```
import Editor from '../src/editor'
describe('fÜSU-•...”pc¥', () => {
  beforeEach(() => {
    cy.visit('http://localhost:3000/canvas-editor')
    cy.get('canvas').first().as('canvas').should('have.length', 1)
  })
  const text = 'canvas-editor'
  const url = 'https://hufe.club/canvas-editor'
  it('•...”pc¥', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      cy.get('.menu-item__hyperlink').click()
      cy.get('.dialog-option__item [name="name"]').type(text)
      cy.get('.dialog-option__item [name="url"]').type(url)
      cy.get('.dialog-menu button')
        .eq(1)
        .click()
        .then(() => {
          const data = editor.command.getValue().data.main
          expect(data[0].type).to.eq('hyperlink')
          expect(data[0].url).to.eq(url)
          expect(data[0]? .valueList?.[0].value).to.eq(text)
        })
    })
  })
})
```

File Path: canvas-editor/cypress/integration/menus/image.spec.ts

```
import Editor from '../src/editor'
describe('fÜSU-VprG', () => {
  beforeEach(() => {
    cy.visit('http://localhost:3000/canvas-editor')
    cy.get('canvas').first().as('canvas').should('have.length', 1)
  })
  it('VprG', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      cy.get('#image').attachFile('test.png')
      cy.wait(200).then(() => {
        const data = editor.command.getValue().data.main
        expect(data[0].type).to.eq('image')
      })
    })
  })
})
```

File Path: canvas-editor/cypress/integration/menus/latex.spec.ts

```
import Editor from '../src/editor'
describe('fÜSU-LaTeX', () => {
  beforeEach(() => {
    cy.visit('http://localhost:3000/canvas-editor')
    cy.get('canvas').first().as('canvas').should('have.length', 1)
  })
  const text = 'canvas-editor'
  it('LaTeX', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      cy.get('.menu-item__latex').click()
      cy.get('.dialog-option__item [name="value"]').type(text)
      cy.get('.dialog-menu button')
        .eq(1)
        .click()
        .then(() => {
          const data = editor.command.getValue().data.main
          expect(data[0].type).to.eq('latex')
          expect(data[0].value).to.eq(text)
        })
    })
  })
})
```

File Path: canvas-editor/cypress/integration/menus/pagebreak.spec.ts

```
import Editor from '../src/editor'
```

```
{
```

```
  describe('föSU-R ~u{&', () => {
```

```
    {
```

```
      beforeEach(() => {
```

```
        cy.visit('http://localhost:3000/canvas-editor/')
```

```
      {
```

```
        cy.get('canvas').first().as('canvas').should('have.length', 1)
```

```
      })
```

```
    {
```

```
      it('R ~u{&', () => {
```

```
        {
```

```
          cy.getEditor().then((editor: Editor) => {
```

```
            editor.command.executeSelectAll()
```

```
          {
```

```
            editor.command.executeBackspace()
```

```
          {
```

```
            cy.get('.menu-item__page-break').click().click()
```

```
          {
```

```
            cy.get('canvas').should('have.length', 2)
```

```
          })
```

```
        {
```

```
          })
```

```
      {
```

```
    })
```

File Path: canvas-editor/cypress/integration/menus/painter.spec.ts

```
import Editor from '../src/editor'
```

```
ð
```

```
describe('fÜSU-h<_ R7', () => {ð
```

```
ð
```

```
  beforeEach(() => {ð
```

```
    cy.visit('http://localhost:3000/canvas-editor/')ð
```

```
ð
```

```
    cy.get('canvas').first().as('canvas').should('have.length', 1)ð
```

```
  })ð
```

```
ð
```

```
    const text = 'canvas-editor'
```

```
    const textLength = text.lengthð
```

```
ð
```

```
    it('h<_ R7', () => {ð
```

```
      cy.getEditor().then((editor: Editor) => {ð
```

```
        editor.command.executeSelectAll()ð
```

```
ð
```

```
        editor.command.executeBackspace()ð
```

```
ð
```

```
        editor.command.executeInsertElementList([ð
```

```
          value: text,ð
```

```
          bold: true,ð
```

```
          italic: trueð
```

```
        ])ð
```

```
ð
```

```
        editor.command.executeInsertElementList([ð
```

```
          value: textð
```

```
        ])ð
```

```
ð
```

```
        editor.command.executeSetRange(0, textLength)ð
```

```
ð
```

```
        cy.get('.menu-item__painter')ð
```

```
          .click()ð
```

```
          .then(() => {ð
```

```
            editor.command.executeSetRange(textLength, 2 * textLength)ð
```

```
ð
```

```
            editor.command.executeApplyPainterStyle()ð
```

```
ð
```

```
            const data = editor.command.getValue().data.mainð
```

```
ð
```

```
            expect(data.length).to.eq(1)ð
```

```
ð
```

```
            expect(data[0].italic).to.eq(true)ð
```

```
ð
```

```
            expect(data[0].bold).to.eq(true)ð
```



}}D  
}}D  
}}D  
D  
}}D

File Path: canvas-editor/cypress/integration/menus/print.spec.ts

```
import Editor from '../src/editor'
describe('fÜSU-bSSp', () => {
  beforeEach(() => {
    cy.visit('http://localhost:3000/canvas-editor')
    cy.get('canvas').should('have.length', 2)
  })
  it('bSSp', () => {
    cy.getEditor().then(async (editor: Editor) => {
      const imageList2 = await editor.command.getImage()
      expect(imageList2.length).to.eq(2)
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      cy.wait(200).then(async () => {
        const imageList1 = await editor.command.getImage()
        expect(imageList1.length).to.eq(1)
      })
    })
  })
})
```

File Path: canvas-editor/cypress/integration/menus/row.spec.ts

```
import Editor from '../src/editor'
describe('fÜSU-^LY t ', () => {
  beforeEach(() => {
    cy.visit('http://localhost:3000/canvas-editor')
    cy.get('canvas').first().as('canvas').should('have.length', 1)
  })
  const text = 'canvas-editor'
  it('æüŸP', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      editor.command.executeInsertElementList([
        {
          value: text
        }
      ])
      cy.get('.menu-item__left')
        .click()
        .then(() => {
          const data = editor.command.getValue().data.main
          expect(data[0].rowFlex).to.eq('left')
        })
    })
  })
  it('\EN-üŸP', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      editor.command.executeInsertElementList([
        {
          value: text
        }
      ])
      cy.get('.menu-item__center')
        .click()
        .then(() => {
```

```

    const data = editor.command.getValue().data.main
  })
  expect(data[0].rowFlex).to.eq('center')
})
})
  })
  it('—`Só[ùŸP', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
    })
    editor.command.executeBackspace()
    editor.command.executeInsertElementList([
      {
        value: text
      }
    ])
    cy.get('.menu-item__right')
      .click()
      .then(() => {
        const data = editor.command.getValue().data.main
      })
      expect(data[0].rowFlex).to.eq('right')
    })
  })
  it('ˆL•ô•Ý', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
    })
    editor.command.executeBackspace()
    editor.command.executeInsertElementList([
      {
        value: text
      }
    ])
    cy.get('.menu-item__row-margin').as('rowMargin').click()
    cy.get('@rowMargin')
      .find('li')
      .eq(1)
      .click()
      .then(() => {
        const data = editor.command.getValue().data.main
      })
  })

```

```
        expect(data[0].rowMargin).to.eq(1.25)
    })
  })
}
}
}
```

File Path: canvas-editor/cypress/integration/menus/search.spec.ts

```
import Editor, { ElementType } from '../../src/editor'
```

```
ð
```

```
describe('fÜSU-d }"', () => {ð
```

```
ð
```

```
  beforeEach(() => {ð
```

```
    cy.visit('http://localhost:3000/canvas-editor/')ð
```

```
ð
```

```
    cy.get('canvas').first().as('canvas').should('have.length', 1)ð
```

```
  })ð
```

```
ð
```

```
  const searchText = 'canvas-editor'ð
```

```
  const replaceText = 'replace'ð
```

```
  const type: ElementType = <ElementType>'table'ð
```

```
ð
```

```
  it('d }"', () => {ð
```

```
    cy.getEditor().then((editor: Editor) => {ð
```

```
      editor.command.executeSelectAll()ð
```

```
ð
```

```
      editor.command.executeBackspace()ð
```

```
ð
```

```
      editor.command.executeInsertElementList([ð
```

```
        {ð
```

```
          value: searchTextð
```

```
        },ð
```

```
        {ð
```

```
          value: '\n',ð
```

```
          type,ð
```

```
          trList: [ð
```

```
            {ð
```

```
              height: 42,ð
```

```
              tdList: [ð
```

```
                {ð
```

```
                  colspan: 1,ð
```

```
                  rowspan: 1,ð
```

```
                  value: [ð
```

```
                    {ð
```

```
                      value: searchTextð
```

```
                    }ð
```

```
                  ]ð
```

```
                },ð
```

```
                {ð
```

```
                  colspan: 1,ð
```

```
                  rowspan: 1,ð
```

```
                  value: []ð
```

```
                }ð
```

```

    ]
  },
  {
    height: 42,
    tdList: [
      {
        colspan: 1,
        rowspan: 1,
        value: []
      },
      {
        colspan: 1,
        rowspan: 1,
        value: [
          {
            value: searchText
          }
        ]
      }
    ]
  }
],
colgroup: [
  {
    width: 200
  },
  {
    width: 200
  }
]
})
}
cy.get('.menu-item__search').click()
cy.get('.menu-item__search__collapse input').eq(0).type(searchText)
// d }"ü,*
cy.get('.menu-item__search__collapse .arrow-right').click()
cy.get('.menu-item__search__collapse__search .search-result')
  .should('have.text', '1/3')
cy.get('.menu-item__search__collapse__replace').as('replace')
cy.get('@replace').find('input').type(replaceText)

```

```

cy.get('@replace')
  .find('button')
  .click()
  .then(() => {
    const data = editor.command.getValue().data.main
    // fn• e±g,
    expect(data[0].value).to.be.eq(replaceText)
    // ^hh<Q...e±g,
    expect(data[1].trList![0].tdList[0].value[0].value).to.be.eq(replaceText)
    expect(data[1].trList![1].tdList[1].value[0].value).to.be.eq(replaceText)
  })
})
})

```



File Path: canvas-editor/cypress/integration/menus/separator.spec.ts

```
import Editor from '../src/editor'
describe('fÜSU-R Rr~ç', () => {
  beforeEach(() => {
    cy.visit('http://localhost:3000/canvas-editor')
    cy.get('canvas').first().as('canvas').should('have.length', 1)
  })
  it('R Rr~ç', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      cy.get('.menu-item__separator').click()
      cy.get('.menu-item__separator li')
        .eq(1)
        .click()
        .then(() => {
          const data = editor.command.getValue().data.main
          expect(data[0].type).to.eq('separator')
          expect(data[0]?.dashArray?.[0]).to.eq(1)
          expect(data[0]?.dashArray?.[1]).to.eq(1)
        })
    })
  })
})
```

File Path: canvas-editor/cypress/integration/menus/table.spec.ts

```
import Editor from '../src/editor'
describe('fÜSU-^hh<', () => {
  beforeEach(() => {
    cy.visit('http://localhost:3000/canvas-editor')
    cy.get('canvas').first().as('canvas').should('have.length', 1)
  })
  it('^hh<', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      editor.command.executeInsertTable(8, 8)
      const data = editor.command.getValue().data.main
      expect(data[0].type).to.eq('table')
      expect(data[0].trList?.length).to.eq(8)
    })
  })
})
```

File Path: canvas-editor/cypress/integration/menus/text.spec.ts

```
import Editor from '../src/editor'
describe('fÜSU-e±g,Y t ', () => {
  beforeEach(() => {
    cy.visit('http://localhost:3000/canvas-editor/')
    cy.get('canvas').first().as('canvas').should('have.length', 1)
  })
  const text = 'canvas-editor'
  const textLength = text.length
  it('["WOS', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      editor.command.executeInsertElementList([
        {
          value: text
        }
      ])
      editor.command.executeSetRange(0, textLength)
      cy.get('.menu-item__font').as('font').click()
      cy.get('@font')
        .find('li')
        .eq(1)
        .click()
        .then(() => {
          const data = editor.command.getValue().data.main
          expect(data[0].font).to.eq('OS')
        })
    })
  })
  it('["WS÷¼•n', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
    })
  })
})
```

```

        editor.command.executeInsertElementList([{
            value: text
        }])
    }
    editor.command.executeSetRange(0, textLength)
    cy.get('.menu-item__size').as('size').click()
    cy.get('@size')
        .find('li')
        .eq(0)
        .click()
        .then(() => {
            const data = editor.command.getValue().data.main
            expect(data[0].size).to.eq(56)
        })
    })
    it('["WOSXžY", () => {
        cy.getEditor().then((editor: Editor) => {
            editor.command.executeSelectAll()
            editor.command.executeBackspace()
            editor.command.executeInsertElementList([{
                value: text
            }])
            editor.command.executeSetRange(0, textLength)
            cy.get('.menu-item__size-add')
                .click()
                .then(() => {
                    const data = editor.command.getValue().data.main
                    expect(data[0].size).to.eq(18)
                })
            })
        })
    it('["WOSQİ", () => {
        cy.getEditor().then((editor: Editor) => {
            editor.command.executeSelectAll()

```

```

    editor.command.executeBackspace()
  })
  editor.command.executeInsertElementList([
    {
      value: text
    }
  ])
  editor.command.executeSetRange(0, textLength)
  cy.get('.menu-item__size-minus')
    .click()
    .then(() => {
      const data = editor.command.getValue().data.main
      expect(data[0].size).to.eq(14)
    })
  })
  it('R |—', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      editor.command.executeInsertElementList([
        {
          value: text
        }
      ])
      editor.command.executeSetRange(0, textLength)
      cy.get('.menu-item__bold')
        .click()
        .then(() => {
          const data = editor.command.getValue().data.main
          expect(data[0].bold).to.eq(true)
        })
      })
    })
    it('œOS', () => {
      cy.getEditor().then((editor: Editor) => {
        editor.command.executeSelectAll()
        editor.command.executeBackspace()
      })
    })
  })

```

```

    editor.command.executeInsertElementList([{
      value: text
    }])
  })
  editor.command.executeSetRange(0, textLength)
  cy.get('.menu-item__italic')
    .click()
    .then(() => {
      const data = editor.command.getValue().data.main
      expect(data[0].italic).to.eq(true)
    })
  })
  it('N R ~ı', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      editor.command.executeInsertElementList([{
        value: text
      }])
      editor.command.executeSetRange(0, textLength)
      cy.get('.menu-item__underline')
        .click()
        .then(() => {
          const data = editor.command.getValue().data.main
          expect(data[0].underline).to.eq(true)
        })
    })
  })
  it('R -d~ı', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      editor.command.executeInsertElementList([{
        value: text
      }])
    })
  })

```

```

    })
  })
  editor.command.executeSetRange(0, textLength)
  cy.get('.menu-item__strikeout')
    .click()
    .then(() => {
      const data = editor.command.getValue().data.main
      expect(data[0].strikeout).to.eq(true)
    })
  })
  it('N h ', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      editor.command.executeInsertElementList([
        {
          value: text
        }
      ])
      editor.command.executeSetRange(0, textLength)
      cy.get('.menu-item__superscript')
        .click()
        .then(() => {
          const data = editor.command.getValue().data.main
          expect(data[0].type).to.eq('superscript')
        })
    })
    it('N h ', () => {
      cy.getEditor().then((editor: Editor) => {
        editor.command.executeSelectAll()
        editor.command.executeBackspace()
        editor.command.executeInsertElementList([
          {
            value: text
          }
        ])
      })
    })
  })

```

```

    editor.command.executeSetRange(0, textLength)
  }
  cy.get('.menu-item__subscript').click().then(() => {
    const data = editor.command.getValue().data.main
    expect(data[0].type).to.eq('subscript')
  })
})
})
})
it('["WOS~œ,r', () => {
  cy.getEditor().then((editor: Editor) => {
    editor.command.executeSelectAll()
    editor.command.executeBackspace()
    editor.command.executeInsertElementList([
      {
        value: text
      }
    ])
    editor.command.executeSetRange(0, textLength)
    editor.command.executeColor('red')
    const data = editor.command.getValue().data.main
    expect(data[0].color).to.eq('red')
  })
})
it('["šØN®', () => {
  cy.getEditor().then((editor: Editor) => {
    editor.command.executeSelectAll()
    editor.command.executeBackspace()
    editor.command.executeInsertElementList([
      {
        value: text
      }
    ])
    editor.command.executeSetRange(0, textLength)
    editor.command.executeHighlight('red')
    const data = editor.command.getValue().data.main
  })
})

```



```
    expect(data[0].highlight).to.eq('red')  
  })  
})  
D  
})
```

```

File Path: canvas-editor/cypress/integration/menus/title.spec.ts
import Editor, { ElementType, TitleLevel } from '../../src/editor'
describe('fÜSU-h ~', () => {
  const url = 'http://localhost:3000/canvas-editor/'
  beforeEach(() => {
    cy.visit(url)
    cy.get('canvas').first().as('canvas').should('have.length', 1)
  })
  const text = 'canvas-editor'
  const elementType = <ElementType>'title'
  const level = <TitleLevel>'first'
  it('h ~', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      editor.command.executeInsertElementList([
        {
          value: text
        }
      ])
      cy.get('.menu-item__title').as('title').click()
      cy.get('@title')
        .find('li')
        .eq(1)
        .click()
        .then(() => {
          const data = editor.command.getValue().data.main
          expect(data[0].type).to.eq(elementType)
          expect(data[0].level).to.eq(level)
        })
    })
  })
})

```

File Path: canvas-editor/cypress/integration/menus/undoRedo.spec.ts

```
import Editor from '../src/editor'
describe('föSU-d & íPZ', () => {
  beforeEach(() => {
    cy.visit('http://localhost:3000/canvas-editor')
    cy.get('canvas').first().as('canvas').should('have.length', 1)
  })
  const text = 'canvas-editor'
  it('d', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      cy.get('@canvas').type(`${text}1`)
      cy.get('.menu-item__undo').click()
      .then(() => {
        const data = editor.command.getValue().data.main
        expect(data[0].value).to.eq(text)
      })
    })
  })
  it('íPZ', () => {
    cy.getEditor().then((editor: Editor) => {
      editor.command.executeSelectAll()
      editor.command.executeBackspace()
      cy.get('@canvas').type(`${text}1`)
      cy.get('.menu-item__undo').click()
      cy.get('.menu-item__redo').click()
      .then(() => {
        const data = editor.command.getValue().data.main
      })
    })
  })
})
```

```
        expect(data[0].value).to.eq(`${text}1`)
    })
})
}
}
}
```

File Path: canvas-editor/cypress/integration/menus/watermark.spec.ts

```
import Editor from '../src/editor'
describe('fÜSU-l4Sp', () => {
  beforeEach(() => {
    cy.visit('http://localhost:3000/canvas-editor/')
    cy.get('canvas').first().as('canvas').should('have.length', 1)
  })
  const text = 'canvas-editor'
  const size = 80
  it('mûR l4Sp', () => {
    cy.getEditor().then((editor: Editor) => {
      cy.get('.menu-item__watermark').click()
      cy.get('.menu-item__watermark li').eq(0).click()
      cy.get('.dialog-option [name="data"]').type(text)
      cy.get('.dialog-option [name="size"]').as('size')
      cy.get('@size').clear()
      cy.get('@size').type(`${size}`)
      cy.get('.dialog-menu button')
        .eq(1)
        .click()
        .then(() => {
          const payload = editor.command.getValue()
          const { watermark } = payload
          expect(watermark?.data).to.eq(text)
          expect(watermark?.size).to.eq(size)
        })
    })
  })
  it('R -dl4Sp', () => {
    cy.getEditor().then((editor: Editor) => {
      cy.get('.menu-item__watermark').click()
    })
  })
})
```

```
    })
    cy.get('.menu-item__watermark li')
      .eq(1)
      .click()
      .then(() => {
        const payload = editor.command.getValue()
        const { watermark } = payload
        expect(watermark?.data).to.eq(undefined)
        expect(watermark?.size).to.eq(undefined)
      })
    })
  })
})
```

File Path: canvas-editor/cypress/plugins/index.ts

```
/// <reference types="cypress" />
```

```
/**
```

```
 * @type {Cypress.PluginConfig}
```

```
 */
```

```
export default (on: Cypress.PluginEvents, config: Cypress.PluginConfigOptions) => {
```

```
  // `on` is used to hook into various events Cypress emits
```

```
  // `config` is the resolved Cypress config
```

```
  // codeCoverageTask(on, config)
```

```
  return config
```

```
}
```

```
File Path: canvas-editor/cypress/support/commands.ts
import 'cypress-file-upload'
Cypress.Commands.add('getEditor', () => {
  return cy.window().its('editor')
})
```



File Path: canvas-editor/cypress/support/index.ts  
import './commands'

File Path: canvas-editor/docs/.vitepress/config.ts

```
import { defineConfig } from 'vitepress'
export default defineConfig({
  base: '/canvas-editor-docs/',
  title: 'canvas-editor',
  description: 'rich text editor by canvas/svg',
  themeConfig: {
    algolia: {
      appId: 'RWSVW6F3S5',
      apiKey: 'e462fffb4d2e9ab4a78c29e0b457ab33',
      indexName: 'hufe',
    },
    logo: '/favicon.png',
    nav: [
      {
        text: 'c SW',
        link: '/guide/start',
        activeMatch: '/guide/'
      },
      {
        text: 'Demo',
        link: 'https://hufe.club/canvas-editor'
      }
    ],
    sidebar: [
      {
        text: ' _ YË',
        items: [
          { text: 'Qe•è', link: '/guide/start' },
          { text: 'M•n', link: '/guide/option' },
          { text: 'Vý–ES ', link: '/guide/i18n' },
          { text: 'epcn~Óg,,', link: '/guide/schema' }
        ]
      },
      {
        text: 'T}Nä',
        items: [
          { text: 'bg^LR"O\T}Nä', link: '/guide/command-execute' },
          { text: 'f·SÖepcnT}Nä', link: '/guide/command-get' }
        ]
      },
      {
        text: 'vÑT,',
        items: [
          { text: 'N<NövÑT,', link: '/guide/listener' }
        ]
      }
    ]
  }
})
```

```

    text: '_ëcw•.',Ð
    items: [Ð
      { text: 'Q...•è_ëcw•.', link: '/guide/shortcut-internal' },Ð
      { text: '•ê[šNI_ëcw•.', link: '/guide/shortcut-custom' }],Ð
    ],Ð
  },Ð
  {Ð
    text: 'Só•.fÜSU',Ð
    items: [Ð
      { text: 'Q...•èSó•.fÜSU', link: '/guide/contextmenu-internal' },Ð
      { text: '•ê[šNISó•.fÜSU', link: '/guide/contextmenu-custom' }],Ð
    ],Ð
  },Ð
  {Ð
    text: 'API',Ð
    items: [Ð
      { text: 'Qh\@API', link: '/guide/api' }],Ð
    ],Ð
  },Ð
  {Ð
    text: 'cÖNö',Ð
    items: [Ð
      { text: '•ê[šNIcÖNö', link: '/guide/plugin' }],Ð
    ],Ð
  },Ð
],Ð
socialLinks: [{Ð
  icon: 'github',Ð
  link: 'https://github.com/Hufe921/canvas-editor'Ð
}],Ð
footer: {Ð
  message: 'Released under the MIT License.',Ð
  copyright: 'Copyright © 2021-present Hufe'Ð
},Ð
},Ð
})

```

File Path: canvas-editor/docs/guide/api.md

```
# Qh\@APIĐ
```

```
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```

```
## O•u(e¹_ Đ
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```
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```

```
```javascriptĐ
```

```
import Editor from "@hufe921/canvas-editor"Đ
```

```
Đ
```

```
const instance = new Editor(container, <|Element[]>data, options)Đ
```

```
instance.apiName()Đ
```

```
```Đ
```

```
## destroyĐ
```

```
RŸ€ýŸ • kÁ• •VhĐ
```

```
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```
u(lŌŸ Đ
```

```
```javascriptĐ
```

```
instance.destroy()Đ
```

```
```Đ
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```
::: warningĐ
```

```
NÁ• kÁ• •VhdomSÊvøQsNŸNöŸ fÜSUh 0 ]åQwh 0 Y •èSØ'İ|— •ê^LY t 0 Đ
```

```
:::
```

File Path: canvas-editor/docs/guide/command-execute.md

```
# bg^LR"O\T}Nä
```

```
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```

```
## O•u(e¹_ Đ
```

```
Đ
```

```
```javascriptĐ
```

```
import Editor from "@hufe921/canvas-editor"Đ
```

```
Đ
```

```
const instance = new Editor(container, <|Element[]>data, options)Đ
```

```
instance.command.commandName()Đ
```

```
```Đ
```

```
Đ
```

```
## executeModeĐ
```

```
RŸ€ŸŸ R cb••Vhj!_ Ÿ ••0 n m 0 SêˆŸŸ Đ
```

```
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```

```
u(lŌŸŸ Đ
```

```
```javascriptĐ
```

```
instance.command.executeMode(editorMode: EditorMode)Đ
```

```
```Đ
```

```
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```

```
## executeCutĐ
```

```
RŸ€ŸŸ RjR Đ
```

```
Đ
```

```
u(lŌŸŸ Đ
```

```
```javascriptĐ
```

```
instance.command.executeCut()Đ
```

```
```Đ
```

```
Đ
```

```
## executeCopyĐ
```

```
RŸ€ŸŸ Y R6Đ
```

```
Đ
```

```
u(lŌŸŸ Đ
```

```
```javascriptĐ
```

```
instance.command.executeCopy()Đ
```

```
```Đ
```

```
Đ
```

```
## executePasteĐ
```

```
RŸ€ŸŸ |~•4Đ
```

```
Đ
```

```
u(lŌŸŸ Đ
```

```
```javascriptĐ
```

```
instance.command.executePaste()Đ
```

```
```Đ
```

```
Đ
```

```
## executeSelectAllĐ
```

```
RŸ€ŸŸ Qh• Đ
```

```

Ð
u(lÕÿ Ð
```javascriptÐ
instance.command.executeSelectAll()Ð
```Ð
Ð
## executeBackspaceÐ
RŸ€ÿÿ T RMR -dÐ
Ð
u(lÕÿ Ð
```javascriptÐ
instance.command.executeBackspace()Ð
```Ð
Ð
## executeSetRangeÐ
RŸ€ÿÿ ¸¼•n• S:Ð
Ð
u(lÕÿ Ð
```javascriptÐ
instance.command.executeSetRange(startIndex: number , endIndex: number)Ð
```Ð
Ð
## executeUndoÐ
RŸ€ÿÿ d¤• Ð
Ð
u(lÕÿ Ð
```javascriptÐ
instance.command.executeUndo()Ð
```Ð
Ð
## executeRedoÐ
RŸ€ÿÿ 'ÍPZÐ
Ð
u(lÕÿ Ð
```javascriptÐ
instance.command.executeRedo()Ð
```Ð
Ð
## executePainterÐ
RŸ€ÿÿ h<_ R7-Y R6h7_ Ð
Ð
u(lÕÿ Ð
```javascriptÐ
instance.command.executePainter()Ð
```Ð
Ð

```

```

## executeApplyPainterStyleĐ
RŸ€ýŸ h<_ R7-^"u(h7_ Đ
Đ
u(lŌŸ Đ
```javascriptĐ
instance.command.executeApplyPainterStyle()Đ
```Đ
Đ
## executeFormatĐ
RŸ€ýŸ n –dh7_ Đ
Đ
u(lŌŸ Đ
```javascriptĐ
instance.command.executeFormat()Đ
```Đ
Đ
## executeFontĐ
RŸ€ýŸ ‹¾•n[WOSĐ
Đ
u(lŌŸ Đ
```javascriptĐ
instance.command.executeFont(font: string)Đ
```Đ
Đ
## executeSizeĐ
RŸ€ýŸ ‹¾•n[WS÷Đ
Đ
u(lŌŸ Đ
```javascriptĐ
instance.command.executeSize(size: number)Đ
```Đ
Đ
## executeSizeAddĐ
RŸ€ýŸ XžY'[WS÷Đ
Đ
u(lŌŸ Đ
```javascriptĐ
instance.command.executeSizeAdd()Đ
```Đ
Đ
## executeSizeMinusĐ
RŸ€ýŸ Qİ\ [WS÷Đ
Đ
u(lŌŸ Đ
```javascriptĐ
instance.command.executeSizeMinus()Đ

```

```

```
Ð
## executeBoldÐ
RŸ€ýŸ [WOSR |—Ð
Ð
u(lÕŸ Ð
```javascriptÐ
instance.command.executeBold()Ð
```
Ð
## executeltalicÐ
RŸ€ýŸ [WOSecœOSÐ
Ð
u(lÕŸ Ð
```javascriptÐ
instance.command.executeltalic()Ð
```
Ð
## executeUnderlineÐ
RŸ€ýŸ N R ~¿Ð
Ð
u(lÕŸ Ð
```javascriptÐ
instance.command.executeUnderline()Ð
```
Ð
## executeStrikeoutÐ
RŸ€ýŸ R –d~¿Ð
Ð
u(lÕŸ Ð
```javascriptÐ
instance.command.executeStrikeout()Ð
```
Ð
## executeSuperscriptÐ
RŸ€ýŸ N h Ð
Ð
u(lÕŸ Ð
```javascriptÐ
instance.command.executeSuperscript()Ð
```
Ð
## executeSubscriptÐ
RŸ€ýŸ N N h Ð
Ð
u(lÕŸ Ð

```



```

```javascript
instance.command.executeSubscript()
```
Ð
## executeColor
RŸ€ýŸ [WOS~œ,r
Ð
u(lÕŸ Ð
```javascript
instance.command.executeColor()
```
Ð
## executeHighlight
RŸ€ýŸ šØN®
Ð
u(lÕŸ Ð
```javascript
instance.command.executeHighlight()
```
Ð
## executeTitle
RŸ€ýŸ h ˆ¼•n
Ð
u(lÕŸ Ð
```javascript
instance.command.executeTitle(TitleLevel | null)
```
Ð
## executeList
RŸ€ýŸ R ˆ¼•n
Ð
u(lÕŸ Ð
```javascript
instance.command.executeList(listType: ListType | null, listStyle?: ListStyle)
```
Ð
## executeRowFlex
RŸ€ýŸ ^L[ùŸP
Ð
u(lÕŸ Ð
```javascript
instance.command.executeRowFlex(rowFlex: RowFlex)
```
Ð
## executeRowMargin
RŸ€ýŸ ^L•ô•Ý
Ð

```

```

u(lŌÿ Đ
```javascriptĐ
instance.command.executeRowMargin(rowMargin: number)Đ
```Đ
Đ
## executeInsertTableĐ
RŸ€ÿÿ cŌQe^hh<Đ
Đ
u(lŌÿ Đ
```javascriptĐ
instance.command.executeInsertTable(row: number, col: number)Đ
```Đ
Đ
## executeInsertTableTopRowĐ
RŸ€ÿÿ T N cŌQeN ^LĐ
Đ
u(lŌÿ Đ
```javascriptĐ
instance.command.executeInsertTableTopRow()Đ
```Đ
Đ
## executeInsertTableBottomRowĐ
RŸ€ÿÿ T N cŌQeN ^LĐ
Đ
u(lŌÿ Đ
```javascriptĐ
instance.command.executeInsertTableBottomRow()Đ
```Đ
Đ
## executeInsertTableLeftColĐ
RŸ€ÿÿ T ]æcŌQeN R Đ
Đ
u(lŌÿ Đ
```javascriptĐ
instance.command.executeInsertTableLeftCol()Đ
```Đ
Đ
## executeInsertTableRightColĐ
RŸ€ÿÿ T SócŌQeN R Đ
Đ
u(lŌÿ Đ
```javascriptĐ
instance.command.executeInsertTableRightCol()Đ
```Đ
Đ
## executeDeleteTableRowĐ

```

```

RŸ€ýŸ R -d_SRM^LĐ
Đ
u(lŌŸ Đ
```javascriptĐ
instance.command.executeDeleteTableRow()Đ
```Đ
Đ
## executeDeleteTableColĐ
RŸ€ýŸ R -d_SRM R Đ
Đ
u(lŌŸ Đ
```javascriptĐ
instance.command.executeDeleteTableCol()Đ
```Đ
Đ
## executeDeleteTableĐ
RŸ€ýŸ R -d^hh<Đ
Đ
u(lŌŸ Đ
```javascriptĐ
instance.command.executeDeleteTable()Đ
```Đ
Đ
## executeMergeTableCellĐ
RŸ€ýŸ T ^v^hh<Đ
Đ
u(lŌŸ Đ
```javascriptĐ
instance.command.executeMergeTableCell()Đ
```Đ
Đ
## executeCancelMergeTableCellĐ
RŸ€ýŸ SŌm^T ^v^hh<Đ
Đ
u(lŌŸ Đ
```javascriptĐ
instance.command.executeCancelMergeTableCell()Đ
```Đ
Đ
## executeTableTdVerticalAlignĐ
RŸ€ýŸ ^hh<SUQCh<W,vô[ùŸPe¹_ Đ
Đ
u(lŌŸ Đ
```javascriptĐ
instance.command.executeTableTdVerticalAlign(payload: VerticalAlign)Đ
```Đ

```

```

Ð
## executeTableBorderTypeÐ
RŸ€ÿÿ ^hh<•¹hF|{W·Ð
Ð
u(lÕÿ Ð
```javascriptÐ
instance.command.executeTableBorderType(payload: TableBorder)Ð
```Ð
Ð
## executeTableTdBackgroundColorÐ
RŸ€ÿÿ ^hh<SUQCh<€lfo,rÐ
Ð
u(lÕÿ Ð
```javascriptÐ
instance.command.executeTableTdBackgroundColor(payload: string)Ð
```Ð
Ð
## executeImageÐ
RŸ€ÿÿ cÕQeVprGÐ
Ð
u(lÕÿ Ð
```javascriptÐ
instance.command.executeImage({Ð
    width: number;Ð
    height: number;Ð
    value: string;Ð
})Ð
```Ð
Ð
## executeHyperlinkÐ
RŸ€ÿÿ cÕQe”pc¥Ð
Ð
u(lÕÿ Ð
```javascriptÐ
instance.command.executeHyperlink({Ð
    type: ElementType.HYPERLINK,Ð
    value: string,Ð
    url: string,Ð
    valueList: IElement[]Ð
})Ð
```Ð
Ð
## executeDeleteHyperlinkÐ
RŸ€ÿÿ R –d”pc¥Ð
Ð
u(lÕÿ Ð

```

```

```javascript
instance.command.executeDeleteHyperlink()
```
Đ
## executeCancelHyperlink
RŸ€Ÿ SÖm~”pc¥
Đ
u(lÕŸ Đ
```javascript
instance.command.executeCancelHyperlink()
```
Đ
## executeEditHyperlink
RŸ€Ÿ ••”pc¥
Đ
u(lÕŸ Đ
```javascript
instance.command.executeEditHyperlink(newUrl: string)
```
Đ
## executeSeparator
RŸ€Ÿ cÒQeR Rr~¿
Đ
u(lÕŸ Đ
```javascript
instance.command.executeSeparator(dashArray: number[])
```
Đ
## executePageBreak
RŸ€Ÿ R ~u{&
Đ
u(lÕŸ Đ
```javascript
instance.command.executePageBreak()
```
Đ
## executeAddWatermark
RŸ€Ÿ mûR l4Sp
Đ
u(lÕŸ Đ
```javascript
instance.command.executeAddWatermark({
  data: string;
  color?: string;
  opacity?: number;
  size?: number;

```

```

    font?: string;Đ
})Đ
```Đ
Đ
## executeDeleteWatermarkĐ
RŸ€Ÿ d } "Đ
Đ
u(lŌŸ Đ
```javascriptĐ
instance.command.executeDeleteWatermark())Đ
```Đ
Đ
## executeSearchĐ
RŸ€Ÿ d } "Đ
Đ
u(lŌŸ Đ
```javascriptĐ
instance.command.executeSearch(keyword: string)Đ
```Đ
Đ
## executeSearchNavigatePreĐ
RŸ€Ÿ d } "[ü,*-N N N*Đ
Đ
u(lŌŸ Đ
```javascriptĐ
instance.command.executeSearchNavigatePre())Đ
```Đ
Đ
## executeSearchNavigateNextĐ
RŸ€Ÿ d } "[ü,*-N N N*Đ
Đ
u(lŌŸ Đ
```javascriptĐ
instance.command.executeSearchNavigateNext())Đ
```Đ
Đ
## executeReplaceĐ
RŸ€Ÿ d } "fŸcbĐ
Đ
u(lŌŸ Đ
```javascriptĐ
instance.command.executeReplace(newWord: string)Đ
```Đ
Đ
## executePrintĐ
RŸ€Ÿ bSSĐ

```

```

Ð
u(lÕÿ Ð
```javascriptÐ
instance.command.executePrint()Ð
```Ð
Ð
## executeReplacelImageElementÐ
RŸ€ÿÿ fyçbVprGÐ
Ð
u(lÕÿ Ð
```javascriptÐ
instance.command.executeReplacelImageElement(newUrl: string)Ð
```Ð
Ð
## executeSaveAsImageElementÐ
RŸ€ÿÿ Sæ[XN:VprGÐ
Ð
u(lÕÿ Ð
```javascriptÐ
instance.command.executeSaveAsImageElement()Ð
```Ð
Ð
## executeChangelImageDisplayÐ
RŸ€ÿÿ e9SØVprG^Lf>y:e' _ Ð
Ð
u(lÕÿ Ð
```javascriptÐ
instance.command.executeSaveAsImageElement(element: IElement, display:
ImageDisplay)Ð
```Ð
Ð
## executePageModeÐ
RŸ€ÿÿ ~u—bj!_ Ð
Ð
u(lÕÿ Ð
```javascriptÐ
instance.command.executePageMode(pageMode: PageMode)Ð
```Ð
Ð
## executePageScaleRecoveryÐ
RŸ€ÿÿ `bY ~u—bSŸYĚ•)e>kÔO«Ð
Ð
u(lÕÿ Ð
```javascriptÐ
instance.command.executePageScaleRecovery()Ð
```Ð

```

```

Ð
## executePageScaleMinusÐ
RŸ€ŸŸ Ÿu—b•)\ Ð
Ð
u(lŒŸ Ð
```javascriptÐ
instance.command.executePageScaleMinus()Ð
```Ð
Ð
## executePageScaleAddÐ
RŸ€ŸŸ Ÿu—be>Y'Ð
Ð
u(lŒŸ Ð
```javascriptÐ
instance.command.executePageScaleAdd()Ð
```Ð
Ð
## executePaperSizeÐ
RŸ€ŸŸ ‹¼•n~,_ Y\ Ð
Ð
u(lŒŸ Ð
```javascriptÐ
instance.command.executePaperSize(width: number, height: number)Ð
```Ð
Ð
## executePaperDirectionÐ
RŸ€ŸŸ ‹¼•n~,_ e¹T Ð
Ð
u(lŒŸ Ð
```javascriptÐ
instance.command.executePaperDirection(paperDirection: PaperDirection)Ð
```Ð
Ð
## executeSetPaperMarginÐ
RŸ€ŸŸ ‹¼•n~,_ Ÿu¹•ŸÐ
Ð
u(lŒŸ Ð
```javascriptÐ
instance.command.executeSetPaperMargin([top: number, right: number, bottom:
number, left: number])Ð
```Ð
Ð
## executeInsertElementListÐ
RŸ€ŸŸ cŒQeQC} Ð
Ð
u(lŒŸ Ð

```



```

```javascript
instance.command.executeInsertElementList(elementList: IElement[])
```
Ð
Ð
## executeAppendElementList
RŸ€ŸŸ •ŸR QC} Ð
Ð
u(lŌŸ Ð
```javascript
instance.command.executeAppendElementList(elementList: IElement[], options?:
IAppendElementListOption)
```
Ð
Ð
## executeSetValue
RŸ€ŸŸ ‹¾•n••‘VhepcnÐ
Ð
u(lŌŸ Ð
```javascript
instance.command.executeSetValue(payload: Partial<IEditorData>)
```
Ð
Ð
## executeRemoveControl
RŸ€ŸŸ R –dc$NöÐ
Ð
u(lŌŸ Ð
```javascript
instance.command.executeRemoveControl()
```
Ð
Ð
## executeSetLocale
RŸ€ŸŸ ‹¾•ng,W0‹íŠ Ð
Ð
u(lŌŸ Ð
```javascript
instance.command.executeSetLocale(locale: string)
```
Ð
Ð
## executeLocationCatalog
RŸ€ŸŸ [šOMvî_UOM•nÐ
Ð
u(lŌŸ Ð
```javascript
instance.command.executeLocationCatalog(titleId: string)
```
Ð
Ð
## executeWordTool

```

RŸ€ŸŸ e‡[W]åQwŸ R –dzz^L0 ^L™–zzh<Ÿ Đ  
Đ  
u(lŌŸ Đ  
``javascriptĐ  
instance.command.executeWordTool()Đ  
``

File Path: canvas-editor/docs/guide/command-get.md

```
# f·SÖepcnT}NäĐ
```

```
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```

```
## O•u(e¹_ Đ
```

```
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```

```
```javascriptĐ
```

```
import Editor from "@hufe921/canvas-editor"Đ
```

```
Đ
```

```
const instance = new Editor(container, <IElement[]>data, options)Đ
```

```
const value = instance.command.commandName()Đ
```

```
```Đ
```

```
## getValueĐ
```

```
RŸ€ŸŸ f·SÖ_SRMęhcOá`oĐ
```

```
Đ
```

```
u(lŌŸ Đ
```

```
```javascriptĐ
```

```
const {Đ
```

```
  version: string;Đ
```

```
  width: number;Đ
```

```
  height: number;Đ
```

```
  margins: IMargin;Đ
```

```
  header?: IHeader;Đ
```

```
  watermark?: IWatermark;Đ
```

```
  data: IEditorData;Đ
```

```
} = instance.command.getValue(options?: IGetValueOption)Đ
```

```
```Đ
```

```
Đ
```

```
## getImageĐ
```

```
RŸ€ŸŸ f·SÖ_SRM~u—bVprGbase64[W{&N2Đ
```

```
Đ
```

```
u(lŌŸ Đ
```

```
```javascriptĐ
```

```
const base64StringList = await instance.command.getImage(pixelRatio?: number)Đ
```

```
```Đ
```

```
Đ
```

```
## getWordCountĐ
```

```
RŸ€ŸŸ f·SÖęhc[WepĐ
```

```
Đ
```

```
u(lŌŸ Đ
```

```
```javascriptĐ
```

```
const wordCount = await instance.command.getWordCount()Đ
```

```
```Đ
```

```
Đ
```

```
## getRangeTextĐ
```

```
RŸ€ŸŸ f·SÖ• S:ęg,Đ
```

```
Đ
```

```

u(lŌÿ Đ
```javascriptĐ
const rangeText = instance.command.getRangeText()Đ
```Đ
Đ
## getRangeContextĐ
RŸ€ÿÿ f·SÖ• S:N N e‡Đ
Đ
u(lŌÿ Đ
```javascriptĐ
const rangeContext = instance.command.getRangeContext()Đ
```Đ
Đ
## getPaperMarginĐ
RŸ€ÿÿ f·SÖ~u••ŸĐ
Đ
u(lŌÿ Đ
```javascriptĐ
const [top: number, right: number, bottom: number, left: number] =
instance.command.getPaperMargin()Đ
```Đ
Đ
## getSearchNavigateInfoĐ
RŸ€ÿÿ f·SÖd }"[ü,*Oá`oĐ
Đ
u(lŌÿ Đ
```javascriptĐ
const {Đ
  index: number;Đ
  count: number;Đ
} = instance.command.getSearchNavigateInfo()Đ
```Đ
Đ
## getCatalogĐ
RŸ€ÿÿ f·SÖvî_UĐ
Đ
u(lŌÿ Đ
```javascriptĐ
const catalog = await instance.command.getCatalog()Đ
```

```

File Path: canvas-editor/docs/guide/contextmenu-custom.md

```
# •ê[šNISó•.fÜSUĐ
```

```
Đ
```

```
## O•u(e¹_ Đ
```

```
Đ
```

```
```javascriptĐ
```

```
import Editor from "@hufe921/canvas-editor"Đ
```

```
Đ
```

```
const instance = new Editor(container, <|Element[]>data, options)Đ
```

```
instance.register.contextMenuList([Đ
```

```
{Đ
```

```
  isDivider?: boolean;Đ
```

```
  icon?: string;Đ
```

```
  name?: string; // O•u(%sNã~h• S:e±g,0 y:O◁ÿ d }"ÿ %sĐ
```

```
  shortCut?: string;Đ
```

```
  when?: (payload: IContextMenuContext) => boolean;Đ
```

```
  callback?: (command: Command, context: IContextMenuContext) => any;Đ
```

```
  childMenus?: IRegisterContextMenu[];Đ
```

```
}Đ
```

```
])Đ
```

```
```
```

File Path: canvas-editor/docs/guide/contextmenu-internal.md

# Q...•èSó•.fÜSUĐ

Đ

## Qh\@Đ

- RjR Đ

- Y R6Đ

- |~•4Đ

- Qh• Đ

- bSSpĐ

Đ

## •..."pc¥Đ

- R -d"pc¥Đ

- SÖm^"pc¥Đ

- ••"pc¥Đ

Đ

## VprGĐ

- fôe9VprGĐ

- Sæ[XN:VprGĐ

- e‡[Ws~ÖĐ

- ]LQeWĐ

- N N W's~ÖĐ

Đ

## ^hh<Đ

- ^hh<•1hFĐ

- b@g hF~¿Đ

- eàhF~¿Đ

- Y O§hF~¿Đ

- W,vô[ùŸPĐ

- ~vzi[ùŸPĐ

- W,vô\EN-Đ

- ^•zi[ùŸPĐ

- cÒQe^LR Đ

- N e¹cÒQe1^LĐ

- N e¹cÒQe1^LĐ

- ]æO§cÒQe1R Đ

- SóO§cÒQe1R Đ

- R -d^LR Đ

- R -d1^LĐ

- R -d1R Đ

- R -detN\*^hh<Đ

- T ^vSUQCh<Đ

- SÖm^T ^vĐ

Đ

## c§NöĐ

- R -dc§Nö

File Path: canvas-editor/docs/guide/i18n.md

```
# VÝ-ES ð
```

```
ð
```

```
## O•u(e¹_ ð
```

```
ð
```

```
```javascriptð
```

```
import Editor from "@hufe921/canvas-editor"ð
```

```
ð
```

```
const instance = new Editor(container, <|Element[]>data, options)ð
```

```
ð
```

```
// lèQœð
```

```
instance.register.langMap(locale: string, lang: ILang)ð
```

```
ð
```

```
// ¢¼•nð
```

```
instance.command.executeSetLocale(locale)ð
```

```
```ð
```

```
ð
```

```
## ILangð
```

```
ð
```

```
```typescriptð
```

```
interface ILang {ð
```

```
  contextmenu: {ð
```

```
    global: {ð
```

```
      cut: string;ð
```

```
      copy: string;ð
```

```
      paste: string;ð
```

```
      selectAll: string;ð
```

```
      print: string;ð
```

```
    };ð
```

```
    control: {ð
```

```
      delete: string;ð
```

```
    };ð
```

```
    hyperlink: {ð
```

```
      delete: string;ð
```

```
      cancel: string;ð
```

```
      edit: string;ð
```

```
    };ð
```

```
    image: {ð
```

```
      change: string;ð
```

```
      saveAs: string;ð
```

```
      textWrap: string;ð
```

```
      textWrapType: {ð
```

```
        embed: string;ð
```

```
        upDown: string;ð
```

```
      };ð
```

```
    };ð
```

```
table: {␣
  insertRowCol: string;␣
  insertTopRow: string;␣
  insertBottomRow: string;␣
  insertLeftCol: string;␣
  insertRightCol: string;␣
  deleteRowCol: string;␣
  deleteRow: string;␣
  deleteCol: string;␣
  deleteTable: string;␣
  mergeCell: string;␣
  mergeCancelCell: string;␣
  verticalAlign: string;␣
  verticalAlignTop: string;␣
  verticalAlignMiddle: string;␣
  verticalAlignBottom: string;␣
  border: string;␣
  borderAll: string;␣
  borderEmpty: string;␣
  borderExternal: string;␣
};␣
};␣
datePicker: {␣
  now: string;␣
  confirm: string;␣
  return: string;␣
  timeSelect: string;␣
  weeks: {␣
    sun: string;␣
    mon: string;␣
    tue: string;␣
    wed: string;␣
    thu: string;␣
    fri: string;␣
    sat: string;␣
  };␣
  year: string;␣
  month: string;␣
  hour: string;␣
  minute: string;␣
  second: string;␣
};␣
frame: {␣
  header: string;␣
  footer: string;␣
}␣
};␣
```



}D  
'''

File Path: canvas-editor/docs/guide/listener.md

```
# NöväNT,Ð
```

```
Ð
```

```
## O•u(e¹_ Ð
```

```
Ð
```

```
```javascriptÐ
```

```
import Editor from "@hufe921/canvas-editor"Ð
```

```
Ð
```

```
const instance = new Editor(container, <IElement[]>data, options)Ð
```

```
instance.listener.eventName = ()=>{}Ð
```

```
```Ð
```

```
Ð
```

```
## rangeStyleChangeÐ
```

```
RŸ€Ÿ • S:h7_ SÑu e9SØÐ
```

```
Ð
```

```
u(lŌŸ Ð
```

```
```javascriptÐ
```

```
instance.listener.rangeStyleChange = (payload: IRangeStyle)=>{}Ð
```

```
```Ð
```

```
Ð
```

```
## visiblePageNoListChangeÐ
```

```
RŸ€Ÿ Sï%Ō~uSÑu e9SØÐ
```

```
Ð
```

```
u(lŌŸ Ð
```

```
```javascriptÐ
```

```
instance.listener.visiblePageNoListChange = (payload: number[])=>{}Ð
```

```
```Ð
```

```
Ð
```

```
## intersectionPageNoChangeÐ
```

```
RŸ€Ÿ _SRM~uSÑu e9SØÐ
```

```
Ð
```

```
u(lŌŸ Ð
```

```
```javascriptÐ
```

```
instance.listener.intersectionPageNoChange = (payload: number)=>{}Ð
```

```
```Ð
```

```
Ð
```

```
## pageSizeChangeÐ
```

```
RŸ€Ÿ _SRM~uepSÑu e9SØÐ
```

```
Ð
```

```
u(lŌŸ Ð
```

```
```javascriptÐ
```

```
instance.listener.pageSizeChange = (payload: number)=>{}Ð
```

```
```Ð
```

```
Ð
```

```
## pageScaleChangeÐ
```

```
RŸ€Ÿ _SRM~u—b•)e>kŌŌŸSÑu e9SØÐ
```

```

Ð
u(lÕÿ Ð
```javascriptÐ
instance.listener.pageScaleChange = (payload: number)=>{}Ð
```Ð
Ð
## contentChangeÐ
RŸ€ÿÿ _SRMQ...[¹SÑu e9SØÐ
Ð
u(lÕÿ Ð
```javascriptÐ
instance.listener.contentChange = ()=>{}Ð
```Ð
Ð
## controlChangeÐ
RŸ€ÿÿ _SRMQlh b@W(c$NöSÑu e9SØÐ
Ð
u(lÕÿ Ð
```javascriptÐ
instance.listener.controlChange = (payload: IControl | null)=>{}Ð
```Ð
Ð
## pageModeChangeÐ
RŸ€ÿÿ ~u—bj!_ SÑu e9SØÐ
Ð
u(lÕÿ Ð
```javascriptÐ
instance.listener.pageModeChange = (payload: PageMode)=>{}Ð
```Ð
Ð
## savedÐ
RŸ€ÿÿ e‡hcbg^LOÝ[XÐ
Ð
u(lÕÿ Ð
```javascriptÐ
instance.listener.saved = (payload: IEditorResult)=>{}Ð
```Ð
Ð
## zoneChangeÐ
RŸ€ÿÿ S:WßSÑu e9SØÐ
Ð
u(lÕÿ Ð
```javascriptÐ
instance.listener.zoneChange = (payload: EditorZone)=>{}Ð
```

```

File Path: canvas-editor/docs/guide/option.md

```
# 'M•nĐ
```

```
Đ
```

```
## O•u(e¹_ Đ
```

```
Đ
```

```
```javascriptĐ
```

```
import Editor from "@hufe921/canvas-editor"Đ
```

```
Đ
```

```
new Editor(container, IEditorData | IElement[], {Đ
```

```
  // 'M•n~yĐ
```

```
})Đ
```

```
```Đ
```

```
Đ
```

```
## [ŒEt'M•nĐ
```

```
Đ
```

```
```typescriptĐ
```

```
interface IEditorOption {Đ
```

```
  mode?: EditorMode; // ••'Vhj!_ ÿ ••'0 n m ÿ N f>y:%œÆ%œÉ•...R©QC} 0 Y,ÿ R ~u{&ÿ 0 Sêˆu0 žØ«ÿ ••
```

```
  defaultType?: string; // žØ«QC} |{Wˆ0 žØ«ÿ TEXTĐ
```

```
  defaultFont?: string; // žØ«[WOS0 žØ«ÿ YaheiĐ
```

```
  defaultSize?: number; // žØ«[WS÷0 žØ«ÿ 16Đ
```

```
  minSize?: number; // g \ [WS÷0 žØ«ÿ 5Đ
```

```
  maxSize?: number; // g Y'[WS÷0 žØ«ÿ 72Đ
```

```
  defaultBasicRowMarginHeight?: number; // žØ«^LšØ0 žØ«ÿ 8Đ
```

```
  defaultRowMargin?: number; // žØ«^L•ô•Ý0 žØ«ÿ 1Đ
```

```
  defaultTabWidth?: number; // žØ«tab[½^!0 žØ«ÿ 32Đ
```

```
  width?: number; // ~,_ [½^!0 žØ«ÿ 794Đ
```

```
  height?: number; // ~,_ šØ^!0 žØ«ÿ 1123Đ
```

```
  scale?: number; // •)e>kÔOˆ0 žØ«ÿ 1Đ
```

```
  pageGap?: number; // ~,_ •ô—"0 žØ«ÿ 20Đ
```

```
  underlineColor?: string; // N R ~¿œ,r0 žØ«ÿ #000000Đ
```

```
  strikeoutColor?: string; // R -d~¿œ,r0 žØ«ÿ #FF0000Đ
```

```
  rangeColor?: string; // • S:~œ,r0 žØ«ÿ #AECBFAĐ
```

```
  rangeAlpha?: number; // • S:• f ^!0 žØ«ÿ 0.6Đ
```

```
  rangeMinWidth?: number; // • S:g \ [½^!0 žØ«ÿ 5Đ
```

```
  searchMatchColor?: string; // d }"šØN@~œ,r0 žØ«ÿ #FFFF00Đ
```

```
  searchNavigateMatchColor?: string; // d }"ü,*šØN@~œ,r0 žØ«ÿ #AAD280Đ
```

```
  searchMatchAlpha?: number; // d }"šØN@• f ^!0 žØ«ÿ 0.6Đ
```

```
  highlightAlpha?: number; // šØN@QC} • f ^!0 žØ«ÿ 0.6Đ
```

```
  resizerColor?: string; // VprG\:[øVh~œ,r0 žØ«ÿ #4182D9Đ
```

```
  resizerSize?: number; // VprG\:[øVhY\ 0 žØ«ÿ 5Đ
```

```
  marginIndicatorSize?: number; // ~u•¹Ýc y:Vh••^!0 žØ«ÿ 35Đ
```

```
  marginIndicatorColor?: string; // ~u•¹Ýc y:Vh~œ,r0 žØ«ÿ #BABABAĐ
```

```
  margins?: IMargin; // ~u—b•¹Ý0 žØ«ÿ [100, 120, 100, 120]Đ
```

```
  pageMode?: PageMode; // ~,_ j!_ ÿ •b~u0 R ~u0 žØ«ÿ R ~uĐ
```

```
  tdPadding?: number; // SUQCh<Q...•¹Ý0 žØ«ÿ 5Đ
```

```

defaultTrMinHeight?: number; // žØ«^hh<^Lg \ šØ^!0 žØ«ÿ 40Đ
defaultColMinWidth?: number; // žØ«^hh<R g \ [½^!ÿ etOS[½^!•³Y eö^"u(ÿ T&R O c kÔO•)\ ÿ 0 žØ«
defaultHyperlinkColor?: string; // žØ«•..."pcŸœ,r0 žØ«ÿ #0000FFĐ
header?: IHeader; // ~uw Oá`o0 {top?:number; maxHeightRadio?:MaxHeightRatio;}Đ
footer?: IFooter; // ~u• Oá`o0 {bottom?:number; maxHeightRadio?:MaxHeightRatio;}Đ
pageNumber?: IPageNumber; // ~ux Oá`o0 {bottom:number; size:number; font:string; color:string;
rowFlex:RowFlex; format:string; numberType:NumberType;}Đ
paperDirection?: PaperDirection; // ~,_ e¹T Ÿ ~µT 0 j*T Đ
inactiveAlpha?: number; // kce‡Q...[¹Y1q&eö• f ^!0 žØ«P<ÿ 0.6Đ
historyMaxRecordCount: number; // S†Sòÿ d• ‘ÍPZÿ g Y'°_Uk!ep0 žØ«ÿ 100k!Đ
printPixelRatio: number; // bSSpPĭ} kÔs‡ÿ P<•ŠY'•Šn fpÿ OF\:[ø•ŠY'ÿ 0 žØ«ÿ 3Đ
wordBreak: WordBreak; // SU«ÍN h p¹e-^Lÿ BREAK_WORD™—^LN Qús°h p¹&SU«ÍN bÆR 0 BREAK_
watermark?: IWatermark; // l4SpOá`o0 {data:string; color?:string; opacity?:number; size?:number;
font?:string;}Đ
control?: IControlOption; // c§NöOá`o0 {placeholderColor?:string; bracketColor?:string;
prefix?:string; postfix?:string;}Đ
checkbox?: ICheckboxOption; // Y • hFOá`o0 {width?:number; height?:number; gap?:number;
lineWidth?:number; fillStyle?:string; fontStyle?: string;}Đ
cursor?: ICursorOption; // Qlh h7_ 0 {width?: number; color?: string; dragWidth?: number;
dragColor?: string;}Đ
title?: ITitleOption; // h ~M•n0 { defaultFirstSize?: number; defaultSecondSize?: number;
defaultThirdSize?: number defaultFourthSize?: number; defaultFifthSize?: number;
defaultSixthSize?: number;}Đ
placeholder?: IPlaceholder; // ••‘Vhzzv}S`OMe‡g,Đ
}Đ
``Đ
Đ
## ~uw ‘M•nĐ
Đ
``typescriptĐ
interface IHeader {Đ
top?: number; // •Ýy»~u—b~v•èY\ 0 žØ«ÿ 30Đ
maxHeightRadio?: MaxHeightRatio; // S~u—bg Y'šØ^!kÔ0 žØ«ÿ HALFD
disabled?: boolean; // f/T&y•u(Đ
}Đ
``Đ
Đ
## ~u• ‘M•nĐ
Đ
``typescriptĐ
interface IFooter {Đ
bottom?: number; // •Ýy»~u—b^••èY\ 0 žØ«ÿ 30Đ
maxHeightRadio?: MaxHeightRatio; // S~u—bg Y'šØ^!kÔ0 žØ«ÿ HALFD
disabled?: boolean; // f/T&y•u(Đ
}Đ
``Đ

```

```

Ð
## ~ux 'M•nÐ
Ð
```typescriptÐ
interface IPageNumber {Ð
    bottom?: number; // •Ýy»~u—b^••èY\ 0 žØ«ä 60Ð
    size?: number; // [WOSY\ 0 žØ«ä 12Ð
    font?: string; // [WOS0 žØ«ä YaheiÐ
    color?: string; // [WOS~œ,r0 žØ«ä #000000Ð
    rowFlex?: RowFlex; // ^L[ùŸPe' 0 žØ«ä CENTERÐ
    format?: string; // ~ux h<_ 0 žØ«ä {pageNo}0 y:OŸ {,{pageNo}~u/Qq{pageCount}~uÐ
    numberType?: NumberType; // ep[W]{W<0 žØ«ä ARABICÐ
    disabled?: boolean; // f/T&y•u(Ð
    startPageNo?: number; // •wYĚ~ux 0 žØ«ä 1Ð
    fromPageNo?: number; // NÎ{,Qà~u_ YĚQús°~ux 0 žØ«ä 0Ð
}Ð
```Ð
Ð
## l4Sp'M•nÐ
Ð
```typescriptÐ
interface IWatermark {Ð
    data: string; // e‡g,0 Ð
    color?: string; // ~œ,r0 žØ«ä #AEB5C0Ð
    opacity?: number; // • f ^!0 žØ«ä 0.3Ð
    size?: number; // [WOSY\ 0 žØ«ä 200Ð
    font?: string; // [WOS0 žØ«ä YaheiÐ
}Ð
```Ð
Ð
## S`OMe‡g,'M•nÐ
Ð
```typescriptÐ
interface IPlaceholder {Ð
    data: string; // e‡g,0 Ð
    color?: string; // ~œ,r0 žØ«ä #DCDFE6Ð
    opacity?: number; // • f ^!0 žØ«ä 1Ð
    size?: number; // [WOSY\ 0 žØ«ä 16Ð
    font?: string; // [WOS0 žØ«ä YaheiÐ
}Ð
```Ð

```

File Path: canvas-editor/docs/guide/plugin.md

# •ê[šNlcÖNöĐ

Đ

::: warningĐ

vîRMNÂe/c [ù••‘Vh[žO◊•ŮˆLe¹lŬv,,XžR SÊOîe9ÿ T ~íbì\UfôY RŸ€ýĐ

:::Đ

Đ

## \_ SÑcÖNöĐ

Đ

```javascriptĐ

export function myPlugin(editor: Editor, options?: Option) {Đ

// 1. Oîe9e¹lŬÿ ◊æ%‰Áÿ src/plugins/copyĐ

editor.command.updateFunction = () => {}Đ

Đ

// 2. XžR e¹lŬÿ ◊æ%‰Áÿ src/plugins/markdownĐ

editor.command.addFunction = () => {}Đ

}Đ

```Đ

Đ

## O•u(cÖNöĐ

Đ

```javascriptĐ

instance.add(myPlugin, options?: Option)Đ

```

```

File Path: canvas-editor/docs/guide/schema.md
# epcn~Ög,,Ð
Ð
```typescriptÐ
interface IElement {Ð
  // Wúx@Ð
  id?: string;Ð
  type?: {Ð
    TEXT = 'text',Ð
    IMAGE = 'image',Ð
    TABLE = 'table',Ð
    HYPERLINK = 'hyperlink',Ð
    SUPERScript = 'superscript',Ð
    SUBSCRIPT = 'subscript',Ð
    SEPARATOR = 'separator',Ð
    PAGE_BREAK = 'pageBreak',Ð
    CONTROL = 'control',Ð
    CHECKBOX = 'checkbox',Ð
    LATEX = 'latex',Ð
    TAB = 'tab',Ð
    DATE = 'date',Ð
    BLOCK = 'block'Ð
  };Ð
  value: string;Ð
  valueList?: IElement[]; // Y T QC} ÿ •...”pc¥0 h ¯0 R ^h{Iÿ O•u(Ð
  // h7_ Ð
  font?: string;Ð
  size?: number;Ð
  width?: number;Ð
  height?: number;Ð
  bold?: boolean;Ð
  color?: string;Ð
  highlight?: string;Ð
  italic?: boolean;Ð
  underline?: boolean;Ð
  strikethrough?: boolean;Ð
  rowFlex?: {Ð
    LEFT = 'left',Ð
    CENTER = 'center',Ð
    RIGHT = 'right',Ð
    ALIGNMENT = 'alignment'Ð
  };Ð
  rowMargin?: number;Ð
  letterSpacing?: number;Ð
  // ^hh<Ð
  colgroup?: {Ð

```



```

    width: number;Đ
  };Đ
trList?: {Đ
  height: number;Đ
  tdList: {Đ
    colspan: number;Đ
    rowspan: number;Đ
    verticalAlign?: VerticalAlign;Đ
    backgroundColor?: string;Đ
    value: IElement[];Đ
  };Đ
};Đ
borderType?: TableBorder;Đ
// •..."pcĐ
url?: string;Đ
// N N h Đ
actualSize?: number;Đ
// R Rr~¿Đ
dashArray?: number[];Đ
// c§NöĐ
control?: {Đ
  type: {Đ
    TEXT = 'text',Đ
    SELECT = 'select',Đ
    CHECKBOX = 'checkbox'Đ
  };Đ
  value: IElement[] | null;Đ
  placeholder?: string;Đ
  conceptId?: string;Đ
  prefix?: string;Đ
  postfix?: string;Đ
  code: string | null;Đ
  min?: number;Đ
  max?: number;Đ
  valueSets: {Đ
    value: string;Đ
    code: string;Đ
  };Đ
};Đ
checkbox?: {Đ
  value: boolean | null;Đ
  code?: string;Đ
  disabled?: boolean;Đ
};Đ
controlComponent?: {Đ
  PREFIX = 'prefix',Đ

```

```

    POSTFIX = 'postfix',Ð
    PLACEHOLDER = 'placeholder',Ð
    VALUE = 'value',Ð
    CHECKBOX = 'checkbox'Ð
};Ð
// Y • hFÐ
checkbox?: {Ð
    value: boolean | null;Ð
    code?: string;Ð
    disabled?: boolean;Ð
};Ð
// LaTeXÐ
laTexSVG?: string;Ð
// eâg Ð
dateFormat?: string;Ð
// VprGÐ
imgDisplay?: {Ð
    INLINE = 'inline',Ð
    BLOCK = 'block'Ð
}Ð
// Q...[¹WWÐ
block?: {Ð
    type: {Ð
        IFRAME = 'iframe',Ð
        VIDEO = 'video'Ð
    };Ð
    iframeBlock?: {Ð
        src: string;Ð
    };Ð
    videoBlock?: {Ð
        src: string;Ð
    };Ð
};Ð
// h ¯Ð
level?: TitleLevel;Ð
// R ^hÐ
listType?: ListType;Ð
listStyle?: ListStyle;Ð
listWrap?: boolean;Ð
}Ð
...

```

```

File Path: canvas-editor/docs/guide/shortcut-custom.md
# •ê[šNI_ëcw•.Đ
Đ
## O•u(e¹_ Đ
Đ
```javascriptĐ
import Editor from "@hufe921/canvas-editor"Đ
Đ
const instance = new Editor(container, <|Element[]>data, options)Đ
instance.register.shortcutList([Đ
  {Đ
    key: KeyMap;Đ
    ctrl?: boolean;Đ
    meta?: boolean;Đ
    mod?: boolean; // windows:ctrl || mac:commandĐ
    shift?: boolean;Đ
    alt?: boolean;Đ
    isGlobal?: boolean;Đ
    callback: (command: Command) => any;Đ
  }Đ
])Đ
```

```

File Path: canvas-editor/docs/guide/shortcut-internal.md

# Q...•è\_ëcw•.Đ

Đ

## BackspaceĐ

RŸ€ýŸ T RMR –dĐ

Đ

## DeleteĐ

RŸ€ýŸ T T R –dĐ

Đ

## EnterĐ

RŸ€ýŸ cb^LĐ

Đ

## Shift + EnterĐ

RŸ€ýŸ R ^hQ...cb^LĐ

Đ

## !•Đ

RŸ€ýŸ T ]æyûR"Đ

Đ

## Shift + !•Đ

RŸ€ýŸ T ]æ•)e>• S:Đ

Đ

## !'Đ

RŸ€ýŸ T SóyûR"Đ

Đ

## Shift + !'Đ

RŸ€ýŸ T Só•)e>• S:Đ

Đ

## !'Đ

RŸ€ýŸ T N yûR"Đ

Đ

## Shift + !'Đ

RŸ€ýŸ T N •)e>• S:Đ

Đ

## !"Đ

RŸ€ýŸ T N yûR"Đ

Đ

## Shift + !"Đ

RŸ€ýŸ T N •)e>• S:Đ

Đ

## EscĐ

RŸ€ýŸ • Qúh<\_ R7Đ

Đ

## TabĐ

RŸ€ýŸ XžR •)•ûĐ

Đ

## Ctrl/Cmd + ZĐ

RŸ€ýŸ d•• Đ  
Đ  
## Ctrl/Cmd + YĐ  
RŸ€ýŸ 'ÍPZĐ  
Đ  
## Ctrl/Cmd + CĐ  
RŸ€ýŸ Y R6Đ  
Đ  
## Ctrl/Cmd + XĐ  
RŸ€ýŸ RjR Đ  
Đ  
## Ctrl/Cmd + AĐ  
RŸ€ýŸ Qh• Đ  
Đ  
## Ctrl/Cmd + SĐ  
RŸ€ýŸ OÝ[XĐ  
Đ  
## Ctrl/Cmd + {Đ  
RŸ€ýŸ XžY'[WOSĐ  
Đ  
## Ctrl/Cmd + }Đ  
RŸ€ýŸ Qİ\ [WOSĐ  
Đ  
## Ctrl/Cmd + BĐ  
RŸ€ýŸ R |—Đ  
Đ  
## Ctrl/Cmd + IĐ  
RŸ€ýŸ eœOSĐ  
Đ  
## Ctrl/Cmd + UĐ  
RŸ€ýŸ N R ~¿Đ  
Đ  
## Ctrl/Cmd + LĐ  
RŸ€ýŸ ^L\E]æĐ  
Đ  
## Ctrl/Cmd + EĐ  
RŸ€ýŸ ^L\EN-Đ  
Đ  
## Ctrl/Cmd + RĐ  
RŸ€ýŸ ^L\ESóĐ  
Đ  
## Ctrl/Cmd + JĐ  
RŸ€ýŸ N\$zĩ[ùŸPĐ  
Đ  
## Ctrl + Shift + XĐ  
RŸ€ýŸ R -d~¿Đ

Ð  
## Ctrl/Cmd + Shift + >Ð  
RŸ€ŸŸ N h Ð  
Ð  
## Ctrl/Cmd + Shift + <Ð  
RŸ€ŸŸ N h Ð  
Ð  
## Ctrl + Alt/Option + 0Ð  
RŸ€ŸŸ kce‡Ð  
Ð  
## Ctrl + Alt/Option + 1Ð  
RŸ€ŸŸ h ~N Ð  
Ð  
## Ctrl + Alt/Option + 2Ð  
RŸ€ŸŸ h ~NœÐ  
Ð  
## Ctrl + Alt/Option + 3Ð  
RŸ€ŸŸ h ~N Ð  
Ð  
## Ctrl + Alt/Option + 4Ð  
RŸ€ŸŸ h ~VŮÐ  
Ð  
## Ctrl + Alt/Option + 5Ð  
RŸ€ŸŸ h ~N”Ð  
Ð  
## Ctrl + Alt/Option + 6Ð  
RŸ€ŸŸ h ~QmÐ  
Ð  
## Ctrl/Cmd + Shift + IÐ  
RŸ€ŸŸ eà^•R ^hÐ  
Ð  
## Ctrl/Cmd + Shift + UÐ  
RŸ€ŸŸ g ^•R ^h

File Path: canvas-editor/docs/guide/start.md

# Qe•èĐ

Đ

> b@%ÁSsb@\_—v„[lè‡g,••‘Vh0 Đ

Đ

\_—vÊNŽQIh SÊe‡[Wc’rHv„[ŒEQh•ê^L[žs°0 ~ØR6^•\BN\_Siu1svgn2gÓÿ ‹æ%ÁNăx ŷ [feature/svg](http://feature/pdf)(https://github.com/Hufe921/canvas-editor/tree/feature/pdf)0 Đ

Đ

::: warningĐ

[~e¹NĂcĐO•••‘Vhh8\_Ă\BnpmS ŷ fÜSUh b QvNÖY •è]âQwSi•ê^LSÂ€ e‡hcbi\Uÿ b vôc¥SÂ€ [[~e¹](http://

:::Đ

Đ

## RŸ€ýp¹Đ

Đ

- [lè‡g,dÍO\ÿ d••0 ‘ÍPZ0 [WOS0 [WS÷0 R |—0 eœOS0 N N h 0 [ùŸPe¹\_ 0 h ~0 R ^h.....ÿ Đ

- cÔQeQC} ŷ ^hh<0 VprG0 ”pc¥0 Năx WW0 R ~u{&0 MathQI\_ 0 eăg • béVh0 Q...[¹WW.....ÿ Đ

- bSSpÿ WúNŽcanvas•IVprG0 pdf~ØR6ÿ Đ

- c\$Nöÿ SU• 0 e‡g,0 Y • hFÿ Đ

- Só•.fÜSUÿ Q...•è0 •ê[šNIÿ Đ

- \_ëcw•.ÿ Q...•è0 •ê[šNIÿ Đ

- e‡[W0 QC} 0 c\$NöbÖbýĐ

- ~uw 0 ~u• 0 ~ux Đ

- ~u•¹•ÝĐ

- l4SpĐ

- R ~uĐ

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## \_...\_ SÑĐ

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- h ~0 R ^hRŸ€ý[œEU„Đ

- ‹i{—`€ýĐ

- c\$Nö%ÁR Đ

- ^hh<R ~uĐ

- vue0 react{lhFg¶\_ {±Ssu(rHĐ

Đ

## Step. 1: N •}npmS Đ

Đ

```shĐ

npm i @hufe921/canvas-editor --saveĐ

```Đ

Đ

## Step. 2: Q/ÆY N N\*¹¹VhĐ

Đ

```htmlĐ

<div class="canvas-editor"></div>Đ

```Đ

Đ

## Step. 3: [žO(S ••VhĐ

Đ

- NÅS T+kce±Q...[¹Đ

```javascriptĐ

import Editor from "@hufe921/canvas-editor"Đ

Đ

new Editor(document.querySelector(".canvas-editor"), [Đ

{Đ

value: "Hello World"Đ

}Đ

], {}))Đ

```Đ

Đ

- S T+kce±0 ~uw 0 ~u• Q...[¹Đ

```javascriptĐ

import Editor from "@hufe921/canvas-editor"Đ

Đ

new Editor(document.querySelector(".canvas-editor"), {Đ

header: [{Đ

value: "Header",Đ

rowFlex: RowFlex.CENTERĐ

}],Đ

main: [{Đ

value: "Hello World"Đ

}],Đ

footer: [{Đ

value: 'canvas-editor',Đ

size: 12Đ

}]Đ

}, {}))Đ

```Đ

Đ

## Step. 4: 'M•n••VhĐ

Đ

æ%ÁN N ,,



File Path: canvas-editor/docs/index.md

---

layout: home

title: canvas-editor

titleTemplate: rich text editor by canvas/svg

hero:

name: canvas-editor

text: WÚNŽcanvas/svgv,,[l̈e†g,••‘Vh

actions:

- theme: brand

text: \_ YĚ

link: /guide/start.html

- theme: alt

text: W( GitHub N gǎw

link: https://github.com/Hufe921/canvas-editor

features:

- icon: Ø=Üj

title: b@%oÁSsb@\_—

details: |{wordSĩR ~uÿ b@%oÁSsb@\_—

- icon: &jp

title: •{‘İv,,epcn~Óg,,

details: N kµJSONSsSĩTHs°Y gBh7\_

- icon: Ø=Þàp

title: N0[İv,,RŸ€ý

details: e/c ^8%oÁ[l̈e†g,díO\0 ^hh<0 l4Sp0 c§Nö0 Ql\_ {l

- icon: Ø=Üæ

title: O•u(e¹O¿

details: [~e¹SN^ h8\_Ănpms ŷ fÜSUh 0 ]ǎQwh Sï•ê^L~ôb

- icon: Ø=Ý)

title: pum;v,,\_ SÑg:R6

details: ••Çc¥SăSĩf·SÖu T}Thg 0 N(NöVÞŒ 0 •ê[šNISó•.fÜSU0 \_ëcw•.{l

- icon: Ø=Ý

title: [ŒQh|{W(S v,,API

details: pum;v,, API TŒ[Œetv,, TypeScript |{W(

---

<style>

.main>p {

max-width:100% !important;

}

</style>

File Path: canvas-editor/docs/public/favicon.png



File Path: canvas-editor/favicon.png



File Path: canvas-editor/index.html

```
<!DOCTYPE html>Đ
<html lang="en">Đ
Đ
<head>Đ
  <meta charset="UTF-8" />Đ
  <link rel="icon" type="image/png" href="favicon.png" />Đ
  <meta name="viewport" content="width=device-width, initial-scale=1.0" />Đ
  <title>canvas-editor</title>Đ
</head>Đ
Đ
<body>Đ
  <div id="app">Đ
    <div class="menu" editor-component="menu">Đ
      <div class="menu-item">Đ
        <div class="menu-item__undo">Đ
          <i></i>Đ
        </div>Đ
        <div class="menu-item__redo">Đ
          <i></i>Đ
        </div>Đ
        <div class="menu-item__painter" title="h<_ R7(SìQûSi•P~íO•u())">Đ
          <i></i>Đ
        </div>Đ
        <div class="menu-item__format" title="n -dh<_ ">Đ
          <i></i>Đ
        </div>Đ
      </div>Đ
      <div class="menu-divider"></div>Đ
      <div class="menu-item">Đ
        <div class="menu-item__font">Đ
          <span class="select" title="[WOS">_®•o-ÅžÑ</span>Đ
          <div class="options">Đ
            <ul>Đ
              <li data-family="Yahei" style="font-family:'Yahei';">_®•o-ÅžÑ</li>Đ
              <li data-family="[‹OS" style="font-family:'[‹OS';">[‹OS</li>Đ
              <li data-family="žÑOS" style="font-family:'žÑOS';">žÑOS</li>Đ
              <li data-family="Nÿ[‹" style="font-family:'Nÿ[‹';">Nÿ[‹</li>Đ
              <li data-family="iwOS" style="font-family:'iwOS';">iwOS</li>Đ
              <li data-family="{l~ ĭ" style="font-family:'{l~ ĭ';">{l~ ĭ</li>Đ
              <li data-family="SNe†t%ſÀ" style="font-family:'SNe†t%ſÀ';">SNe†t%ſÀ</li>Đ
              <li data-family="SNe†iwOS" style="font-family:'SNe†iwOS';">SNe†iwOS</li>Đ
              <li data-family="SNe†-¶Nf" style="font-family:'SNe†-¶Nf';">SNe†-¶Nf</li>Đ
              <li data-family="SNe†e°›O" style="font-family:'SNe†e°›O';">SNe†e°›O</li>Đ
              <li data-family="SNe†^Liw" style="font-family:'SNe†^Liw';">SNe†^Liw</li>Đ
              <li data-family="SNe†N-[‹" style="font-family:'SNe†N-[‹';">SNe†N-[‹</li>Đ
```

```

    <li data-family="SNeţ_iN'" style="font-family:'SNeţ_iN';">SNeţ_iN'</li>Đ
    <li data-family="Arial" style="font-family:'Arial';">Arial</li>Đ
    <li data-family="Segoe UI" style="font-family:'Segoe UI';">Segoe UI</li>Đ
    <li data-family="Ink Free" style="font-family:'Ink Free';">Ink Free</li>Đ
    <li data-family="Fantasy" style="font-family:'Fantasy';">Fantasy</li>Đ
  </ul>Đ
</div>Đ
</div>Đ
<div class="menu-item__size">Đ
  <span class="select" title="[WOS">\ VŮ</span>Đ
  <div class="options">Đ
    <ul>Đ
      <li data-size="56">R S÷</li>Đ
      <li data-size="48">\ R </li>Đ
      <li data-size="34">N S÷</li>Đ
      <li data-size="32">\ N </li>Đ
      <li data-size="29">NCES÷</li>Đ
      <li data-size="24">\ NCE</li>Đ
      <li data-size="21">N S÷</li>Đ
      <li data-size="20">\ N </li>Đ
      <li data-size="18">VŮS÷</li>Đ
      <li data-size="16">\ VŮ</li>Đ
      <li data-size="14">N”S÷</li>Đ
      <li data-size="12">\ N”</li>Đ
      <li data-size="10">QmS÷</li>Đ
      <li data-size="8">\ Qm</li>Đ
      <li data-size="7">N S÷</li>Đ
      <li data-size="6">QkS÷</li>Đ
    </ul>Đ
  </div>Đ
</div>Đ
<div class="menu-item__size-add">Đ
  <i></i>Đ
</div>Đ
<div class="menu-item__size-minus">Đ
  <i></i>Đ
</div>Đ
<div class="menu-item__bold">Đ
  <i></i>Đ
</div>Đ
<div class="menu-item__italic">Đ
  <i></i>Đ
</div>Đ
<div class="menu-item__underline">Đ
  <i></i>Đ
</div>Đ

```

```

<div class="menu-item__strikeout" title="R -d~¿(Ctrl+Shift+X)">Đ
  <i></i>Đ
</div>Đ
<div class="menu-item__superscript">Đ
  <i></i>Đ
</div>Đ
<div class="menu-item__subscript">Đ
  <i></i>Đ
</div>Đ
<div class="menu-item__color" title="[WOS~œ,r">Đ
  <i></i>Đ
  <span></span>Đ
  <input type="color" id="color" />Đ
</div>Đ
<div class="menu-item__highlight" title="šØN@">Đ
  <i></i>Đ
  <span></span>Đ
  <input type="color" id="highlight">Đ
</div>Đ
</div>Đ
<div class="menu-divider"></div>Đ
<div class="menu-item">Đ
  <div class="menu-item__title">Đ
    <i></i>Đ
    <span class="select" title="R cbh ~">kce‡</span>Đ
    <div class="options">Đ
      <ul>Đ
        <li style="font-size:16px;">kce‡</li>Đ
        <li data-level="first" style="font-size:26px;">h ~1</li>Đ
        <li data-level="second" style="font-size:24px;">h ~2</li>Đ
        <li data-level="third" style="font-size:22px;">h ~3</li>Đ
        <li data-level="fourth" style="font-size:20px;">h ~4</li>Đ
        <li data-level="fifth" style="font-size:18px;">h ~5</li>Đ
        <li data-level="sixth" style="font-size:16px;">h ~6</li>Đ
      </ul>Đ
    </div>Đ
  </div>Đ
  <div class="menu-item__left">Đ
    <i></i>Đ
  </div>Đ
  <div class="menu-item__center">Đ
    <i></i>Đ
  </div>Đ
  <div class="menu-item__right">Đ
    <i></i>Đ
  </div>Đ

```

```

<div class="menu-item__alignment">Đ
  <i></i>Đ
</div>Đ
<div class="menu-item__row-margin">Đ
  <i title="^L•ô•Ý"></i>Đ
  <div class="options">Đ
    <ul>Đ
      <li data-rowmargin='1'>1</li>Đ
      <li data-rowmargin="1.25">1.25</li>Đ
      <li data-rowmargin="1.5">1.5</li>Đ
      <li data-rowmargin="1.75">1.75</li>Đ
      <li data-rowmargin="2">2</li>Đ
      <li data-rowmargin="2.5">2.5</li>Đ
      <li data-rowmargin="3">3</li>Đ
    </ul>Đ
  </div>Đ
</div>Đ
<div class="menu-item__list">Đ
  <i></i>Đ
  <div class="options">Đ
    <ul>Đ
      <li>Đ
        <label>SÖm^R ^h</label>Đ
      </li>Đ
      <li data-list-type="ol" data-list-style='decimal'>Đ
        <label>g ^•R ^hÿ </label>Đ
        <ol>Đ
          <li>_____</li>Đ
        </ol>Đ
      </li>Đ
      <li data-list-type="ul" data-list-style='disc'>Đ
        <label>[ž_ÄW p¹R ^hÿ </label>Đ
        <ul style="list-style-type: disc;">Đ
          <li>_____</li>Đ
        </ul>Đ
      </li>Đ
      <li data-list-type="ul" data-list-style='circle'>Đ
        <label>zz_ÄW p¹R ^hÿ </label>Đ
        <ul style="list-style-type: circle;">Đ
          <li>_____</li>Đ
        </ul>Đ
      </li>Đ
      <li data-list-type="ul" data-list-style='square'>Đ
        <label>zz_Äe¹WWR ^hÿ </label>Đ
        <ul style="list-style-type: square;">Đ
          <li>_____</li>Đ
        </ul>Đ
      </li>Đ
    </ul>Đ
  </div>Đ
</div>Đ

```

```

        </ul>Đ
    </li>Đ
</ul>Đ
</div>Đ
</div>Đ
<div class="menu-divider"></div>Đ
<div class="menu-item">Đ
    <div class="menu-item__table">Đ
        <i title="^hh"></i>Đ
    </div>Đ
    <div class="menu-item__table__collapse">Đ
        <div class="table-close">x</div>Đ
        <div class="table-title">Đ
            <span class="table-select">cÒQe</span>Đ
            <span>^hh</span>Đ
        </div>Đ
        <div class="table-panel"></div>Đ
    </div>Đ
    <div class="menu-item__image">Đ
        <i title="VprG"></i>Đ
        <input type="file" id="image" accept=".png, .jpg, .jpeg, .svg, .gif">Đ
    </div>Đ
    <div class="menu-item__hyperlink">Đ
        <i title="•... "pc¥"></i>Đ
    </div>Đ
    <div class="menu-item__separator">Đ
        <i title="R Rr~¿"></i>Đ
        <div class="options">Đ
            <ul>Đ
                <li data-separator='0,0'>Đ
                    <i></i>Đ
                </li>Đ
                <li data-separator="1,1">Đ
                    <i></i>Đ
                </li>Đ
                <li data-separator="3,1">Đ
                    <i></i>Đ
                </li>Đ
                <li data-separator="4,4">Đ
                    <i></i>Đ
                </li>Đ
                <li data-separator="7,3,3,3">Đ
                    <i></i>Đ
                </li>Đ
                <li data-separator="6,2,2,2,2,2">Đ

```



```

        <i></i>Đ
    </li>Đ
</ul>Đ
</div>Đ
<div class="menu-item__watermark">Đ
    <i title="l4Sp(mûR 0 R -d)"></i>Đ
    <div class="options">Đ
        <ul>Đ
            <li data-menu="add">mûR l4Sp</li>Đ
            <li data-menu="delete">R -dl4Sp</li>Đ
        </ul>Đ
    </div>Đ
</div>Đ
<div class="menu-item__codeblock" title="Năx WW">Đ
    <i></i>Đ
</div>Đ
<div class="menu-item__page-break" title="R ~u{&">Đ
    <i></i>Đ
</div>Đ
<div class="menu-item__control">Đ
    <i title="c§Nö"></i>Đ
    <div class="options">Đ
        <ul>Đ
            <li data-control='text'>e‡g,</li>Đ
            <li data-control="select">R N></li>Đ
            <li data-control="checkbox">Y • hF</li>Đ
        </ul>Đ
    </div>Đ
</div>Đ
<div class="menu-item__checkbox" title="Y • hF">Đ
    <i></i>Đ
</div>Đ
<div class="menu-item__latex" title="LateX">Đ
    <i></i>Đ
</div>Đ
<div class="menu-item__date">Đ
    <i title="eăg "></i>Đ
    <div class="options">Đ
        <ul>Đ
            <li data-format="yyyy-MM-dd"></li>Đ
            <li data-format="yyyy-MM-dd hh:mm:ss"></li>Đ
        </ul>Đ
    </div>Đ
</div>Đ
<div class="menu-item__block" title="Q...[¹WW">Đ

```

```

    <i></i>Đ
  </div>Đ
</div>Đ
<div class="menu-divider"></div>Đ
<div class="menu-item">Đ
  <div class="menu-item__search" data-menu="search">Đ
    <i></i>Đ
  </div>Đ
  <div class="menu-item__search__collapse" data-menu="search">Đ
    <div class="menu-item__search__collapse__search">Đ
      <input type="text" />Đ
      <label class="search-result"></label>Đ
      <div class="arrow-left">Đ
        <i></i>Đ
      </div>Đ
      <div class="arrow-right">Đ
        <i></i>Đ
      </div>Đ
      <span>x</span>Đ
    </div>Đ
    <div class="menu-item__search__collapse__replace">Đ
      <input type="text">Đ
      <button>fÿcb</button>Đ
    </div>Đ
  </div>Đ
  <div class="menu-item__print" data-menu="print">Đ
    <i></i>Đ
  </div>Đ
</div>Đ
</div>Đ
<div class="catalog" editor-component="catalog">Đ
  <div class="catalog__header">Đ
    <span>vî_U</span>Đ
    <div class="catalog__header__close">Đ
      <i></i>Đ
    </div>Đ
  </div>Đ
  <div class="catalog__main"></div>Đ
</div>Đ
<div class="editor"></div>Đ
<div class="footer" editor-component="footer">Đ
  <div>Đ
    <div class="catalog-mode" title="vî_U">Đ
      <i></i>Đ
    </div>Đ
    <div class="page-mode">Đ

```

```
<i title="~u—bj!_ (R ~u0 •p~u)"></i>Đ
<div class="options">Đ
  <ul>Đ
    <li data-page-mode="paging" class="active">R ~u</li>Đ
    <li data-page-mode="continuity">•p~u</li>Đ
  </ul>Đ
</div>Đ
</div>Đ
<span>Si%oÁ~ux ý <span class="page-no-list">1</span></span>Đ
<span>~u—bý <span class="page-no">1</span></span><span class="page-size">1</span></
span>Đ
<span>[Wepý <span class="word-count">0</span></span>Đ
</div>Đ
<div class="editor-mode" title="••'j!_ (••'0 n m 0 Sê'û)">••'j!_ </div>Đ
<div>Đ
  <div class="page-scale-minus" title="•)\ (Ctrl+-)">Đ
    <i></i>Đ
  </div>Đ
  <span class="page-scale-percentage" title="f>y:kÔO◀(p¹QûSiY SŸCtrl+0)">100%</span>Đ
  <div class="page-scale-add" title="e>Y'(Ctrl+=)">Đ
    <i></i>Đ
  </div>Đ
  <div class="paper-size">Đ
    <i title="~,_ |{W' "></i>Đ
    <div class="options">Đ
      <ul>Đ
        <li data-paper-size="794*1123" class="active">A4</li>Đ
        <li data-paper-size="1593*2251">A2</li>Đ
        <li data-paper-size="1125*1593">A3</li>Đ
        <li data-paper-size="565*796">A5</li>Đ
        <li data-paper-size="412*488">5S÷Oá\ </li>Đ
        <li data-paper-size="450*866">6S÷Oá\ </li>Đ
        <li data-paper-size="609*862">7S÷Oá\ </li>Đ
        <li data-paper-size="862*1221">9S÷Oá\ </li>Đ
        <li data-paper-size="813*1266">IŌ_ 'u( ~,_ </li>Đ
        <li data-paper-size="813*1054">Oá ~,_ </li>Đ
      </ul>Đ
    </div>Đ
  </div>Đ
</div>Đ
<div class="paper-direction">Đ
  <i title="~,_ e¹T "></i>Đ
  <div class="options">Đ
    <ul>Đ
      <li data-paper-direction="vertical" class="active">~µT </li>Đ
      <li data-paper-direction="horizontal">j*T </li>Đ
    </ul>Đ
  </div>Đ
</div>
```

```
    </div>Đ
  </div>Đ
  <div class="paper-margin" title="~u•1•Ý">Đ
    <i></i>Đ
  </div>Đ
  <div class="fullscreen" title="Qh\Of>y:">Đ
    <i></i>Đ
  </div>Đ
</div>Đ
</div>Đ
</div>Đ
<script type="module" src="/src/main.ts"></script>Đ
</body>Đ
Đ
</html>
```



File Path: canvas-editor/src/assets/images/alignment.svg

File Path: canvas-editor/src/assets/images/arrow-left.svg

File Path: canvas-editor/src/assets/images/arrow-right.svg

File Path: canvas-editor/src/assets/images/block.svg



File Path: canvas-editor/src/assets/images/bold.svg



File Path: canvas-editor/src/assets/images/catalog.svg

File Path: canvas-editor/src/assets/images/center.svg

File Path: canvas-editor/src/assets/images/checkbox.svg



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File Path: canvas-editor/src/assets/images/format.svg

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File Path: canvas-editor/src/assets/images/italic.svg

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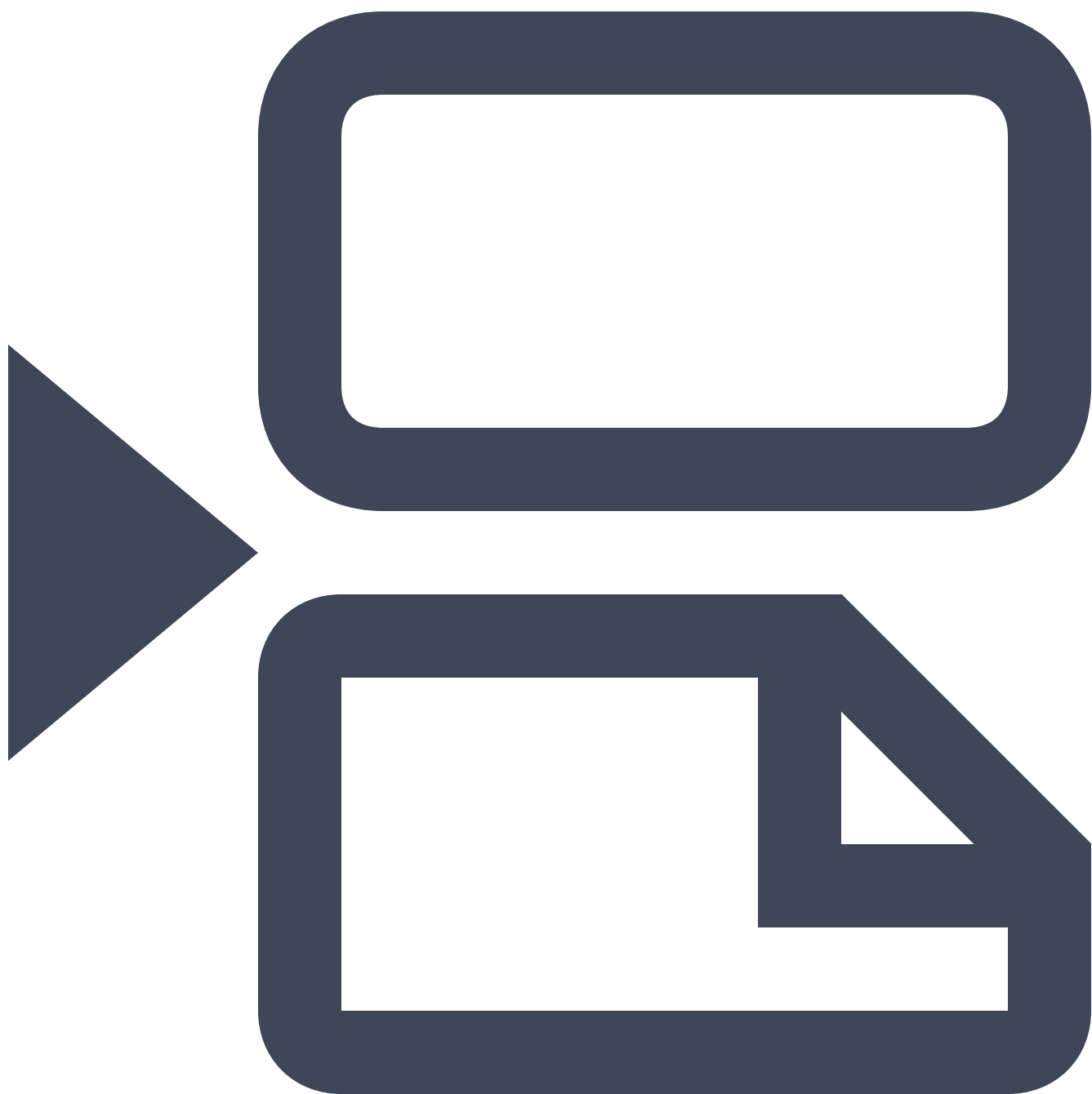
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File Path: canvas-editor/src/assets/images/row-margin.svg



File Path: canvas-editor/src/assets/images/search.svg

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File Path: canvas-editor/src/assets/images/trash.svg

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← → 白 菱 | 微软雅黑 · A<sup>+</sup> A<sup>-</sup> B I U S

## 人民医院门诊

### 主诉:

发热三天, 咳嗽五天。

### 现病史:

发病前14天内有病历报告社区的旅行时或居住地的发热或有呼吸道感染史; 发病前14天内有与发热或有呼吸道感染史的患者或无症状感染者有接触史; 发病前14天内有聚集性发病、学校班级等场所, 出现2例及以上发热或呼吸道感染。

### 既往史:

有糖尿病10年, 有高血压2年, 有**传染性**疾病。

### 体格检查:

T: 36.5°C, P: 80bpm, R: 20次/分, BP: 120/80mmHg

### 辅助检查:

2020年6月10日, 普放: 血细胞比容36.50%  
值 $0.75 \times 10^9/L$  (偏高) 参考值: 0.1 ~ 0.6;

### 门诊诊断:

← → 白 菱 | 微软雅黑 · A<sup>+</sup> A<sup>-</sup> B I U S

## 人民医院门诊

### 主诉:

发热三天, 咳嗽五天。

### 现病史:

发病前14天内有病历报告社区的旅行时或居住地的发热或有呼吸道感染史; 发病前14天内有与发热或有呼吸道感染史的患者或无症状感染者有接触史; 发病前14天内有聚集性发病、学校班级等场所, 出现2例及以上发热或呼吸道感染。

### 既往史:

有糖尿病10年, 有高血压2年, 有**传染性**疾病。

### 体格检查:

T: 36.5°C, P: 80bpm, R: 20次/分, BP: 120/80mmHg

### 辅助检查:

2020年6月10日, 普放: 血细胞比容36.50%  
值 $0.75 \times 10^9/L$  (偏高) 参考值: 0.1 ~ 0.6;

### 门诊诊断:

← → 白 菱形 | 微软雅黑 A<sup>+</sup> A<sup>-</sup> B I U S

# 人民医院门诊

## 主诉：

发热三天，咳嗽五天。

## 现病史：

患者于三天前无明显诱因，感冒后发现面部水肿，乏力，在外治疗无好转，现来我院就诊。

## 既往史：

有糖尿病10年，有高血压2年，有传染性疾病1年。

## 流行病史：

否认14天内接触过新冠肺炎确诊患者、疑似患者；否认14天内去过以下场所：水产、肉类批发市场，超市，夜市；否认14天内与以下场所工作人员密切接触，农贸市场，集市，大型超市；否认14天内周围有聚集性发病；否认14天内接触过有发热或呼吸道感染症状；否认14天内接触过纳入新冠肺炎关联的情形；陪同家属(有无选择代码)有



← → 白 菱形 | 微软雅黑 A<sup>+</sup> A<sup>-</sup> B I U S

## 人民医院门诊

### 主诉:

发热三天, 咳嗽五天。

### 现病史:

患者于三天前无明显诱因, 感冒后发现面部水肿  
力, 在外治疗无好转, 现来我院就诊。

### 既往史:

有糖尿病10年, 有高血压2年, 有~~传染性~~疾病1年

### 流行病史:

否认14天内接触过新冠肺炎确诊患者、疑似患者  
者; 否认14天内去过以下场所: 水产、肉类批发  
超市, 夜市; 否认14天内与以下场所工作人员密  
, 农贸市场, 集市, 大型超市; 否认14天内周围  
上聚集性发病; 否认14天内接触过有发热或呼吸  
身有发热或呼吸道症状; 否认14天内接触过纳入  
新冠肺炎关联的情形; 陪同家属{有无选择代码}

← → 白 微软雅黑 A<sup>+</sup> A<sup>-</sup> B I U S A

# 人民医院门诊

## 主诉:

发热三天, 咳嗽五天。

## 现病史:

患者于三天前无明显诱因, 感冒后发现面部水肿  
力, 在外治疗无好转, 现来我院就诊。

## 既往史:

有糖尿病10年, 有高血压2年, 有传染性疾病1年

## 流行病史:

否认14天内接触过新冠肺炎确诊患者、疑似患者  
者; 否认14天内去过以下场所: 水产、肉类批发  
超市, 夜市; 否认14天内与以下场所工作人员密  
, 农贸市场, 集市, 大型超市; 否认14天内周围  
上聚集性发病; 否认14天内接触过有发热或呼吸  
身有发热或呼吸道症状; 否认14天内接触过纳入  
新冠肺炎关联的情形; 陪同家属{有无选择代码}

← → 白 菱 | 微软雅黑 • A<sup>+</sup> A<sup>-</sup> B I U S

## 人民医院门诊

### 主诉:

发热三天，咳嗽五天。

### 现病史:

患者于三天前无明显诱因，感冒后发现面部水肿，乏力，在外治疗无好转，现来我院就诊。

### 既往史:

有糖尿病10年，有高血压2年，有传染性疾病

### 流行病学:

否认14天内接触过新冠肺炎确诊患者、疑似患者；否认14天内去过以下场所：水产、肉类批发生、超市，夜市；否认14天内与以下场所工作人员接触，农贸市场，集市，大型超市；否认14天内周上聚集性发病；否认14天内接触过有发热或咳嗽、身有发热或呼吸道症状；否认14天内接触过新冠肺炎关联的情形；陪同家属(有无选择代

← → 白 微软雅黑 A<sup>+</sup> A<sup>-</sup> B I U S A a

# 人民医院门诊

## 主诉:

发热三天, 咳嗽五天。

## 现病史:

患者于三天前无明显诱因, 感冒后发现面部水肿, 乏力, 在外治疗无好转, 现来我院就诊。

## 既往史:

有糖尿病10年, 有高血压2年, 有[传染性](#)疾病1年

## 流行病史:

否认14天内接触过[新冠肺炎](#)确诊患者、疑似患者者; 否认14天内去过以下场所: 水产、肉类批发市场, 超市, 夜市; 否认14天内与以下场所工作人员密切接触, 农贸市场, 集市, 大型超市; 否认14天内周围有聚集性发病; 否认14天内接触过有发热或呼吸道感染症状者; 否认14天内接触过纳入医学观察或治疗管理的人员; 否认14天内接触过与新冠肺炎关联的情形; 陪同家属(有无选择代码)

← → 白 菱 微软雅黑 A<sup>+</sup> A<sup>-</sup> B I U S A al

## 人民医院门诊

### 主诉:

发热三天, 咳嗽五天。

### 现病史:

患者于三天前无明显诱因, 感冒后发现面部水肿, 乏力, 在外治疗无好转, 现来我院就诊。

### 既往史:

有糖尿病10年, 有高血压2年, 有传染性疾病1年。

### 流行病史:

否认14天内接触过新冠肺炎确诊患者、疑似患者、无症状感染者; 否认14天内去过以下场所: 水产、肉类批发市场, 超市, 夜市; 否认14天内与以下场所工作人员密切接触, 农贸市场, 集市, 大型超市; 否认14天内周围有聚集性发病; 否认14天内接触过有发热或呼吸道症状者; 否认14天内接触过纳入隔离医学观察者; 否认14天内接触过有新冠肺炎关联的情形; 陪同家属(有无选择代码)有



← → 白 微软雅黑 A+ A- B I U S A al

人民医院门诊

# 人民医院门诊

## 主诉:

发热三天，咳嗽五天。

## 现病史:

患者于三天前无明显诱因，感冒后发现面部水肿，乏力，在外治疗无好转，现来我院就诊。

## 既往史:

有糖尿病10年，有高血压2年，有传染性疾病1年

## 流行病学史:

否认14天内接触过新冠肺炎确诊患者、疑似患者者；否认14天内去过以下场所：水产、肉类批发市场，超市，夜市；否认14天内与以下场所工作人员密切接触，农贸市场，集市，大型超市；否认14天内周围有聚集性发病；否认14天内接触过有发热或呼吸道感染症状；否认14天内接触过纳入新冠肺炎关联的情形；陪同家属(有无选择代码)有

← → 白 菱形 | 微软雅黑 A<sup>+</sup> A<sup>-</sup> B I U S X<sup>2</sup> X<sub>2</sub>

人民医院门诊

## 人民医院门诊

### 主诉:

发热三天，咳嗽五天。

### 现病史:

患者于三天前无明显诱因，感冒后发现面部水肿，乏力，在外治疗无好转，现来我院就诊。

### 既往史:

有糖尿病10年，有高血压2年，有[传染性疾病](#)1

### 流行病史:

否认14天内接触过[新冠肺炎](#)确诊患者、疑似患者；否认14天内去过以下场所：水产、肉类批  
超市，夜市；否认14天内与以下场所工作人员  
，农贸市场，集市，大型超市；否认14天内周  
上聚集性发病；否认14天内接触过有发热或呼  
身有发热或呼吸道症状；否认14天内接触过纳  
新冠肺炎关联的情形；陪同家属{有无选择代

← → 白 菱 微软雅黑 A<sup>+</sup> A<sup>-</sup> B I U S X<sup>2</sup> X<sub>2</sub>

人民医院门诊

# 人民医院门诊

## 主诉：

发热三天，咳嗽五天。

## 现病史：

患者于三天前无明显诱因，感冒后发现面部乏力，在外治疗无好转，现来我院就诊。

## 既往史：

有糖尿病10年，有高血压2年，有[传染性](#)疾病。

## 流行病史：

否认14天内接触过[新冠肺炎](#)确诊患者、疑似患者；否认14天内去过以下场所：水产、肉类超市，夜市；否认14天内与以下场所工作人员，农贸市场，集市，大型超市；否认14天内上聚集性发病；否认14天内接触过有发热或身有发热或呼吸道症状；否认14天内接触过新冠肺炎关联的情形；陪同家属{有无选择代



← → 白 微软雅黑 A<sup>+</sup> A<sup>-</sup> B I U S X<sup>2</sup> X<sub>1</sub>

人民医院

## 人民医院

### 主诉:

发热三天, 咳嗽五天。

### 现病史:

患者于三天前无明显诱因, 感冒后发现面  
力, 在外治疗无好转, 现来我院就诊。

### 既往史:

有糖尿病10年, 有高血压2年, 有传染性

### 流行病史:

否认14天内接触过新冠肺炎确诊患者、疑  
者; 否认14天内去过以下场所: 水产、肉  
超市, 夜市; 否认14天内与以下场所工作  
, 农贸市场, 集市, 大型超市; 否认14天  
上聚集性发病; 否认14天内接触过有发热  
身有发热或呼吸道症状; 否认14天内接触  
新冠肺炎关联的情形; 陪同家属(有无选

← → 白 微软雅黑 A<sup>+</sup> A<sup>-</sup> B I U S X<sup>2</sup> X<sub>1</sub>

人民医院

## 人民医院

### 主诉:

发热三天, 咳嗽五天。

### 现病史:

患者于三天前无明显诱因, 感冒后发现面  
力, 在外治疗无好转, 现来我院就诊。

### 既往史:

有糖尿病10年, 有高血压2年, 有传染性

### 流行病史:

否认14天内接触过新冠肺炎确诊患者、疑  
者; 否认14天内去过以下场所: 水产、肉  
超市, 夜市; 否认14天内与以下场所工作  
, 农贸市场, 集市, 大型超市; 否认14天  
上聚集性发病; 否认14天内接触过有发热  
身有发热或呼吸道症状; 否认14天内接触  
新冠肺炎关联的情形; 陪同家属(有无选

← → 白 微软雅黑 A<sup>+</sup> A<sup>-</sup> B I U S X<sup>2</sup> X<sub>2</sub>

人民医

## 人民医院

### 主诉:

发热三天, 咳嗽五天。

### 现病史:

患者于三天前无明显诱因, 感冒后发现面  
力, 在外治疗无好转, 现来我院就诊。

### 既往史:

有糖尿病10年, 有高血压2年, 有**传染性**

### 流行病史:

否认14天内接触过[新冠肺炎](#)确诊患者、  
者; 否认14天内去过以下场所: 水产、  
超市, 夜市; 否认14天内与以下场所工  
, 农贸市场, 集市, 大型超市; 否认14  
上聚集性发病; 否认14天内接触过有发  
身有发热或呼吸道症状; 否认14天内接  
新冠肺炎关联的情形; 陪同家属(有无选

← → 白 微软雅黑 A<sup>+</sup> A<sup>-</sup> B I U S X<sup>2</sup> X<sub>2</sub>

人民

## 人民医院

### 主诉:

发热三天，咳嗽五天。

### 现病史:

患者于三天前无明显诱因，感冒后发  
力，在外治疗无好转，现来我院就诊。

### 既往史:

有糖尿病10年，有高血压2年，有**传染**

### 流行病史:

否认14天内接触过[新冠肺炎](#)确诊患者  
者；否认14天内去过以下场所：水产  
超市，夜市；否认14天内与以下场所  
，农贸市场，集市，大型超市；否认  
上聚集性发病；否认14天内接触过有  
身有发热或呼吸道症状；否认14天内  
新冠肺炎关联的情形；陪同家属(有无

← → 白 微软雅黑 A<sup>+</sup> A<sup>-</sup> B I U S X<sup>2</sup> X<sub>2</sub>

## 人民医院

### 主诉:

发热三天, 咳嗽五天。

### 现病史:

患者于三天前无明显诱因, 感冒后发  
力, 在外治疗无好转, 现来我院就诊。

### 既往史:

有糖尿病10年, 有高血压2年, 有传

### 流行病史:

否认14天内接触过[新冠肺炎](#)确诊患者  
者; 否认14天内去过以下场所: 水产  
超市, 夜市; 否认14天内与以下场所  
, 农贸市场, 集市, 大型超市; 否认  
上聚集性发病; 否认14天内接触过有  
身有发热或呼吸道症状; 否认14天内  
新冠肺炎关联的情形; 陪同家属(有



← → 白 微软雅黑 A+ A- B I U S X² X₃

# 人民医

## 主诉：

发热三天，咳嗽五天。{其他补充}

## 现病史：

患者于三天前无明显诱因，感冒后发  
力，在外治疗无好转，现来我院就诊

## 既往史：

有糖尿病10年，有高血压2年，有传

## 流行病史：

否认14天内接触过[新冠肺炎](#)确诊患者  
者；否认14天内去过以下场所：水产  
超市，夜市；否认14天内与以下场所  
，农贸市场，集市，大型超市；否认  
上聚集性发病；否认14天内接触过有  
身有发热或呼吸道症状；否认14天内  
新冠肺炎关联的情形；陪同家属无以

← → 白 菱形 | 微软雅黑 • A<sup>+</sup> A<sup>-</sup> B I U S X<sup>2</sup> X<sub>2</sub>

# 人民医

## 主诉：

发热三天，咳嗽五天。{其他补充

## 现病史：

患者于三天前无明显诱因，感冒，  
力，在外治疗无好转，现来我院

## 既往史：

有糖尿病10年，有高血压2年，有

## 流行病学：

否认14天内接触过[新冠肺炎确诊](#)  
者；否认14天内去过以下场所：

超市，夜市；否认14天内与以下  
，农贸市场，集市，大型超市；

上聚集性发病；否认14天内接触  
身有发热或呼吸道症状；否认14

新冠肺炎关联的情形；陪同家属

← → 白 微软雅黑 A+ A- B I U S X² X₃

# 人民国

## 主诉：

发热三天，咳嗽五天。{其他补充

## 现病史：

患者于三天前无明显诱因，感冒  
力，在外治疗无好转，现来我院

## 既往史：

有糖尿病10年，有高血压2年，

## 流行病史：

否认14天内接触过[新冠肺炎](#)确诊  
者；否认14天内去过以下场所：

超市，夜市；否认14天内与以下  
，农贸市场，集市，大型超市；

上聚集性发病；否认14天内接触  
身有发热或呼吸道症状；否认14

新冠肺炎关联的情形；陪同家属



← → 白 微软雅黑 A+ A- B I U S X² X₃

# 人民国

## 主诉：

发热三天，咳嗽五天。{其他补充

## 现病史：

患者于三天前无明显诱因，感冒  
力，在外治疗无好转，现来我院

## 既往史：

有糖尿病10年，有高血压2年，

## 流行病史：

否认14天内接触过[新冠肺炎](#)确诊  
者；否认14天内去过以下场所：

超市，夜市；否认14天内与以下  
，农贸市场，集市，大型超市；

上聚集性发病；否认14天内接触  
身有发热或呼吸道症状；否认14

新冠肺炎关联的情形；陪同家属

← → 白 微软雅黑 A<sup>+</sup> A<sup>-</sup> B I U S X<sup>+</sup> X<sup>-</sup> A

人民

# 人民医院

**主诉：**

发热三天，咳嗽五天。{其他补充}

**现病史：**

患者于三天前无明显诱因，感冒后发现  
力，在外治疗无好转，现来我院就诊。

**既往史：**

有糖尿病10年，有高血压2年，有**传染**

**流行病史：**

否认14天内接触过[新冠肺炎](#)确诊患者、  
者；否认14天内去过以下场所：水产、  
超市，夜市；否认14天内与以下场所、  
，农贸市场，集市，大型超市；否认1  
上聚集性发病；否认14天内接触过有发  
身有发热或呼吸道症状；否认14天内接  
新冠肺炎关联的情形；陪同家属无以

← → 白 微软雅黑 A<sup>+</sup> A<sup>-</sup> B I U S X<sup>2</sup> X<sub>2</sub> A

## 人民医

### 主诉:

发热三天, 咳嗽五天。{其他补充}

### 现病史:

患者于三天前无明显诱因, 感冒后发  
力, 在外治疗无好转, 现来我院就

### 既往史:

有糖尿病10年, 有高血压2年, 有传

### 流行病史:

否认14天内接触过[新冠肺炎](#)确诊患  
者; 否认14天内去过以下场所: 水  
超市, 夜市; 否认14天内与以下场  
, 农贸市场, 集市, 大型超市; 否  
上聚集性发病; 否认14天内接触过  
身有发热或呼吸道症状; 否认14天  
新冠肺炎关联的情形; 陪同家属无

↶ ↷ 白 ❖ 微软雅黑 · A<sup>+</sup> A<sup>-</sup> B I U S X<sup>2</sup> X<sub>2</sub> A

# 人民医

## 主诉:

发热三天，咳嗽五天。{其他补充

## 现病史:

患者于三天前无明显诱因，感冒  
力，在外治疗无好转，现来我院

## 既往史:

有糖尿病10年，有高血压2年，有

## 流行病学:

否认14天内接触过[新冠肺炎确诊](#)  
者；否认14天内去过以下场所：

超市，夜市；否认14天内与以下

，农贸市场，集市，大型超市；

上聚集性发病；否认14天内接触

身有发热或呼吸道症状；否认14

新冠肺炎关联的情形；陪同家属

← → 白 微软雅黑 · A<sup>+</sup> A<sup>-</sup> B I U S X<sup>2</sup> X<sub>2</sub> A ab

# 第一

## 主诉：

发热三天，咳嗽五天。{其他补充

## 现病史：

患者于三天前无明显诱因，感冒  
力，在外治疗无好转，现来我院

## 既往史：

有糖尿病10年，有高血压2年，有

## 流行病史：

否认14天内接触过[新冠肺炎](#)确诊  
者；否认14天内去过以下场所：  
超市，夜市；否认14天内与以下  
，农贸市场，集市，大型超市；  
聚集性发病；否认14天内接触过  
有发热或呼吸道症状；否认14天  
新冠肺炎关联的情形；陪同家属无

## 体格检查：

← → 白 菱形 | 微软雅黑 - 小四 - A<sup>+</sup> A<sup>-</sup> B I U S X<sup>2</sup> X<sub>2</sub> A

## 第

### 主诉:

发热三天,咳嗽五天。{其他

### 现病史:

患者于三天前无明显诱因,感  
力,在外治疗无好转,现来我

### 既往史:

有糖尿病10年,有高血压2年,

### 流行病史:

否认14天内接触过[新冠肺炎](#)确  
者;否认14天内去过以下场所  
超市,夜市;否认14天内与以  
,农贸市场,集市,大型超市  
聚集性发病;否认14天内接触  
有发热或呼吸道症状;否认14  
冠肺炎关联的情形;陪同家属

### 体格检查:



← → 白 微软雅黑 小四 A<sup>+</sup> A<sup>-</sup> B I U S X<sup>2</sup> X<sub>2</sub> A

# 第-

## 主诉:

发热三天，咳嗽五天。{其他补充

## 现病史:

患者于三天前无明显诱因，感冒  
力，在外治疗无好转，现来我院

## 既往史:

有糖尿病10年，有高血压2年，不

## 流行病史:

否认14天内接触过[新冠肺炎](#)确诊  
者；否认14天内去过以下场所：

超市，夜市；否认14天内与以下  
场，农贸市场，集市，大型超市  
上聚集性发病；否认14天内接触

身有发热或呼吸道症状；否认14  
新冠肺炎关联的情形；陪同家属

## 体格检查:

T: 39.5°C P: 80bpm R: 20

↶ ↷ 白 菱 微软雅黑 A<sup>+</sup> A<sup>-</sup> B I U S X<sup>2</sup> X<sub>2</sub> A

# 人民医

## 主诉:

发热三天，咳嗽五天。{其他补充

## 现病史:

患者于三天前无明显诱因，感冒  
力，在外治疗无好转，现来我院

## 既往史:

有糖尿病10年，有高血压2年，有

## 流行病学:

否认14天内接触过[新冠肺炎确诊](#)  
者；否认14天内去过以下场所：

超市，夜市；否认14天内与以下

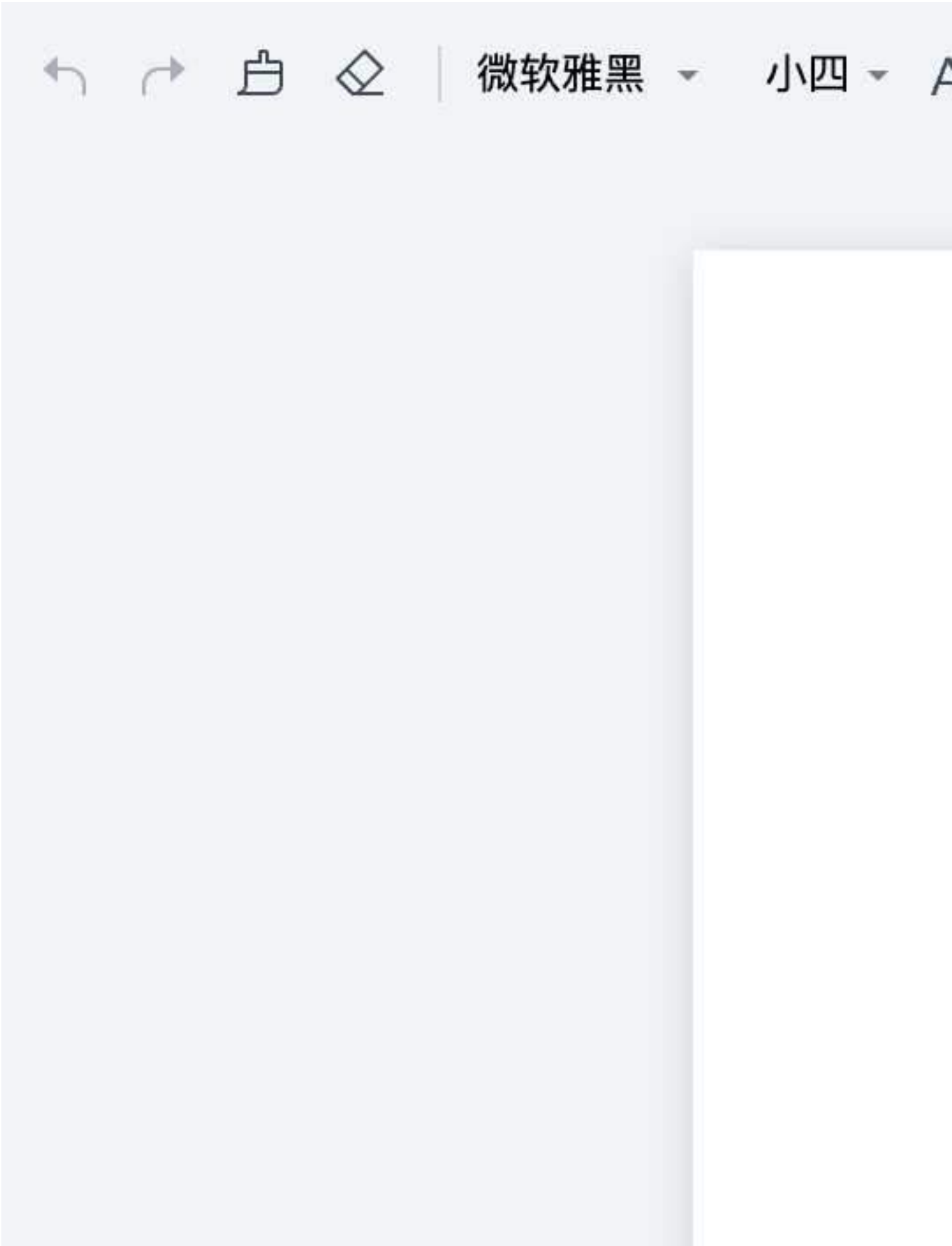
，农贸市场，集市，大型超市；

上聚集性发病；否认14天内接触

身有发热或呼吸道症状；否认14

新冠肺炎关联的情形；陪同家属





# 第

## 主诉：

发热三天，咳嗽五天。{其他补

## 现病史：

患者于三天前无明显诱因，感胃  
力，在外治疗无好转，现来我附

## 既往史：

有糖尿病10年，有高血压2年，

## 流行病史：

否认14天内接触过[新冠肺炎](#)确诊  
者；否认14天内去过以下场所：  
超市，夜市；否认14天内与以  
场，农贸市场，集市，大型超市  
上聚集性发病；否认14天内接触  
身有发热或呼吸道症状；否认1  
新冠肺炎关联的情形；陪同家属

## 体格检查：

T: 38.5°C    P: 98/min    R: 20/min

## 第

### 主诉:

发热三天,咳嗽五天。{其他补

### 现病史:

患者于三天前无明显诱因,感冒  
力,在外治疗无好转,现来我

### 既往史:

有糖尿病10年,有高血压2年,

### 流行病学:

否认14天内接触过[新冠肺炎](#)确诊  
者;否认14天内去过以下场所:

超市,夜市;否认14天内与以下

场,农贸市场,集市,大型超市

上聚集性发病;否认14天内接触

身有发热或呼吸道症状;否认14

新冠肺炎关联的情形;陪同家属

### 体格检查:

T: 39.5°C, P: 80bpm, R:

← → 白 菱 微软雅黑 A<sup>+</sup> A<sup>-</sup> B I U S X<sup>2</sup> X<sub>2</sub> A

# 人民医

## 主诉:

发热三天，咳嗽五天。{其他补充

## 现病史:

患者于三天前无明显诱因，感冒  
力，在外治疗无好转，现来我院

## 既往史:

有糖尿病10年，有高血压2年，有

## 流行病学:

否认14天内接触过[新冠肺炎确诊](#)  
者；否认14天内去过以下场所：

超市，夜市；否认14天内与以下

，农贸市场，集市，大型超市；

上聚集性发病；否认14天内接触

身有发热或呼吸道症状；否认14

新冠肺炎关联的情形；陪同家属

← → 白 菱 微软雅黑 A+ A- B I U S X² X, A

# 人民医

## 主诉:

发热三天，咳嗽五天。{其他补充

## 现病史:

患者于三天前无明显诱因，感冒  
力，在外治疗无好转，现来我院

## 既往史:

有糖尿病10年，有高血压2年，有

## 流行病学:

否认14天内接触过[新冠肺炎确诊](#)  
者；否认14天内去过以下场所：

超市，夜市；否认14天内与以下

，农贸市场，集市，大型超市；

上聚集性发病；否认14天内接触

身有发热或呼吸道症状；否认14

新冠肺炎关联的情形；陪同家属

↶ ↷ 🏠 ✂ | 微软雅黑 • A<sup>+</sup> A<sup>-</sup> B I U S X<sup>2</sup> X<sub>2</sub> A ab

# 人民医

## 主诉:

发热三天，咳嗽五天。{其他补充

## 现病史:

患者于三天前无明显诱因，感冒  
力，在外治疗无好转，现来我院

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有糖尿病10年，有高血压2年，有

## 流行病学:

否认14天内接触过[新冠肺炎确诊](#)  
者；否认14天内去过以下场所：

超市，夜市；否认14天内与以下

，农贸市场，集市，大型超市；

上聚集性发病；否认14天内接触

身有发热或呼吸道症状；否认14

新冠肺炎关联的情形；陪同家属

← → 白 微软雅黑 A+ A- B I U S X² X₃ A ab

# 人民医

## 主诉:

发热三天，咳嗽五天。{其他补充

## 现病史:

患者于三天前无明显诱因，感冒  
力，在外治疗无好转，现来我院

## 既往史:

有糖尿病10年，有高血压2年，有

## 流行病学:

否认14天内接触过[新冠肺炎确诊](#)  
者；否认14天内去过以下场所：

超市，夜市；否认14天内与以下

，农贸市场，集市，大型超市；

上聚集性发病；否认14天内接触

身有发热或呼吸道症状；否认14

新冠肺炎关联的情形；陪同家属



```

File Path: canvas-editor/src/components/dialog/Dialog.ts
import { EditorComponent, EDITOR_COMPONENT } from '../editor'
import './dialog.css'
export interface IDialogData {
  type: string
  label?: string
  name: string
  value?: string
  options?: { label: string; value: string }[]
  placeholder?: string
  width?: number
  height?: number
  required?: boolean
}
export interface IDialogConfirm {
  name: string
  value: string
}
export interface IDialogOptions {
  onClose?: () => void
  onCancel?: () => void
  onConfirm?: (payload: IDialogConfirm[]) => void
  title: string
  data: IDialogData[]
}
export class Dialog {
  private options: IDialogOptions
  private mask: HTMLDivElement | null
  private container: HTMLDivElement | null
  private inputList: (
    | HTMLInputElement
    | HTMLTextAreaElement
    | HTMLSelectElement
  )[]
  constructor(options: IDialogOptions) {
    this.options = options
    this.mask = null
    this.container = null
    this.inputList = []
    this._render()
  }

```



Ð

```
private _render() {Ð
  const { title, data, onClose, onCancel, onConfirm } = this.optionsÐ
  // n2gÖ•n•iBÐ
  const mask = document.createElement('div')Ð
  mask.classList.add('dialog-mask')Ð
  mask.setAttribute(EDITOR_COMPONENT, EditorComponent.COMPONENT)Ð
  document.body.append(mask)Ð
  // n2gÖ[1VhÐ
  const container = document.createElement('div')Ð
  container.classList.add('dialog-container')Ð
  container.setAttribute(EDITOR_COMPONENT, EditorComponent.COMPONENT)Ð
  // _9z—Ð
  const dialogContainer = document.createElement('div')Ð
  dialogContainer.classList.add('dialog')Ð
  container.append(dialogContainer)Ð
  // h ~[1VhÐ
  const titleContainer = document.createElement('div')Ð
  titleContainer.classList.add('dialog-title')Ð
  // h ~&Qs•ic "®Ð
  const titleSpan = document.createElement('span')Ð
  titleSpan.append(document.createTextNode(title))Ð
  const titleClose = document.createElement('i')Ð
  titleClose.onclick = () => {Ð
    if (onClose) {Ð
      onClose()Ð
    }Ð
    this._dispose()Ð
  }Ð
  titleContainer.append(titleSpan)Ð
  titleContainer.append(titleClose)Ð
  dialogContainer.append(titleContainer)Ð
  // •~y[1VhÐ
  const optionContainer = document.createElement('div')Ð
  optionContainer.classList.add('dialog-option')Ð
  // •~yÐ
  for (let i = 0; i < data.length; i++) {Ð
    const option = data[i]Ð
    const optionItemContainer = document.createElement('div')Ð
    optionItemContainer.classList.add('dialog-option__item')Ð
    // •~yT yðÐ
    if (option.label) {Ð
      const optionName = document.createElement('span')Ð
      optionName.append(document.createTextNode(option.label))Ð
      optionItemContainer.append(optionName)Ð
      if (option.required) {Ð
```

```

    optionName.classList.add('dialog-option__item--require')})
  }
}
// •~y•“QehF
let optionInput:
  | HTMLInputElement
  | HTMLTextAreaElement
  | HTMLSelectElement
if (option.type === 'select') {
  optionInput = document.createElement('select')
  option.options?.forEach(item => {
    const optionItem = document.createElement('option')
    optionItem.value = item.value
    optionItem.label = item.label
    optionInput.append(optionItem)
  })
} else if (option.type === 'textarea') {
  optionInput = document.createElement('textarea')
} else {
  optionInput = document.createElement('input')
  optionInput.type = option.type
}
if (option.width) {
  optionInput.style.width = `${option.width}px`
}
if (option.height) {
  optionInput.style.height = `${option.height}px`
}
optionInput.name = option.name
optionInput.value = option.value || ""
if (!(optionInput instanceof HTMLSelectElement)) {
  optionInput.placeholder = option.placeholder || ""
}
optionItemContainer.append(optionInput)
optionContainer.append(optionItemContainer)
this.inputList.push(optionInput)
}
dialogContainer.append(optionContainer)
// c”®[¹Vh
const menuContainer = document.createElement('div')
menuContainer.classList.add('dialog-menu')
// SÖm^c”®
const cancelBtn = document.createElement('button')
cancelBtn.classList.add('dialog-menu__cancel')
cancelBtn.append(document.createTextNode('SÖm^'))
cancelBtn.type = 'button'

```

```

cancelBtn.onclick = () => {
  if (onCancel) {
    onCancel()
  }
  this._dispose()
}
menuContainer.append(cancelBtn)
// xn'ac "®
const confirmBtn = document.createElement('button')
confirmBtn.append(document.createTextNode('xn[š'))
confirmBtn.type = 'submit'
confirmBtn.onclick = () => {
  if (onConfirm) {
    const payload = this.inputList.map<IDialogConfirm>(input => ({
      name: input.name,
      value: input.value
    }))
    onConfirm(payload)
  }
  this._dispose()
}
menuContainer.append(confirmBtn)
dialogContainer.append(menuContainer)
// n2gÓ
document.body.append(container)
this.container = container
this.mask = mask
}
}
private _dispose() {
  this.mask?.remove()
  this.container?.remove()
}
}

```

File Path: canvas-editor/src/components/dialog/dialog.css

```
.dialog-mask {
  position: fixed;
  left: 0;
  top: 0;
  width: 100%;
  height: 100%;
  opacity: .5;
  background: #000000;
  z-index: 99;
}

.dialog-container {
  position: fixed;
  top: 0;
  right: 0;
  bottom: 0;
  left: 0;
  overflow: auto;
  z-index: 999;
  margin: 0;
  display: flex;
  justify-content: center;
  align-items: center;
}

.dialog {
  position: absolute;
  padding: 0 30px 30px;
  background: #ffffff;
  box-shadow: 0 2px 12px 0 rgb(56 56 56 / 20%);
  border: 1px solid #e2e6ed;
  border-radius: 2px;
}

.dialog-title {
  position: relative;
  border-bottom: 1px solid #e2e6ed;
  margin-bottom: 30px;
  height: 60px;
  display: flex;
  align-items: center;
  justify-content: space-between;
}

.dialog-title i {
```

```

width: 16px;Đ
height: 16px;Đ
cursor: pointer;Đ
display: inline-block;Đ
background: url(../assets/images/close.svg);Đ
}Đ
Đ
.dialog-option__item {Đ
margin-bottom: 18px;Đ
display: flex;Đ
align-items: center;Đ
justify-content: space-between;Đ
}Đ
Đ
.dialog-option__item span {Đ
margin-right: 12px;Đ
font-size: 14px;Đ
color: #3d4757;Đ
position: relative;Đ
}Đ
Đ
.dialog-option__item input,Đ
.dialog-option__item textarea,Đ
.dialog-option__item select {Đ
width: 276px;Đ
height: 30px;Đ
border-radius: 2px;Đ
border: 1px solid #d3d3d3;Đ
min-height: 30px;Đ
padding: 5px;Đ
box-sizing: border-box;Đ
outline: none;Đ
appearance: none;Đ
user-select: none;Đ
font-family: inherit;Đ
}Đ
Đ
.dialog-option__item input:focus,Đ
.dialog-option__item textarea:focus {Đ
border-color: #4991f2;Đ
}Đ
Đ
.dialog-option__item--require::before {Đ
content: "*";Đ
color: #f56c6c;Đ
margin-right: 4px;Đ

```

```
    position: absolute;␣
    left: -8px;␣
}␣
␣
.dialog-menu {␣
    display: flex;␣
    align-items: center;␣
    justify-content: flex-end;␣
}␣
␣
.dialog-menu button {␣
    position: relative;␣
    display: inline-block;␣
    border: 1px solid #e2e6ed;␣
    border-radius: 2px;␣
    background: #ffffff;␣
    line-height: 22px;␣
    padding: 0 16px;␣
    white-space: nowrap;␣
    cursor: pointer;␣
}␣
␣
.dialog-menu button:hover {␣
    background: rgba(25, 55, 88, .04);␣
}␣
␣
.dialog-menu__cancel {␣
    margin-right: 16px;␣
}␣
␣
.dialog-menu button[type='submit'] {␣
    color: #ffffff;␣
    background: #4991f2;␣
    border-color: #4991f2;␣
}␣
␣
.dialog-menu button[type='submit']:hover {␣
    background: #5b9cf3;␣
    border-color: #5b9cf3;␣
}
```

```

File Path: canvas-editor/src/components/signature/Signature.ts
import { EditorComponent, EDITOR_COMPONENT } from '../editor'
import './signature.css'
import {
  export interface ISignatureResult {
    value: string
    width: number
    height: number
  }
  export interface ISignatureOptions {
    width?: number
    height?: number
    onClose?: () => void
    onCancel?: () => void
    onConfirm?: (payload: ISignatureResult | null) => void
  }
  export class Signature {
    private readonly MAX_RECORD_COUNT = 1000
    private readonly DEFAULT_WIDTH = 390
    private readonly DEFAULT_HEIGHT = 180
    private undoStack: Array<Function> = []
    private x = 0
    private y = 0
    private isDrawing = false
    private isDrawn = false
    private linePoints: [number, number][] = []
    private canvasWidth: number
    private canvasHeight: number
    private options: ISignatureOptions
    private mask: HTMLDivElement
    private container: HTMLDivElement
    private trashContainer: HTMLDivElement
    private undoContainer: HTMLDivElement
    private canvas: HTMLCanvasElement
    private ctx: CanvasRenderingContext2D
    private preTimeStamp: number
    private dpr: number

    constructor(options: ISignatureOptions) {
      this.options = options
      this.preTimeStamp = 0
      this.dpr = window.devicePixelRatio
      this.canvasWidth = (options.width || this.DEFAULT_WIDTH) * this.dpr
      this.canvasHeight = (options.height || this.DEFAULT_HEIGHT) * this.dpr
    }
  }

```

```

const { mask, container, trashContainer, undoContainer, canvas } = {}
  this._render(){}
  this.mask = mask{}
  this.container = container{}
  this.trashContainer = trashContainer{}
  this.undoContainer = undoContainer{}
  this.canvas = canvas{}
  this.ctx = <CanvasRenderingContext2D>canvas.getContext('2d'){}
  this.ctx.scale(this.dpr, this.dpr){}
  this.ctx.lineCap = 'round'{}
  this._bindEvent(){}
  this._clearUndoFn(){}
}{}
{}
private _render() {}
  const { onClose, onCancel, onConfirm } = this.options{}
  // n2gÖ•n•i\B{}
  const mask = document.createElement('div'){}
  mask.classList.add('signature-mask'){}
  mask.setAttribute(EDITOR_COMPONENT, EditorComponent.COMPONENT){}
  document.body.append(mask){}
  // n2gÖ[1Vh{}
  const container = document.createElement('div'){}
  container.classList.add('signature-container'){}
  container.setAttribute(EDITOR_COMPONENT, EditorComponent.COMPONENT){}
  // _9z—{}
  const signatureContainer = document.createElement('div'){}
  signatureContainer.classList.add('signature'){}
  container.append(signatureContainer){}
  // h ~[1Vh{}
  const titleContainer = document.createElement('div'){}
  titleContainer.classList.add('signature-title'){}
  // h ~&Qs•íc "®{}
  const titleSpan = document.createElement('span'){}
  titleSpan.append(document.createTextNode('cÔQe{~T ')){}
  const titleClose = document.createElement('i'){}
  titleClose.onclick = () => {}
    if (onClose) {}
      onClose(){}
    }{}
    this._dispose(){}
  }{}
  titleContainer.append(titleSpan){}
  titleContainer.append(titleClose){}
  signatureContainer.append(titleContainer){}
  // dÍO\S:{}

```



```

const operationContainer = document.createElement('div')
operationContainer.classList.add('signature-operation')
// dα•
const undoContainer = document.createElement('div')
undoContainer.classList.add('signature-operation__undo')
const undolcon = document.createElement('i')
const undoLabel = document.createElement('span')
undoLabel.innerText = 'dα•'
undoContainer.append(undolcon)
undoContainer.append(undoLabel)
operationContainer.append(undoContainer)
// n zzu;^
const trashContainer = document.createElement('div')
trashContainer.classList.add('signature-operation__trash')
const trashlcon = document.createElement('i')
const trashLabel = document.createElement('span')
trashLabel.innerText = 'n zz'
trashContainer.append(trashlcon)
trashContainer.append(trashLabel)
operationContainer.append(trashContainer)
signatureContainer.append(operationContainer)
// ~ØVpS:
const canvasContainer = document.createElement('div')
canvasContainer.classList.add('signature-canvas')
const canvas = document.createElement('canvas')
canvas.width = this.canvasWidth
canvas.height = this.canvasHeight
canvas.style.width = `${this.canvasWidth / this.dpr}px`
canvas.style.height = `${this.canvasHeight / this.dpr}px`
canvasContainer.append(canvas)
signatureContainer.append(canvasContainer)
// c "®[!Vh
const menuContainer = document.createElement('div')
menuContainer.classList.add('signature-menu')
// SÖm^c "®
const cancelBtn = document.createElement('button')
cancelBtn.classList.add('signature-menu__cancel')
cancelBtn.append(document.createTextNode('SÖm^'))
cancelBtn.type = 'button'
cancelBtn.onclick = () => {
  if (onCancel) {
    onCancel()
  }
  this._dispose()
}
menuContainer.append(cancelBtn)

```

```

// xn<ac "®
const confirmBtn = document.createElement('button')
confirmBtn.append(document.createTextNode('xn[š'))
confirmBtn.type = 'submit'
confirmBtn.onclick = () => {
  if (onConfirm) {
    onConfirm(this._toData())
  }
  this._dispose()
}
menuContainer.append(confirmBtn)
signatureContainer.append(menuContainer)
// n2gÓ
document.body.append(container)
this.container = container
this.mask = mask
return {
  mask,
  canvas,
  container,
  trashContainer,
  undoContainer
}
}
}
}
private _bindEvent() {
  this.trashContainer.onclick = this._clearCanvas.bind(this)
  this.undoContainer.onclick = this._undo.bind(this)
  this.canvas.onmousedown = this._startDraw.bind(this)
  this.canvas.onmousemove = this._draw.bind(this)
  this.container.onmouseup = this._stopDraw.bind(this)
}
}
private _undo() {
  if (this.undoStack.length > 1) {
    this.undoStack.pop()
    if (this.undoStack.length) {
      this.undoStack[this.undoStack.length - 1]()
    }
  }
}
}
private _saveUndoFn(fn: Function) {
  this.undoStack.push(fn)
  while (this.undoStack.length > this.MAX_RECORD_COUNT) {
    this.undoStack.shift()
  }
}

```

```

    }
  }
}
private _clearUndoFn() {
  const clearFn = () => {
    this.ctx.clearRect(0, 0, this.canvasWidth, this.canvasHeight)
  }
  this.undoStack = [clearFn]
}
private _clearCanvas() {
  this._clearUndoFn()
  this.ctx.clearRect(0, 0, this.canvasWidth, this.canvasHeight)
}
private _startDraw(evt: MouseEvent) {
  this.isDrawing = true
  this.x = evt.offsetX
  this.y = evt.offsetY
  this.ctx.lineWidth = 1
}
private _draw(evt: MouseEvent) {
  if (!this.isDrawing) return
  // {x: 10, y: 10, x2: 100, y2: 100}
  const curTimestamp = performance.now()
  const distance = Math.sqrt(evt.movementX ** 2 + evt.movementY ** 2)
  const speed = distance / (curTimestamp - this.preTimeStamp)
  // v ~ 1/2 * g * t^2
  const SPEED_FACTOR = 3
  const targetLineWidth = Math.min(5, Math.max(1, 5 - speed * SPEED_FACTOR))
  // ^sn~•Çn!{—lÖÿ 20%v„SØS kÔOÿ OE et~¿ga|—~Æÿ |ûep0.2
  const SMOOTH_FACTOR = 0.2
  this.ctx.lineWidth =
    this.ctx.lineWidth * (1 - SMOOTH_FACTOR) + targetLineWidth *
    SMOOTH_FACTOR
  // ~ØR6
  const { offsetX, offsetY } = evt
  this.ctx.beginPath()
  this.ctx.moveTo(this.x, this.y)
  this.ctx.lineTo(offsetX, offsetY)
  this.ctx.stroke()
  this.x = offsetX
  this.y = offsetY
  this.linePoints.push([offsetX, offsetY])
  this.isDrawn = true
}

```

```

    // • [XNKRMëö•ôb3
    this.preTimeStamp = curTimeStamp
  }
}
private _stopDraw() {
  this.isDrawing = false
  if (this.isDrawn) {
    const imageData = this.ctx.getImageData(
      0,
      0,
      this.canvasWidth,
      this.canvasHeight
    )
    const self = this
    this._saveUndoFn(function () {
      self.ctx.clearRect(0, 0, self.canvasWidth, self.canvasHeight)
      self.ctx.putImageData(imageData, 0, 0)
    })
    this.isDrawn = false
  }
}
private _toData(): ISignatureResult | null {
  if (!this.linePoints.length) return null
  // gâb~wé_bVÛ%öÖWPh
  const startX = this.linePoints[0][0]
  const startY = this.linePoints[0][1]
  let minX = startX
  let minY = startY
  let maxX = startX
  let maxY = startY
  for (let p = 0; p < this.linePoints.length; p++) {
    const point = this.linePoints[p]
    if (minX > point[0]) {
      minX = point[0]
    }
    if (maxX < point[0]) {
      maxX = point[0]
    }
    if (minY > point[1]) {
      minY = point[1]
    }
    if (maxY < point[1]) {
      maxY = point[1]
    }
  }
}

```

```

// XžR •¹hF[½^!Đ
const lineWidth = this.ctx.lineWidthĐ
minX = minX < lineWidth ? 0 : minX - lineWidthĐ
minY = minY < lineWidth ? 0 : minY - lineWidthĐ
maxX = maxX + lineWidthĐ
maxY = maxY + lineWidthĐ
const sw = maxX - minXĐ
const sh = maxY - minYĐ
// ^ÁRjVpPİĐ
const imageData = this.ctx.getImageData(Đ
  minX * this.dpr,Đ
  minY * this.dpr,Đ
  sw * this.dpr,Đ
  sh * this.dprĐ
)Đ
const canvas = document.createElement('canvas')Đ
canvas.style.width = `${sw}px`Đ
canvas.style.height = `${sh}px`Đ
canvas.width = sw * this.dprĐ
canvas.height = sh * this.dprĐ
const ctx = <CanvasRenderingContext2D>canvas.getContext('2d')!Đ
ctx.putImageData(imageData, 0, 0)Đ
const value = canvas.toDataURL()Đ
return {Đ
  value,Đ
  width: sw,Đ
  height: shĐ
}Đ
}Đ
Đ
private _dispose() {Đ
  this.mask.remove()Đ
  this.container.remove()Đ
}Đ
}Đ

```

File Path: canvas-editor/src/components/signature/signature.css

```
.signature-mask {  
  position: fixed;  
  left: 0;  
  top: 0;  
  width: 100%;  
  height: 100%;  
  opacity: .5;  
  background: #000000;  
  z-index: 99;  
}  
  
.signature-container {  
  position: fixed;  
  top: 0;  
  right: 0;  
  bottom: 0;  
  left: 0;  
  overflow: auto;  
  z-index: 999;  
  margin: 0;  
  display: flex;  
  justify-content: center;  
  align-items: center;  
}  
  
.signature {  
  position: absolute;  
  padding: 0 30px 30px;  
  background: #ffffff;  
  box-shadow: 0 2px 12px 0 rgb(56 56 56 / 20%);  
  border: 1px solid #e2e6ed;  
  border-radius: 2px;  
}  
  
.signature-title {  
  position: relative;  
  border-bottom: 1px solid #e2e6ed;  
  margin-bottom: 15px;  
  height: 60px;  
  display: flex;  
  align-items: center;  
  justify-content: space-between;  
}  
  
.signature-title i {
```

```

width: 16px;Đ
height: 16px;Đ
cursor: pointer;Đ
display: inline-block;Đ
background: url(../../assets/images/close.svg);Đ
}Đ
Đ
.signature-operation>div {Đ
  cursor: pointer;Đ
  display: inline-flex;Đ
  align-items: center;Đ
  color: #3d4757;Đ
  user-select: none;Đ
}Đ
Đ
.signature-operation>div: hover {Đ
  color: #6e7175;Đ
}Đ
Đ
.signature-operation>div i {Đ
  width: 24px;Đ
  height: 24px;Đ
  display: inline-block;Đ
}Đ
Đ
.signature-operation__undo {Đ
  background: url(../../assets/images/signature-undo.svg) no-repeat;Đ
}Đ
Đ
.signature-operation__trash {Đ
  background: url(../../assets/images/trash.svg) no-repeat;Đ
}Đ
Đ
.signature-operation>div span {Đ
  font-size: 12px;Đ
  margin: 0 5px;Đ
}Đ
Đ
.signature-canvas {Đ
  margin: 15px 0;Đ
  user-select: none;Đ
}Đ
Đ
.signature-canvas canvas {Đ
  background: #f3f5f7;Đ
}Đ

```

```

Ð
.signature-menu {Ð
  display: flex;Ð
  align-items: center;Ð
  justify-content: flex-end;Ð
}Ð
Ð
.signature-menu button {Ð
  position: relative;Ð
  display: inline-block;Ð
  border: 1px solid #e2e6ed;Ð
  border-radius: 2px;Ð
  background: #ffffff;Ð
  line-height: 22px;Ð
  padding: 0 16px;Ð
  white-space: nowrap;Ð
  cursor: pointer;Ð
}Ð
Ð
.signature-menu button:hover {Ð
  background: rgba(25, 55, 88, .04);Ð
}Ð
Ð
.signature-menu__cancel {Ð
  margin-right: 16px;Ð
}Ð
Ð
.signature-menu button[type='submit'] {Ð
  color: #ffffff;Ð
  background: #4991f2;Ð
  border-color: #4991f2;Ð
}Ð
Ð
.signature-menu button[type='submit']:hover {Ð
  background: #5b9cf3;Ð
  border-color: #5b9cf3;Ð
}

```



File Path: canvas-editor/src/editor/assets/css/block/block.css

```
.ce-block-item {  
  position: absolute;  
  z-index: 0;  
  overflow: hidden;  
  border-radius: 8px;  
  background-color: #ffffff;  
  border: 1px solid rgb(235 236 240);  
}
```

File Path: canvas-editor/src/editor/assets/css/contextmenu/contextmenu.css

```
.ce-contextmenu-container {  
  z-index: 9;  
  position: fixed;  
  display: none;  
  padding: 4px;  
  overflow-x: hidden;  
  overflow-y: auto;  
  background: #fff;  
  box-shadow: 0 2px 12px 0 rgb(56 56 56 / 20%);  
  border: 1px solid #e2e6ed;  
  border-radius: 2px;  
}  
  
.ce-contextmenu-content {  
  display: flex;  
  flex-direction: column;  
}  
  
.ce-contextmenu-content .ce-contextmenu-sub-item::after {  
  position: absolute;  
  content: "";  
  width: 16px;  
  height: 16px;  
  right: 12px;  
  background: url(../images/submenu-dropdown.svg);  
}  
  
.ce-contextmenu-content .ce-contextmenu-item {  
  min-width: 140px;  
  padding: 0 32px 0 16px;  
  height: 30px;  
  display: flex;  
  align-items: center;  
  white-space: nowrap;  
  box-sizing: border-box;  
  cursor: pointer;  
}  
  
.ce-contextmenu-content .ce-contextmenu-item.hover {  
  background: rgba(25, 55, 88, .04);  
}  
  
.ce-contextmenu-content .ce-contextmenu-item span {  
  max-width: 300px;  
  font-size: 12px;  
}
```

```

    color: #3d4757;Đ
    overflow: hidden;Đ
    white-space: nowrap;Đ
    text-overflow: ellipsis;Đ
}Đ
Đ
.ce-contextmenu-content .ce-contextmenu-item span.ce-shortcut {Đ
    color: #767c85;Đ
    height: 30px;Đ
    flex: 1;Đ
    text-align: right;Đ
    line-height: 30px;Đ
    margin-left: 20px;Đ
}Đ
Đ
.ce-contextmenu-content .ce-contextmenu-item i {Đ
    width: 16px;Đ
    height: 16px;Đ
    vertical-align: middle;Đ
    display: inline-block;Đ
    background-repeat: no-repeat;Đ
    background-size: 100% 100%;Đ
    flex-shrink: 0;Đ
    margin-right: 8px;Đ
}Đ
Đ
.ce-contextmenu-divider {Đ
    background-color: #e2e6ed;Đ
    margin: 4px 16px;Đ
    height: 1px;Đ
}Đ
Đ
.ce-contextmenu-print {Đ
    background-image: url(../../assets/images/print.svg);Đ
}Đ
Đ
.ce-contextmenu-image {Đ
    background-image: url(../../assets/images/image.svg);Đ
}Đ
Đ
.ce-contextmenu-image-change {Đ
    background-image: url(../../assets/images/image-change.svg);Đ
}Đ
Đ
.ce-contextmenu-insert-row-col {Đ
    background-image: url(../../assets/images/insert-row-col.svg);Đ
}Đ

```

```
}␣
␣
.ce-contextmenu-insert-top-row {␣
  background-image: url(../../assets/images/insert-top-row.svg);␣
}␣
␣
.ce-contextmenu-insert-bottom-row {␣
  background-image: url(../../assets/images/insert-bottom-row.svg);␣
}␣
␣
.ce-contextmenu-insert-left-col {␣
  background-image: url(../../assets/images/insert-left-col.svg);␣
}␣
␣
.ce-contextmenu-insert-right-col {␣
  background-image: url(../../assets/images/insert-right-col.svg);␣
}␣
␣
.ce-contextmenu-delete-row-col {␣
  background-image: url(../../assets/images/delete-row-col.svg);␣
}␣
␣
.ce-contextmenu-delete-row {␣
  background-image: url(../../assets/images/delete-row.svg);␣
}␣
␣
.ce-contextmenu-delete-col {␣
  background-image: url(../../assets/images/delete-col.svg);␣
}␣
␣
.ce-contextmenu-delete-table {␣
  background-image: url(../../assets/images/delete-table.svg);␣
}␣
␣
.ce-contextmenu-merge-cell {␣
  background-image: url(../../assets/images/merge-cell.svg);␣
}␣
␣
.ce-contextmenu-merge-cancel-cell {␣
  background-image: url(../../assets/images/merge-cancel-cell.svg);␣
}␣
␣
.ce-contextmenu-vertical-align {␣
  background-image: url(../../assets/images/vertical-align.svg);␣
}␣
␣
```

```
.ce-contextmenu-vertical-align-top {␣
  background-image: url(../../../../assets/images/vertical-align-top.svg);␣
}␣
␣
.ce-contextmenu-vertical-align-middle {␣
  background-image: url(../../../../assets/images/vertical-align-middle.svg);␣
}␣
␣
.ce-contextmenu-vertical-align-bottom {␣
  background-image: url(../../../../assets/images/vertical-align-bottom.svg);␣
}␣
␣
.ce-contextmenu-border-all {␣
  background-image: url(../../../../assets/images/table-border-all.svg);␣
}␣
␣
.ce-contextmenu-border-empty {␣
  background-image: url(../../../../assets/images/table-border-empty.svg);␣
}␣
␣
.ce-contextmenu-border-external {␣
  background-image: url(../../../../assets/images/table-border-external.svg);␣
}
```

File Path: canvas-editor/src/editor/assets/css/control/select.css

```
.ce-select-control-popup {  
  max-width: 160px;  
  min-width: 69px;  
  max-height: 225px;  
  position: absolute;  
  z-index: 1;  
  border: 1px solid #e4e7ed;  
  border-radius: 4px;  
  background-color: #fff;  
  box-shadow: 0 2px 12px 0 rgba(0, 0, 0, .1);  
  box-sizing: border-box;  
  margin: 5px 0;  
  overflow-y: auto;  
}  
  
.ce-select-control-popup ul {  
  list-style: none;  
  padding: 3px 0;  
  margin: 0;  
  box-sizing: border-box;  
}  
  
.ce-select-control-popup ul li {  
  font-size: 13px;  
  padding: 0 20px;  
  position: relative;  
  white-space: nowrap;  
  overflow: hidden;  
  text-overflow: ellipsis;  
  color: #666;  
  height: 36px;  
  line-height: 36px;  
  box-sizing: border-box;  
  cursor: pointer;  
}  
  
.ce-select-control-popup ul li:hover {  
  background-color: #EEF2FD;  
}  
  
.ce-select-control-popup ul li.active {  
  color: var(--COLOR-HOVER, #5175f4);  
  font-weight: 700;  
}
```

File Path: canvas-editor/src/editor/assets/css/date/datePicker.css

```
.ce-date-container {  
  display: none;  
  width: 300px;  
  overflow: hidden;  
  left: 0;  
  right: 0;  
  position: absolute;  
  z-index: 1;  
  color: #606266;  
  background: #ffffff;  
  border-radius: 4px;  
  padding: 10px;  
  user-select: none;  
  border: 1px solid #e4e7ed;  
  box-shadow: 0 2px 12px 0 rgb(0 0 0 / 10%);  
}  
  
.ce-date-container.active {  
  display: block;  
}  
  
.ce-date-wrap {  
  display: none;  
}  
  
.ce-date-wrap.active {  
  display: block;  
}  
  
.ce-date-title {  
  display: flex;  
  justify-content: center;  
  align-items: center;  
  text-align: center;  
  color: #606266;  
  font-size: 16px;  
}  
  
.ce-date-title>span {  
  display: inline-block;  
}  
  
.ce-date-title>span:not(.ce-date-title__now) {  
  font-family: cursive;  
  cursor: pointer;  
}
```

```

}
}
. ce-date-title>span:not(. ce-date-title__now):hover {
  color: #5175F4;
}
}
. ce-date-title . ce-date-title__pre-year {
  width: 15%;
}
}
. ce-date-title . ce-date-title__pre-month {
  width: 15%;
}
}
. ce-date-title . ce-date-title__now {
  width: 40%;
}
}
. ce-date-title . ce-date-title__next-year {
  width: 15%;
}
}
. ce-date-title . ce-date-title__next-month {
  width: 15%;
}
}
. ce-date-week {
  width: 100%;
  display: flex;
  justify-content: center;
  margin-top: 15px;
  padding-bottom: 5px;
  border-bottom: 1px solid #e4e7ed;
}
}
. ce-date-week>span {
  list-style: none;
  width: calc(100%/7);
  text-align: center;
  color: #606266;
  font-size: 14px;
}
}
. ce-date-day {
  width: 100%;
  display: flex;

```



```

    flex-wrap: wrap;Đ
    align-items: center;Đ
    margin-top: 5px;Đ
}Đ
Đ
.ce-date-day>div {Đ
    width: calc(100%/7);Đ
    height: 40px;Đ
    text-align: center;Đ
    color: #606266;Đ
    font-size: 14px;Đ
    cursor: pointer;Đ
    line-height: 40px;Đ
    border-radius: 4px;Đ
}Đ
Đ
.ce-date-day>div:hover {Đ
    color: #5175F4;Đ
    opacity: .8;Đ
}Đ
Đ
.ce-date-day>div.active {Đ
    color: #5175F4;Đ
    font-weight: 700;Đ
}Đ
Đ
.ce-date-day>div.disable {Đ
    color: #c0c4cc;Đ
}Đ
Đ
.ce-date-day>div.select {Đ
    color: #fff;Đ
    background-color: #5175F4;Đ
}Đ
Đ
.ce-time-wrap {Đ
    display: none;Đ
    padding: 10px;Đ
    height: 286px;Đ
}Đ
Đ
.ce-time-wrap::-webkit-scrollbar {Đ
    width: 0;Đ
}Đ
Đ
.ce-time-wrap.active {Đ

```

```

    display: flex;Đ
}Đ
Đ
.ce-time-wrap li {Đ
    list-style: none;Đ
}Đ
Đ
.ce-time-wrap>li {Đ
    width: 33.3%;Đ
    height: 100%;Đ
    text-align: center;Đ
}Đ
Đ
.ce-time-wrap>li>span {Đ
    transform: translateY(-5px);Đ
    display: inline-block;Đ
}Đ
Đ
.ce-time-wrap>li>ol {Đ
    height: calc(100% - 20px);Đ
    overflow-y: auto;Đ
    border: 1px solid #e2e2e2;Đ
    position: relative;Đ
}Đ
Đ
.ce-time-wrap>li:first-child>ol {Đ
    border-right: 0;Đ
}Đ
Đ
.ce-time-wrap>li:last-child>ol {Đ
    border-left: 0;Đ
}Đ
Đ
.ce-time-wrap>li>ol>li {Đ
    line-height: 30px;Đ
    cursor: pointer;Đ
    transition: all .3s;Đ
}Đ
Đ
.ce-time-wrap>li>ol>li:hover {Đ
    background-color: #eaeaea;Đ
}Đ
Đ
.ce-time-wrap>li>ol>li.active {Đ
    color: #ffffff;Đ
    background: #5175F4;Đ

```

```

}
}
.ce-date-menu {
  width: 100%;
  height: 28px;
  display: flex;
  justify-content: flex-end;
  align-items: center;
  padding-top: 10px;
  position: relative;
  border-top: 1px solid #e4e7ed;
}
}
.ce-date-menu button {
  display: inline-block;
  line-height: 1;
  white-space: nowrap;
  cursor: pointer;
  background: #fff;
  border: 1px solid #dcdfe6;
  color: #606266;
  appearance: none;
  text-align: center;
  box-sizing: border-box;
  outline: none;
  margin: 0;
  transition: .1s;
  font-weight: 500;
  user-select: none;
  padding: 7px 15px;
  font-size: 12px;
  border-radius: 3px;
  margin-left: 10px;
}
}
.ce-date-menu button:hover {
  color: #5175F4;
  border-color: #5175F4;
}
}
.ce-date-menu button.ce-date-menu__time {
  border: 1px solid transparent;
  position: absolute;
  left: 0;
  margin-left: 0;
}
}

```

```
⌘  
.ce-date-menu button.ce-date-menu__time:hover {⌘  
  color: #5175F4;⌘  
}
```

File Path: canvas-editor/src/editor/assets/css/hyperlink/hyperlink.css

```
.ce-hyperlink-popup {  
  background: #fff;  
  box-shadow: 0 2px 12px 0 rgb(98 107 132 / 20%);  
  border-radius: 2px;  
  color: #3d4757;  
  padding: 12px 16px;  
  position: absolute;  
  z-index: 1;  
  text-align: center;  
  display: none;  
}
```

```
  
.  
.ce-hyperlink-popup a {  
  min-width: 100px;  
  max-width: 300px;  
  font-size: 12px;  
  display: inline-block;  
  white-space: nowrap;  
  overflow: hidden;  
  text-overflow: ellipsis;  
  cursor: pointer;  
  text-decoration: none;  
  border-bottom-width: 1px;  
  border-bottom-style: solid;  
  color: #0000ff;  
}
```

File Path: canvas-editor/src/editor/assets/css/index.css

```
@import './control/select.css';
@import './date/datePicker.css';
@import './block/block.css';
@import './table/table.css';
@import './resizer/resizer.css';
@import './previewer/previewer.css';
@import './contextmenu/contextmenu.css';
@import './hyperlink/hyperlink.css';
@import './zone/zone.css';
```

{

```
.ce-inputarea {
  width: 100px;
  height: 30px;
  min-width: 0;
  min-height: 0;
  margin: 0;
  padding: 0;
  left: 0;
  right: 0;
  letter-spacing: 0;
  font-size: 12px;
  position: absolute;
  z-index: -1;
  outline: none;
  resize: none;
  border: none;
  overflow: hidden;
  color: transparent;
  user-select: none;
  background-color: transparent;
}
```

}

{

```
.ce-cursor {
  width: 1px;
  height: 20px;
  left: 0;
  right: 0;
  position: absolute;
  outline: none;
  background-color: #000000;
  pointer-events: none;
}
```

}

{

```
.ce-cursor.ce-cursor--animation {
  animation-duration: 1s;
}
```

```
    animation-iteration-count: infinite;␣
    animation-name: cursorAnimation;␣
}␣
␣
@keyframes cursorAnimation {␣
    from {␣
        opacity: 1␣
    }␣
    ␣
    13% {␣
        opacity: 0␣
    }␣
    ␣
    50% {␣
        opacity: 0␣
    }␣
    ␣
    63% {␣
        opacity: 1␣
    }␣
    ␣
    to {␣
        opacity: 1␣
    }␣
}
```

File Path: canvas-editor/src/editor/assets/css/previewer/previewer.css

```
.ce-image-preview {
  position: fixed;
  left: 0;
  top: 0;
  z-index: 1000;
  width: 100%;
  height: 100%;
  overflow: hidden;
  background: #f2f4f7;
  display: flex;
  align-items: center;
  justify-content: center;
  animation: previewerAnimation .3s;
}
@keyframes previewerAnimation {
  0% {
    opacity: 0.1;
  }
  100% {
    opacity: 1;
  }
}
.ce-image-preview .image-close {
  width: 24px;
  height: 24px;
  display: inline-block;
  position: absolute;
  right: 50px;
  top: 30px;
  z-index: 99;
  cursor: pointer;
  background: url(../images/close.svg) no-repeat;
  background-size: 100% 100%;
  transition: all .3s;
  border-radius: 50%;
}
.ce-image-preview .image-close:hover {
  background-color: #e2e6ed;
}
.ce-image-preview .ce-image-container {
```



```

    position: relative;Đ
}Đ
Đ
.ce-image-preview .ce-image-container img {Đ
    cursor: move;Đ
    position: relative;Đ
}Đ
Đ
.ce-image-preview .ce-image-menu {Đ
    height: 50px;Đ
    position: absolute;Đ
    bottom: 50px;Đ
    z-index: 99;Đ
    display: flex;Đ
    align-items: center;Đ
    justify-content: center;Đ
}Đ
Đ
.ce-image-preview .ce-image-menu i {Đ
    width: 32px;Đ
    height: 32px;Đ
    margin: 0 8px;Đ
    cursor: pointer;Đ
    display: inline-block;Đ
    background-repeat: no-repeat;Đ
    background-size: 100% 100%;Đ
    transition: all .3s;Đ
    border-radius: 50%;Đ
}Đ
Đ
.ce-image-preview .ce-image-menu i:hover {Đ
    background-color: #e2e6ed;Đ
}Đ
Đ
.ce-image-preview .ce-image-menu i.zoom-in {Đ
    background-image: url(../images/zoom-in.svg);Đ
}Đ
Đ
.ce-image-preview .ce-image-menu i.zoom-out {Đ
    background-image: url(../images/zoom-out.svg);Đ
}Đ
Đ
.ce-image-preview .ce-image-menu i.rotate {Đ
    background-image: url(../images/rotate.svg);Đ
}Đ
Đ

```

```
.ce-image-preview .ce-image-menu i.original-size {  
  background-image: url(../images/original-size.svg);  
}  
  
.ce-image-preview .ce-image-menu i.image-download {  
  background-image: url(../images/image-download.svg);  
}
```

File Path: canvas-editor/src/editor/assets/css/resizer/resizer.css

```
.ce-resizer-selection {  
  position: absolute;  
  border: 1px solid;  
}  
  
.ce-resizer-selection>div {  
  position: absolute;  
  z-index: 9;  
  width: 10px;  
  height: 10px;  
  box-shadow: 0 1px 4px 0 rgb(0 0 0 / 30%);  
  border-radius: 5px;  
  border: 2px solid #ffffff;  
  box-sizing: border-box;  
}  
  
.ce-resizer-selection .handle-0 {  
  cursor: nw-resize;  
}  
  
.ce-resizer-selection .handle-1 {  
  cursor: n-resize;  
}  
  
.ce-resizer-selection .handle-2 {  
  cursor: ne-resize;  
}  
  
.ce-resizer-selection .handle-3 {  
  cursor: e-resize;  
}  
  
.ce-resizer-selection .handle-4 {  
  cursor: se-resize;  
}  
  
.ce-resizer-selection .handle-5 {  
  cursor: s-resize;  
}  
  
.ce-resizer-selection .handle-6 {  
  cursor: sw-resize;  
}  
  
.ce-resizer-selection .handle-7 {
```

```
    cursor: w-resize;␣
}␣
␣
.ce-resizer-image {␣
    position: absolute;␣
    opacity: 0.5;␣
}
```

File Path: canvas-editor/src/editor/assets/css/table/table.css

```
.ce-table-tool__row {  
  position: absolute;  
  width: 12px;  
  border-radius: 6.5px;  
  overflow: hidden;  
  background-color: #E2E6ED;  
}  
  
.ce-table-tool__row .ce-table-tool__row__item {  
  width: 100%;  
  position: relative;  
}  
  
.ce-table-tool__row .ce-table-tool__row__item::after {  
  content: " ";  
  position: absolute;  
  bottom: 0;  
  left: 2px;  
  width: 8px;  
  height: 1px;  
  background-color: #C0C6CF;  
}  
  
.ce-table-tool__row .ce-table-tool__row__item:last-child:after {  
  display: none;  
}  
  
.ce-table-tool__col {  
  position: absolute;  
  height: 12px;  
  border-radius: 6.5px;  
  overflow: hidden;  
  background-color: #E2E6ED;  
  display: flex;  
}  
  
.ce-table-tool__col .ce-table-tool__col__item {  
  height: 100%;  
  position: relative;  
}  
  
.ce-table-tool__col .ce-table-tool__col__item::after {  
  content: " ";  
  position: absolute;  
  top: 2px;  
}
```

```

left: -1px;Đ
width: 1px;Đ
height: 8px;Đ
z-index: 1;Đ
background-color: #C0C6CF;Đ
}Đ
Đ
.ce-table-tool__col .ce-table-tool__col__item:first-child:after {Đ
display: none;Đ
}Đ
Đ
.ce-table-tool__row .ce-table-tool__row__item.active,Đ
.ce-table-tool__col .ce-table-tool__col__item.active {Đ
background-color: #C4D7FA;Đ
}Đ
Đ
.ce-table-tool__col .ce-table-tool__anchor {Đ
right: -5px;Đ
width: 10px;Đ
height: 12px;Đ
z-index: 9;Đ
position: absolute;Đ
cursor: col-resize;Đ
}Đ
Đ
.ce-table-tool__row .ce-table-tool__anchor {Đ
bottom: -5px;Đ
left: 0;Đ
width: 12px;Đ
height: 10px;Đ
z-index: 9;Đ
position: absolute;Đ
cursor: row-resize;Đ
}Đ
Đ
.ce-table-anchor__line {Đ
z-index: 9;Đ
position: absolute;Đ
border: 1px dotted #000000;Đ
}Đ
Đ
.ce-table-tool__border {Đ
position: absolute;Đ
z-index: 1;Đ
background: transparent;Đ
pointer-events: none;Đ

```

```
}␣
␣
.ce-table-tool__border__row {␣
  position: absolute;␣
  cursor: row-resize;␣
  pointer-events: auto;␣
}␣
␣
.ce-table-tool__border__col {␣
  position: absolute;␣
  cursor: col-resize;␣
  pointer-events: auto;␣
}
```

File Path: canvas-editor/src/editor/assets/css/zone/zone.css

```
.ce-zone-indicator>div {  
  padding: 3px 6px;  
  color: #000000;  
  font-size: 12px;  
  background: rgb(218 231 252);  
  position: absolute;  
  transform-origin: 0 0;  
}  
  
.ce-zone-indicator-border__top,  
.ce-zone-indicator-border__bottom,  
.ce-zone-indicator-border__left,  
.ce-zone-indicator-border__right {  
  display: block;  
  position: absolute;  
  z-index: 0;  
}  
  
.ce-zone-indicator-border__top {  
  border-top: 2px dashed rgb(238, 238, 238);  
}  
  
.ce-zone-indicator-border__bottom {  
  border-top: 2px dashed rgb(238, 238, 238);  
  width: 100%;  
}  
  
.ce-zone-indicator-border__left {  
  border-left: 2px dashed rgb(238, 238, 238);  
}  
  
.ce-zone-indicator-border__right {  
  border-right: 2px dashed rgb(238, 238, 238);  
}
```





File Path: canvas-editor/src/editor/assets/images/close.svg

File Path: canvas-editor/src/editor/assets/images/delete-col.svg

File Path: canvas-editor/src/editor/assets/images/delete-row-col.svg



File Path: canvas-editor/src/editor/assets/images/delete-row.svg

File Path: canvas-editor/src/editor/assets/images/delete-table.svg



File Path: canvas-editor/src/editor/assets/images/image-change.svg



File Path: canvas-editor/src/editor/assets/images/image-download.svg

File Path: canvas-editor/src/editor/assets/images/image.svg







File Path: canvas-editor/src/editor/assets/images/insert-bottom-row.svg



File Path: canvas-editor/src/editor/assets/images/insert-left-col.svg



File Path: canvas-editor/src/editor/assets/images/insert-right-col.svg



File Path: canvas-editor/src/editor/assets/images/insert-row-col.svg



File Path: canvas-editor/src/editor/assets/images/insert-top-row.svg



File Path: canvas-editor/src/editor/assets/images/merge-cancel-cell.svg



File Path: canvas-editor/src/editor/assets/images/merge-cell.svg



File Path: canvas-editor/src/editor/assets/images/original-size.svg





File Path: canvas-editor/src/editor/assets/images/print.svg



File Path: canvas-editor/src/editor/assets/images/rotate.svg

File Path: canvas-editor/src/editor/assets/images/submenu-dropdown.svg



File Path: canvas-editor/src/editor/assets/images/table-border-all.svg

[1-2-3]

File Path: canvas-editor/src/editor/assets/images/table-border-empty.svg



File Path: canvas-editor/src/editor/assets/images/table-border-external.svg



File Path: canvas-editor/src/editor/assets/images/vertical-align-bottom.svg



File Path: canvas-editor/src/editor/assets/images/vertical-align-middle.svg



File Path: canvas-editor/src/editor/assets/images/vertical-align-top.svg

File Path: canvas-editor/src/editor/assets/images/vertical-align.svg



File Path: canvas-editor/src/editor/assets/images/zoom-in.svg



File Path: canvas-editor/src/editor/assets/images/zoom-out.svg

File Path: canvas-editor/src/editor/core/command/Command.ts

```
import { CommandAdapt } from './CommandAdapt'
export class Command {
  public executeMode: CommandAdapt['mode']
  public executeCut: CommandAdapt['cut']
  public executeCopy: CommandAdapt['copy']
  public executePaste: CommandAdapt['paste']
  public executeSelectAll: CommandAdapt['selectAll']
  public executeBackspace: CommandAdapt['backspace']
  public executeSetRange: CommandAdapt['setRange']
  public executeUndo: CommandAdapt['undo']
  public executeRedo: CommandAdapt['redo']
  public executePainter: CommandAdapt['painter']
  public executeApplyPainterStyle: CommandAdapt['applyPainterStyle']
  public executeFormat: CommandAdapt['format']
  public executeFont: CommandAdapt['font']
  public executeSize: CommandAdapt['size']
  public executeSizeAdd: CommandAdapt['sizeAdd']
  public executeSizeMinus: CommandAdapt['sizeMinus']
  public executeBold: CommandAdapt['bold']
  public executeItalic: CommandAdapt['italic']
  public executeUnderline: CommandAdapt['underline']
  public executeStrikeout: CommandAdapt['strikeout']
  public executeSuperscript: CommandAdapt['superscript']
  public executeSubscript: CommandAdapt['subscript']
  public executeColor: CommandAdapt['color']
  public executeHighlight: CommandAdapt['highlight']
  public executeTitle: CommandAdapt['title']
  public executeList: CommandAdapt['list']
  public executeRowFlex: CommandAdapt['rowFlex']
  public executeRowMargin: CommandAdapt['rowMargin']
  public executeInsertTable: CommandAdapt['insertTable']
  public executeInsertTableTopRow: CommandAdapt['insertTableTopRow']
  public executeInsertTableBottomRow: CommandAdapt['insertTableBottomRow']
  public executeInsertTableLeftCol: CommandAdapt['insertTableLeftCol']
  public executeInsertTableRightCol: CommandAdapt['insertTableRightCol']
  public executeDeleteTableRow: CommandAdapt['deleteTableRow']
  public executeDeleteTableCol: CommandAdapt['deleteTableCol']
  public executeDeleteTable: CommandAdapt['deleteTable']
  public executeMergeTableCell: CommandAdapt['mergeTableCell']
  public executeCancelMergeTableCell: CommandAdapt['cancelMergeTableCell']
  public executeTableTdVerticalAlign: CommandAdapt['tableTdVerticalAlign']
  public executeTableBorderStyle: CommandAdapt['tableBorderStyle']
  public executeTableTdBackgroundColor: CommandAdapt['tableTdBackgroundColor']
}
```

```

public executeImage: CommandAdapt['image']Đ
public executeHyperlink: CommandAdapt['hyperlink']Đ
public executeDeleteHyperlink: CommandAdapt['deleteHyperlink']Đ
public executeCancelHyperlink: CommandAdapt['cancelHyperlink']Đ
public executeEditHyperlink: CommandAdapt['editHyperlink']Đ
public executeSeparator: CommandAdapt['separator']Đ
public executePageBreak: CommandAdapt['pageBreak']Đ
public executeAddWatermark: CommandAdapt['addWatermark']Đ
public executeDeleteWatermark: CommandAdapt['deleteWatermark']Đ
public executeSearch: CommandAdapt['search']Đ
public executeSearchNavigatePre: CommandAdapt['searchNavigatePre']Đ
public executeSearchNavigateNext: CommandAdapt['searchNavigateNext']Đ
public executeReplace: CommandAdapt['replace']Đ
public executePrint: CommandAdapt['print']Đ
public executeReplaceImageElement: CommandAdapt['replaceImageElement']Đ
public executeSaveAsImageElement: CommandAdapt['saveAsImageElement']Đ
public executeChangeImageDisplay: CommandAdapt['changeImageDisplay']Đ
public executePageMode: CommandAdapt['pageMode']Đ
public executePageScaleRecovery: CommandAdapt['pageScaleRecovery']Đ
public executePageScaleMinus: CommandAdapt['pageScaleMinus']Đ
public executePageScaleAdd: CommandAdapt['pageScaleAdd']Đ
public executePaperSize: CommandAdapt['paperSize']Đ
public executePaperDirection: CommandAdapt['paperDirection']Đ
public executeSetPaperMargin: CommandAdapt['setPaperMargin']Đ
public executeInsertElementList: CommandAdapt['insertElementList']Đ
public executeAppendElementList: CommandAdapt['appendElementList']Đ
public executeSetValue: CommandAdapt['setValue']Đ
public executeRemoveControl: CommandAdapt['removeControl']Đ
public executeSetLocale: CommandAdapt['setLocale']Đ
public executeLocationCatalog: CommandAdapt['locationCatalog']Đ
public executeWordTool: CommandAdapt['wordTool']Đ
public getCatalog: CommandAdapt['getCatalog']Đ
public getImage: CommandAdapt['getImage']Đ
public getValue: CommandAdapt['getValue']Đ
public getWordCount: CommandAdapt['getWordCount']Đ
public getRangeText: CommandAdapt['getRangeText']Đ
public getRangeContext: CommandAdapt['getRangeContext']Đ
public getPaperMargin: CommandAdapt['getPaperMargin']Đ
public getSearchNavigateInfo: CommandAdapt['getSearchNavigateInfo']Đ
Đ
constructor(adapt: CommandAdapt) {Đ
    // Qh\@T}NăĐ
    this.executeMode = adapt.mode.bind(adapt)Đ
    this.executeCut = adapt.cut.bind(adapt)Đ
    this.executeCopy = adapt.copy.bind(adapt)Đ
    this.executePaste = adapt.paste.bind(adapt)Đ

```

```

this.executeSelectAll = adapt.selectAll.bind(adapt)Đ
this.executeBackspace = adapt.backspace.bind(adapt)Đ
this.executeSetRange = adapt.setRange.bind(adapt)Đ
// d• 0 'IPZ0 h<_ R70 n -dh<_ Đ
this.executeUndo = adapt.undo.bind(adapt)Đ
this.executeRedo = adapt.redo.bind(adapt)Đ
this.executePainter = adapt.painter.bind(adapt)Đ
this.executeApplyPainterStyle = adapt.applyPainterStyle.bind(adapt)Đ
this.executeFormat = adapt.format.bind(adapt)Đ
// [WOS0 [WOSY\ 0 [WOSSØY'0 [WOSSØ\ 0 R |—0 eœOS0 N R ~¿0 R -d~¿0 [WOS~œ,r0 €lfo,rĐ
this.executeFont = adapt.font.bind(adapt)Đ
this.executeSize = adapt.size.bind(adapt)Đ
this.executeSizeAdd = adapt.sizeAdd.bind(adapt)Đ
this.executeSizeMinus = adapt.sizeMinus.bind(adapt)Đ
this.executeBold = adapt.bold.bind(adapt)Đ
this.executeltalic = adapt.italic.bind(adapt)Đ
this.executeUnderline = adapt.underline.bind(adapt)Đ
this.executeStrikeout = adapt.strikeout.bind(adapt)Đ
this.executeSuperscript = adapt.superscript.bind(adapt)Đ
this.executeSubscript = adapt.subscript.bind(adapt)Đ
this.executeColor = adapt.color.bind(adapt)Đ
this.executeHighlight = adapt.highlight.bind(adapt)Đ
// h ~0 [üŸPe¹_ 0 R ^hĐ
this.executeTitle = adapt.title.bind(adapt)Đ
this.executeList = adapt.list.bind(adapt)Đ
this.executeRowFlex = adapt.rowFlex.bind(adapt)Đ
this.executeRowMargin = adapt.rowMargin.bind(adapt)Đ
// ^hh<0 VprGN O 0 •..."pc¥0 d }"0 bSSp0 VprGdÍO\Đ
this.executeInsertTable = adapt.insertTable.bind(adapt)Đ
this.executeInsertTableTopRow = adapt.insertTableTopRow.bind(adapt)Đ
this.executeInsertTableBottomRow = adapt.insertTableBottomRow.bind(adapt)Đ
this.executeInsertTableLeftCol = adapt.insertTableLeftCol.bind(adapt)Đ
this.executeInsertTableRightCol = adapt.insertTableRightCol.bind(adapt)Đ
this.executeDeleteTableRow = adapt.deleteTableRow.bind(adapt)Đ
this.executeDeleteTableCol = adapt.deleteTableCol.bind(adapt)Đ
this.executeDeleteTable = adapt.deleteTable.bind(adapt)Đ
this.executeMergeTableCell = adapt.mergeTableCell.bind(adapt)Đ
this.executeCancelMergeTableCell = adapt.cancelMergeTableCell.bind(adapt)Đ
this.executeTableTdVerticalAlign = adapt.tableTdVerticalAlign.bind(adapt)Đ
this.executeTableBorderStyle = adapt.tableBorderStyle.bind(adapt)Đ
this.executeTableTdBackgroundColor =Đ
    adapt.tableTdBackgroundColor.bind(adapt)Đ
this.executeImage = adapt.image.bind(adapt)Đ
this.executeHyperlink = adapt.hyperlink.bind(adapt)Đ
this.executeDeleteHyperlink = adapt.deleteHyperlink.bind(adapt)Đ
this.executeCancelHyperlink = adapt.cancelHyperlink.bind(adapt)Đ

```

```

this.executeEditHyperlink = adapt.editHyperlink.bind(adapt)Đ
this.executeSeparator = adapt.separator.bind(adapt)Đ
this.executePageBreak = adapt.pageBreak.bind(adapt)Đ
this.executeAddWatermark = adapt.addWatermark.bind(adapt)Đ
this.executeDeleteWatermark = adapt.deleteWatermark.bind(adapt)Đ
this.executeSearch = adapt.search.bind(adapt)Đ
this.executeSearchNavigatePre = adapt.searchNavigatePre.bind(adapt)Đ
this.executeSearchNavigateNext = adapt.searchNavigateNext.bind(adapt)Đ
this.executeReplace = adapt.replace.bind(adapt)Đ
this.executePrint = adapt.print.bind(adapt)Đ
this.executeReplaceImageElement = adapt.replaceImageElement.bind(adapt)Đ
this.executeSaveAsImageElement = adapt.saveAsImageElement.bind(adapt)Đ
this.executeChangeImageDisplay = adapt.changeImageDisplay.bind(adapt)Đ
// ~u—bj!_ 0 ~u—b•)e>0 ~,_ Y\ 0 ~,_ e¹T 0 ~u••YĐ
this.executePageMode = adapt.pageMode.bind(adapt)Đ
this.executePageScaleRecovery = adapt.pageScaleRecovery.bind(adapt)Đ
this.executePageScaleMinus = adapt.pageScaleMinus.bind(adapt)Đ
this.executePageScaleAdd = adapt.pageScaleAdd.bind(adapt)Đ
this.executePaperSize = adapt.paperSize.bind(adapt)Đ
this.executePaperDirection = adapt.paperDirection.bind(adapt)Đ
this.executeSetPaperMargin = adapt.setPaperMargin.bind(adapt)Đ
// • u(Đ
this.executeInsertElementList = adapt.insertElementList.bind(adapt)Đ
this.executeAppendElementList = adapt.appendElementList.bind(adapt)Đ
this.executeSetValue = adapt.setValue.bind(adapt)Đ
this.executeRemoveControl = adapt.removeControl.bind(adapt)Đ
this.executeSetLocale = adapt.setLocale.bind(adapt)Đ
this.executeLocationCatalog = adapt.locationCatalog.bind(adapt)Đ
this.executeWordTool = adapt.wordTool.bind(adapt)Đ
// f·SÖĐ
this.getImage = adapt.getImage.bind(adapt)Đ
this.getValue = adapt.getValue.bind(adapt)Đ
this.getWordCount = adapt.getWordCount.bind(adapt)Đ
this.getRangeText = adapt.getRangeText.bind(adapt)Đ
this.getRangeContext = adapt.getRangeContext.bind(adapt)Đ
this.getCatalog = adapt.getCatalog.bind(adapt)Đ
this.getPaperMargin = adapt.getPaperMargin.bind(adapt)Đ
this.getSearchNavigateInfo = adapt.getSearchNavigateInfo.bind(adapt)Đ
}Đ
}Đ

```



```

File Path: canvas-editor/src/editor/core/command/CommandAdapt.ts
import { NBSP, WRAP, ZERO } from '../dataset/constant/Common'Ð
import { EDITOR_ELEMENT_STYLE_ATTR } from '../dataset/constant/Element'Ð
import { titleSizeMapping } from '../dataset/constant/Title'Ð
import { defaultWatermarkOption } from '../dataset/constant/Watermark'Ð
import { ControlComponent, ImageDisplay } from '../dataset/enum/Control'Ð
import {Ð
  EditorContext,Ð
  EditorMode,Ð
  PageMode,Ð
  PaperDirectionÐ
} from '../dataset/enum/Editor'Ð
import { ElementType } from '../dataset/enum/Element'Ð
import { ElementStyleKey } from '../dataset/enum/ElementStyle'Ð
import { ListStyle, ListType } from '../dataset/enum/List'Ð
import { RowFlex } from '../dataset/enum/Row'Ð
import { TableBorder } from '../dataset/enum/table/Table'Ð
import { TitleLevel } from '../dataset/enum/Title'Ð
import { VerticalAlign } from '../dataset/enum/VerticalAlign'Ð
import { ICatalog } from '../interface/Catalog'Ð
import {Ð
  IAppendElementListOption,Ð
  IDrawImagePayload,Ð
  IGetValueOption,Ð
  IPainterOptionÐ
} from '../interface/Draw'Ð
import {Ð
  IEditorData,Ð
  IEditorOption,Ð
  IEditorResultÐ
} from '../interface/Editor'Ð
import { IElement, IElementStyle } from '../interface/Element'Ð
import { IMargin } from '../interface/Margin'Ð
import { RangeContext } from '../interface/Range'Ð
import { IColgroup } from '../interface/table/Colgroup'Ð
import { ITd } from '../interface/table/Td'Ð
import { ITr } from '../interface/table/Tr'Ð
import { IWatermark } from '../interface/Watermark'Ð
import { deepClone, downloadFile, getUUID } from '../utils'Ð
import {Ð
  formatElementContext,Ð
  formatElementList,Ð
  isTextLikeElement,Ð
  pickElementAttrÐ
} from '../utils/element'Ð
import { printImageBase64 } from '../utils/print'Ð

```

```

import { Control } from '../draw/control/Control'Đ
import { Draw } from '../draw/Draw'Đ
import { INavigateInfo, Search } from '../draw/interactive/Search'Đ
import { TableTool } from '../draw/particle/table/TableTool'Đ
import { CanvasEvent } from '../event/CanvasEvent'Đ
import { HistoryManager } from '../history/HistoryManager'Đ
import { I18n } from '../i18n/I18n'Đ
import { Position } from '../position/Position'Đ
import { RangeManager } from '../range/RangeManager'Đ
import { WorkerManager } from '../worker/WorkerManager'Đ
Đ
export class CommandAdapt {Đ
  private draw: DrawĐ
  private range: RangeManagerĐ
  private position: PositionĐ
  private historyManager: HistoryManagerĐ
  private canvasEvent: CanvasEventĐ
  private tableTool: TableToolĐ
  private options: Required<IEditorOption>Đ
  private control: ControlĐ
  private workerManager: WorkerManagerĐ
  private searchManager: SearchĐ
  private i18n: I18nĐ
Đ
  constructor(draw: Draw) {Đ
    this.draw = drawĐ
    this.range = draw.getRange()Đ
    this.position = draw.getPosition()Đ
    this.historyManager = draw.getHistoryManager()Đ
    this.canvasEvent = draw.getCanvasEvent()Đ
    this.tableTool = draw.getTableTool()Đ
    this.options = draw.getOptions()Đ
    this.control = draw.getControl()Đ
    this.workerManager = draw.getWorkerManager()Đ
    this.searchManager = draw.getSearch()Đ
    this.i18n = draw.getI18n()Đ
  }Đ
Đ
  public mode(payload: EditorMode) {Đ
    const mode = this.draw.getMode()Đ
    if (mode === payload) returnĐ
    this.draw.setMode(payload)Đ
    this.draw.render({Đ
      isSetCursor: false,Đ
      isSubmitHistory: falseĐ
    })Đ
  }Đ
}

```

```

    }
}
}
public cut() {
    const isReadOnly = this.draw.isReadOnly()
    if (isReadOnly) return
    this.canvasEvent.cut()
}
}
}
public copy() {
    this.canvasEvent.copy()
}
}
}
public async paste() {
    const isReadOnly = this.draw.isReadOnly()
    if (isReadOnly) return
    const text = await navigator.clipboard.readText()
    if (text) {
        this.canvasEvent.input(text)
    }
}
}
}
public selectAll() {
    this.canvasEvent.selectAll()
}
}
}
public backspace() {
    const isReadOnly = this.draw.isReadOnly()
    if (isReadOnly) return
    const elementList = this.draw.getElementList()
    const { startIndex, endIndex } = this.range.getRange()
    const isCollapsed = startIndex === endIndex
    //  $\text{TM}$ —[W{&y•kbR —d
    if (
        isCollapsed &&
        elementList[startIndex].value === ZERO &&
        startIndex === 0
    ) {
        return
    }
    if (!isCollapsed) {
        this.draw.spliceElementList(
            elementList,
            startIndex + 1,
            endIndex - startIndex
        )
    } else {

```

```

        this.draw.spliceElementList(elementList, startIndex, 1)
    }
    const curIndex = isCollapsed ? startIndex - 1 : startIndex
    this.range.setRange(curIndex, curIndex)
    this.draw.render({ curIndex })
}
}
public setRange(startIndex: number, endIndex: number) {
    if (startIndex < 0 || endIndex < 0 || endIndex < startIndex) return
    this.range.setRange(startIndex, endIndex)
    const isCollapsed = startIndex === endIndex
    this.draw.render({
        curIndex: isCollapsed ? startIndex : undefined,
        isCompute: false,
        isSubmitHistory: false,
        isSetCursor: isCollapsed
    })
}
}
public undo() {
    const isReadOnly = this.draw.isReadOnly()
    if (isReadOnly) return
    this.historyManager.undo()
}
}
public redo() {
    const isReadOnly = this.draw.isReadOnly()
    if (isReadOnly) return
    this.historyManager.redo()
}
}
public painter(options: IPainterOption) {
    const isReadOnly = this.draw.isReadOnly()
    if (isReadOnly) return
    const selection = this.range.getSelection()
    if (!selection) return
    const painterStyle: IElementStyle = {}
    selection.forEach(s => {
        const painterStyleKeys = EDITOR_ELEMENT_STYLE_ATTR
        painterStyleKeys.forEach(p => {
            const key = p as keyof typeof ElementStyleKey
            if (painterStyle[key] === undefined) {
                painterStyle[key] = s[key] as any
            }
        })
    })
}
}

```

```

    this.draw.setPainterStyle(painterStyle, options)Đ
  }Đ
Đ
  public applyPainterStyle() {Đ
    this.canvasEvent.applyPainterStyle()Đ
  }Đ
Đ
  public format() {Đ
    const isReadonly = this.draw.isReadonly()Đ
    if (isReadonly) returnĐ
    const selection = this.range.getSelection()Đ
    if (!selection) returnĐ
    selection.forEach(el => {Đ
      el.font = "Đ
      el.color = "Đ
      el.bold = falseĐ
      el.italic = falseĐ
      el.underline = falseĐ
      el.strikeout = falseĐ
    })Đ
    this.draw.render({ isSetCursor: false })Đ
  }Đ
Đ
  public font(payload: string) {Đ
    const isReadonly = this.draw.isReadonly()Đ
    if (isReadonly) returnĐ
    const selection = this.range.getSelection()Đ
    if (!selection) returnĐ
    selection.forEach(el => {Đ
      el.font = payloadĐ
    })Đ
    this.draw.render({ isSetCursor: false })Đ
  }Đ
Đ
  public size(payload: number) {Đ
    const { minSize, maxSize, defaultSize } = this.optionsĐ
    if (payload < minSize || payload > maxSize) returnĐ
    const isReadonly = this.draw.isReadonly()Đ
    if (isReadonly) returnĐ
    const selection = this.range.getTextLikeSelection()Đ
    if (!selection || !selection.length) returnĐ
    let isExistUpdate = falseĐ
    selection.forEach(el => {Đ
      if (Đ
        (!el.size && payload === defaultSize) ||Đ
        (el.size && el.size === payload)Đ

```

```

    ) {
        return
    }
    el.size = payload
    isExistUpdate = true
})
if (isExistUpdate) {
    this.draw.render({ isSetCursor: false })
}
}
}

public sizeAdd() {
    const isReadonly = this.draw.isReadonly()
    if (isReadonly) return
    const selection = this.range.getTextLikeSelection()
    if (!selection || !selection.length) return
    const { defaultSize, maxSize } = this.options
    let isExistUpdate = false
    selection.forEach(el => {
        if (!el.size) {
            el.size = defaultSize
        }
        if (el.size >= maxSize) return
        if (el.size + 2 > maxSize) {
            el.size = maxSize
        } else {
            el.size += 2
        }
    })
    isExistUpdate = true
})
if (isExistUpdate) {
    this.draw.render({ isSetCursor: false })
}
}

public sizeMinus() {
    const isReadonly = this.draw.isReadonly()
    if (isReadonly) return
    const selection = this.range.getTextLikeSelection()
    if (!selection || !selection.length) return
    const { defaultSize, minSize } = this.options
    let isExistUpdate = false
    selection.forEach(el => {
        if (!el.size) {
            el.size = defaultSize
        }
    })

```

```

        if (el.size <= minSize) return
        if (el.size - 2 < minSize) {
            el.size = minSize
        } else {
            el.size -= 2
        }
        isExistUpdate = true
    })
    if (isExistUpdate) {
        this.draw.render({ isSetCursor: false })
    }
}

public bold() {
    const isReadonly = this.draw.isReadonly()
    if (isReadonly) return
    const selection = this.range.getSelection()
    if (!selection) return
    const noBoldIndex = selection.findIndex(s => !s.bold)
    selection.forEach(el => {
        el.bold = !!~noBoldIndex
    })
    this.draw.render({ isSetCursor: false })
}

public italic() {
    const isReadonly = this.draw.isReadonly()
    if (isReadonly) return
    const selection = this.range.getSelection()
    if (!selection) return
    const noItalicIndex = selection.findIndex(s => !s.italic)
    selection.forEach(el => {
        el.italic = !!~noItalicIndex
    })
    this.draw.render({ isSetCursor: false })
}

public underline() {
    const isReadonly = this.draw.isReadonly()
    if (isReadonly) return
    const selection = this.range.getSelection()
    if (!selection) return
    const noUnderlineIndex = selection.findIndex(s => !s.underline)
    selection.forEach(el => {
        el.underline = !!~noUnderlineIndex
    })
}

```

```

    this.draw.render({ isSetCursor: false })
  }
}
public knockout() {
  const isReadOnly = this.draw.isReadOnly()
  if (isReadOnly) return
  const selection = this.range.getSelection()
  if (!selection) return
  const noStrikeoutIndex = selection.findIndex(s => !s.strikeout)
  selection.forEach(el => {
    el.strikeout = !!~noStrikeoutIndex
  })
  this.draw.render({ isSetCursor: false })
}
}
public superscript() {
  const isReadOnly = this.draw.isReadOnly()
  if (isReadOnly) return
  const activeControl = this.control.getActiveControl()
  if (activeControl) return
  const selection = this.range.getSelection()
  if (!selection) return
  const superscriptIndex = selection.findIndex(
    s => s.type === ElementType.SUPERSCRIPT
  )
  selection.forEach(el => {
    // SÖm^N h
    if (~superscriptIndex) {
      if (el.type === ElementType.SUPERSCRIPT) {
        el.type = ElementType.TEXT
        delete el.actualSize
      }
    } else {
      // ¼•nN h
      if (
        !el.type ||
        el.type === ElementType.TEXT ||
        el.type === ElementType.SUBSCRIPT
      ) {
        el.type = ElementType.SUPERSCRIPT
      }
    }
  })
  this.draw.render({ isSetCursor: false })
}
}

```



```

public subscript() {
  const isReadOnly = this.draw.isReadOnly()
  if (isReadOnly) return
  const activeControl = this.control.getActiveControl()
  if (activeControl) return
  const selection = this.range.getSelection()
  if (!selection) return
  const subscriptIndex = selection.findIndex(
    s => s.type === ElementType.SUBSCRIPT
  )
  selection.forEach(el => {
    // SÖm^N h
    if (~subscriptIndex) {
      if (el.type === ElementType.SUBSCRIPT) {
        el.type = ElementType.TEXT
        delete el.actualSize
      }
    } else {
      // ¼•nN h
      if (
        !el.type ||
        el.type === ElementType.TEXT ||
        el.type === ElementType.SUPERSCRIPT
      ) {
        el.type = ElementType.SUBSCRIPT
      }
    }
  })
  this.draw.render({ isSetCursor: false })
}

public color(payload: string) {
  const isReadOnly = this.draw.isReadOnly()
  if (isReadOnly) return
  const selection = this.range.getSelection()
  if (!selection) return
  selection.forEach(el => {
    el.color = payload
  })
  this.draw.render({
    isSetCursor: false,
    isCompute: false
  })
}

public highlight(payload: string) {

```

```

const isReadonly = this.draw.isReadonly()
if (isReadonly) return
const selection = this.range.getSelection()
if (!selection) return
selection.forEach(el => {
  el.highlight = payload
})
this.draw.render({
  isSetCursor: false,
  isCompute: false
})
}
}
public title(payload: TitleLevel | null) {
  const isReadonly = this.draw.isReadonly()
  if (isReadonly) return
  const { startIndex, endIndex } = this.range.getRange()
  if (!~startIndex && !~endIndex) return
  const elementList = this.draw.getElementList()
  // — %•e9SØv,,QC} R ^h
  const changeElementList =
    startIndex === endIndex
      ? this.range.getRangeElementList()
      : elementList.slice(startIndex + 1, endIndex + 1)
  if (!changeElementList || !changeElementList.length) return
  // ¼•nP<
  const titleId = getUUID()
  const titleOptions = this.draw.getOptions().title
  changeElementList.forEach(el => {
    if (!el.type && el.value === ZERO) return
    if (payload) {
      el.level = payload
      el.titleId = titleId
      if (isTextLikeElement(el)) {
        el.size = titleOptions[titleSizeMapping[payload]]
        el.bold = true
      }
    } else {
      if (el.titleId) {
        delete el.titleId
        delete el.level
        delete el.size
        delete el.bold
      }
    }
  })
}
}
}

```

```

// Qlh [šOMĐ
const isSetCursor = startIndex === endIndexĐ
const curlIndex = isSetCursor ? endIndex : startIndexĐ
this.draw.render({ curlIndex, isSetCursor })Đ
}Đ
Đ
public list(listType: ListType | null, listStyle?: ListStyle) {Đ
  const isReadonly = this.draw.isReadonly()Đ
  if (isReadonly) returnĐ
  const { startIndex, endIndex } = this.range.getRange()Đ
  if (!~startIndex && !~endIndex) returnĐ
  // — %o•e9SØv,,QC} R ^hĐ
  const changeElementList = this.range.getRangeElementList()Đ
  if (!changeElementList || !changeElementList.length) returnĐ
  // Y,gœS T+R ^hR ‹¾•nN:SÖm^R ^hĐ
  const isUnsetList = changeElementList.find(Đ
    el => el.listType === listType && el.listStyle === listStyleĐ
  )Đ
  // ‹¾•nP<Đ
  const listId = getUUID()Đ
  changeElementList.forEach(el => {Đ
    if (!isUnsetList && listType) {Đ
      el.listId = listIdĐ
      el.listType = listTypeĐ
      el.listStyle = listStyleĐ
    } else {Đ
      if (el.listId) {Đ
        delete el.listIdĐ
        delete el.listTypeĐ
        delete el.listStyleĐ
      }Đ
    }Đ
  })Đ
  // Qlh [šOMĐ
  const isSetCursor = startIndex === endIndexĐ
  const curlIndex = isSetCursor ? endIndex : startIndexĐ
  this.draw.render({ curlIndex, isSetCursor })Đ
}Đ
Đ
public rowFlex(payload: RowFlex) {Đ
  const isReadonly = this.draw.isReadonly()Đ
  if (isReadonly) returnĐ
  const { startIndex, endIndex } = this.range.getRange()Đ
  if (!~startIndex && !~endIndex) returnĐ
  // • S:~LOá`oĐ
  const rangeRow = this.range.getRow()Đ

```

```

if (!rangeRow) return
const positionList = this.position.getPositionList()
const elementList = this.draw.getElementList()
// _SRM• S:b@W(~L
for (let p = 0; p < positionList.length; p++) {
  const position = positionList[p]
  const rowSet = rangeRow.get(position.pageNo)
  if (!rowSet) continue
  if (rowSet.has(position.rowNo)) {
    elementList[p].rowFlex = payload
  }
}
// Qlh [šOM
const isSetCursor = startIndex === endIndex
const curlIndex = isSetCursor ? endIndex : startIndex
this.draw.render({ curlIndex, isSetCursor })
}
}
public rowMargin(payload: number) {
  const isReadonly = this.draw.isReadonly()
  if (isReadonly) return
  const { startIndex, endIndex } = this.range.getRange()
  if (!~startIndex && !~endIndex) return
  // • S:~LOá`o
  const rangeRow = this.range.getRangeRow()
  if (!rangeRow) return
  const positionList = this.position.getPositionList()
  const elementList = this.draw.getElementList()
  // _SRM• S:b@W(~L
  for (let p = 0; p < positionList.length; p++) {
    const position = positionList[p]
    const rowSet = rangeRow.get(position.pageNo)
    if (!rowSet) continue
    if (rowSet.has(position.rowNo)) {
      elementList[p].rowMargin = payload
    }
  }
  // Qlh [šOM
  const isSetCursor = startIndex === endIndex
  const curlIndex = isSetCursor ? endIndex : startIndex
  this.draw.render({ curlIndex, isSetCursor })
}
}
public insertTable(row: number, col: number) {
  const isReadonly = this.draw.isReadonly()
  if (isReadonly) return

```

```

const activeControl = this.control.getActiveControl()
if (activeControl) return
const { startIndex, endIndex } = this.range.getRange()
if (!~startIndex && !~endIndex) return
const elementList = this.draw.getElementList()
let offsetX = 0
if (elementList[startIndex]?.listId) {
  const positionList = this.position.getPositionList()
  const { rowIndex } = positionList[startIndex]
  const rowList = this.draw.getRowList()
  const row = rowList[rowIndex]
  offsetX = row?.offsetX || 0
}
const innerWidth = this.draw.getOriginalInnerWidth() - offsetX
// colgroup
const colgroup: IColgroup[] = []
const colWidth = innerWidth / col
for (let c = 0; c < col; c++) {
  colgroup.push({
    width: colWidth
  })
}
// trlist
const trList: ITr[] = []
for (let r = 0; r < row; r++) {
  const tdList: ITd[] = []
  const tr: ITr = {
    height: this.options.defaultTrMinHeight,
    tdList
  }
  for (let c = 0; c < col; c++) {
    tdList.push({
      colspan: 1,
      rowspan: 1,
      value: [{ value: ZERO, size: 16 }]
    })
  }
  trList.push(tr)
}
const element: IElement = {
  type: ElementType.TABLE,
  value: "",
  colgroup,
  trList
}
// h<_ S element

```

```

formatElementList([element], {
  editorOptions: this.options
})
formatElementContext(elementList, [element], startIndex)
const curIndex = startIndex + 1
this.draw.spliceElementList(
  elementList,
  curIndex,
  startIndex === endIndex ? 0 : endIndex - startIndex,
  element
)
this.range.setRange(curIndex, curIndex)
this.draw.render({ curIndex, isSetCursor: false })
}
}
public insertTableTopRow() {
  const isReadOnly = this.draw.isReadOnly()
  if (isReadOnly) return
  const positionContext = this.position.getPositionContext()
  if (!positionContext.isTable) return
  const { index, trIndex, tableId } = positionContext
  const originalElementList = this.draw.getOriginalElementList()
  const element = originalElementList[index]
  const curTrList = element.trList
  const curTr = curTrList[trIndex]
  // NKRM•è^Lv,,XžR •è^Lep
  if (curTr.tdList.length < element.colgroup!.length) {
    const curTrNo = curTr.tdList[0].rowIndex
    for (let t = 0; t < trIndex; t++) {
      const tr = curTrList[t]
      for (let d = 0; d < tr.tdList.length; d++) {
        const td = tr.tdList[d]
        if (td.rowspan > 1 && td.rowIndex + td.rowspan >= curTrNo + 1) {
          td.rowspan += 1
        }
      }
    }
  }
  // XžR _SRM^L
  const newTrId = getUUID()
  const newTr: ITr = {
    height: curTr.height,
    id: newTrId,
    tdList: []
  }
  for (let t = 0; t < curTr.tdList.length; t++) {

```

```

const curTd = curTr.tdList[t]
const newTdId = getUUID()
newTr.tdList.push({
  id: newTdId,
  rowspan: 1,
  colspan: curTd.colspan,
  value: [
    {
      value: ZERO,
      size: 16,
      tableId,
      trId: newTrId,
      tdId: newTdId
    }
  ]
})
curTrList.splice(trIndex!, 0, newTr)
// 'ie°'³¼•nN N e±
this.position.setPositionContext({
  isTable: true,
  index,
  trIndex,
  tdIndex: 0,
  tdId: newTr.tdList[0].id,
  trId: newTr.id,
  tableId
})
this.range.setRange(0, 0)
// 'ie°n2gÓ
this.draw.render({ curIndex: 0 })
this.tableTool.render()
}
}
public insertTableBottomRow() {
  const isReadOnly = this.draw.isReadOnly()
  if (isReadOnly) return
  const positionContext = this.position.getPositionContext()
  if (!positionContext.isTable) return
  const { index, trIndex, tableId } = positionContext
  const originalElementList = this.draw.getOriginalElementList()
  const element = originalElementList[index]
  const curTrList = element.trList
  const curTr = curTrList[trIndex]
  const anchorTr =
    curTrList.length - 1 === trIndex ? curTr : curTrList[trIndex! + 1]

```

```

// NKRM/_SRM^L•è^Lv,,XžR •è^LepĐ
if (anchorTr.tdList.length < element.colgroup!.length) {Đ
  const curTrNo = anchorTr.tdList[0].rowIndex!Đ
  for (let t = 0; t < trIndex! + 1; t++) {Đ
    const tr = curTrList[t]Đ
    for (let d = 0; d < tr.tdList.length; d++) {Đ
      const td = tr.tdList[d]Đ
      if (td.rowspan > 1 && td.rowIndex! + td.rowspan >= curTrNo + 1) {Đ
        td.rowspan += 1Đ
      }Đ
    }Đ
  }Đ
}Đ
// XžR _SRM^LĐ
const newTrId = getUUID()Đ
const newTr: ITr = {Đ
  height: anchorTr.height,Đ
  id: newTrId,Đ
  tdList: []Đ
}Đ
for (let t = 0; t < anchorTr.tdList.length; t++) {Đ
  const curTd = anchorTr.tdList[t]Đ
  const newTdId = getUUID()Đ
  newTr.tdList.push({Đ
    id: newTdId,Đ
    rowspan: 1,Đ
    colspan: curTd.colspan,Đ
    value: [Đ
      {Đ
        value: ZERO,Đ
        size: 16,Đ
        tableId,Đ
        trId: newTrId,Đ
        tdId: newTdIdĐ
      }Đ
    ]Đ
  })Đ
}Đ
curTrList.splice(trIndex! + 1, 0, newTr)Đ
// 'İe°ˆ¾•nN N e‡Đ
this.position.setPositionContext({Đ
  isTable: true,Đ
  index,Đ
  trIndex: trIndex! + 1,Đ
  tdIndex: 0,Đ
  tdId: newTr.tdList[0].id,Đ

```



```

        trId: newTr.id,
        tableId
    })
    this.range.setRange(0, 0)
    // 'ie°n2gÓ
    this.draw.render({ curIndex: 0 })
    this.tableTool.render()
}
}
public insertTableLeftCol() {
    const isReadOnly = this.draw.isReadOnly()
    if (isReadOnly) return
    const positionContext = this.position.getPositionContext()
    if (!positionContext.isTable) return
    const { index, tdIndex, tableId } = positionContext
    const originalElementList = this.draw.getOriginalElementList()
    const element = originalElementList[index]
    const curTrList = element.trList
    const curTdIndex = tdIndex
    // XŽR R
    for (let t = 0; t < curTrList.length; t++) {
        const tr = curTrList[t]
        const tdId = getUUID()
        tr.tdList.splice(curTdIndex, 0, {
            id: tdId,
            rowspan: 1,
            colspan: 1,
            value: [
                {
                    value: ZERO,
                    size: 16,
                    tableId,
                    trId: tr.id,
                    tdId
                }
            ]
        })
    }
    // 'ie°{—[½^
    const colgroup = element.colgroup
    colgroup.splice(curTdIndex, 0, {
        width: this.options.defaultColMinWidth
    })
    const colgroupWidth = colgroup.reduce((pre, cur) => pre + cur.width, 0)
    const width = this.draw.getOriginalInnerWidth()
    if (colgroupWidth > width) {

```

```

const adjustWidth = (colgroupWidth - width) / colgroup.length
for (let g = 0; g < colgroup.length; g++) {
  const group = colgroup[g]
  group.width -= adjustWidth
}
}
// 'le°¼•nN N e±
this.position.setPositionContext({
  isTable: true,
  index,
  trIndex: 0,
  tdIndex: curTdIndex,
  tdId: curTrList[0].tdList[curTdIndex].id,
  trId: curTrList[0].id,
  tableId
})
this.range.setRange(0, 0)
// 'le°n2gÓ
this.draw.render({ curIndex: 0 })
this.tableTool.render()
}
}
public insertTableRightCol() {
  const isReadOnly = this.draw.isReadOnly()
  if (isReadOnly) return
  const positionContext = this.position.getPositionContext()
  if (!positionContext.isTable) return
  const { index, tdIndex, tableId } = positionContext
  const originalElementList = this.draw.getOriginalElementList()
  const element = originalElementList[index!]
  const curTrList = element.trList!
  const curTdIndex = tdIndex! + 1
  // XŽR R
  for (let t = 0; t < curTrList.length; t++) {
    const tr = curTrList[t]
    const tdId = getUUID()
    tr.tdList.splice(curTdIndex, 0, {
      id: tdId,
      rowspan: 1,
      colspan: 1,
      value: [
        {
          value: ZERO,
          size: 16,
          tableId,
          trId: tr.id,

```

```

        tdlIdĐ
    }Đ
}Đ
})Đ
}Đ
// 'íe°'i{—[½^!Đ
const colgroup = element.colgroup!Đ
colgroup.splice(curTdIndex, 0, {Đ
    width: this.options.defaultColMinWidthĐ
})Đ
const colgroupWidth = colgroup.reduce((pre, cur) => pre + cur.width, 0)Đ
const width = this.draw.getOriginalInnerWidth()Đ
if (colgroupWidth > width) {Đ
    const adjustWidth = (colgroupWidth - width) / colgroup.lengthĐ
    for (let g = 0; g < colgroup.length; g++) {Đ
        const group = colgroup[g]Đ
        group.width -= adjustWidthĐ
    }Đ
}Đ
// 'íe°'¾•nN N e‡Đ
this.position.setPositionContext({Đ
    isTable: true,Đ
    index,Đ
    trIndex: 0,Đ
    tdIndex: curTdIndex,Đ
    tdlId: curTrList[0].tdList[curTdIndex].id,Đ
    trId: curTrList[0].id,Đ
    tableIdĐ
})Đ
this.range.setRange(0, 0)Đ
// 'íe°n2gÓĐ
this.draw.render({ curIndex: 0 })Đ
this.tableTool.render()Đ
}Đ
Đ
public deleteTableRow() {Đ
    const isReadOnly = this.draw.isReadOnly()Đ
    if (isReadOnly) returnĐ
    const positionContext = this.position.getPositionContext()Đ
    if (!positionContext.isTable) returnĐ
    const { index, trIndex } = positionContextĐ
    const originalElementList = this.draw.getOriginalElementList()Đ
    const element = originalElementList[index!]Đ
    const curTrList = element.trList!Đ
    const curTr = curTrList[trIndex!]Đ
    // Y,gœf/g T N ^Lÿ vœc¥R –detN*^hh<Đ

```

```

if (curTrList.length <= 1) {
  this.deleteTable()
  return
}
// ^e•è^L
for (let d = 0; d < curTr.tdList.length; d++) {
  const td = curTr.tdList[d]
  if (td.rowspan > 1) {
    let start = trIndex! + 1
    while (start < trIndex! + td.rowspan) {
      const tdId = getUUID()
      const tr = curTrList[start]
      tr.tdList.splice(d, 0, {
        id: tdId,
        rowspan: 1,
        colspan: 1,
        value: [
          {
            value: ZERO,
            size: 16,
            tableId: element.id,
            trId: tr.id,
            tdId
          }
        ]
      })
      start += 1
    }
  }
  // R -d_SRM^L
  curTrList.splice(trIndex!, 1)
  // 'íe°¿¼•nN N e‡
  this.position.setPositionContext({
    isTable: false
  })
  this.range.setRange(0, 0)
  // 'íe°n2gÓ
  this.draw.render({
    curIndex: positionContext.index
  })
  this.tableTool.dispose()
}
}
public deleteTableCol() {
  const isReadOnly = this.draw.isReadOnly()

```

```

if (isReadOnly) return
const positionContext = this.position.getPositionContext()
if (!positionContext.isTable) return
const { index, tdIndex, trIndex } = positionContext
const originalElementList = this.draw.getOriginalElementList()
const element = originalElementList[index]
const curTrList = element.trList
const curTd = curTrList[trIndex].tdList[tdIndex]
const curColIndex = curTd.colIndex
// Y,gœf/g T N R ÿ vöc¥R –detN*^hh<
const moreTdTr = curTrList.find(tr => tr.tdList.length > 1)
if (!moreTdTr) {
  this.deleteTable()
  return
}
// •èR Y t
for (let t = 0; t < curTrList.length; t++) {
  const tr = curTrList[t]
  for (let d = 0; d < tr.tdList.length; d++) {
    const td = tr.tdList[d]
    if (td.colspan > 1) {
      const tdColIndex = td.colIndex
      // NªSÉQİS»N R
      if (
        tdColIndex <= curColIndex &&
        tdColIndex + td.colspan - 1 >= curColIndex
      ) {
        td.colspan -= 1
      }
    }
  }
}
// R –d_SRM R
for (let t = 0; t < curTrList.length; t++) {
  const tr = curTrList[t]
  let start = -1
  for (let d = 0; d < tr.tdList.length; d++) {
    const td = tr.tdList[d]
    if (td.colIndex === curColIndex) {
      start = d
    }
  }
  if (~start) {
    tr.tdList.splice(start, 1)
  }
}

```

```

    element.colgroup?.splice(curColIndex, 1)
    // 'íe°³¼•nN N e‡
    this.position.setPositionContext({
      isTable: false
    })
    this.range.setRange(0, 0)
    // 'íe°n2gÓ
    this.draw.render({
      curIndex: positionContext.index
    })
    this.tableTool.dispose()
  }
}
}

public deleteTable() {
  const isReadOnly = this.draw.isReadOnly()
  if (isReadOnly) return
  const positionContext = this.position.getPositionContext()
  if (!positionContext.isTable) return
  const originalElementList = this.draw.getOriginalElementList()
  originalElementList.splice(positionContext.index!, 1)
  const curIndex = positionContext.index! - 1
  this.position.setPositionContext({
    isTable: false,
    index: curIndex
  })
  this.range.setRange(curIndex, curIndex)
  this.draw.render({ curIndex })
  this.tableTool.dispose()
}

}

public mergeTableCell() {
  const isReadOnly = this.draw.isReadOnly()
  if (isReadOnly) return
  const positionContext = this.position.getPositionContext()
  if (!positionContext.isTable) return
  const {
    isCrossRowCol,
    startTdIndex,
    endTdIndex,
    startTrIndex,
    endTrIndex
  } = this.range.getRange()
  if (!isCrossRowCol) return
  const { index } = positionContext
  const originalElementList = this.draw.getOriginalElementList()
  const element = originalElementList[index!]

```

```

const curTrList = element.trList!Đ
let startTd = curTrList[startTrIndex!].tdList[startTdIndex!]Đ
let endTd = curTrList[endTrIndex!].tdList[endTdIndex!]Đ
// Nꜛcb•wYĖOM•nĐ
if (startTd.x! > endTd.x! || startTd.y! > endTd.y!) {Đ
  // prettier-ignoreĐ
  [startTd, endTd] = [endTd, startTd]Đ
}Đ
const startColIndex = startTd.colIndex!Đ
const endColIndex = endTd.colIndex! + (endTd.colspan - 1)Đ
const startRowIndex = startTd.rowIndex!Đ
const endRowIndex = endTd.rowIndex! + (endTd.rowspan - 1)Đ
// • S:ˆLR Đ
const rowCol: ITd[][] = []Đ
for (let t = 0; t < curTrList.length; t++) {Đ
  const tr = curTrList[t]Đ
  const tdList: ITd[] = []Đ
  for (let d = 0; d < tr.tdList.length; d++) {Đ
    const td = tr.tdList[d]Đ
    const tdColIndex = td.colIndex!Đ
    const tdRowIndex = td.rowIndex!Đ
    if (Đ
      tdColIndex >= startColIndex &&Đ
      tdColIndex <= endColIndex &&Đ
      tdRowIndex >= startRowIndex &&Đ
      tdRowIndex <= endRowIndexĐ
    ) {Đ
      tdList.push(td)Đ
    }Đ
  }Đ
  if (tdList.length) {Đ
    rowCol.push(tdList)Đ
  }Đ
}Đ
if (!rowCol.length) returnĐ
// f/T&f/wé_bĐ
const lastRow = rowCol[rowCol.length - 1]Đ
const leftTop = rowCol[0][0]Đ
const rightBottom = lastRow[lastRow.length - 1]Đ
const startX = leftTop.x!Đ
const startY = leftTop.y!Đ
const endX = rightBottom.x! + rightBottom.width!Đ
const endY = rightBottom.y! + rightBottom.height!Đ
for (let t = 0; t < rowCol.length; t++) {Đ
  const tr = rowCol[t]Đ
  for (let d = 0; d < tr.length; d++) {Đ

```

```

const td = tr[d]
const tdStartX = td.x
const tdStartY = td.y
const tdEndX = tdStartX + td.width
const tdEndY = tdStartY + td.height
// [XW(N {&T ~y
if (
  startX > tdStartX ||
  startY > tdStartY ||
  endX < tdEndX ||
  endY < tdEndY
) {
  return
}
}
}
}
// T ^vSUQCh<
const mergeTdIdList: string[] = []
const anchorTd = rowCol[0][0]
for (let t = 0; t < rowCol.length; t++) {
  const tr = rowCol[t]
  for (let d = 0; d < tr.length; d++) {
    const td = tr[d]
    const isAnchorTd = t === 0 && d === 0
    // _...R -dSUQCid
    if (!isAnchorTd) {
      mergeTdIdList.push(td.id!)
    }
    // R T ^v
    if (t === 0 && d !== 0) {
      anchorTd.colspan += td.colspan
    }
    // ^LT ^v
    if (t !== 0) {
      if (anchorTd.colIndex === td.colIndex) {
        anchorTd.rowspan += td.rowspan
      }
    }
  }
}
}
// yû-dY OYSUQCh<
for (let t = 0; t < curTrList.length; t++) {
  const tr = curTrList[t]
  let d = 0
  while (d < tr.tdList.length) {
    const td = tr.tdList[d]

```



```

        if (mergeTdIdList.includes(td.id!)) {
            tr.tdList.splice(d, 1)
            d--
        }
        d++
    }
}
// 'íe°n2gÓ
const curlIndex = startTd.value.length - 1
this.range.setRange(curlIndex, curlIndex)
this.draw.render()
this.tableTool.render()
}
}
public cancelMergeTableCell() {
    const isReadonly = this.draw.isReadonly()
    if (isReadonly) return
    const positionContext = this.position.getPositionContext()
    if (!positionContext.isTable) return
    const { index, tdIndex, trIndex } = positionContext
    const originalElementList = this.draw.getOriginalElementList()
    const element = originalElementList[index!]
    const curTrList = element.trList!
    const curTr = curTrList[trIndex!]
    const curTd = curTr.tdList[tdIndex!]
    if (curTd.rowspan === 1 && curTd.colspan === 1) return
    const colspan = curTd.colspan
    // ¼•nèR
    if (curTd.colspan > 1) {
        for (let c = 1; c < curTd.colspan; c++) {
            const tdId = getUUID()
            curTr.tdList.splice(tdIndex! + c, 0, {
                id: tdId,
                rowspan: 1,
                colspan: 1,
                value: [
                    {
                        value: ZERO,
                        size: 16,
                        tableId: element.id,
                        trId: curTr.id,
                        tdId
                    }
                ]
            })
        }
    }
}

```

```

    curTd.colspan = 1
  }
  // '¼•nè^L
  if (curTd.rowspan > 1) {
    for (let r = 1; r < curTd.rowspan; r++) {
      const tr = curTrList[trIndex! + r]
      for (let c = 0; c < colspan; c++) {
        const tdId = getUUID()
        tr.tdList.splice(curTd.colIndex!, 0, {
          id: tdId,
          rowspan: 1,
          colspan: 1,
          value: [
            {
              value: ZERO,
              size: 16,
              tableId: element.id,
              trId: tr.id,
              tdId
            }
          ]
        })
      }
    }
    curTd.rowspan = 1
  }
  // 'íe°n2gÓ
  const curIndex = curTd.value.length - 1
  this.range.setRange(curIndex, curIndex)
  this.draw.render()
  this.tableTool.render()
}
}

public tableTdVerticalAlign(payload: VerticalAlign) {
  const isReadOnly = this.draw.isReadOnly()
  if (isReadOnly) return
  const positionContext = this.position.getPositionContext()
  if (!positionContext.isTable) return
  const { index, trIndex, tdIndex } = positionContext
  const originalElementList = this.draw.getOriginalElementList()
  const element = originalElementList[index!]
  const curTd = element?.trList?.[trIndex!]?.tdList?.[tdIndex!]
  if (
    !curTd ||
    curTd.verticalAlign === payload ||
    (!curTd.verticalAlign && payload === VerticalAlign.TOP)
  )

```

```

    ) {
        return
    }
    // 'Í¼W,vô[ùŸPe¹_
    curTd.verticalAlign = payload
    const { endIndex } = this.range.getRange()
    this.draw.render({
        curIndex: endIndex
    })
}
}

public tableBorderType(payload: TableBorder) {
    const isReadOnly = this.draw.isReadOnly()
    if (isReadOnly) return
    const positionContext = this.position.getPositionContext()
    if (!positionContext.isTable) return
    const { index } = positionContext
    const originalElementList = this.draw.getOriginalElementList()
    const element = originalElementList[index!]
    if (
        (!element.borderType && payload === TableBorder.ALL) ||
        element.borderType === payload
    ) {
        return
    }
    element.borderType = payload
    const { endIndex } = this.range.getRange()
    this.draw.render({
        curIndex: endIndex
    })
}

public tableTdBackgroundColor(payload: string) {
    const isReadOnly = this.draw.isReadOnly()
    if (isReadOnly) return
    const rowCol = this.draw.getTableParticle().getRangeRowCol()
    if (!rowCol) return
    for (let r = 0; r < rowCol.length; r++) {
        const row = rowCol[r]
        for (let c = 0; c < row.length; c++) {
            const col = row[c]
            col.backgroundColor = payload
        }
    }
    const { endIndex } = this.range.getRange()
    this.range.setRange(endIndex, endIndex)
}

```

```

        this.draw.render({
            isCompute: false
        })
    }
}

public hyperlink(payload: IElement) {
    const isReadonly = this.draw.isReadonly()
    if (isReadonly) return
    const activeControl = this.control.getActiveControl()
    if (activeControl) return
    const { startIndex, endIndex } = this.range.getRange()
    if (!~startIndex && !~endIndex) return
    const elementList = this.draw.getElementList()
    const { valueList, url } = payload
    const hyperlinkId = getUUID()
    const newElementList = valueList?.map<IElement>(v => ({
        url,
        hyperlinkId,
        value: v.value,
        type: ElementType.HYPERLINK
    }))
    if (!newElementList) return
    const start = startIndex + 1
    formatElementContext(elementList, newElementList, start)
    this.draw.spliceElementList(
        elementList,
        start,
        startIndex === endIndex ? 0 : endIndex - startIndex,
        ...newElementList
    )
    const curlIndex = start + newElementList.length - 1
    this.range.setRange(curlIndex, curlIndex)
    this.draw.render({ curlIndex })
}

public getHyperlinkRange(): [number, number] | null {
    let leftIndex = -1
    let rightIndex = -1
    const { startIndex, endIndex } = this.range.getRange()
    if (!~startIndex && !~endIndex) return null
    const elementList = this.draw.getElementList()
    const startElement = elementList[startIndex]
    if (startElement.type !== ElementType.HYPERLINK) return null
    // T ]ægåb~
    let preIndex = startIndex
    while (preIndex > 0) {

```

```

    const preElement = elementList[preIndex]
    if (preElement.hyperlinkId !== startElement.hyperlinkId) {
        leftIndex = preIndex + 1
        break
    }
    preIndex--
}
// T Sógåb~
let nextIndex = startIndex + 1
while (nextIndex < elementList.length) {
    const nextElement = elementList[nextIndex]
    if (nextElement.hyperlinkId !== startElement.hyperlinkId) {
        rightIndex = nextIndex - 1
        break
    }
    nextIndex++
}
// c§NöW(g T
if (nextIndex === elementList.length) {
    rightIndex = nextIndex - 1
}
if (!~leftIndex || !~rightIndex) return null
return [leftIndex, rightIndex]
}
}
public deleteHyperlink() {
    // f·SÖ•..."pc¥}" _
    const hyperRange = this.getHyperlinkRange()
    if (!hyperRange) return
    const elementList = this.draw.getElementList()
    const [leftIndex, rightIndex] = hyperRange
    // R -dQC}
    this.draw.spliceElementList(
        elementList,
        leftIndex,
        rightIndex - leftIndex + 1
    )
    this.draw.getHyperlinkParticle().clearHyperlinkPopup()
    // 'í•nu;^
    const newIndex = leftIndex - 1
    this.range.setRange(newIndex, newIndex)
    this.draw.render({
        curIndex: newIndex
    })
}
}

```

```

public cancelHyperlink() {
  // f·SÖ•..."pc¥}"_
  const hyperRange = this.getHyperlinkRange()
  if (!hyperRange) return
  const elementList = this.draw.getElementList()
  const [leftIndex, rightIndex] = hyperRange
  // R -d\^'
  for (let i = leftIndex; i <= rightIndex; i++) {
    const element = elementList[i]
    delete element.type
    delete element.url
    delete element.hyperlinkId
    delete element.underline
  }
  this.draw.getHyperlinkParticle().clearHyperlinkPopup()
  // 'İ•nu;^
  const { endIndex } = this.range.getRange()
  this.draw.render({
    curlIndex: endIndex,
    isCompute: false
  })
}
}

public editHyperlink(payload: string) {
  // f·SÖ•..."pc¥}"_
  const hyperRange = this.getHyperlinkRange()
  if (!hyperRange) return
  const elementList = this.draw.getElementList()
  const [leftIndex, rightIndex] = hyperRange
  // fyçburl
  for (let i = leftIndex; i <= rightIndex; i++) {
    const element = elementList[i]
    element.url = payload
  }
  this.draw.getHyperlinkParticle().clearHyperlinkPopup()
  // 'İ•nu;^
  const { endIndex } = this.range.getRange()
  this.draw.render({
    curlIndex: endIndex,
    isCompute: false
  })
}
}

public separator(payload: number[]) {
  const isReadOnly = this.draw.isReadOnly()
  if (isReadOnly) return

```

```

const activeControl = this.control.getActiveControl()
if (activeControl) return
const { startIndex, endIndex } = this.range.getRange()
if (!startIndex && !endIndex) return
const elementList = this.draw.getElementList()
let curlIndex = -1
// Qlh [XW(R Rr~¿ÿ R R$e-N:Oîe9~¿κμ•;•
const endElement = elementList[endIndex + 1]
if (endElement && endElement.type === ElementType.SEPARATOR) {
  if (
    endElement.dashArray &&
    endElement.dashArray.join() === payload.join()
  ) {
    return
  }
  curlIndex = endIndex
  endElement.dashArray = payload
} else {
  const newElement: IElement = {
    value: WRAP,
    type: ElementType.SEPARATOR,
    dashArray: payload
  }
  // NÎ~LY4XŽR R Rr~¿
  formatElementContext(elementList, [newElement], startIndex)
  if (startIndex !== 0 && elementList[startIndex].value === ZERO) {
    this.draw.spliceElementList(elementList, startIndex, 1, newElement)
    curlIndex = startIndex - 1
  } else {
    this.draw.spliceElementList(elementList, startIndex + 1, 0, newElement)
    curlIndex = startIndex
  }
}
this.range.setRange(curlIndex, curlIndex)
this.draw.render({ curlIndex })
}
}

public pageBreak() {
  const isReadonly = this.draw.isReadonly()
  if (isReadonly) return
  const activeControl = this.control.getActiveControl()
  if (activeControl) return
  this.insertElementList([
    {
      type: ElementType.PAGE_BREAK,
      value: WRAP
    }
  ])
}

```

```

    }
  })
}
}

public addWatermark(payload: IWatermark) {
  const isReadOnly = this.draw.isReadOnly()
  if (isReadOnly) return
  const options = this.draw.getOptions()
  const { color, size, opacity, font } = defaultWatermarkOption
  options.watermark.data = payload.data
  options.watermark.color = payload.color || color
  options.watermark.size = payload.size || size
  options.watermark.opacity = payload.opacity || opacity
  options.watermark.font = payload.font || font
  this.draw.render({
    isSetCursor: false,
    isSubmitHistory: false,
    isCompute: false
  })
}

public deleteWatermark() {
  const isReadOnly = this.draw.isReadOnly()
  if (isReadOnly) return
  const options = this.draw.getOptions()
  if (options.watermark && options.watermark.data) {
    options.watermark = { ...defaultWatermarkOption }
    this.draw.render({
      isSetCursor: false,
      isSubmitHistory: false,
      isCompute: false
    })
  }
}

public image(payload: IDrawImagePayload) {
  const isReadOnly = this.draw.isReadOnly()
  if (isReadOnly) return
  const activeControl = this.control.getActiveControl()
  if (activeControl) return
  const { startIndex, endIndex } = this.range.getRange()
  if (!~startIndex && !~endIndex) return
  const elementList = this.draw.getElementList()
  const { value, width, height } = payload
  const element: IElement = {
    value,

```



```

        width,Ð
        height,Ð
        id: getUUID(),Ð
        type: ElementType.IMAGED
    }Ð
    const curlIndex = startIndex + 1Ð
    formatElementContext(elementList, [element], startIndex)Ð
    this.draw.spliceElementList(Ð
        elementList,Ð
        curlIndex,Ð
        startIndex === endIndex ? 0 : endIndex - startIndex,Ð
        elementÐ
    )Ð
    this.range.setRange(curlIndex, curlIndex)Ð
    this.draw.render({ curlIndex })Ð
}Ð
Ð
public search(payload: string | null) {Ð
    this.searchManager.setSearchKeyword(payload)Ð
    this.draw.render({Ð
        isSetCursor: false,Ð
        isSubmitHistory: falseÐ
    })Ð
}Ð
Ð
public searchNavigatePre() {Ð
    const index = this.searchManager.searchNavigatePre()Ð
    if (index === null) returnÐ
    this.draw.render({Ð
        isSetCursor: false,Ð
        isSubmitHistory: false,Ð
        isCompute: false,Ð
        isLazy: falseÐ
    })Ð
}Ð
Ð
public searchNavigateNext() {Ð
    const index = this.searchManager.searchNavigateNext()Ð
    if (index === null) returnÐ
    this.draw.render({Ð
        isSetCursor: false,Ð
        isSubmitHistory: false,Ð
        isCompute: false,Ð
        isLazy: falseÐ
    })Ð
}Ð

```

```

Ð
public getSearchNavigateInfo(): null | INavigateInfo {Ð
    return this.searchManager.getSearchNavigateInfo()Ð
}Ð
Ð
public replace(payload: string) {Ð
    const isReadOnly = this.draw.isReadOnly()Ð
    if (isReadOnly) returnÐ
    if (!payload || new RegExp(`${ZERO}`, 'g').test(payload)) returnÐ
    const matchList = this.draw.getSearch().getSearchMatchList()Ð
    if (!matchList.length) returnÐ
    // S9'MindexSØS v,,]îP<Ð
    let pageDiffCount = 0Ð
    let tableDiffCount = 0Ð
    // S9'Md }"‹Ív,,~Äh ‹ÆÐ
    let curGroupId = "Ð
    // ^hh<N N e‡Ð
    let curTdId = "Ð
    // d }"P< > fyçbP<ÿ XžR QC} ÿ d }"P< < fyçbP<ÿ Qİ\ QC} Ð
    let firstMatchIndex = -1Ð
    const elementList = this.draw.getOriginalElementList()Ð
    for (let m = 0; m < matchList.length; m++) {Ð
        const match = matchList[m]Ð
        if (match.type === EditorContext.TABLE) {Ð
            const { tableIndex, trIndex, tdIndex, index, tdId } = matchÐ
            if (curTdId && tdId !== curTdId) {Ð
                tableDiffCount = 0Ð
            }Ð
            curTdId = tdId!Ð
            const curTableIndex = tableIndex! + pageDiffCountÐ
            const tableElementList =Ð
                elementList[curTableIndex].trList![trIndex!].tdList[tdIndex!].valueÐ
            // ^hh<Q...QC} Ð
            const curIndex = index + tableDiffCountÐ
            const tableElement = tableElementList[curIndex]Ð
            if (curGroupId === match.groupId) {Ð
                this.draw.spliceElementList(tableElementList, curIndex, 1)Ð
                tableDiffCount--Ð
                continueÐ
            }Ð
            for (let p = 0; p < payload.length; p++) {Ð
                const value = payload[p]Ð
                if (p === 0) {Ð
                    tableElement.value = valueÐ
                } else {Ð
                    this.draw.spliceElementList(tableElementList, curIndex + p, 0, {Ð

```

```

        ...tableElement,Ð
        valueÐ
    })Ð
    tableDiffCount++Ð
}Ð
}Ð
} else {Ð
    const curlIndex = match.index + pageDiffCountÐ
    const element = elementList[curlIndex]Ð
    if (Ð
        element.type === ElementType.CONTROL &&Ð
        element.controlComponent !== ControlComponent.VALUEÐ
    ) {Ð
        continueÐ
    }Ð
    if (!~firstMatchIndex) {Ð
        firstMatchIndex = mÐ
    }Ð
    if (curGroupId === match.groupId) {Ð
        this.draw.spliceElementList(elementList, curlIndex, 1)Ð
        pageDiffCount--Ð
        continueÐ
    }Ð
    for (let p = 0; p < payload.length; p++) {Ð
        const value = payload[p]Ð
        if (p === 0) {Ð
            element.value = valueÐ
        } else {Ð
            this.draw.spliceElementList(elementList, curlIndex + p, 0, {Ð
                ...element,Ð
                valueÐ
            })Ð
            pageDiffCount++Ð
        }Ð
    }Ð
}Ð
curGroupId = match.groupIdÐ
}Ð
if (!~firstMatchIndex) returnÐ
// [ŠOM-™-N*^«S9'MQs•.İT Ð
const firstMatch = matchList[firstMatchIndex]Ð
const firstIndex = firstMatch.index + (payload.length - 1)Ð
if (firstMatch.type === EditorContext.TABLE) {Ð
    const { tableIndex, trIndex, tdIndex, index } = firstMatchÐ
    const element = Ð
        elementList[tableIndex!].trList[trIndex!].tdList[tdIndex!].value[index]Ð

```

```

    this.position.setPositionContext({
      isTable: true,
      index: tableIndex,
      trIndex,
      tdIndex,
      tdId: element.tdId,
      trId: element.trId,
      tableId: element.tableId
    })
  } else {
    this.position.setPositionContext({
      isTable: false
    })
  }
  this.range.setRange(firstIndex, firstIndex)
  // 'Íe°n2gÓ
  this.draw.render({
    curlIndex: firstIndex
  })
}
}
public async print() {
  const { scale, printPixelRatio } = this.options
  if (scale !== 1) {
    this.draw.setPageScale(1)
  }
  const width = this.draw.getOriginalWidth()
  const height = this.draw.getOriginalHeight()
  const base64List = await this.draw.getDataURL(printPixelRatio)
  printImageBase64(base64List, width, height)
  if (scale !== 1) {
    this.draw.setPageScale(scale)
  }
}
}
public replaceImageElement(payload: string) {
  const { startIndex } = this.range.getRange()
  const elementList = this.draw.getElementList()
  const element = elementList[startIndex]
  if (!element || element.type !== ElementType.IMAGE) return
  // fÿcbVprG
  element.id = getUUID()
  element.value = payload
  this.draw.render({
    isSetCursor: false
  })
}

```

```

    }
}
}
public saveAsImageElement() {
    const { startIndex } = this.range.getRange()
    const elementList = this.draw.getElementList()
    const element = elementList[startIndex]
    if (!element || element.type !== ElementType.IMAGE) return
    downloadFile(element.value, `${element.id!}.png`)
}
}
public changeImageDisplay(element: IElement, display: ImageDisplay) {
    if (element.imgDisplay === display) return
    element.imgDisplay = display
    this.draw.getPreviewer().clearResizer()
    this.draw.render({
        isSetCursor: false
    })
}
}
public getImage(pixelRatio?: number): Promise<string[]> {
    return this.draw.getDataURL(pixelRatio)
}
}
public getValue(options?: IGetValueOption): IEditorResult {
    return this.draw.getValue(options)
}
}
public getWordCount(): Promise<number> {
    return this.workerManager.getWordCount()
}
}
public getRangeText(): string {
    return this.range.toString()
}
}
public getRangeContext(): RangeContext | null {
    const range = this.range.getRange()
    const { startIndex, endIndex } = range
    if (!~startIndex && !~endIndex) return null
    // • S:Oá`o
    const isCollapsed = startIndex === endIndex
    // QC} Oá`o
    const elementList = this.draw.getElementList()
    const startElement = pickElementAttr(
        elementList[isCollapsed ? startIndex : startIndex + 1]
    )
}
}

```

```

const endElement = pickElementAttr(elementList[endIndex])Đ
// ~ux Oá`oĐ
const positionList = this.position.getPositionList()Đ
const startPageNo = positionList[startIndex].pageNoĐ
const endPageNo = positionList[endIndex].pageNoĐ
return deepClone({Đ
  isCollapsed,Đ
  startElement,Đ
  endElement,Đ
  startPageNo,Đ
  endPageNoĐ
})Đ
}Đ
Đ
public pageMode(payload: PageMode) {Đ
  this.draw.setPageMode(payload)Đ
}Đ
Đ
public pageScaleRecovery() {Đ
  const { scale } = this.optionsĐ
  if (scale !== 1) {Đ
    this.draw.setPageScale(1)Đ
  }Đ
}Đ
Đ
public pageScaleMinus() {Đ
  const { scale } = this.optionsĐ
  const nextScale = scale * 10 - 1Đ
  if (nextScale >= 5) {Đ
    this.draw.setPageScale(nextScale / 10)Đ
  }Đ
}Đ
Đ
public pageScaleAdd() {Đ
  const { scale } = this.optionsĐ
  const nextScale = scale * 10 + 1Đ
  if (nextScale <= 30) {Đ
    this.draw.setPageScale(nextScale / 10)Đ
  }Đ
}Đ
Đ
public paperSize(width: number, height: number) {Đ
  this.draw.setPaperSize(width, height)Đ
}Đ
Đ
public paperDirection(payload: PaperDirection) {Đ

```

```

    this.draw.setPaperDirection(payload)Đ
}Đ
Đ
public getPaperMargin(): number[] {Đ
    return this.options.marginsĐ
}Đ
Đ
public setPaperMargin(payload: IMargin) {Đ
    return this.draw.setPaperMargin(payload)Đ
}Đ
Đ
public insertElementList(payload: IElement[]) {Đ
    if (!payload.length) returnĐ
    const isReadOnly = this.draw.isReadOnly()Đ
    if (isReadOnly) returnĐ
    // h<_ S N N e±Oá`oĐ
    const { startIndex } = this.range.getRange()Đ
    const elementList = this.draw.getElementList()Đ
    formatElementContext(elementList, payload, startIndex)Đ
    this.draw.insertElementList(payload)Đ
}Đ
Đ
public appendElementList(Đ
    elementList: IElement[],Đ
    options?: IAppendElementListOptionĐ
) {Đ
    if (!elementList.length) returnĐ
    const isReadOnly = this.draw.isReadOnly()Đ
    if (isReadOnly) returnĐ
    this.draw.appendElementList(elementList, options)Đ
}Đ
Đ
public setValue(payload: Partial<IEditorData>) {Đ
    this.draw.setValue(payload)Đ
}Đ
Đ
public removeControl() {Đ
    const { startIndex, endIndex } = this.range.getRange()Đ
    if (startIndex !== endIndex) returnĐ
    const elementList = this.draw.getElementList()Đ
    const element = elementList[startIndex]Đ
    if (element.type !== ElementType.CONTROL) returnĐ
    // R -dc§NöĐ
    const control = this.draw.getControl()Đ
    const newIndex = control.removeControl(startIndex)Đ
    // 'íe°n2gÓĐ

```

```

        this.range.setRange(newIndex, newIndex)Đ
        this.draw.render({Đ
            curlIndex: newIndexĐ
        })Đ
    }Đ
Đ
    public setLocale(payload: string) {Đ
        this.i18n.setLocale(payload)Đ
    }Đ
Đ
    public getCatalog(): Promise<ICatalog | null> {Đ
        return this.workerManager.getCatalog()Đ
    }Đ
Đ
    public locationCatalog(titleId: string) {Đ
        const elementList = this.draw.getMainElementList()Đ
        let newIndex = -1Đ
        for (let e = 0; e < elementList.length; e++) {Đ
            const element = elementList[e]Đ
            if (Đ
                element.titleId === titleId &&Đ
                elementList[e + 1]?.titleId !== titleIdĐ
            ) {Đ
                newIndex = eĐ
                breakĐ
            }Đ
        }Đ
        if (!~newIndex) returnĐ
        this.range.setRange(newIndex, newIndex)Đ
        this.draw.render({Đ
            curlIndex: newIndex,Đ
            isCompute: false,Đ
            isSubmitHistory: falseĐ
        })Đ
    }Đ
Đ
    public wordTool() {Đ
        const elementList = this.draw.getMainElementList()Đ
        let isApply = falseĐ
        for (let i = 0; i < elementList.length; i++) {Đ
            const element = elementList[i]Đ
            // R -dzz^L0 ^L™-zzh<Đ
            if (element.value === ZERO) {Đ
                while (i + 1 < elementList.length) {Đ
                    const nextElement = elementList[i + 1]Đ
                    if (nextElement.value !== ZERO && nextElement.value !== NBSP) breakĐ
                }
            }
        }
    }
}

```



```
    elementList.splice(i + 1, 1)
    isApply = true
  }
}
}
if (!isApply) {
  // ••QM•“QehFQlh N"Y1
  const isCollapsed = this.range.getIsCollapsed()
  this.draw.getCursor().drawCursor({
    isShow: isCollapsed
  })
} else {
  this.draw.render({
    isSetCursor: false
  })
}
}
}
```

File Path: canvas-editor/src/editor/core/contextmenu/ContextMenu.ts

```
import { NAME_PLACEHOLDER } from '../dataset/constant/ContextMenu'
import { EDITOR_COMPONENT, EDITOR_PREFIX } from '../dataset/constant/Editor'
import { EditorComponent } from '../dataset/enum/Editor'
import {
  IContextMenuContext,
  IRegisterContextMenu
} from '../interface/contextmenu/ContextMenu'
import { findParent } from '../utils'
import { Command } from '../command/Command'
import { Draw } from '../draw/Draw'
import { I18n } from '../i18n/I18n'
import { Position } from '../position/Position'
import { RangeManager } from '../range/RangeManager'
import { controlMenus } from '../menus/controlMenus'
import { globalMenus } from '../menus/globalMenus'
import { hyperlinkMenus } from '../menus/hyperlinkMenus'
import { imageMenus } from '../menus/imageMenus'
import { tableMenus } from '../menus/tableMenus'
}
interface IRenderPayload {
  contextMenuList: IRegisterContextMenu[]
  left: number
  top: number
  parentMenuContainer?: HTMLDivElement
}
}
export class ContextMenu {
  private draw: Draw
  private command: Command
  private range: RangeManager
  private position: Position
  private i18n: I18n
  private container: HTMLDivElement
  private contextMenuList: IRegisterContextMenu[]
  private contextMenuContainerList: HTMLDivElement[]
  private contextMenuRelationShip: Map<HTMLDivElement, HTMLDivElement>
  private context: IContextMenuContext | null
}
constructor(draw: Draw, command: Command) {
  this.draw = draw
  this.command = command
  this.range = draw.getRange()
  this.position = draw.getPosition()
  this.i18n = draw.getI18n()
  this.container = draw.getContainer()
}
```

```

this.context = null
// Q...•èfÜSU
this.contextMenuList = [
  ...globalMenus,
  ...tableMenus,
  ...imageMenus,
  ...controlMenus,
  ...hyperlinkMenus
]
this.contextMenuContainerList = []
this.contextMenuRelaShip = new Map()
this._addEvent()
}
}
private _addEvent() {
  // fÜSUgC-P
  this.container.addEventListener('contextmenu', this._proxyContextMenuEvent)
  // RoO\u(Y t
  document.addEventListener('mousedown', this._handleEffect)
}
}
public removeEvent() {
  this.container.removeEventListener(
    'contextmenu',
    this._proxyContextMenuEvent
  )
  document.removeEventListener('mousedown', this._handleEffect)
}
}
private _proxyContextMenuEvent = (evt: MouseEvent) => {
  this.context = this._getContext()
  const renderList: IRegisterContextMenu[] = []
  let isRegisterContextMenu = false
  for (let c = 0; c < this.contextMenuList.length; c++) {
    const menu = this.contextMenuList[c]
    if (menu.isDivider) {
      renderList.push(menu)
    } else {
      const isMatch = menu.when?.(this.context)
      if (isMatch) {
        renderList.push(menu)
        isRegisterContextMenu = true
      }
    }
  }
  if (isRegisterContextMenu) {

```

```

        this.dispose()
        this._render({
            contextMenuList: renderList,
            left: evt.x,
            top: evt.y
        })
    }
    evt.preventDefault()
}
}
}
private _handleEffect = (evt: MouseEvent) => {
    if (this.contextMenuContainerList.length) {
        // p1Qû—^Só•.fÜSUQ...
        const contextMenuDom = findParent(
            evt.target as Element,
            (node: Node & Element) =>
                !!node &&
                node.nodeType === 1 &&
                node.getAttribute(EDITOR_COMPONENT) ===
EditorComponent.CONTEXTMENU,
            true
        )
        if (!contextMenuDom) {
            this.dispose()
        }
    }
}
}
}
private _getContext(): IContextMenuContext {
    // f/T&f/Sê'ûj!_
    const isReadOnly = this.draw.isReadOnly()
    const {
        isCrossRowCol: crossRowCol,
        startIndex,
        endIndex
    } = this.range.getRange()
    // f/T&[XW(q&p1
    const editorTextFocus = !!(~startIndex || ~endIndex)
    // f/T&[XW(• S:
    const editorHasSelection = editorTextFocus && startIndex !== endIndex
    // f/T&W(^hh<Q...
    const positionContext = this.position.getPositionContext()
    const isInTable = positionContext.isTable
    // f/T&[XW(•è^L/R
    const isCrossRowCol = isInTable && !!crossRowCol
    // _SRMQC}

```

```

const elementList = this.draw.getElementList()
const startElement = elementList[startIndex] || null
const endElement = elementList[endIndex] || null
}
return {
  startElement,
  endElement,
  isReadOnly,
  editorHasSelection,
  editorTextFocus,
  isInTable,
  isCrossRowCol
}
}
}
private _createContextMenuContainer(): HTMLDivElement {
  const contextMenuContainer = document.createElement('div')
  contextMenuContainer.classList.add(`${EDITOR_PREFIX}-contextmenu-container`)
  contextMenuContainer.setAttribute(
    EDITOR_COMPONENT,
    EditorComponent.CONTEXTMENU
  )
  this.container.append(contextMenuContainer)
  return contextMenuContainer
}
private _render(payload: IRenderPayload): HTMLDivElement {
  const { contextMenuList, left, top, parentMenuContainer } = payload
  const contextMenuContainer = this._createContextMenuContainer()
  const contextMenuContent = document.createElement('div')
  contextMenuContent.classList.add(`${EDITOR_PREFIX}-contextmenu-content`)
  // vô vàn
  let childMenuContainer: HTMLDivElement | null = null
  // r6fÜSUmûR [PfÜSuf \ Qs|û
  if (parentMenuContainer) {
    this.contextMenuRelationship.set(
      parentMenuContainer,
      contextMenuContainer
    )
  }
  for (let c = 0; c < contextMenuList.length; c++) {
    const menu = contextMenuList[c]
    if (menu.isDivider) {
      // TM- \>R -"}&N n2gÓ
      if (c !== 0 && c !== contextMenuList.length - 1) {
        const divider = document.createElement('div')

```

```

    divider.classList.add(`${EDITOR_PREFIX}-contextmenu-divider`)
    contextMenuContent.append(divider)
  }
} else {
  const menuItem = document.createElement('div')
  menuItem.classList.add(`${EDITOR_PREFIX}-contextmenu-item`)
  // fÜSUNö
  if (menu.childMenus) {
    menuItem.classList.add(`${EDITOR_PREFIX}-contextmenu-sub-item`)
    menuItem.onmouseenter = () => {
      this._setHoverStatus(menuItem, true)
      this._removeSubMenu(contextMenuContainer)
      // PfÜSUD
      const subMenuRect = menuItem.getBoundingClientRect()
      const left = subMenuRect.left + subMenuRect.width
      const top = subMenuRect.top
      childMenuContainer = this._render({
        contextMenuList: menu.childMenus!,
        left,
        top,
        parentMenuContainer: contextMenuContainer
      })
    }
    menuItem.onmouseleave = evt => {
      // yûR"R0[PfÜSU•~y•N-r¶ N SØS
      if (
        !childMenuContainer ||
        !childMenuContainer.contains(evt.relatedTarget as Node)
      ) {
        this._setHoverStatus(menuItem, false)
      }
    }
  } else {
    menuItem.onmouseenter = () => {
      this._setHoverStatus(menuItem, true)
      this._removeSubMenu(contextMenuContainer)
    }
    menuItem.onmouseleave = () => {
      this._setHoverStatus(menuItem, false)
    }
    menuItem.onclick = () => {
      if (menu.callback && this.context) {
        menu.callback(this.command, this.context)
      }
      this.dispose()
    }
  }
}

```

```

    }
    // Vph
    const icon = document.createElement('i')
    menuItem.append(icon)
    if (menu.icon) {
        icon.classList.add(`${EDITOR_PREFIX}-contextmenu-${menu.icon}`)
    }
    // e±g,
    const span = document.createElement('span')
    const name = menu.i18nPath
        ? this._formatName(this.i18n.t(menu.i18nPath))
        : this._formatName(menu.name || "")
    span.append(document.createTextNode(name))
    menuItem.append(span)
    // _ēcwe¹_ cÐy:
    if (menu.shortCut) {
        const span = document.createElement('span')
        span.classList.add(`${EDITOR_PREFIX}-shortcut`)
        span.append(document.createTextNode(menu.shortCut))
        menuItem.append(span)
    }
    contextMenuContent.append(menuItem)
}
contextMenuContainer.append(contextMenuContent)
contextMenuContainer.style.display = 'block'
const innerWidth = window.innerWidth
const contextMenuWidth = contextMenuContainer.getBoundingClientRect().width
// SÓO$zz•ôN •³eöÿ NăfÜSUSóN %oÖO\N:•wYĚp¹
const adjustLeft =
    left + contextMenuWidth > innerWidth ? left - contextMenuWidth : left
contextMenuContainer.style.left = `${adjustLeft}px`
contextMenuContainer.style.top = `${top}px`
this.contextMenuContainerList.push(contextMenuContainer)
return contextMenuContainer
}
}
}

```

```

private _setHoverStatus(payload: HTMLDivElement, status: boolean) {
  if (status) {
    payload.parentNode
      ?.querySelectorAll(`${EDITOR_PREFIX}-contextmenu-item`)
      .forEach(child => child.classList.remove('hover'))
    payload.classList.add('hover')
  } else {
    payload.classList.remove('hover')
  }
}

private _formatName(name: string): string {
  const placeholderValues = Object.values(NAME_PLACEHOLDER)
  const placeholderReg = new RegExp(`${placeholderValues.join('|')}`)
  let formatName = name
  if (placeholderReg.test(formatName)) {
    // • S:T y
    const selectedReg = new RegExp(NAME_PLACEHOLDER.SELECTED_TEXT, 'g')
    if (selectedReg.test(formatName)) {
      const selectedText = this.range.toString()
      formatName = formatName.replace(selectedReg, selectedText)
    }
  }
  return formatName
}

public registerContextMenuList(payload: IRegisterContextMenu[]) {
  this.contextMenuList.push(...payload)
}

public dispose() {
  this.contextMenuContainerList.forEach(child => child.remove())
  this.contextMenuContainerList = []
  this.contextMenuRelationship.clear()
}

```



```

File Path: canvas-editor/src/editor/core/contextmenu/menus/controlMenus.ts
import { ElementType } from '../../../../dataset/enum/Element'
import { IRegisterContextMenu } from '../../../../interface/contextmenu/ContextMenu'
import { Command } from '../../../../command/Command'

export const controlMenus: IRegisterContextMenu[] = [
  {
    id: 'contextmenu.control.delete',
    when: payload => {
      return (
        !payload.isReadOnly &&
        !payload.editorHasSelection &&
        payload.startElement?.type === ElementType.CONTROL
      )
    },
    callback: (command: Command) => {
      command.executeRemoveControl()
    }
  }
]

```

```

File Path: canvas-editor/src/editor/core/contextmenu/menus/globalMenus.ts
import { IRegisterContextMenu } from '../../../interface/contextmenu/ContextMenu'
import { isApple } from '../../../utils/ua'
import { Command } from '../../../command/Command'

export const globalMenus: IRegisterContextMenu[] = [
  {
    id: 'contextmenu.global.cut',
    shortcut: `${isApple ? 'Cmd' : 'Ctrl'} + X`,
    when: payload => {
      return !payload.isReadOnly
    },
    callback: (command: Command) => {
      command.executeCut()
    }
  },
  {
    id: 'contextmenu.global.copy',
    shortcut: `${isApple ? 'Cmd' : 'Ctrl'} + C`,
    when: payload => {
      return payload.editorHasSelection
    },
    callback: (command: Command) => {
      command.executeCopy()
    }
  },
  {
    id: 'contextmenu.global.paste',
    shortcut: `${isApple ? 'Cmd' : 'Ctrl'} + V`,
    when: payload => {
      return !payload.isReadOnly && payload.editorTextFocus
    },
    callback: (command: Command) => {
      command.executePaste()
    }
  },
  {
    id: 'contextmenu.global.selectAll',
    shortcut: `${isApple ? 'Cmd' : 'Ctrl'} + A`,
    when: payload => {
      return payload.editorTextFocus
    },
    callback: (command: Command) => {
      command.executeSelectAll()
    }
  }
]

```

```
{␣
  isDivider: true␣
},␣
{␣
  i18nPath: 'contextmenu.global.print',␣
  icon: 'print',␣
  when: () => true,␣
  callback: (command: Command) => {␣
    command.executePrint()␣
  }␣
}␣
}␣
]␣
```

File Path: canvas-editor/src/editor/core/contextmenu/menus/hyperlinkMenus.ts

```
import { ElementType } from '../../../dataset/enum/Element'
import {
  IContextMenuContext,
  IRegisterContextMenu
} from '../../../interface/contextmenu/ContextMenu'
import { Command } from '../../../command/Command'

export const hyperlinkMenus: IRegisterContextMenu[] = [
  {
    id: 'contextmenu.hyperlink.delete',
    when: payload => {
      return (
        !payload.isReadOnly &&
        payload.startElement?.type === ElementType.HYPERLINK
      )
    },
    callback: (command: Command) => {
      command.executeDeleteHyperlink()
    }
  },
  {
    id: 'contextmenu.hyperlink.cancel',
    when: payload => {
      return (
        !payload.isReadOnly &&
        payload.startElement?.type === ElementType.HYPERLINK
      )
    },
    callback: (command: Command) => {
      command.executeCancelHyperlink()
    }
  },
  {
    id: 'contextmenu.hyperlink.edit',
    when: payload => {
      return (
        !payload.isReadOnly &&
        payload.startElement?.type === ElementType.HYPERLINK
      )
    },
    callback: (command: Command, context: IContextMenuContext) => {
      const url = window.prompt('••“”pc¥', context.startElement?.url)
      if (url) {
        command.executeEditHyperlink(url)
      }
    }
  }
]
```

}D  
}D  
]D

File Path: canvas-editor/src/editor/core/contextmenu/menus/imageMenus.ts

```
import { ImageDisplay } from '../../../../dataset/enum/Control'
import { ElementType } from '../../../../dataset/enum/Element'
import {
  IContextMenuContext,
  IRegisterContextMenu
} from '../../../../interface/contextmenu/ContextMenu'
import { Command } from '../../../../command/Command'

export const imageMenus: IRegisterContextMenu[] = [
  {
    id: 'contextmenu.image.change',
    icon: 'image-change',
    when: payload => {
      return (
        !payload.isReadOnly &&
        !payload.editorHasSelection &&
        payload.startElement?.type === ElementType.IMAGE
      )
    },
    callback: (command: Command) => {
      // R ^úNãt QC
      const proxyInputFile = document.createElement('input')
      proxyInputFile.type = 'file'
      proxyInputFile.accept = '.png, .jpg, .jpeg'
      // vÑT,N O
      proxyInputFile.onChange = () => {
        const file = proxyInputFile.files![0]!
        const fileReader = new FileReader()
        fileReader.readAsDataURL(file)
        fileReader.onload = () => {
          const value = fileReader.result as string
          command.executeReplaceImageElement(value)
        }
      }
      proxyInputFile.click()
    },
    id: 'contextmenu.image.saveAs',
    icon: 'image',
    when: payload => {
      return (
        !payload.editorHasSelection &&
        payload.startElement?.type === ElementType.IMAGE
      )
    },
```

```

    },
    callback: (command: Command) => {
        command.executeSaveAsImageElement()
    },
},
{
    i18nPath: 'contextmenu.image.textWrap',
    when: payload => {
        return (
            !payload.isReadOnly &&
            !payload.editorHasSelection &&
            payload.startElement?.type === ElementType.IMAGE
        )
    },
},
childMenus: [
    {
        i18nPath: 'contextmenu.image.textWrapType.embed',
        when: () => true,
        callback: (command: Command, context: IContextMenuContext) => {
            command.executeChangeImageDisplay(
                context.startElement!,
                ImageDisplay.BLOCK
            )
        },
    },
    {
        i18nPath: 'contextmenu.image.textWrapType.upDown',
        when: () => true,
        callback: (command: Command, context: IContextMenuContext) => {
            command.executeChangeImageDisplay(
                context.startElement!,
                ImageDisplay.INLINE
            )
        },
    },
],
},
]

```

```

File Path: canvas-editor/src/editor/core/contextmenu/menus/tableMenus.ts
import { VerticalAlign } from '../../../../dataset/enum/VerticalAlign'
import { TableBorder } from '../../../../dataset/enum/table/Table'
import { IRegisterContextMenu } from '../../../../interface/contextmenu/ContextMenu'
import { Command } from '../../../../command/Command'

export const tableMenus: IRegisterContextMenu[] = [
  {
    isDivider: true
  },
  {
    i18nPath: 'contextmenu.table.border',
    icon: 'border-all',
    when: payload => {
      return !payload.isReadOnly && payload.isInTable
    },
    childMenus: [
      {
        i18nPath: 'contextmenu.table.borderAll',
        icon: 'border-all',
        when: () => true,
        callback: (command: Command) => {
          command.executeTableBorderType(TableBorder.ALL)
        }
      },
      {
        i18nPath: 'contextmenu.table.borderEmpty',
        icon: 'border-empty',
        when: () => true,
        callback: (command: Command) => {
          command.executeTableBorderType(TableBorder.EMPTY)
        }
      },
      {
        i18nPath: 'contextmenu.table.borderExternal',
        icon: 'border-external',
        when: () => true,
        callback: (command: Command) => {
          command.executeTableBorderType(TableBorder.EXTERNAL)
        }
      }
    ]
  },
  {
    i18nPath: 'contextmenu.table.verticalAlign',
    icon: 'vertical-align',

```



```

when: payload => {
  return !payload.isReadOnly && payload.isInTable
},
childMenus: [
  {
    i18nPath: 'contextmenu.table.verticalAlignTop',
    icon: 'vertical-align-top',
    when: () => true,
    callback: (command: Command) => {
      command.executeTableTdVerticalAlign(VerticalAlign.TOP)
    }
  },
  {
    i18nPath: 'contextmenu.table.verticalAlignMiddle',
    icon: 'vertical-align-middle',
    when: () => true,
    callback: (command: Command) => {
      command.executeTableTdVerticalAlign(VerticalAlign.MIDDLE)
    }
  },
  {
    i18nPath: 'contextmenu.table.verticalAlignBottom',
    icon: 'vertical-align-bottom',
    when: () => true,
    callback: (command: Command) => {
      command.executeTableTdVerticalAlign(VerticalAlign.BOTTOM)
    }
  }
],
{
  i18nPath: 'contextmenu.table.insertRowCol',
  icon: 'insert-row-col',
  when: payload => {
    return !payload.isReadOnly && payload.isInTable
  },
  childMenus: [
    {
      i18nPath: 'contextmenu.table.insertTopRow',
      icon: 'insert-top-row',
      when: () => true,
      callback: (command: Command) => {
        command.executeInsertTableTopRow()
      }
    }
  ]
}

```

```

i18nPath: 'contextmenu.table.insertBottomRow',Đ
icon: 'insert-bottom-row',Đ
when: () => true,Đ
callback: (command: Command) => {Đ
  command.executeInsertTableBottomRow()Đ
}Đ
},Đ
{Đ
  i18nPath: 'contextmenu.table.insertLeftCol',Đ
  icon: 'insert-left-col',Đ
  when: () => true,Đ
  callback: (command: Command) => {Đ
    command.executeInsertTableLeftCol()Đ
  }Đ
},Đ
{Đ
  i18nPath: 'contextmenu.table.insertRightCol',Đ
  icon: 'insert-right-col',Đ
  when: () => true,Đ
  callback: (command: Command) => {Đ
    command.executeInsertTableRightCol()Đ
  }Đ
}Đ
]Đ
},Đ
{Đ
  i18nPath: 'contextmenu.table.deleteRowCol',Đ
  icon: 'delete-row-col',Đ
  when: payload => {Đ
    return !payload.isReadOnly && payload.isInTableĐ
  },Đ
  childMenus: [Đ
    {Đ
      i18nPath: 'contextmenu.table.deleteRow',Đ
      icon: 'delete-row',Đ
      when: () => true,Đ
      callback: (command: Command) => {Đ
        command.executeDeleteTableRow()Đ
      }Đ
    },Đ
    {Đ
      i18nPath: 'contextmenu.table.deleteCol',Đ
      icon: 'delete-col',Đ
      when: () => true,Đ
      callback: (command: Command) => {Đ
        command.executeDeleteTableCol()Đ
      }Đ
    }
  ]
}

```

```

    }␣
  },␣
  {␣
    i18nPath: 'contextmenu.table.deleteTable',␣
    icon: 'delete-table',␣
    when: () => true,␣
    callback: (command: Command) => {␣
      command.executeDeleteTable()␣
    }␣
  }␣
},␣
{␣
  i18nPath: 'contextmenu.table.mergeCell',␣
  icon: 'merge-cell',␣
  when: payload => {␣
    return !payload.isReadOnly && payload.isCrossRowCol␣
  },␣
  callback: (command: Command) => {␣
    command.executeMergeTableCell()␣
  }␣
},␣
{␣
  i18nPath: 'contextmenu.table.mergeCancelCell',␣
  icon: 'merge-cancel-cell',␣
  when: payload => {␣
    return !payload.isReadOnly && payload.isInTable␣
  },␣
  callback: (command: Command) => {␣
    command.executeCancelMergeTableCell()␣
  }␣
}␣
]␣

```

```

File Path: canvas-editor/src/editor/core/cursor/Cursor.ts
import { CURSOR_AGENT_HEIGHT } from '../../dataset/constant/Cursor'
import { EDITOR_PREFIX } from '../../dataset/constant/Editor'
import { DeepRequired } from '../../interface/Common'
import { ICursorOption } from '../../interface/Cursor'
import { IEditorOption } from '../../interface/Editor'
import { Draw } from '../draw/Draw'
import { CanvasEvent } from '../event/CanvasEvent'
import { Position } from '../position/Position'
import { CursorAgent } from './CursorAgent'
import {
  export type IDrawCursorOption = ICursorOption & {
    isShow?: boolean
    isBlink?: boolean
    isFocus?: boolean
    hitLineStartIndex?: number
  }
  export class Cursor {
    private readonly ANIMATION_CLASS = `${EDITOR_PREFIX}-cursor--animation`
    private draw: Draw
    private container: HTMLDivElement
    private options: DeepRequired<IEditorOption>
    private position: Position
    private cursorDom: HTMLDivElement
    private cursorAgent: CursorAgent
    private blinkTimeout: number | null
    constructor(draw: Draw, canvasEvent: CanvasEvent) {
      this.draw = draw
      this.container = draw.getContainer()
      this.position = draw.getPosition()
      this.options = draw.getOptions()
      this.cursorDom = document.createElement('div')
      this.cursorDom.classList.add(`${EDITOR_PREFIX}-cursor`)
      this.container.append(this.cursorDom)
      this.cursorAgent = new CursorAgent(draw, canvasEvent)
      this.blinkTimeout = null
    }
    public getCursorDom(): HTMLDivElement {
      return this.cursorDom
    }
  }
}

```

```

    public getAgentDom(): HTMLTextAreaElement {
        return this.cursorAgent.getAgentCursorDom()
    }
}

    public getAgentIsActive(): boolean {
        return this.getAgentDom() === document.activeElement
    }
}

    public getAgentDomValue(): string {
        return this.getAgentDom().value
    }
}

    public clearAgentDomValue() {
        this.getAgentDom().value = ""
    }
}

    private _blinkStart() {
        this.cursorDom.classList.add(this.ANIMATION_CLASS)
    }
}

    private _blinkStop() {
        this.cursorDom.classList.remove(this.ANIMATION_CLASS)
    }
}

    private _setBlinkTimeout() {
        this._clearBlinkTimeout()
        this.blinkTimeout = window.setTimeout(() => {
            this._blinkStart()
        }, 500)
    }
}

    private _clearBlinkTimeout() {
        if (this.blinkTimeout) {
            this._blinkStop()
            window.clearTimeout(this.blinkTimeout)
            this.blinkTimeout = null
        }
    }
}

    public drawCursor(payload?: IDrawCursorOption) {
        let cursorPosition = this.position.getCursorPosition()
        if (!cursorPosition) return
        const { scale, cursor } = this.options
        const {
            color,
            width,

```

```

isShow = true,Đ
isBlink = true,Đ
isFocus = true,Đ
hitLineStartIndexĐ
} = { ...cursor, ...payload }Đ
// ¼•nQlh Năt Đ
const height = this.draw.getHeight()Đ
const pageGap = this.draw.getPageGap()Đ
// Qlh OM•nĐ
if (hitLineStartIndex) {Đ
  const positionList = this.position.getPositionList()Đ
  cursorPosition = positionList[hitLineStartIndex]Đ
}Đ
const {Đ
  metrics,Đ
  coordinate: { leftTop, rightTop },Đ
  ascent,Đ
  pageNoĐ
} = cursorPositionĐ
const zoneManager = this.draw.getZone()Đ
const curPageNo = zoneManager.isMainActive()Đ
  ? pageNoĐ
  : this.draw.getPageNo()Đ
const preY = curPageNo * (height + pageGap)Đ
// XžR 1/4[WOSY\ Đ
const offsetHeight = metrics.height / 4Đ
const cursorHeight = metrics.height + offsetHeight * 2Đ
const agentCursorDom = this.cursorAgent.getAgentCursorDom()Đ
if (isFocus) {Đ
  setTimeout(() => {Đ
    agentCursorDom.focus()Đ
    agentCursorDom.setSelectionRange(0, 0)Đ
  })Đ
}Đ
// fillTextOM•n + e‡[WWú~¿R0^••è•Ýy» - j!bßQlh POyû'İĐ
const descent =Đ
  metrics.boundingBoxDescent < 0 ? 0 : metrics.boundingBoxDescentĐ
const cursorTop =Đ
  leftTop[1] + ascent + descent - (cursorHeight - offsetHeight) + preYĐ
const cursorLeft = hitLineStartIndex ? leftTop[0] : rightTop[0]Đ
agentCursorDom.style.left = `${cursorLeft}px`Đ
agentCursorDom.style.top = `${Đ
  cursorTop + cursorHeight - CURSOR_AGENT_HEIGHT * scaleĐ
}px`Đ
// j!bßQlh f>y:Đ
if (!isShow) returnĐ

```

```

const isReadonly = this.draw.isReadonly()
this.cursorDom.style.width = `${width}px`
this.cursorDom.style.backgroundColor = color
this.cursorDom.style.left = `${cursorLeft}px`
this.cursorDom.style.top = `${cursorTop}px`
this.cursorDom.style.display = isReadonly ? 'none' : 'block'
this.cursorDom.style.height = `${cursorHeight}px`
if (isBlink) {
  this._setBlinkTimeout()
} else {
  this._clearBlinkTimeout()
}
}
}
}
public recoveryCursor() {
  this.cursorDom.style.display = 'none'
  this._clearBlinkTimeout()
}
}

```

```

File Path: canvas-editor/src/editor/core/cursor/CursorAgent.ts
import { ZERO } from '../dataset/constant/Common'Đ
import { EDITOR_PREFIX } from '../dataset/constant/Editor'Đ
import { VIRTUAL_ELEMENT_TYPE } from '../dataset/constant/Element'Đ
import { ElementType } from '../dataset/enum/Element'Đ
import { IElement } from '../interface/Element'Đ
import { debounce } from '../utils'Đ
import { getElementListByHTML } from '../utils/clipboard'Đ
import { formatElementContext } from '../utils/element'Đ
import { Draw } from './draw/Draw'Đ
import { CanvasEvent } from './event/CanvasEvent'Đ
Đ
export class CursorAgent {Đ
  private draw: DrawĐ
  private container: HTMLDivElementĐ
  private agentCursorDom: HTMLTextAreaElementĐ
  private canvasEvent: CanvasEventĐ
Đ
  constructor(draw: Draw, canvasEvent: CanvasEvent) {Đ
    this.draw = drawĐ
    this.container = draw.getContainer()Đ
    this.canvasEvent = canvasEventĐ
    // Năt Qlh ~ØR6Đ
    const agentCursorDom = document.createElement('textarea')Đ
    agentCursorDom.autocomplete = 'off'Đ
    agentCursorDom.classList.add(`${EDITOR_PREFIX}-inputarea`)Đ
    agentCursorDom.innerText = ""Đ
    this.container.append(agentCursorDom)Đ
    this.agentCursorDom = agentCursorDomĐ
    // NĀNöĐ
    agentCursorDom.onkeydown = (evt: KeyboardEvent) => this._keyDown(evt)Đ
    agentCursorDom.oninput = debounce(this._input.bind(this), 0)Đ
    agentCursorDom.onpaste = (evt: ClipboardEvent) => this._paste(evt)Đ
    agentCursorDom.addEventListener(Đ
      'compositionstart',Đ
      this._compositionstart.bind(this)Đ
    )Đ
    agentCursorDom.addEventListener(Đ
      'compositionend',Đ
      this._compositionend.bind(this)Đ
    )Đ
  }Đ
Đ
  public getAgentCursorDom(): HTMLTextAreaElement {Đ
    return this.agentCursorDomĐ
  }Đ
}

```



```

    }
    private _keyDown(evt: KeyboardEvent) {
        this.canvasEvent.keydown(evt)
    }
    private _input(evt: InputEvent) {
        if (!evt.data) return
        this.canvasEvent.input(evt.data)
    }
    private _paste(evt: ClipboardEvent) {
        const clipboardData = evt.clipboardData
        if (!clipboardData) return
        const rangeManager = this.draw.getRange()
        const { startIndex } = rangeManager.getRange()
        const elementList = this.draw.getElementList()
        // NÎ~•4g•cĐSÖepcn
        let isHTML = false
        for (let i = 0; i < clipboardData.items.length; i++) {
            const item = clipboardData.items[i]
            if (item.type === 'text/html') {
                isHTML = true
                break
            }
        }
        for (let i = 0; i < clipboardData.items.length; i++) {
            const item = clipboardData.items[i]
            if (item.kind === 'string') {
                if (item.type === 'text/plain' && !isHTML) {
                    item.getAsText(plainText => {
                        this.canvasEvent.input(plainText)
                    })
                }
                if (item.type === 'text/html' && isHTML) {
                    item.getAsText(htmlText => {
                        const pasteElementList = getElementListByHTML(htmlText, {
                            innerWidth: this.draw.getOriginalInnerWidth()
                        })
                        // Qh• |~•4eà— h<_ S N N e‡
                        if (~startIndex && !rangeManager.getIsSelectAll()) {
                            // Y,gœf/Y R6R0†ZbßQC} 'ïy R |~•4R ^hv„†ZbßQC} — bA^sS Y t ÿ ••QMN§u e°v„†ZbßQC}
                            const anchorElement = elementList[startIndex]
                            if (anchorElement?.titleId || anchorElement?.listId) {
                                let start = 0
                                while (start < pasteElementList.length) {
                                    const pasteElement = pasteElementList[start]

```

```

    if (anchorElement.titleId && /\n/.test(pasteElement.value)) {Đ
        breakĐ
    }Đ
    if (VIRTUAL_ELEMENT_TYPE.includes(pasteElement.type!)) {Đ
        pasteElementList.splice(start, 1)Đ
        if (pasteElement.valueList) {Đ
            for (let v = 0; v < pasteElement.valueList.length; v++) {Đ
                const element = pasteElement.valueList[v]Đ
                if (element.value === ZERO || element.value === '\n') {Đ
                    continueĐ
                }Đ
                pasteElementList.splice(start, 0, element)Đ
                start++Đ
            }Đ
        }Đ
        start--Đ
    }Đ
    start++Đ
}Đ
}Đ
formatElementContext(elementList, pasteElementList, startIndex, {Đ
    isBreakWhenWrap: trueĐ
})Đ
}Đ
this.draw.insertElementList(pasteElementList)Đ
})Đ
}Đ
} else if (item.kind === 'file') {Đ
    if (item.type.includes('image')) {Đ
        const file = item.getAsFile()Đ
        if (file) {Đ
            const fileReader = new FileReader()Đ
            fileReader.readAsDataURL(file)Đ
            fileReader.onload = () => {Đ
                // <i{—[½šØĐ
                const image = new Image()Đ
                const value = fileReader.result as stringĐ
                image.src = valueĐ
                image.onload = () => {Đ
                    const imageElement: IElement = {Đ
                        value,Đ
                        type: ElementType.IMAGE,Đ
                        width: image.width,Đ
                        height: image.heightĐ
                    }Đ
                }Đ
                if (~startIndex) {Đ

```

```
formatElementContext(elementList, [imageElement], startIndex)␣  
    }␣  
    this.draw.insertElementList([imageElement])␣  
}␣  
}  
}  
}  
}  
}  
}  
evt.preventDefault()␣  
}  
␣  
private _compositionstart() {␣  
    this.canvasEvent.compositionstart()␣  
}  
␣  
private _compositionend(evt: CompositionEvent) {␣  
    this.canvasEvent.compositionend(evt)␣  
}  
}
```

```
File Path: canvas-editor/src/editor/core/draw/Draw.ts
import { version } from '../../../../package.json'
import { ZERO } from '../../../../dataset/constant/Common'
import { RowFlex } from '../../../../dataset/enum/Row'
import {
  IAppendElementListOption,
  IDrawOption,
  IDrawPagePayload,
  IDrawRowPayload,
  IGetValueOption,
  IPainterOption
} from '../../../../interface/Draw'
import {
  IEditorData,
  IEditorOption,
  IEditorResult
} from '../../../../interface/Editor'
import {
  IElement,
  IElementMetrics,
  IElementFillRect,
  IElementStyle
} from '../../../../interface/Element'
import { IRow, IRowElement } from '../../../../interface/Row'
import { deepClone, getUUID, nextTick } from '../../../../utils'
import { Cursor } from '../../../cursor/Cursor'
import { CanvasEvent } from '../../../event/CanvasEvent'
import { GlobalEvent } from '../../../event/GlobalEvent'
import { HistoryManager } from '../../../history/HistoryManager'
import { Listener } from '../../../listener/Listener'
import { Position } from '../../../position/Position'
import { RangeManager } from '../../../range/RangeManager'
import { Background } from '../../../frame/Background'
import { Highlight } from '../../../richtext/Highlight'
import { Margin } from '../../../frame/Margin'
import { Search } from '../../../interactive/Search'
import { Strikeout } from '../../../richtext/Strikeout'
import { Underline } from '../../../richtext/Underline'
import { ElementType } from '../../../../dataset/enum/Element'
import { ImageParticle } from '../../../particle/ImageParticle'
import { LaTeXParticle } from '../../../particle/latex/LaTeXParticle'
import { TextParticle } from '../../../particle/TextParticle'
import { PageNumber } from '../../../frame/PageNumber'
import { ScrollObserver } from '../../../observer/ScrollObserver'
import { SelectionObserver } from '../../../observer/SelectionObserver'
import { TableParticle } from '../../../particle/table/TableParticle'
```

```

import { TableTool } from './particle/table/TableTool'Đ
import { HyperlinkParticle } from './particle/HyperlinkParticle'Đ
import { Header } from './frame/Header'Đ
import { SuperscriptParticle } from './particle/Superscript'Đ
import { SubscriptParticle } from './particle/Subscript'Đ
import { SeparatorParticle } from './particle/Separator'Đ
import { PageBreakParticle } from './particle/PageBreak'Đ
import { Watermark } from './frame/Watermark'Đ
import {Đ
  EditorComponent,Đ
  EditorMode,Đ
  EditorZone,Đ
  PageMode,Đ
  PaperDirection,Đ
  WordBreakĐ
} from '../dataset/enum/Editor'Đ
import { Control } from './control/Control'Đ
import { zipElementList } from '../utils/element'Đ
import { CheckboxParticle } from './particle/CheckboxParticle'Đ
import { DeepRequired } from '../interface/Common'Đ
import { ControlComponent, ImageDisplay } from '../dataset/enum/Control'Đ
import { formatElementList } from '../utils/element'Đ
import { WorkerManager } from './worker/WorkerManager'Đ
import { Previewer } from './particle/previewer/Previewer'Đ
import { DateParticle } from './particle/date/DateParticle'Đ
import { IMargin } from '../interface/Margin'Đ
import { BlockParticle } from './particle/block/BlockParticle'Đ
import { EDITOR_COMPONENT, EDITOR_PREFIX } from '../dataset/constant/Editor'Đ
import { I18n } from './i18n/I18n'Đ
import { ImageObserver } from './observer/ImageObserver'Đ
import { Zone } from './zone/Zone'Đ
import { Footer } from './frame/Footer'Đ
import { INLINE_ELEMENT_TYPE } from '../dataset/constant/Element'Đ
import { ListParticle } from './particle/ListParticle'Đ
import { Placeholder } from './frame/Placeholder'Đ
import { WORD_LIKE_REG } from '../dataset/constant/Regular'Đ
Đ
export class Draw {Đ
  private container: HTMLDivElementĐ
  private pageContainer: HTMLDivElementĐ
  private pageList: HTMLCanvasElement[]Đ
  private ctxList: CanvasRenderingContext2D[]Đ
  private pageNo: numberĐ
  private pagePixelRatio: number | nullĐ
  private mode: EditorModeĐ
  private options: DeepRequired<IEditorOption>Đ

```

```
private position: PositionĐ
private zone: ZoneĐ
private headerElementList: IElement[]Đ
private elementList: IElement[]Đ
private footerElementList: IElement[]Đ
private listener: ListenerĐ
Đ
private i18n: I18nĐ
private canvasEvent: CanvasEventĐ
private globalEvent: GlobalEventĐ
private cursor: CursorĐ
private range: RangeManagerĐ
private margin: MarginĐ
private background: BackgroundĐ
private search: SearchĐ
private underline: UnderlineĐ
private strikeouts: StrikeoutĐ
private highlight: HighlightĐ
private historyManager: HistoryManagerĐ
private previewer: PreviewerĐ
private imageParticle: ImageParticleĐ
private latexParticle: LatexParticleĐ
private textParticle: TextParticleĐ
private tableParticle: TableParticleĐ
private tableTool: TableToolĐ
private pageNumber: PageNumberĐ
private waterMark: WatermarkĐ
private placeholder: PlaceholderĐ
private header: HeaderĐ
private footer: FooterĐ
private hyperlinkParticle: HyperlinkParticleĐ
private dateParticle: DateParticleĐ
private separatorParticle: SeparatorParticleĐ
private pageBreakParticle: PageBreakParticleĐ
private superscriptParticle: SuperscriptParticleĐ
private subscriptParticle: SubscriptParticleĐ
private checkboxParticle: CheckboxParticleĐ
private blockParticle: BlockParticleĐ
private listParticle: ListParticleĐ
private control: ControlĐ
private workerManager: WorkerManagerĐ
private scrollObserver: ScrollObserverĐ
private selectionObserver: SelectionObserverĐ
private imageObserver: ImageObserverĐ
Đ
private rowList: IRow[]Đ
```

```

private pageRowList: IRow[][]
private painterStyle: IElementStyle | null
private painterOptions: IPainterOption | null
private visiblePageNoList: number[]
private intersectionPageNo: number
private lazyRenderIntersectionObserver: IntersectionObserver | null

constructor(
  rootContainer: HTMLElement,
  options: DeepRequired<IEditorOption>,
  data: IEditorData,
  listener: Listener
) {
  this.container = this._wrapContainer(rootContainer)
  this.pageList = []
  this.ctxList = []
  this.pageNo = 0
  this.pagePixelRatio = null
  this.mode = options.mode
  this.options = options
  this.headerElementList = data.header || []
  this.elementList = data.main
  this.footerElementList = data.footer || []
  this.listener = listener
}

this._formatContainer()
this.pageContainer = this._createPageContainer()
this._createPage(0)

this.i18n = new I18n()
this.historyManager = new HistoryManager(this)
this.position = new Position(this)
this.zone = new Zone(this)
this.range = new RangeManager(this)
this.margin = new Margin(this)
this.background = new Background(this)
this.search = new Search(this)
this.underline = new Underline(this)
this.strikeout = new Strikeout(this)
this.highlight = new Highlight(this)
this.previewer = new Previewer(this)
this.imageParticle = new ImageParticle(this)
this.latexParticle = new LatexParticle(this)
this.textParticle = new TextParticle(this)
this.tableParticle = new TableParticle(this)
this.tableTool = new TableTool(this)

```

```

    this.pageNumber = new PageNumber(this)Đ
    this.waterMark = new Watermark(this)Đ
    this.placeholder = new Placeholder(this)Đ
    this.header = new Header(this)Đ
    this.footer = new Footer(this)Đ
    this.hyperlinkParticle = new HyperlinkParticle(this)Đ
    this.dateParticle = new DateParticle(this)Đ
    this.separatorParticle = new SeparatorParticle()Đ
    this.pageBreakParticle = new PageBreakParticle(this)Đ
    this.superscriptParticle = new SuperscriptParticle()Đ
    this.subscriptParticle = new SubscriptParticle()Đ
    this.checkboxParticle = new CheckboxParticle(this)Đ
    this.blockParticle = new BlockParticle(this)Đ
    this.listParticle = new ListParticle(this)Đ
    this.control = new Control(this)Đ
Đ
    this.scrollObserver = new ScrollObserver(this)Đ
    this.selectionObserver = new SelectionObserver(this)Đ
    this.imageObserver = new ImageObserver()Đ
Đ
    this.canvasEvent = new CanvasEvent(this)Đ
    this.cursor = new Cursor(this, this.canvasEvent)Đ
    this.canvasEvent.register()Đ
    this.globalEvent = new GlobalEvent(this, this.canvasEvent)Đ
    this.globalEvent.register()Đ
Đ
    this.workerManager = new WorkerManager(this)Đ
Đ
    this.rowList = []Đ
    this.pageRowList = []Đ
    this.painterStyle = nullĐ
    this.painterOptions = nullĐ
    this.visiblePageNoList = []Đ
    this.intersectionPageNo = 0Đ
    this.lazyRenderIntersectionObserver = nullĐ
Đ
    this.render({ isSetCursor: false })Đ
}Đ
Đ
public getMode(): EditorMode {Đ
    return this.modeĐ
}Đ
Đ
public setMode(payload: EditorMode) {Đ
    this.mode = payloadĐ
}Đ

```



```

    }
    public isReadOnly() {
        return this.mode === EditorMode.READONLY
    }
    public getOriginalWidth(): number {
        const { paperDirection, width, height } = this.options
        return paperDirection === PaperDirection.VERTICAL ? width : height
    }
    public getOriginalHeight(): number {
        const { paperDirection, width, height } = this.options
        return paperDirection === PaperDirection.VERTICAL ? height : width
    }
    public getWidth(): number {
        return Math.floor(this.getOriginalWidth() * this.options.scale)
    }
    public getHeight(): number {
        return Math.floor(this.getOriginalHeight() * this.options.scale)
    }
    public getMainHeight(): number {
        const pageHeight = this.getHeight()
        return pageHeight - this.getMainOuterHeight()
    }
    public getMainOuterHeight(): number {
        const margins = this.getMargins()
        const headerExtraHeight = this.header.getExtraHeight()
        const footerExtraHeight = this.footer.getExtraHeight()
        return margins[0] + margins[2] + headerExtraHeight + footerExtraHeight
    }
    public getCanvasWidth(pageNo = -1): number {
        const page = this.getPage(pageNo)
        return page.width
    }
    public getCanvasHeight(pageNo = -1): number {
        const page = this.getPage(pageNo)
        return page.height
    }
    public getInnerWidth(): number {

```

```

    const width = this.getWidth()
    const margins = this.getMargins()
    return width - margins[1] - margins[3]
  }
}

public getOriginalInnerWidth(): number {
  const width = this.getOriginalWidth()
  const margins = this.getOriginalMargins()
  return width - margins[1] - margins[3]
}

public getMargins(): IMargin {
  return <IMargin>this.getOriginalMargins().map(m => m * this.options.scale)
}

public getOriginalMargins(): number[] {
  const { margins, paperDirection } = this.options
  return paperDirection === PaperDirection.VERTICAL
    ? margins
    : [margins[1], margins[2], margins[3], margins[0]]
}

public getPageGap(): number {
  return this.options.pageGap * this.options.scale
}

public getPageNumberBottom(): number {
  const {
    pageNumber: { bottom },
    scale
  } = this.options
  return bottom * scale
}

public getMarginIndicatorSize(): number {
  return this.options.marginIndicatorSize * this.options.scale
}

public getDefaultBasicRowMarginHeight(): number {
  return this.options.defaultBasicRowMarginHeight * this.options.scale
}

public getTdPadding(): number {
  return this.options.tdPadding * this.options.scale
}

```

```

    public getContainer(): HTMLDivElement {Đ
        return this.containerĐ
    }Đ
Đ
    public getPageContainer(): HTMLDivElement {Đ
        return this.pageContainerĐ
    }Đ
Đ
    public getVisiblePageNoList(): number[] {Đ
        return this.visiblePageNoListĐ
    }Đ
Đ
    public setVisiblePageNoList(payload: number[]) {Đ
        this.visiblePageNoList = payloadĐ
        if (this.listener.visiblePageNoListChange) {Đ
            this.listener.visiblePageNoListChange(this.visiblePageNoList)Đ
        }Đ
    }Đ
Đ
    public getIntersectionPageNo(): number {Đ
        return this.intersectionPageNoĐ
    }Đ
Đ
    public setIntersectionPageNo(payload: number) {Đ
        this.intersectionPageNo = payloadĐ
        if (this.listener.intersectionPageNoChange) {Đ
            this.listener.intersectionPageNoChange(this.intersectionPageNo)Đ
        }Đ
    }Đ
Đ
    public getPageNo(): number {Đ
        return this.pageNoĐ
    }Đ
Đ
    public setPageNo(payload: number) {Đ
        this.pageNo = payloadĐ
    }Đ
Đ
    public getPage(pageNo = -1): HTMLCanvasElement {Đ
        return this.pageList[~pageNo ? pageNo : this.pageNo]Đ
    }Đ
Đ
    public getPageList(): HTMLCanvasElement[] {Đ
        return this.pageListĐ
    }Đ
Đ

```

```

    public getPageCount(): number {
        return this.pageList.length
    }
}

public getTableRowList(sourceElementList: IElement[]): IRow[] {
    const positionContext = this.position.getPositionContext()
    const { index, trIndex, tdIndex } = positionContext
    return sourceElementList[index!].trList![trIndex!].tdList[tdIndex!].rowList!
}

public getOriginalRowList() {
    const zoneManager = this.getZone()
    if (zoneManager.isHeaderActive()) {
        return this.header.getRowList()
    }
    if (zoneManager.isFooterActive()) {
        return this.footer.getRowList()
    }
    return this.rowList
}

public getRowList(): IRow[] {
    const positionContext = this.position.getPositionContext()
    return positionContext.isTable
        ? this.getTableRowList(this.getOriginalElementList())
        : this.getOriginalRowList()
}

public getPageRowList(): IRow[][] {
    return this.pageRowList
}

public getCtx(): CanvasRenderingContext2D {
    return this.ctxList[this.pageNo]
}

public getOptions(): DeepRequired<IEditorOption> {
    return this.options
}

public getSearch(): Search {
    return this.search
}

public getHistoryManager(): HistoryManager {
    return this.historyManager
}

```

```

    }
}
@
public getPosition(): Position {
    return this.position
}
}
@
public getZone(): Zone {
    return this.zone
}
}
@
public getRange(): RangeManager {
    return this.range
}
}
@
public getHeaderElementList(): IElement[] {
    return this.headerElementList
}
}
@
public getTableElementList(sourceElementList: IElement[]): IElement[] {
    const positionContext = this.position.getPositionContext()
    const { index, trIndex, tdIndex } = positionContext
    return sourceElementList[index!].trList[trIndex!].tdList[tdIndex!].value
}
}
@
public getElementList(): IElement[] {
    const positionContext = this.position.getPositionContext()
    const elementList = this.getOriginalElementList()
    return positionContext.isTable
        ? this.getTableElementList(elementList)
        : elementList
}
}
@
public getMainElementList(): IElement[] {
    const positionContext = this.position.getPositionContext()
    return positionContext.isTable
        ? this.getTableElementList(this.elementList)
        : this.elementList
}
}
@
public getOriginalElementList() {
    const zoneManager = this.getZone()
    if (zoneManager.isHeaderActive()) {
        return this.header.getElementList()
    }
    if (zoneManager.isFooterActive()) {
        return this.footer.getElementList()
    }
}
}

```

```

    }
    return this.elementList
  }
}
public getOriginalMainElementList(): IElement[] {
  return this.elementList
}
public getFooterElementList(): IElement[] {
  return this.footerElementList
}
public insertElementList(payload: IElement[]) {
  if (!payload.length) return
  const isPartRangeInControlOutside =
    this.control.isPartRangeInControlOutside()
  if (isPartRangeInControlOutside) return
  const { startIndex, endIndex } = this.range.getRange()
  if (!~startIndex && !~endIndex) return
  formatElementList(payload, {
    isHandleFirstElement: false,
    editorOptions: this.options
  })
  let curIndex = -1
  // R$e-f/T&W(c$NöQ...
  const activeControl = this.control.getActiveControl()
  if (activeControl && !this.control.isRangeInPostfix()) {
    curIndex = activeControl.setValue(payload)
  } else {
    const elementList = this.getElementList()
    const isCollapsed = startIndex === endIndex
    const start = startIndex + 1
    if (!isCollapsed) {
      this.spliceElementList(elementList, start, endIndex - startIndex)
    }
    this.spliceElementList(elementList, start, 0, ...payload)
    curIndex = startIndex + payload.length
  }
  if (~curIndex) {
    this.range.setRange(curIndex, curIndex)
    this.render({
      curIndex
    })
  }
}
}

```

```

public appendElementList(
  elementList: IElement[],
  options: IAppendElementListOption = {}
) {
  if (!elementList.length) return
  formatElementList(elementList, {
    isHandleFirstElement: false,
    editorOptions: this.options
  })
  let curIndex: number
  const { isPrepend } = options
  if (isPrepend) {
    this.elementList.splice(1, 0, ...elementList)
    curIndex = elementList.length
  } else {
    this.elementList.push(...elementList)
    curIndex = this.elementList.length - 1
  }
  this.range.setRange(curIndex, curIndex)
  this.render({
    curIndex
  })
}

public spliceElementList(
  elementList: IElement[],
  start: number,
  deleteCount: number,
  ...items: IElement[]
) {
  if (deleteCount > 0) {
    // _Sg T QC} N _ YEQC} R ^hOá`oN N •œöÿ n -d_SRMR ^hOá`o
    const endIndex = start + deleteCount
    const endElement = elementList[endIndex]
    const endElementListId = endElement?.listId
    if (
      endElementListId &&
      elementList[start - 1]?.listId !== endElementListId
    ) {
      let startIndex = endIndex
      while (startIndex < elementList.length) {
        const curElement = elementList[startIndex]
        if (
          curElement.listId !== endElementListId ||
          curElement.value === ZERO
        ) {

```

```

        break
    }
    delete curElement.listId
    delete curElement.listType
    delete curElement.listStyle
    startIndex++
    }
    }
    }
    elementList.splice(start, deleteCount, ...items)
}
}
public getCanvasEvent(): CanvasEvent {
    return this.canvasEvent
}
}
public getListener(): Listener {
    return this.listener
}
}
public getCursor(): Cursor {
    return this.cursor
}
}
public getPreviewer(): Previewer {
    return this.previewer
}
}
public getImageParticle(): ImageParticle {
    return this.imageParticle
}
}
public getTableTool(): TableTool {
    return this.tableTool
}
}
public getTableParticle(): TableParticle {
    return this.tableParticle
}
}
public getHeader(): Header {
    return this.header
}
}
public getFooter(): Footer {
    return this.footer
}
}

```



```

    }
  }
  public getHyperlinkParticle(): HyperlinkParticle {
    return this.hyperlinkParticle
  }
  public getDateParticle(): DateParticle {
    return this.dateParticle
  }
  public getListParticle(): ListParticle {
    return this.listParticle
  }
  public getControl(): Control {
    return this.control
  }
  public getWorkerManager(): WorkerManager {
    return this.workerManager
  }
  public getImageObserver(): ImageObserver {
    return this.imageObserver
  }
  public getI18n(): I18n {
    return this.i18n
  }
  public getRowCount(): number {
    return this.rowList.length
  }
  public async getDataURL(pixelRatio?: number): Promise<string[]> {
    if (pixelRatio) {
      this.setPagePixelRatio(pixelRatio)
    }
    this.render({
      isLazy: false,
      isCompute: false,
      isSetCursor: false,
      isSubmitHistory: false
    })
    await this.imageObserver.allSettled()
    const dataUrlList = this.pageList.map(c => c.toDataURL())
  }

```

```

        if (pixelRatio) {
            this.setPagePixelRatio(null)
        }
        return dataUrlList
    }
}

public getPainterStyle(): IElementStyle | null {
    return this.painterStyle && Object.keys(this.painterStyle).length
        ? this.painterStyle
        : null
}

public getPainterOptions(): IPainterOption | null {
    return this.painterOptions
}

public setPainterStyle(
    payload: IElementStyle | null,
    options?: IPainterOption
) {
    this.painterStyle = payload
    this.painterOptions = options || null
    if (this.getPainterStyle()) {
        this.pageList.forEach(c => (c.style.cursor = 'copy'))
    }
}

public setDefaultRange() {
    if (!this.elementList.length) return
    setTimeout(() => {
        const curIndex = this.elementList.length - 1
        this.range.setRange(curIndex, curIndex)
        this.range.setRangeStyle()
    })
}

public getIsPagingMode(): boolean {
    return this.options.pageMode === PageMode.PAGING
}

public setPageMode(payload: PageMode) {
    if (!payload || this.options.pageMode === payload) return
    this.options.pageMode = payload
    // ~, _ Y\ 'í•n
    if (payload === PageMode.PAGING) {
        const { height } = this.options
    }
}

```

```

const dpr = this.getPagePixelRatio()
const canvas = this.pageList[0]
canvas.style.height = `${height}px`
canvas.height = height * dpr
// canvas\:[øSÑu SØS ÿ N N e‡^«‘Í•n
this._initPageContext(this.ctxList[0])
} else {
// •P~uj!_ ÿ yû-daÒR •}vÑT,&n zz~uw ~u• ‘j{—epcn
this._disconnectLazyRender()
this.header.recovery()
this.footer.recovery()
this.zone.setZone(EditorZone.MAIN)
}
this.render({
  isSubmitHistory: false,
  isSetCursor: false
})
// Vpœ
setTimeout(() => {
  if (this.listener.pageModeChange) {
    this.listener.pageModeChange(payload)
  }
})
}
}
public setPageScale(payload: number) {
  const dpr = this.getPagePixelRatio()
  this.options.scale = payload
  const width = this.getWidth()
  const height = this.getHeight()
  this.container.style.width = `${width}px`
  this.pageList.forEach((p, i) => {
    p.width = width * dpr
    p.height = height * dpr
    p.style.width = `${width}px`
    p.style.height = `${height}px`
    p.style.marginBottom = `${this.getPageGap()}px`
    this._initPageContext(this.ctxList[i])
  })
  this.render({
    isSubmitHistory: false,
    isSetCursor: false
  })
  if (this.listener.pageScaleChange) {
    this.listener.pageScaleChange(payload)
  }
}

```

```

    }
  }
  public getPagePixelRatio(): number {
    return this.pagePixelRatio || window.devicePixelRatio
  }
  public setPagePixelRatio(payload: number | null) {
    if (
      (!this.pagePixelRatio && payload === window.devicePixelRatio) ||
      payload === this.pagePixelRatio
    ) {
      return
    }
    this.pagePixelRatio = payload
    this.setPageDevicePixel()
  }
  public setPageDevicePixel() {
    const dpr = this.getPagePixelRatio()
    const width = this.getWidth()
    const height = this.getHeight()
    this.pageList.forEach((p, i) => {
      p.width = width * dpr
      p.height = height * dpr
      this._initPageContext(this.ctxList[i])
    })
    this.render({
      isSubmitHistory: false,
      isSetCursor: false
    })
  }
  public setPaperSize(width: number, height: number) {
    this.options.width = width
    this.options.height = height
    const dpr = this.getPagePixelRatio()
    const realWidth = this.getWidth()
    const realHeight = this.getHeight()
    this.container.style.width = `${realWidth}px`
    this.pageList.forEach((p, i) => {
      p.width = realWidth * dpr
      p.height = realHeight * dpr
      p.style.width = `${realWidth}px`
      p.style.height = `${realHeight}px`
      this._initPageContext(this.ctxList[i])
    })
  }

```

```

    this.render({
      isSubmitHistory: false,
      isSetCursor: false
    })
  }
}

public setPaperDirection(payload: PaperDirection) {
  const dpr = this.getPagePixelRatio()
  this.options.paperDirection = payload
  const width = this.getWidth()
  const height = this.getHeight()
  this.container.style.width = `${width}px`
  this.pageList.forEach((p, i) => {
    p.width = width * dpr
    p.height = height * dpr
    p.style.width = `${width}px`
    p.style.height = `${height}px`
    this._initPageContext(this.ctxList[i])
  })
  this.render({
    isSubmitHistory: false,
    isSetCursor: false
  })
}

public setPaperMargin(payload: IMargin) {
  this.options.margins = payload
  this.render({
    isSubmitHistory: false,
    isSetCursor: false
  })
}

public getValue(options: IGetValueOption = {}): IEditorResult {
  // 'M•n
  const { width, height, margins, watermark } = this.options
  // epcn
  const { pageNo } = options
  let mainElementList = this.elementList
  if (
    Number.isInteger(pageNo) &&
    pageNo! >= 0 &&
    pageNo! < this.pageRowList.length
  ) {
    mainElementList = this.pageRowList[pageNo!].flatMap(
      row => row.elementList
    )
  }
}

```

```

    )Đ
  }Đ
  const data: IEditorData = {Đ
    header: zipElementList(this.headerElementList),Đ
    main: zipElementList(mainElementList),Đ
    footer: zipElementList(this.footerElementList)Đ
  }Đ
  return {Đ
    version,Đ
    width,Đ
    height,Đ
    margins,Đ
    watermark: watermark.data ? watermark : undefined,Đ
    dataĐ
  }Đ
}Đ
Đ
public setValue(payload: Partial<IEditorData>) {Đ
  const { header, main, footer } = payloadĐ
  if (!header && !main && !footer) returnĐ
  if (header) {Đ
    formatElementList(header, {Đ
      editorOptions: this.optionsĐ
    })Đ
    this.header.setElementList(header)Đ
  }Đ
  if (main) {Đ
    formatElementList(main, {Đ
      editorOptions: this.optionsĐ
    })Đ
    this.elementList = mainĐ
  }Đ
  if (footer) {Đ
    formatElementList(footer, {Đ
      editorOptions: this.optionsĐ
    })Đ
    this.footer.setElementList(footer)Đ
  }Đ
  // n2gÓ&{—&n zzS†Sòˆ°_UĐ
  this.historyManager.recovery()Đ
  this.render({Đ
    isSetCursor: falseĐ
  })Đ
}Đ
Đ
private _wrapContainer(rootContainer: HTMLElement): HTMLDivElement {Đ

```

```

    const container = document.createElement('div')Đ
    rootContainer.append(container)Đ
    return containerĐ
}Đ
Đ
private _formatContainer() {Đ
    // ['1Vh['½^!— •ß—•~_ ['½^!Đ
    this.container.style.position = 'relative'Đ
    this.container.style.width = `${this.getWidth()}px`Đ
    this.container.setAttribute(EDITOR_COMPONENT, EditorComponent.MAIN)Đ
}Đ
Đ
private _createPageContainer(): HTMLDivElement {Đ
    const pageContainer = document.createElement('div')Đ
    pageContainer.classList.add(`${EDITOR_PREFIX}-page-container`)Đ
    this.container.append(pageContainer)Đ
    return pageContainerĐ
}Đ
Đ
private _createPage(pageNo: number) {Đ
    const width = this.getWidth()Đ
    const height = this.getHeight()Đ
    const canvas = document.createElement('canvas')Đ
    canvas.style.width = `${width}px`Đ
    canvas.style.height = `${height}px`Đ
    canvas.style.display = 'block'Đ
    canvas.style.backgroundColor = '#ffffff'Đ
    canvas.style.marginBottom = `${this.getPageGap()}px`Đ
    canvas.setAttribute('data-index', String(pageNo))Đ
    this.pageContainer.append(canvas)Đ
    // Œ etR •"s‡Đ
    const dpr = this.getPagePixelRatio()Đ
    canvas.width = width * dprĐ
    canvas.height = height * dprĐ
    canvas.style.cursor = 'text'Đ
    const ctx = canvas.getContext('2d')!Đ
    // R YĖS N N e‡'M•nĐ
    this._initPageContext(ctx)Đ
    // • [XN N e‡Đ
    this.pageList.push(canvas)Đ
    this.ctxList.push(ctx)Đ
}Đ
Đ
private _initPageContext(ctx: CanvasRenderingContext2D) {Đ
    const dpr = this.getPagePixelRatio()Đ
    ctx.scale(dpr, dpr)Đ

```

```

// 'Í•nNâN \^`f/Và•èR mO%oÈVh(chrome)O ^"u(cssh7_ Ð
ctx.letterSpacing = '0px'Ð
ctx.wordSpacing = '0px'Ð
ctx.direction = 'ltr'Ð
}Ð
Ð
private _getFont(el: IElement, scale = 1): string {Ð
  const { defaultSize, defaultFont } = this.optionsÐ
  const font = el.font || defaultFontÐ
  const size = el.actualSize || el.size || defaultSizeÐ
  return `${el.italic ? 'italic ' : ''}${el.bold ? 'bold ' : ''}${Ð
    size * scaleÐ
  }px ${font}`Ð
}Ð
Ð
public computeRowList(innerWidth: number, elementList: IElement[]) {Ð
  const { defaultSize, defaultRowMargin, scale, tdPadding, defaultTabWidth } =Ð
    this.optionsÐ
  const defaultBasicRowMarginHeight = this.getDefaultBasicRowMarginHeight()Ð
  const canvas = document.createElement('canvas')Ð
  const ctx = canvas.getContext('2d') as CanvasRenderingContext2DÐ
  // ¸{—R ^hPOyû[½^!Ð
  const listStyleMap = this.listParticle.computeListStyle(ctx, elementList)Ð
  const rowList: IRow[] = []Ð
  if (elementList.length) {Ð
    rowList.push({Ð
      width: 0,Ð
      height: 0,Ð
      ascent: 0,Ð
      elementList: [],Ð
      startIndex: 0,Ð
      rowFlex: elementList?.[1]?.rowFlexÐ
    })Ð
  }Ð
  // R ^hOM•nÐ
  let listId: string | undefinedÐ
  let listIndex = 0Ð
  for (let i = 0; i < elementList.length; i++) {Ð
    const curRow: IRow = rowList[rowList.length - 1]Ð
    const element = elementList[i]Ð
    const rowMargin =Ð
      defaultBasicRowMarginHeight * (element.rowMargin || defaultRowMargin)Ð
    const metrics: IElementMetrics = {Ð
      width: 0,Ð
      height: 0,Ð
      boundingBoxAscent: 0,Ð

```



```

    boundingBoxDescent: 0
  }
  // [ž-ESiu([½^
  const offsetX = element.listId ? listStyleMap.get(element.listId) || 0 : 0
  const availableWidth = innerWidth - offsetX
  if (
    element.type === ElementType.IMAGE ||
    element.type === ElementType.LATEX
  ) {
    const elementWidth = element.width! * scale
    const elementHeight = element.height! * scale
    // VprG...Qú\:[øT•ê•^
    const curRowWidth =
      element.imgDisplay === ImageDisplay.INLINE ? 0 : curRow.width
    if (curRowWidth + elementWidth > availableWidth) {
      // {—RiOYY\
      const surplusWidth = availableWidth - curRowWidth
      const adaptiveWidth =
        surplusWidth > 0
          ? surplusWidth
          : Math.min(elementWidth, availableWidth)
      element.width = adaptiveWidth
      element.height = (elementHeight * adaptiveWidth) / elementWidth
      metrics.width = element.width
      metrics.height = element.height
      metrics.boundingBoxDescent = element.height
    } else {
      metrics.width = elementWidth
      metrics.height = elementHeight
      metrics.boundingBoxDescent = elementHeight
    }
    metrics.boundingBoxAscent = 0
  } else if (element.type === ElementType.TABLE) {
    const tdGap = tdPadding * 2
    // {—^hh<^LR
    this.tableParticle.computeRowCollInfo(element)
    // {—^hh<Q...QC} Oá`o
    const trList = element.trList!
    for (let t = 0; t < trList.length; t++) {
      const tr = trList[t]
      for (let d = 0; d < tr.tdList.length; d++) {
        const td = tr.tdList[d]
        const rowList = this.computeRowList(
          (td.width! - tdGap) * scale,
          td.value
        )
      }
    }
  }

```

```

const rowHeight = rowList.reduce((pre, cur) => pre + cur.height, 0)
td.rowList = rowList
// yû-d•)e>[ü•ôv,,^LšØSØS -n2gÓeöO •Ů^L•)e>Œ et
const curTdHeight = (rowHeight + tdGap) / scale
// Q...[¹šØ^!Y'NŽ_SRMSUQCh<šØ^!— XžR
if (td.height! < curTdHeight) {
  const extraHeight = curTdHeight - td.height!
  const changeTr = trList[t + td.rowspan - 1]
  changeTr.height += extraHeight
  changeTr.tdList.forEach(changeTd => {
    changeTd.height! += extraHeight
  })
}
// _SRMSUQCh<g \ šØ^!SÊw [žšØ^!ÿ S T+•èR ŷ
let curTdMinHeight = 0
let curTdRealHeight = 0
let i = 0
while (i < td.rowspan) {
  const curTr = trList[i + t]
  curTdMinHeight += curTr.minHeight!
  curTdRealHeight += curTr.height!
  i++
}
td.realMinHeight = curTdMinHeight
td.realHeight = curTdRealHeight
td.mainHeight = curTdHeight
}
}
// SUQCh<šØ^!Y'NŽ[ž—EQ...[¹šØ^!— QÏ\
const reduceTrList = this.tableParticle.getTrListGroupByCol(trList)
for (let t = 0; t < reduceTrList.length; t++) {
  const tr = reduceTrList[t]
  let reduceHeight = -1
  for (let d = 0; d < tr.tdList.length; d++) {
    const td = tr.tdList[d]
    const curTdRealHeight = td.realHeight!
    const curTdHeight = td.mainHeight!
    const curTdMinHeight = td.realMinHeight!
    // f·SÖg Y'SiQÏ\ šØ^!
    const curReduceHeight =
      curTdHeight < curTdMinHeight
        ? curTdRealHeight - curTdMinHeight
        : curTdRealHeight - curTdHeight
    if (!~reduceHeight || curReduceHeight < reduceHeight) {
      reduceHeight = curReduceHeight
    }
  }
}

```

```

    }
    if (reduceHeight > 0) {
      const changeTr = trList[t]
      changeTr.height -= reduceHeight
      changeTr.tdList.forEach(changeTd => {
        changeTd.height! -= reduceHeight
      })
    }
  }
}
// — %•'íe°{—^hh<Q...P<
this.tableParticle.computeRowCollInfo(element)
// {—Qú^hh<šØ^!
const tableHeight = trList.reduce((pre, cur) => pre + cur.height, 0)
const tableWidth = element.colgroup!.reduce(
  (pre, cur) => pre + cur.width,
  0
)
element.width = tableWidth
element.height = tableHeight
const elementWidth = tableWidth * scale
const elementHeight = tableHeight * scale
metrics.width = elementWidth
metrics.height = elementHeight
metrics.boundingBoxDescent = elementHeight
metrics.boundingBoxAscent = 0
// ^hh<R ~uY t (bÆER ^hh<)
const height = this.getHeight()
const marginHeight = this.getMainOuterHeight()
let curPagePreHeight = marginHeight
for (let r = 0; r < rowList.length; r++) {
  const row = rowList[r]
  if (
    row.height + curPagePreHeight > height ||
    rowList[r - 1]?.isPageBreak
  ) {
    curPagePreHeight = marginHeight + row.height
  } else {
    curPagePreHeight += row.height
  }
}
// ^hh<šØ^!•...•Ç~u—bšØ^!
const rowMarginHeight = rowMargin * 2 * scale
if (curPagePreHeight + rowMarginHeight + elementHeight > height) {
  const trList = element.trList!
  // {— %•yû—dv,,^Lep
  let deleteStart = 0

```

```

let deleteCount = 0
let preTrHeight = 0
if (trList.length > 1) {
  for (let r = 0; r < trList.length; r++) {
    const tr = trList[r]
    const trHeight = tr.height * scale
    if (
      curPagePreHeight + rowMarginHeight + preTrHeight + trHeight >
      height
    ) {
      // f/T&•èR
      if (element.colgroup?.length !== tr.tdList.length) {
        deleteCount = 0
      }
      break
    } else {
      deleteStart = r + 1
      deleteCount = trList.length - deleteStart
      preTrHeight += trHeight
    }
  }
}
if (deleteCount) {
  const cloneTrList = trList.splice(deleteStart, deleteCount)
  const cloneTrHeight = cloneTrList.reduce(
    (pre, cur) => pre + cur.height,
    0
  )
  element.height -= cloneTrHeight
  metrics.height -= cloneTrHeight
  metrics.boundingBoxDescent -= cloneTrHeight
  // •ýR bÆR ^hh<
  const cloneElement = deepClone(element)
  cloneElement.trList = cloneTrList
  cloneElement.id = getUUID()
  this.spliceElementList(elementList, i + 1, 0, cloneElement)
  // cb~uv,,f/_SRM^LR e9SØN N e±
  const positionContext = this.position.getPositionContext()
  if (
    positionContext.isTable &&
    positionContext.trIndex === deleteStart
  ) {
    positionContext.index! += 1
    positionContext.trIndex = 0
    this.position.setPositionContext(positionContext)
  }
}

```

```

    }
  }
  } else if (element.type === ElementType.SEPARATOR) {
    element.width = availableWidth
    metrics.width = availableWidth
    metrics.height = defaultSize
    metrics.boundingBoxAscent = -rowMargin
    metrics.boundingBoxDescent = -rowMargin
  } else if (element.type === ElementType.PAGE_BREAK) {
    element.width = availableWidth
    metrics.width = availableWidth
    metrics.height = defaultSize
  } else if (
    element.type === ElementType.CHECKBOX ||
    element.controlComponent === ControlComponent.CHECKBOX
  ) {
    const { width, height, gap } = this.options.checkbox
    const elementWidth = (width + gap * 2) * scale
    element.width = elementWidth
    metrics.width = elementWidth
    metrics.height = height * scale
  } else if (element.type === ElementType.TAB) {
    metrics.width = defaultTabWidth * scale
    metrics.height = defaultSize * scale
    metrics.boundingBoxDescent = 0
    metrics.boundingBoxAscent = metrics.height
  } else if (element.type === ElementType.BLOCK) {
    if (!element.width) {
      metrics.width = availableWidth
    } else {
      const elementWidth = element.width * scale
      metrics.width = Math.min(elementWidth, availableWidth)
    }
    metrics.height = element.height! * scale
    metrics.boundingBoxDescent = metrics.height
    metrics.boundingBoxAscent = 0
  } else {
    // ¾NN h w [WOS:[
    const size = element.size || defaultSize
    if (
      element.type === ElementType.SUPERSCRIPT ||
      element.type === ElementType.SUBSCRIPT
    ) {
      element.actualSize = Math.ceil(size * 0.6)
    }
    metrics.height = (element.actualSize || size) * scale
  }

```

```

ctx.font = this._getFont(element)
const fontMetrics = this.textParticle.measureText(ctx, element)
metrics.width = fontMetrics.width * scale
if (element.letterSpacing) {
  metrics.width += element.letterSpacing * scale
}
metrics.boundingBoxAscent =
  (element.value === ZERO
    ? defaultSize
    : fontMetrics.actualBoundingBoxAscent) * scale
metrics.boundingBoxDescent =
  fontMetrics.actualBoundingBoxDescent * scale
if (element.type === ElementType.SUPERSCRIPT) {
  metrics.boundingBoxAscent += metrics.height / 2
} else if (element.type === ElementType.SUBSCRIPT) {
  metrics.boundingBoxDescent += metrics.height / 2
}
const ascent =
  (element.imgDisplay !== ImageDisplay.INLINE &&
    element.type === ElementType.IMAGE) ||
  element.type === ElementType.LATEX
  ? metrics.height + rowMargin
  : metrics.boundingBoxAscent + rowMargin
const height =
  rowMargin +
  metrics.boundingBoxAscent +
  metrics.boundingBoxDescent +
  rowMargin
const rowElement: IRowElement = Object.assign(element, {
  metrics,
  style: this._getFont(element, scale)
})
// •...•Ç–P[š[½^
const preElement = elementList[i - 1]
let nextElement = elementList[i + 1]
// }/ı^L[½ + _SRMQC} [½^ + c'RH[½^ (,ñe‡SU (letOS[½^ + T —bh p1{&S÷[½^
let curRowWidth = curRow.width + metrics.width
if (this.options.wordBreak === WordBreak.BREAK_WORD) {
  if (
    (!preElement?.type || preElement?.type === ElementType.TEXT) &&
    (!element.type || element.type === ElementType.TEXT)
  ) {
    // ,ñe‡SU (
    const word = `${preElement?.value || ""}${element.value}`
    if (WORD_LIKE_REG.test(word)) {

```

```

const { width, endElement } = this.textParticle.measureWord(Đ
  ctx,Đ
  elementList,Đ
  iĐ
)Đ
curRowWidth += widthĐ
nextElement = endElementĐ
}Đ
// h p¹{&S÷Đ
curRowWidth += this.textParticle.measurePunctuationWidth(Đ
  ctx,Đ
  nextElementĐ
)Đ
}Đ
}Đ
}Đ
// R ^hOá`oĐ
if (element.listId) {Đ
  if (element.listId !== listId) {Đ
    listIndex = 0Đ
  } else if (element.value === ZERO && !element.listWrap) {Đ
    listIndex++Đ
  }Đ
}Đ
listId = element.listIdĐ
if (Đ
  element.type === ElementType.TABLE ||Đ
  preElement?.type === ElementType.TABLE ||Đ
  preElement?.type === ElementType.BLOCK ||Đ
  element.type === ElementType.BLOCK ||Đ
  preElement?.imgDisplay === ImageDisplay.INLINE ||Đ
  element.imgDisplay === ImageDisplay.INLINE ||Đ
  curRowWidth > availableWidth ||Đ
  (i !== 0 && element.value === ZERO) ||Đ
  preElement?.listId !== element.listIdĐ
) {Đ
  // Qİ\ ^LQC} RM{,N ^Lzz^L^LšØĐ
  if (Đ
    curRow.startIndex === 0 &&Đ
    curRow.elementList.length === 1 &&Đ
    (INLINE_ELEMENT_TYPE.includes(element.type!) || element.listId)Đ
  ) {Đ
    curRow.height = defaultBasicRowMarginHeightĐ
  }Đ
  // N$zi[ùŸPĐ
  if (Đ
    preElement?.rowFlex === RowFlex.ALIGNMENT &&Đ

```

```

    curRowWidth > availableWidth) {
    }
    const gap =
      (availableWidth - curRow.width) / curRow.elementList.length
    for (let e = 0; e < curRow.elementList.length; e++) {
      const el = curRow.elementList[e]
      el.metrics.width += gap
    }
    curRow.width = availableWidth
  }
  const row: IRow = {
    width: metrics.width,
    height,
    startIndex: i,
    elementList: [rowElement],
    ascent,
    rowFlex: elementList[i + 1]?.rowFlex,
    isPageBreak: element.type === ElementType.PAGE_BREAK
  }
  if (element.listId) {
    row.isList = true
    row.offsetX = listStyleMap.get(element.listId!)
    row.listIndex = listIndex
  }
  rowList.push(row)
} else {
  curRow.width += metrics.width
  if (curRow.height < height) {
    curRow.height = height
    curRow.ascent = ascent
  }
  curRow.elementList.push(rowElement)
}
}
return rowList
}
}

private _computePageList(): IRow[][] {
  const pageRowList: IRow[][] = []
  const { pageMode } = this.options
  const height = this.getHeight()
  const marginHeight = this.getMainOuterHeight()
  let pageHeight = marginHeight
  let pageNo = 0
  if (pageMode === PageMode.CONTINUITY) {
    pageRowList[0] = this.rowList
  }

```



```

// 'İ•nšØ^'İ
pageHeight += this.rowList.reduce((pre, cur) => pre + cur.height, 0)İ
const dpr = this.getPagePixelRatio()İ
const pageDom = this.pageList[0]İ
const pageDomHeight = Number(pageDom.style.height.replace('px', ''))İ
if (pageHeight > pageDomHeight) {İ
  pageDom.style.height = `${pageHeight}px`İ
  pageDom.height = pageHeight * dprİ
} else {İ
  const reduceHeight = pageHeight < height ? height : pageHeightİ
  pageDom.style.height = `${reduceHeight}px`İ
  pageDom.height = reduceHeight * dprİ
}İ
this._initPageContext(this.ctxList[0])İ
} else {İ
  for (let i = 0; i < this.rowList.length; i++) {İ
    const row = this.rowList[i]İ
    if (İ
      row.height + pageHeight > height ||İ
      this.rowList[i - 1]?.isPageBreakİ
    ) {İ
      pageHeight = marginHeight + row.heightİ
      pageRowList.push([row])İ
      pageNo++İ
    } else {İ
      pageHeight += row.heightİ
      pageRowList[pageNo].push(row)İ
    }İ
  }İ
}İ
return pageRowListİ
}İ
İ
private _drawRichText(ctx: CanvasRenderingContext2D) {İ
  this.underline.render(ctx)İ
  this.strikeout.render(ctx)İ
  this.highlight.render(ctx)İ
  this.textParticle.complete()İ
}İ
İ
public drawRow(ctx: CanvasRenderingContext2D, payload: IDrawRowPayload) {İ
  const { rowList, pageNo, elementList, positionList, startIndex, zone } =İ
  payloadİ
  const { scale, tdPadding } = this.optionsİ
  const { isCrossRowCol, tableId } = this.range.getRange()İ
  let index = startIndexİ

```

```

for (let i = 0; i < rowList.length; i++) {
  const curRow = rowList[i]
  // • S:~ØR6ˆ°_U
  const rangeRecord: IElementFillRect = {
    x: 0,
    y: 0,
    width: 0,
    height: 0
  }
  let tableRangeElement: IElement | null = null
  for (let j = 0; j < curRow.elementList.length; j++) {
    const element = curRow.elementList[j]
    const metrics = element.metrics
    // _SRMQC} OM•nOá`o
    const {
      ascent: offsetY,
      coordinate: {
        leftTop: [x, y]
      }
    } = positionList[curRow.startIndex + j]
    const preElement = curRow.elementList[j - 1]
    // QC} šØN@ˆ°_U
    if (element.highlight) {
      // šØN@QC} vø•P— zËSs~ØR6ÿ ^vˆ°_UN N QC} WPh
      if (
        preElement &&
        preElement.highlight &&
        preElement.highlight !== element.highlight
      ) {
        this.highlight.render(ctx)
      }
      this.highlight.recordFillInfo(
        ctx,
        x,
        y,
        metrics.width,
        curRow.height,
        element.highlight
      )
    } else if (preElement?.highlight) {
      this.highlight.render(ctx)
    }
    // QC} ~ØR6
    if (element.type === ElementType.IMAGE) {
      this._drawRichText(ctx)
      this.imageParticle.render(ctx, element, x, y + offsetY)
    }
  }
}

```

```

} else if (element.type === ElementType.LATEX) {
  this._drawRichText(ctx)
  this.latexParticle.render(ctx, element, x, y + offsetY)
} else if (element.type === ElementType.TABLE) {
  if (isCrossRowCol) {
    rangeRecord.x = x
    rangeRecord.y = y
    tableRangeElement = element
  }
  this.tableParticle.render(ctx, element, x, y)
} else if (element.type === ElementType.HYPERLINK) {
  this._drawRichText(ctx)
  this.hyperlinkParticle.render(ctx, element, x, y + offsetY)
} else if (element.type === ElementType.DATE) {
  this._drawRichText(ctx)
  this.dateParticle.render(ctx, element, x, y + offsetY)
} else if (element.type === ElementType.SUPERSCRIPT) {
  this._drawRichText(ctx)
  this.superscriptParticle.render(ctx, element, x, y + offsetY)
} else if (element.type === ElementType.SUBSCRIPT) {
  this._drawRichText(ctx)
  this.subscriptParticle.render(ctx, element, x, y + offsetY)
} else if (element.type === ElementType.SEPARATOR) {
  this.separatorParticle.render(ctx, element, x, y)
} else if (element.type === ElementType.PAGE_BREAK) {
  if (this.mode !== EditorMode.CLEAN) {
    this.pageBreakParticle.render(ctx, element, x, y)
  }
} else if (
  element.type === ElementType.CHECKBOX ||
  element.controlComponent === ControlComponent.CHECKBOX
) {
  this._drawRichText(ctx)
  this.checkboxParticle.render(ctx, element, x, y + offsetY)
} else if (element.type === ElementType.TAB) {
  this._drawRichText(ctx)
} else if (element.rowFlex === RowFlex.ALIGNMENT) {
  // Y,goef/N$zi[ùŸPŸ VâcanvasvîRMN e/c letterSpacing— SUri~ØR6e†g,
  this.textParticle.record(ctx, element, x, y + offsetY)
  this._drawRichText(ctx)
} else if (element.type === ElementType.BLOCK) {
  this._drawRichText(ctx)
  this.blockParticle.render(pageNo, element, x, y)
} else {
  this.textParticle.record(ctx, element, x, y + offsetY)
}

```

```

// N R ~¿ˆ°_U
if (element.underline) {
  this.underline.recordFillInfo(
    ctx,
    x,
    y + curRow.height,
    metrics.width,
    0,
    element.color
  )
} else if (preElement?.underline) {
  this.underline.render(ctx)
}
// R -d~¿ˆ°_U
if (element.strikeout) {
  this.strikeout.recordFillInfo(
    ctx,
    x,
    y + curRow.height / 2,
    metrics.width
  )
} else if (preElement?.strikeout) {
  this.strikeout.render(ctx)
}
// • S:ˆ°_U
const {
  zone: currentZone,
  startIndex,
  endIndex
} = this.range.getRange()
if (
  currentZone === zone &&
  startIndex !== endIndex &&
  startIndex <= index &&
  index <= endIndex
) {
  // NÎ^L\>_ YË--ØR6g \ [½^|
  if (startIndex === index) {
    const nextElement = elementList[startIndex + 1]
    if (nextElement && nextElement.value === ZERO) {
      rangeRecord.x = x + metrics.width
      rangeRecord.y = y
      rangeRecord.height = curRow.height
      rangeRecord.width += this.options.rangeMinWidth
    }
  } else {

```

```

const positionContext = this.position.getPositionContext()
// ^hh<— -P[šN N e‡
if (
  (!positionContext.isTable && !element.tdId) ||
  positionContext.tdId === element.tdId
) {
  let rangeWidth = metrics.width
  // g \ • S:[½^
  if (rangeWidth === 0 && curRow.elementList.length === 1) {
    rangeWidth = this.options.rangeMinWidth
  }
  // °_U{,N k!OM•n0 ^LšØ
  if (!rangeRecord.width) {
    rangeRecord.x = x
    rangeRecord.y = y
    rangeRecord.height = curRow.height
  }
  rangeRecord.width += rangeWidth
}
}
}
index++
// ~ØR6^hh<Q...QC}
if (element.type === ElementType.TABLE) {
  const tdGap = tdPadding * 2
  for (let t = 0; t < element.trList!.length; t++) {
    const tr = element.trList![t]
    for (let d = 0; d < tr.tdList!.length; d++) {
      const td = tr.tdList[d]
      this.drawRow(ctx, {
        elementList: td.value,
        positionList: td.positionList!,
        rowList: td.rowList!,
        pageNo,
        startIndex: 0,
        innerWidth: (td.width! - tdGap) * scale,
        zone
      })
    }
  }
}
}
}
// ~ØR6R ^hh7_
if (curRow.isList) {
  this.listParticle.drawListStyle(
    ctx,

```

```

        curRow,Đ
        positionList[curRow.startIndex]Đ
    )Đ
}Đ
// ~ØR6[]le±g,SÊe±[WĐ
this._drawRichText(ctx)Đ
// ~ØR6• S:Đ
if (rangeRecord.width && rangeRecord.height) {Đ
    const { x, y, width, height } = rangeRecordĐ
    this.range.render(ctx, x, y, width, height)Đ
}Đ
if (Đ
    isCrossRowCol &&Đ
    tableRangeElement &&Đ
    tableRangeElement.id === tableIdĐ
) {Đ
    const {Đ
        coordinate: {Đ
            leftTop: [x, y]Đ
        }Đ
    } = positionList[curRow.startIndex]Đ
    this.tableParticle.drawRange(ctx, tableRangeElement, x, y)Đ
}Đ
}Đ
}Đ
Đ
private _clearPage(pageNo: number) {Đ
    const ctx = this.ctxList[pageNo]Đ
    const pageDom = this.pageList[pageNo]Đ
    ctx.clearRect(0, 0, pageDom.width, pageDom.height)Đ
    this.blockParticle.clear()Đ
}Đ
Đ
private _drawPage(payload: IDrawPagePayload) {Đ
    const { elementList, positionList, rowList, pageNo } = payloadĐ
    const { inactiveAlpha, pageMode, header, footer, pageNumber } = this.optionsĐ
    const innerWidth = this.getInnerWidth()Đ
    const ctx = this.ctxList[pageNo]Đ
    // R$e- _SRMoÀm;S:Wß—^kce±S:WßeöQC} • f ^!—MONĐ
    ctx.globalAlpha = !this.zone.isMainActive() ? inactiveAlpha : 1Đ
    this._clearPage(pageNo)Đ
    // ~ØR6€İfoĐ
    this.background.render(ctx)Đ
    // ~ØR6~u•!•ÝĐ
    this.margin.render(ctx, pageNo)Đ
    // n2gÓQC} Đ

```

```

const index = rowList[0].startIndex
this.drawRow(ctx, {
  elementList,
  positionList,
  rowList,
  pageNo,
  startIndex: index,
  innerWidth,
  zone: EditorZone.MAIN
})
if (this.getIsPagingMode()) {
  // ~ØR6~uw
  if (!header.disabled) {
    this.header.render(ctx, pageNo)
  }
  // ~ØR6~ux
  if (!pageNumber.disabled) {
    this.pageNumber.render(ctx, pageNo)
  }
  // ~ØR6~u•
  if (!footer.disabled) {
    this.footer.render(ctx, pageNo)
  }
}
// d }"S9'M~ØR6
if (this.search.getSearchKeyword()) {
  this.search.render(ctx, pageNo)
}
// ~ØR6l4Sp
if (pageMode !== PageMode.CONTINUITY && this.options.watermark.data) {
  this.waterMark.render(ctx)
}
// ~ØR6zzv}S`OM{&
if (this.elementList.length <= 1) {
  this.placeholder.render(ctx)
}
}
}
private _disconnectLazyRender() {
  this.lazyRenderIntersectionObserver?.disconnect()
}
}
private _lazyRender() {
  const positionList = this.position.getOriginalMainPositionList()
  const elementList = this.getOriginalMainElementList()
  this._disconnectLazyRender()
}

```

```

this.lazyRenderIntersectionObserver = new IntersectionObserver(entries => {
  entries.forEach(entry => {
    if (entry.isIntersecting) {
      const index = Number((<HTMLCanvasElement>entry.target).dataset.index)
      this._drawPage({
        elementList,
        positionList,
        rowList: this.pageRowList[index],
        pageNo: index
      })
    }
  })
})
this.pageList.forEach(el => {
  this.lazyRenderIntersectionObserver!.observe(el)
})
}

private _immediateRender() {
  const positionList = this.position.getOriginalMainPositionList()
  const elementList = this.getOriginalMainElementList()
  for (let i = 0; i < this.pageRowList.length; i++) {
    this._drawPage({
      elementList,
      positionList,
      rowList: this.pageRowList[i],
      pageNo: i
    })
  }
}

public render(payload?: IDrawOption) {
  const { header, footer } = this.options
  const {
    isSubmitHistory = true,
    isSetCursor = true,
    isCompute = true,
    isLazy = true
  } = payload || {}
  let { curlIndex } = payload || {}
  const innerWidth = this.getInnerWidth()
  const isPagingMode = this.getIsPagingMode()
  // 1. 计算
  if (isCompute) {
    if (isPagingMode) {
      // 2. 更新
    }
  }
}

```



```

    if (!header.disabled) {Đ
        this.header.compute()Đ
    }Đ
    // ~u• Oá` oĐ
    if (!footer.disabled) {Đ
        this.footer.compute()Đ
    }Đ
}Đ
// ^LOá` oĐ
this.rowList = this.computeRowList(innerWidth, this.elementList)Đ
// ~u—bOá` oĐ
this.pageRowList = this._computePageList()Đ
// OM•nOá` oĐ
this.position.computePositionList()Đ
// d }"Oá` oĐ
const searchKeyword = this.search.getSearchKeyword()Đ
if (searchKeyword) {Đ
    this.search.compute(searchKeyword)Đ
}Đ
}Đ
// n -dQlh {IRoO\u(Đ
this.imageObserver.clearAll()Đ
this.cursor.recoveryCursor()Đ
// R ^ú~, _ Đ
for (let i = 0; i < this.pageRowList.length; i++) {Đ
    if (!this.pageList[i]) {Đ
        this._createPage(i)Đ
    }Đ
}Đ
// yû—dY OY~uĐ
const curPageCount = this.pageRowList.lengthĐ
const prePageCount = this.pageList.lengthĐ
if (prePageCount > curPageCount) {Đ
    const deleteCount = prePageCount - curPageCountĐ
    this.ctxList.splice(curPageCount, deleteCount)Đ
    this.pageListĐ
        .splice(curPageCount, deleteCount)Đ
        .forEach(page => page.remove())Đ
}Đ
// ~ØR6QC} Đ
// •P~ĩuVàN:g šØ^!v„SØS O [ü•ôcanvasn2gÓzzv}ÿ — zËSsn2gÓÿ T&R O Qús°•êR“Đ
if (isLazy && isPagingMode) {Đ
    this._lazyRender()Đ
} else {Đ
    this._immediateRender()Đ
}Đ

```

```

const positionContext = this.position.getPositionContext()
// Qlh 'Í~Ø
if (isSetCursor) {
  const positionList = this.position.getPositionList()
  if (positionContext.isTable) {
    const { index, trIndex, tdIndex } = positionContext
    const elementList = this.getOriginalElementList()
    const tablePositionList =
      elementList[index!].trList?.[trIndex!].tdList[tdIndex!].positionList
    if (curlIndex === undefined && tablePositionList) {
      curlIndex = tablePositionList.length - 1
    }
    const tablePosition = tablePositionList?.[curlIndex!]
    this.position.setCursorPosition(tablePosition || null)
  } else {
    this.position.setCursorPosition(
      curlIndex !== undefined ? positionList[curlIndex] : null
    )
  }
  this.cursor.drawCursor()
}
// S†Sòˆ°_Uu(NŽundo0 redo
if (isSubmitHistory) {
  const self = this
  const oldElementList = deepClone(this.elementList)
  const oldHeaderElementList = deepClone(this.header.getElementList())
  const oldFooterElementList = deepClone(this.footer.getElementList())
  const { startIndex, endIndex } = this.range.getRange()
  const pageNo = this.pageNo
  const oldPositionContext = deepClone(positionContext)
  const zone = this.zone.getZone()
  this.historyManager.execute(function () {
    self.zone.setZone(zone)
    self.setPageNo(pageNo)
    self.position.setPositionContext(deepClone(oldPositionContext))
    self.header.setElementList(deepClone(oldHeaderElementList))
    self.footer.setElementList(deepClone(oldFooterElementList))
    self.elementList = deepClone(oldElementList)
    self.range.setRange(startIndex, endIndex)
    self.render({ curlIndex, isSubmitHistory: false })
  })
}
// Oá`oSØR`VÞŒ
nextTick(() => {
  // ^hh<]âQw'Íe°n2gÓ
  if (isCompute && !this.isReadOnly() && positionContext.isTable) {

```

```

        this.tableTool.render()
    }
    // ~uw c y:Vh'íe°n2gÓ
    if (isCompute && !this.zone.isMainActive()) {
        this.zone.drawZoneIndicator()
    }
    // ~u—b\:[øe9SØ
    if (this.listener.pageSizeChange) {
        this.listener.pageSizeChange(this.pageRowList.length)
    }
    // e‡hcQ...[¹e9SØ
    if (this.listener.contentChange && isSubmitHistory) {
        this.listener.contentChange()
    }
    })
}
}
public destroy() {
    this.container.remove()
    this.globalEvent.removeEvent()
    this.scrollObserver.removeEvent()
    this.selectionObserver.removeEvent()
}
}

```

File Path: canvas-editor/src/editor/core/draw/control/Control.ts

```
import { ControlComponent, ControlType } from '../../../../dataset/enum/Control'
import { ElementType } from '../../../../dataset/enum/Element'
import {
  IControl,
  IControlInitOption,
  IControlInstance,
  IControlOption
} from '../../../../interface/Control'
import { IElement, IElementPosition } from '../../../../interface/Element'
import { IRange } from '../../../../interface/Range'
import { deepClone, splitText } from '../../../../utils'
import {
  formatElementContext,
  pickElementAttr,
  zipElementList
} from '../../../../utils/element'
import { Listener } from '../../../../listener/Listener'
import { RangeManager } from '../../../../range/RangeManager'
import { Draw } from '../Draw'
import { CheckboxControl } from '../../checkbox/CheckboxControl'
import { SelectControl } from '../../select/SelectControl'
import { TextControl } from '../../text/TextControl'

interface IMoveCursorResult {
  newIndex: number
  newElement: IElement
}

export class Control {
  private draw: Draw
  private range: RangeManager
  private listener: Listener
  private options: IControlOption
  private activeControl: IControlInstance | null

  constructor(draw: Draw) {
    this.draw = draw
    this.range = draw.getRange()
    this.listener = draw.getListener()
    this.options = draw.getOptions().control
    this.activeControl = null
  }

  public getDraw(): Draw {
    return this.draw
  }
}
```

```

Ð
// R$e-• S:•èR W(c$Nö•¹uLY Ð
public isPartRangeInControlOutside(): boolean {Ð
    const { startIndex, endIndex } = this.getRange()Ð
    if (!~startIndex && !~endIndex) return falseÐ
    const elementList = this.getElementList()Ð
    const startElement = elementList[startIndex]Ð
    const endElement = elementList[endIndex]Ð
    if (Ð
        (startElement.type === ElementType.CONTROL ||Ð
            endElement.type === ElementType.CONTROL) &&Ð
        startElement.controlId !== endElement.controlIdÐ
    ) {Ð
        return trueÐ
    }Ð
    return falseÐ
}Ð
Ð
// R$e-• S:f/T&W(T • Y Ð
public isRangeInPostfix(): boolean {Ð
    if (!this.activeControl) return falseÐ
    const { startIndex, endIndex } = this.getRange()Ð
    if (startIndex !== endIndex) return falseÐ
    const elementList = this.getElementList()Ð
    const element = elementList[startIndex]Ð
    return element.controlComponent === ControlComponent.POSTFIXÐ
}Ð
Ð
public getContainer(): HTMLDivElement {Ð
    return this.draw.getContainer()Ð
}Ð
Ð
public getElementList(): IElement[] {Ð
    return this.draw.getElementList()Ð
}Ð
Ð
public getPosition(): IElementPosition | null {Ð
    const positionList = this.draw.getPosition().getPositionList()Ð
    const { endIndex } = this.range.getRange()Ð
    return positionList[endIndex] || nullÐ
}Ð
Ð
public getPreY(): number {Ð
    const height = this.draw.getHeight()Ð
    const pageGap = this.draw.getPageGap()Ð
    return this.draw.getPageNo() * (height + pageGap)Ð
}

```

```

    }
}
public getRange(): IRange {
    return this.range.getRange()
}
public shrinkBoundary() {
    this.range.shrinkBoundary()
}
public getActiveControl(): IControlInstance | null {
    return this.activeControl
}
public initControl() {
    const isReadOnly = this.draw.isReadOnly()
    if (isReadOnly) return
    const elementList = this.getElementList()
    const range = this.getRange()
    const element = elementList[range.startIndex]
    // R$e-c$Nöf/T&]ò~ÏoÀm;
    if (this.activeControl) {
        // R N>c$NöU$"N bÉ_9z—
        if (this.activeControl instanceof SelectControl) {
            this.activeControl.awake()
        }
        const controlElement = this.activeControl.getElement()
        if (element.controlId === controlElement.controlId) return
    }
    // • kÁeçoÀm;c$Nö
    this.destroyControl()
    // oÀm;c$Nö
    const control = element.control!
    if (control.type === ControlType.TEXT) {
        this.activeControl = new TextControl(element, this)
    } else if (control.type === ControlType.SELECT) {
        const selectControl = new SelectControl(element, this)
        this.activeControl = selectControl
        selectControl.awake()
    } else if (control.type === ControlType.CHECKBOX) {
        this.activeControl = new CheckboxControl(element, this)
    }
    // oÀm;c$NöVÞœ
    setTimeout(() => {
        if (this.listener.controlChange) {
            let payload: IControl

```

```

        const value = this.activeControl?.getValue()
        if (value && value.length) {
            payload = zipElementList(value)[0].control!
        } else {
            payload = pickElementAttr(deepClone(element)).control!
        }
        this.listener.controlChange(payload)
    }
}
}

public destroyControl() {
    if (this.activeControl) {
        if (this.activeControl instanceof SelectControl) {
            this.activeControl.destroy()
        }
        this.activeControl = null
        // • kÁc§NöVÞœ
        setTimeout(() => {
            if (this.listener.controlChange) {
                this.listener.controlChange(null)
            }
        })
    }
}

public repaintControl(curlIndex: number) {
    this.range.setRange(curlIndex, curlIndex)
    this.draw.render({
        curlIndex
    })
}

public moveCursor(position: IControlInitOption): IMoveCursorResult {
    const { index, trIndex, tdIndex, tdValueIndex } = position
    let elementList = this.draw.getOriginalElementList()
    let element: IElement
    const newIndex = position.isTable ? tdValueIndex! : index
    if (position.isTable) {
        elementList = elementList[index!].trList![trIndex!].tdList[tdIndex!].value
        element = elementList[tdValueIndex!]
    } else {
        element = elementList[index]
    }
    if (element.controlComponent === ControlComponent.VALUE) {
        // VALUE-eà— yûR
    }
}

```

```

return {
  newIndex,
  newElement: element
}
} else if (element.controlComponent === ControlComponent.POSTFIX) {
  // POSTFIX-yûR"R0g T N N*T • [W{&T
  let startIndex = newIndex + 1
  while (startIndex < elementList.length) {
    const nextElement = elementList[startIndex]
    if (nextElement.controlId !== element.controlId) {
      return {
        newIndex: startIndex - 1,
        newElement: elementList[startIndex - 1]
      }
    }
    startIndex++
  }
} else if (element.controlComponent === ControlComponent.PREFIX) {
  // PREFIX-yûR"R0g T N N*RM• [W{&T
  let startIndex = newIndex + 1
  while (startIndex < elementList.length) {
    const nextElement = elementList[startIndex]
    if (
      nextElement.controlId !== element.controlId ||
      nextElement.controlComponent !== ControlComponent.PREFIX
    ) {
      return {
        newIndex: startIndex - 1,
        newElement: elementList[startIndex - 1]
      }
    }
    startIndex++
  }
} else if (element.controlComponent === ControlComponent.PLACEHOLDER) {
  // PLACEHOLDER-yûR"R0{,N N*RM• T
  let startIndex = newIndex - 1
  while (startIndex > 0) {
    const preElement = elementList[startIndex]
    if (
      preElement.controlId !== element.controlId ||
      preElement.controlComponent === ControlComponent.PREFIX
    ) {
      return {
        newIndex: startIndex,
        newElement: elementList[startIndex]
      }
    }
  }
}

```



```

    }Ð
    startlIndex--Ð
  }Ð
}Ð
return {Ð
  newIndex,Ð
  newElement: elementÐ
}Ð
}Ð
Ð
public removeControl(startlIndex: number): number {Ð
  const elementList = this.getElementList()Ð
  const startElement = elementList[startlIndex]Ð
  let leftlIndex = -1Ð
  let rightlIndex = -1Ð
  // T ]ægåb~Ð
  let prelIndex = startlIndexÐ
  while (prelIndex > 0) {Ð
    const preElement = elementList[prelIndex]Ð
    if (preElement.controlld !== startElement.controlld) {Ð
      leftlIndex = prelIndexÐ
      breakÐ
    }Ð
    prelIndex--Ð
  }Ð
  // T Sógåb~Ð
  let nextlIndex = startlIndex + 1Ð
  while (nextlIndex < elementList.length) {Ð
    const nextElement = elementList[nextlIndex]Ð
    if (nextElement.controlld !== startElement.controlld) {Ð
      rightlIndex = nextlIndex - 1Ð
      breakÐ
    }Ð
    nextlIndex++Ð
  }Ð
  // c$NöW(g T Ð
  if (nextlIndex === elementList.length) {Ð
    rightlIndex = nextlIndex - 1Ð
  }Ð
  if (!~leftlIndex && !~rightlIndex) return startlIndexÐ
  leftlIndex = ~leftlIndex ? leftlIndex : 0Ð
  // R -dQC} Ð
  this.draw.spliceElementList(Ð
    elementList,Ð
    leftlIndex + 1,Ð
    rightlIndex - leftlIndexÐ

```

```

    )
    return leftIndex
}
}
}

public removePlaceholder(startIndex: number) {
    const elementList = this.getElementList()
    const startElement = elementList[startIndex]
    const nextElement = elementList[startIndex + 1]
    if (
        startElement.controlComponent === ControlComponent.PLACEHOLDER ||
        nextElement.controlComponent === ControlComponent.PLACEHOLDER
    ) {
        let index = startIndex
        while (index < elementList.length) {
            const curElement = elementList[index]
            if (curElement.controlId !== startElement.controlId) break
            if (curElement.controlComponent === ControlComponent.PLACEHOLDER) {
                this.draw.spliceElementList(elementList, index, 1)
            } else {
                index++
            }
        }
    }
}

}

}

}

}

public addPlaceholder(startIndex: number) {
    const elementList = this.getElementList()
    const startElement = elementList[startIndex]
    const control = startElement.control!
    if (!control.placeholder) return
    const placeholderStrList = splitText(control.placeholder)
    for (let p = 0; p < placeholderStrList.length; p++) {
        const value = placeholderStrList[p]
        const newElement: IElement = {
            value,
            controlId: startElement.controlId,
            type: ElementType.CONTROL,
            control: startElement.control,
            controlComponent: ControlComponent.PLACEHOLDER,
            color: this.options.placeholderColor
        }
        formatElementContext(elementList, [newElement], startIndex)
        this.draw.spliceElementList(
            elementList,
            startIndex + p + 1,
            0,

```

```
newElement() {  
    }  
}  
  
set  
public setValue(data: IElement[]): number {  
    if (!this.activeControl) {  
        throw new Error('active control is null')  
    }  
    return this.activeControl.setValue(data)  
}  
  
keydown  
public keydown(evt: KeyboardEvent): number {  
    if (!this.activeControl) {  
        throw new Error('active control is null')  
    }  
    return this.activeControl.keydown(evt)  
}  
  
cut  
public cut(): number {  
    if (!this.activeControl) {  
        throw new Error('active control is null')  
    }  
    return this.activeControl.cut()  
}
```

File Path: canvas-editor/src/editor/core/draw/control/checkbox/CheckboxControl.ts

```
import { ControlComponent } from '../../../dataset/enum/Control'Đ
import { KeyMap } from '../../../dataset/enum/KeyMap'Đ
import { IControllInstance } from '../../../interface/Control'Đ
import { IElement } from '../../../interface/Element'Đ
import { Control } from '../Control'Đ
Đ
export class CheckboxControl implements IControllInstance {Đ
  private element: IElementĐ
  private control: ControlĐ
Đ
  constructor(element: IElement, control: Control) {Đ
    this.element = elementĐ
    this.control = controlĐ
  }Đ
Đ
  public getElement(): IElement {Đ
    return this.elementĐ
  }Đ
Đ
  public getCode(): string | null {Đ
    return this.element.control?.code || nullĐ
  }Đ
Đ
  public getValue(): IElement[] {Đ
    const elementList = this.control.getElementList()Đ
    const { startIndex } = this.control.getRange()Đ
    const startElement = elementList[startIndex]Đ
    const data: IElement[] = []Đ
    // T ]ægåb~Đ
    let preIndex = startIndexĐ
    while (preIndex > 0) {Đ
      const preElement = elementList[preIndex]Đ
      if (Đ
        preElement.controlId !== startElement.controlId ||Đ
        preElement.controlComponent === ControlComponent.PREFIXĐ
      ) {Đ
        breakĐ
      }Đ
      if (preElement.controlComponent === ControlComponent.VALUE) {Đ
        data.unshift(preElement)Đ
      }Đ
      preIndex--Đ
    }Đ
    // T Sógåb~Đ
    let nextIndex = startIndex + 1Đ
```

```

while (nextIndex < elementList.length) {
  const nextElement = elementList[nextIndex]
  if (
    nextElement.controlId !== startElement.controlId ||
    nextElement.controlComponent === ControlComponent.POSTFIX
  ) {
    break
  }
  if (nextElement.controlComponent === ControlComponent.VALUE) {
    data.push(nextElement)
  }
  nextIndex++
}
return data
}
}

public setValue(): number {
  return -1
}
}

public setSelect() {
  const { control } = this.element
  const elementList = this.control.getElementList()
  const { startIndex } = this.control.getRange()
  const startElement = elementList[startIndex]
  const data: string[] = []
  // T ]ægåb~
  let preIndex = startIndex
  while (preIndex > 0) {
    const preElement = elementList[preIndex]
    if (
      preElement.controlId !== startElement.controlId ||
      preElement.controlComponent === ControlComponent.PREFIX
    ) {
      break
    }
    if (preElement.controlComponent === ControlComponent.CHECKBOX) {
      const checkbox = preElement.checkbox
      if (checkbox && checkbox.value && checkbox.code) {
        data.unshift(checkbox.code)
      }
    }
    preIndex--
  }
  // T Sógåb~
  let nextIndex = startIndex + 1

```

```

while (nextIndex < elementList.length) {
  const nextElement = elementList[nextIndex]
  if (
    nextElement.controlId !== startElement.controlId ||
    nextElement.controlComponent === ControlComponent.POSTFIX
  ) {
    break
  }
  if (nextElement.controlComponent === ControlComponent.CHECKBOX) {
    const checkbox = nextElement.checkbox
    if (checkbox && checkbox.value && checkbox.code) {
      data.push(checkbox.code)
    }
  }
  nextIndex++
}
control!.code = data.join(',')
}
}

public keydown(evt: KeyboardEvent): number {
  const range = this.control.getRange()
  // e6••1uLR0ValueQ...
  this.control.shrinkBoundary()
  const { startIndex, endIndex } = range
  // R -d
  if (evt.key === KeyMap.Backspace || evt.key === KeyMap.Delete) {
    return this.control.removeControl(startIndex)
  }
  return endIndex
}

public cut(): number {
  return -1
}
}

```

File Path: canvas-editor/src/editor/core/draw/control/select/SelectControl.ts

```
import {  
  EDITOR_COMPONENT,   
  EDITOR_PREFIX  
} from '../../dataset/constant/Editor'  
import { ControlComponent } from '../../dataset/enum/Control'  
import { EditorComponent } from '../../dataset/enum/Editor'  
import { KeyMap } from '../../dataset/enum/KeyMap'  
import { IControllInstance } from '../../interface/Control'  
import { IElement } from '../../interface/Element'  
import { splitText } from '../../utils'  
import { formatElementContext } from '../../utils/element'  
import { Control } from './Control'  
  
export class SelectControl implements IControllInstance {  
  private element: IElement  
  private control: Control  
  private isPopup: boolean  
  private selectDom: HTMLDivElement | null  
  
  constructor(element: IElement, control: Control) {  
    this.element = element  
    this.control = control  
    this.isPopup = false  
    this.selectDom = null  
  }  
  
  public getElement(): IElement {  
    return this.element  
  }  
  
  public getCode(): string | null {  
    return this.element.control?.code || null  
  }  
  
  public getValue(): IElement[] {  
    const elementList = this.control.getElementList()  
    const { startIndex } = this.control.getRange()  
    const startElement = elementList[startIndex]  
    const data: IElement[] = []  
    // T ]ægåb~  
    let preIndex = startIndex  
    while (preIndex > 0) {  
      const preElement = elementList[preIndex]  
      if (  
        preElement.controlId !== startElement.controlId ||  

```

```

    preElement.controlComponent === ControlComponent.PREFIXĐ
) {Đ
    breakĐ
}Đ
if (preElement.controlComponent === ControlComponent.VALUE) {Đ
    data.unshift(preElement)Đ
}Đ
preIndex--Đ
}Đ
// T Sógåb~Đ
let nextIndex = startIndex + 1Đ
while (nextIndex < elementList.length) {Đ
    const nextElement = elementList[nextIndex]Đ
    if (Đ
        nextElement.controlId !== startElement.controlId ||Đ
        nextElement.controlComponent === ControlComponent.POSTFIXĐ
    ) {Đ
        breakĐ
    }Đ
    if (nextElement.controlComponent === ControlComponent.VALUE) {Đ
        data.push(nextElement)Đ
    }Đ
    nextIndex++Đ
}Đ
return dataĐ
}Đ
Đ
public setValue(): number {Đ
    return -1Đ
}Đ
Đ
public keydown(evt: KeyboardEvent): number {Đ
    const elementList = this.control.getElementList()Đ
    const range = this.control.getRange()Đ
    // e6••¹uLR0ValueQ...Đ
    this.control.shrinkBoundary()Đ
    const { startIndex, endIndex } = rangeĐ
    const startElement = elementList[startIndex]Đ
    const endElement = elementList[endIndex]Đ
    // backspaceĐ
    if (evt.key === KeyMap.Backspace) {Đ
        // n zz•~yĐ
        if (startIndex !== endIndex) {Đ
            return this.clearSelect()Đ
        } else {Đ
            if (Đ

```



```

        startElement.controlComponent === ControlComponent.PREFIX ||Đ
        endElement.controlComponent === ControlComponent.POSTFIX ||Đ
        startElement.controlComponent === ControlComponent.PLACEHOLDERĐ
    ) {Đ
        // RM• 0 T • 0 S`OM{&Đ
        return this.control.removeControl(startIndex)Đ
    } else {Đ
        // n zz•~yĐ
        return this.clearSelect()Đ
    }Đ
}Đ
} else if (evt.key === KeyMap.Delete) {Đ
    // yû–d• S:QC} Đ
    if (startIndex !== endIndex) {Đ
        // n zz•~yĐ
        return this.clearSelect()Đ
    } else {Đ
        const endNextElement = elementList[endIndex + 1]Đ
        if (Đ
            (startElement.controlComponent === ControlComponent.PREFIX &&Đ
                endNextElement.controlComponent === ControlComponent.PLACEHOLDER) ||Đ
            endNextElement.controlComponent === ControlComponent.POSTFIX ||Đ
            startElement.controlComponent === ControlComponent.PLACEHOLDERĐ
        ) {Đ
            // RM• 0 T • 0 S`OM{&Đ
            return this.control.removeControl(startIndex)Đ
        } else {Đ
            // n zz•~yĐ
            return this.clearSelect()Đ
        }Đ
    }Đ
}Đ
return endIndexĐ
}Đ
Đ
public cut(): number {Đ
    this.control.shrinkBoundary()Đ
    const { startIndex, endIndex } = this.control.getRange()Đ
    if (startIndex === endIndex) {Đ
        return startIndexĐ
    }Đ
    // n zz•~yĐ
    return this.clearSelect()Đ
}Đ
Đ
public clearSelect(): number {Đ

```

```

const elementList = this.control.getElementList()Đ
const { startIndex } = this.control.getRange()Đ
const startElement = elementList[startIndex]Đ
let leftIndex = -1Đ
let rightIndex = -1Đ
// T ]ægåb~Đ
let preIndex = startIndexĐ
while (preIndex > 0) {Đ
  const preElement = elementList[preIndex]Đ
  if (Đ
    preElement.controlId !== startElement.controlId ||Đ
    preElement.controlComponent === ControlComponent.PREFIXĐ
  ) {Đ
    leftIndex = preIndexĐ
    breakĐ
  }Đ
  preIndex--Đ
}Đ
// T Sógåb~Đ
let nextIndex = startIndex + 1Đ
while (nextIndex < elementList.length) {Đ
  const nextElement = elementList[nextIndex]Đ
  if (Đ
    nextElement.controlId !== startElement.controlId ||Đ
    nextElement.controlComponent === ControlComponent.POSTFIXĐ
  ) {Đ
    rightIndex = nextIndex - 1Đ
    breakĐ
  }Đ
  nextIndex++Đ
}Đ
if (!~leftIndex || !~rightIndex) return -1Đ
// R -dQC} Đ
const draw = this.control.getDraw()Đ
draw.spliceElementList(elementList, leftIndex + 1, rightIndex - leftIndex)Đ
// XžR S`OM{&Đ
this.control.addPlaceholder(preIndex)Đ
this.element.control!.code = nullĐ
return preIndexĐ
}Đ
Đ
public setSelect(code: string) {Đ
  const control = this.element.control!Đ
  const valueSets = control.valueSetsĐ
  if (!Array.isArray(valueSets) || !valueSets.length) returnĐ
  // •lcbcodeĐ

```

```

const valueSet = valueSets.find(v => v.code === code)Đ
if (!valueSet) returnĐ
// n zz• ~yĐ
const startIndex = this.clearSelect()Đ
this.control.removePlaceholder(startIndex)Đ
// cÖQeĐ
const elementList = this.control.getElementList()Đ
const startElement = elementList[startIndex]Đ
const start = startIndex + 1Đ
const data = splitText(valueSet.value)Đ
const draw = this.control.getDraw()Đ
for (let i = 0; i < data.length; i++) {Đ
  const newElement: IElement = {Đ
    ...startElement,Đ
    value: data[i],Đ
    controlComponent: ControlComponent.VALUEĐ
  }Đ
  formatElementContext(elementList, [newElement], startIndex)Đ
  draw.spliceElementList(elementList, start + i, 0, newElement)Đ
}Đ
// renderĐ
const newIndex = start + data.length - 1Đ
this.control.repaintControl(newIndex)Đ
// ¼•nr  Đ
this.element.control!.code = codeĐ
this.destroy()Đ
}Đ
Đ
private _createSelectPopupDom() {Đ
  const control = this.element.control!Đ
  const valueSets = control.valueSetsĐ
  if (!Array.isArray(valueSets) || !valueSets.length) returnĐ
  const position = this.control.getPosition()Đ
  if (!position) returnĐ
  // domh ỹ <div><ul><li>item</li></ul></div>Đ
  const selectPopupContainer = document.createElement('div')Đ
  selectPopupContainer.classList.add(`${EDITOR_PREFIX}-select-control-popup`)Đ
  selectPopupContainer.setAttribute(EDITOR_COMPONENT,
EditorComponent.POPUP)Đ
  const ul = document.createElement('ul')Đ
  for (let v = 0; v < valueSets.length; v++) {Đ
    const valueSet = valueSets[v]Đ
    const li = document.createElement('li')Đ
    const code = this.getCode()Đ
    if (code === valueSet.code) {Đ
      li.classList.add('active')Đ
    }
  }
}

```

```

    }
    li.onclick = () => {
      this.setSelect(valueSet.code)
    }
    li.append(document.createTextNode(valueSet.value))
    ul.append(li)
  }
  selectPopupContainer.append(ul)
  // [šOM
  const {
    coordinate: {
      leftTop: [left, top]
    },
    lineHeight
  } = position
  const preY = this.control.getPreY()
  selectPopupContainer.style.left = `${left}px`
  selectPopupContainer.style.top = `${top + preY + lineHeight}px`
  // •ýR •ócontainer
  const container = this.control.getContainer()
  container.append(selectPopupContainer)
  this.selectDom = selectPopupContainer
}
Đ
public awake() {
  if (this.isPopup) return
  const { startIndex } = this.control.getRange()
  const elementList = this.control.getElementList()
  if (elementList[startIndex + 1]?.controllId !== this.element.controllId) {
    return
  }
  this._createSelectPopupDom()
  this.isPopup = true
}
Đ
public destroy() {
  if (!this.isPopup) return
  this.selectDom?.remove()
  this.isPopup = false
}
Đ
}
Đ

```

File Path: canvas-editor/src/editor/core/draw/control/text/TextControl.ts

```
import { ControlComponent } from '../../dataset/enum/Control'Đ
import { KeyMap } from '../../dataset/enum/KeyMap'Đ
import { IControllInstance } from '../../interface/Control'Đ
import { IElement } from '../../interface/Element'Đ
import { formatElementContext } from '../../utils/element'Đ
import { Control } from '../Control'Đ
Đ
export class TextControl implements IControllInstance {Đ
  private element: IElementĐ
  private control: ControlĐ
Đ
  constructor(element: IElement, control: Control) {Đ
    this.element = elementĐ
    this.control = controlĐ
  }Đ
Đ
  public getElement(): IElement {Đ
    return this.elementĐ
  }Đ
Đ
  public getValue(): IElement[] {Đ
    const elementList = this.control.getElementList()Đ
    const { startIndex } = this.control.getRange()Đ
    const startElement = elementList[startIndex]Đ
    const data: IElement[] = []Đ
    // T ]ægåb~Đ
    let preIndex = startIndexĐ
    while (preIndex > 0) {Đ
      const preElement = elementList[preIndex]Đ
      if (Đ
        preElement.controlId !== startElement.controlId ||Đ
        preElement.controlComponent === ControlComponent.PREFIXĐ
      ) {Đ
        breakĐ
      }Đ
      if (preElement.controlComponent === ControlComponent.VALUE) {Đ
        data.unshift(preElement)Đ
      }Đ
      preIndex--Đ
    }Đ
    // T Sógåb~Đ
    let nextIndex = startIndex + 1Đ
    while (nextIndex < elementList.length) {Đ
      const nextElement = elementList[nextIndex]Đ
      if (Đ
```

```

        nextElement.controlId !== startElement.controlId ||
        nextElement.controlComponent === ControlComponent.POSTFIX
    ) {
        break
    }
    if (nextElement.controlComponent === ControlComponent.VALUE) {
        data.push(nextElement)
    }
    nextIndex++
}
return data
}
}

public setValue(data: IElement[]): number {
    const elementList = this.control.getElementList()
    const range = this.control.getRange()
    // e6••1uLR0ValueQ...
    this.control.shrinkBoundary()
    const { startIndex, endIndex } = range
    const draw = this.control.getDraw()
    // yû-d• S:QC}
    if (startIndex !== endIndex) {
        draw.spliceElementList(elementList, startIndex + 1, endIndex - startIndex)
    } else {
        // yû-dzzv}S`OM{&
        this.control.removePlaceholder(startIndex)
    }
    // cÔQe
    const startElement = elementList[startIndex]
    const start = range.startIndex + 1
    for (let i = 0; i < data.length; i++) {
        const newElement: IElement = {
            ...startElement,
            ...data[i],
            controlComponent: ControlComponent.VALUE
        }
        formatElementContext(elementList, [newElement], startIndex)
        draw.spliceElementList(elementList, start + i, 0, newElement)
    }
    return start + data.length - 1
}
}

public keydown(evt: KeyboardEvent): number {
    const elementList = this.control.getElementList()
    const range = this.control.getRange()
    // e6••1uLR0ValueQ...

```

```

this.control.shrinkBoundary()
const { startIndex, endIndex } = range
const startElement = elementList[startIndex]
const endElement = elementList[endIndex]
const draw = this.control.getDraw()
// backspace
if (evt.key === KeyMap.Backspace) {
  // yû-d• S:QC}
  if (startIndex !== endIndex) {
    draw.spliceElementList(
      elementList,
      startIndex + 1,
      endIndex - startIndex
    )
    const value = this.getValue()
    if (!value.length) {
      this.control.addPlaceholder(startIndex)
    }
    return startIndex
  } else {
    if (
      startElement.controlComponent === ControlComponent.PREFIX ||
      endElement.controlComponent === ControlComponent.POSTFIX ||
      startElement.controlComponent === ControlComponent.PLACEHOLDER
    ) {
      // RM• 0 T • 0 S`OM{&
      return this.control.removeControl(startIndex)
    } else {
      // e†g,
      draw.spliceElementList(elementList, startIndex, 1)
      const value = this.getValue()
      if (!value.length) {
        this.control.addPlaceholder(startIndex - 1)
      }
      return startIndex - 1
    }
  }
} else if (evt.key === KeyMap.Delete) {
  // yû-d• S:QC}
  if (startIndex !== endIndex) {
    draw.spliceElementList(
      elementList,
      startIndex + 1,
      endIndex - startIndex
    )
    const value = this.getValue()

```

```

    if (!value.length) {
        this.control.addPlaceholder(startIndex)
    }
    return startIndex
} else {
    const endNextElement = elementList[endIndex + 1]
    if (
        (startElement.controlComponent === ControlComponent.PREFIX &&
            endNextElement.controlComponent === ControlComponent.PLACEHOLDER) ||
        endNextElement.controlComponent === ControlComponent.POSTFIX ||
        startElement.controlComponent === ControlComponent.PLACEHOLDER
    ) {
        // RM• 0 T • 0 S`OM{&
        return this.control.removeControl(startIndex)
    } else {
        // e†g,
        draw.spliceElementList(elementList, startIndex + 1, 1)
        const value = this.getValue()
        if (!value.length) {
            this.control.addPlaceholder(startIndex)
        }
        return startIndex
    }
}
}
return endIndex
}
}
public cut(): number {
    this.control.shrinkBoundary()
    const { startIndex, endIndex } = this.control.getRange()
    if (startIndex === endIndex) {
        return startIndex
    }
    const draw = this.control.getDraw()
    const elementList = this.control.getElementList()
    draw.spliceElementList(elementList, startIndex + 1, endIndex - startIndex)
    const value = this.getValue()
    if (!value.length) {
        this.control.addPlaceholder(startIndex)
    }
    return startIndex
}
}

```



File Path: canvas-editor/src/editor/core/draw/frame/Background.ts

```
import { Draw } from '../Draw'
```

```
{
```

```
  export class Background {
```

```
    private draw: Draw
```

```
  {
```

```
    constructor(draw: Draw) {
```

```
      this.draw = draw
```

```
    }
```

```
  }
```

```
  public render(ctx: CanvasRenderingContext2D) {
```

```
    const width = this.draw.getOriginalWidth()
```

```
    const height = this.draw.getOriginalHeight()
```

```
    ctx.save()
```

```
    ctx.fillStyle = 'ffffff'
```

```
    ctx.fillRect(0, 0, width, height)
```

```
    ctx.restore()
```

```
  }
```

```
}
```

File Path: canvas-editor/src/editor/core/draw/frame/Footer.ts

```
import { maxHeightRadioMapping } from '../../../../dataset/constant/Common'Đ
import { EditorZone } from '../../../../dataset/enum/Editor'Đ
import { DeepRequired } from '../../../../interface/Common'Đ
import { IEditorOption } from '../../../../interface/Editor'Đ
import { IElement, IElementPosition } from '../../../../interface/Element'Đ
import { IRow } from '../../../../interface/Row'Đ
import { Position } from '../../../../position/Position'Đ
import { Draw } from '../Draw'Đ
Đ
export class Footer {Đ
  private draw: DrawĐ
  private position: PositionĐ
  private options: DeepRequired<IEditorOption>Đ
Đ
  private elementList: IElement[]Đ
  private rowList: IRow[]Đ
  private positionList: IElementPosition[]Đ
Đ
  constructor(draw: Draw) {Đ
    this.draw = drawĐ
    this.position = draw.getPosition()Đ
    this.options = draw.getOptions()Đ
Đ
    this.elementList = draw.getFooterElementList()Đ
    this.rowList = []Đ
    this.positionList = []Đ
  }Đ
Đ
  public getRowList(): IRow[] {Đ
    return this.rowListĐ
  }Đ
Đ
  public setElementList(elementList: IElement[]) {Đ
    this.elementList = elementListĐ
  }Đ
Đ
  public getElementList(): IElement[] {Đ
    return this.elementListĐ
  }Đ
Đ
  public getPositionList(): IElementPosition[] {Đ
    return this.positionListĐ
  }Đ
Đ
  public compute() {Đ
```

```

    this.recovery()
    this._computeRowList()
    this._computePositionList()
  }
}

public recovery() {
  this.rowList = []
  this.positionList = []
}

private _computeRowList() {
  const innerWidth = this.draw.getInnerWidth()
  this.rowList = this.draw.computeRowList(innerWidth, this.elementList)
}

private _computePositionList() {
  const footerBottom = this.getFooterBottom()
  const innerWidth = this.draw.getInnerWidth()
  const margins = this.draw.getMargins()
  const startX = margins[3]
  // ~u—bšØ^! - ~u• ~v•è•Yy»~u—b^••èšØ^!
  const pageHeight = this.draw.getHeight()
  const footerHeight = this.getHeight()
  const startY = pageHeight - footerBottom - footerHeight
  this.position.computePageRowPosition({
    positionList: this.positionList,
    rowList: this.rowList,
    pageNo: 0,
    startRowIndex: 0,
    startIndex: 0,
    startX,
    startY,
    innerWidth
  })
}

public getFooterBottom(): number {
  const {
    footer: { bottom, disabled },
    scale
  } = this.options
  if (disabled) return 0
  return Math.floor(bottom * scale)
}

public getMaxHeight(): number {

```

```

    const {
      footer: { maxHeightRadio }
    } = this.options
    const height = this.draw.getHeight()
    return Math.floor(height * maxHeightRadioMapping[maxHeightRadio])
  }
}

public getHeight(): number {
  const maxHeight = this.getMaxHeight()
  const rowHeight = this.getRowHeight()
  return rowHeight > maxHeight ? maxHeight : rowHeight
}

public getRowHeight(): number {
  return this.rowList.reduce((pre, cur) => pre + cur.height, 0)
}

public getExtraHeight(): number {
  // ~u• N •1•Ý + [ž-EšØ - ~u—bN •1•Ý
  const margins = this.draw.getMargins()
  const footerHeight = this.getHeight()
  const footerBottom = this.getFooterBottom()
  const extraHeight = footerBottom + footerHeight - margins[2]
  return extraHeight <= 0 ? 0 : extraHeight
}

public render(ctx: CanvasRenderingContext2D, pageNo: number) {
  ctx.globalAlpha = 1
  const innerWidth = this.draw.getInnerWidth()
  const maxHeight = this.getMaxHeight()
  // •...Qúg Y'šØ^!N n2gÓ
  const rowList: IRow[] = []
  let curRowHeight = 0
  for (let r = 0; r < this.rowList.length; r++) {
    const row = this.rowList[r]
    if (curRowHeight + row.height > maxHeight) {
      break
    }
    rowList.push(row)
    curRowHeight += row.height
  }
  this.draw.drawRow(ctx, {
    elementList: this.elementList,
    positionList: this.positionList,
    rowList,
    pageNo,
  })
}

```

```
    startIndex: 0,
    innerWidth,
    zone: EditorZone.FOOTER
  })
}
}
```

File Path: canvas-editor/src/editor/core/draw/frame/Header.ts

```
import { maxHeightRadioMapping } from '../../../../dataset/constant/Common'Đ
import { EditorZone } from '../../../../dataset/enum/Editor'Đ
import { DeepRequired } from '../../../../interface/Common'Đ
import { IEditorOption } from '../../../../interface/Editor'Đ
import { IElement, IElementPosition } from '../../../../interface/Element'Đ
import { IRow } from '../../../../interface/Row'Đ
import { Position } from '../../../../position/Position'Đ
import { Draw } from '../Draw'Đ
Đ
export class Header {Đ
  private draw: DrawĐ
  private position: PositionĐ
  private options: DeepRequired<IEditorOption>Đ
Đ
  private elementList: IElement[]Đ
  private rowList: IRow[]Đ
  private positionList: IElementPosition[]Đ
Đ
  constructor(draw: Draw) {Đ
    this.draw = drawĐ
    this.position = draw.getPosition()Đ
    this.options = draw.getOptions()Đ
Đ
    this.elementList = draw.getHeaderElementList()Đ
    this.rowList = []Đ
    this.positionList = []Đ
  }Đ
Đ
  public getRowList(): IRow[] {Đ
    return this.rowListĐ
  }Đ
Đ
  public setElementList(elementList: IElement[]) {Đ
    this.elementList = elementListĐ
  }Đ
Đ
  public getElementList(): IElement[] {Đ
    return this.elementListĐ
  }Đ
Đ
  public getPositionList(): IElementPosition[] {Đ
    return this.positionListĐ
  }Đ
Đ
  public compute() {Đ
```

```

        this.recovery()
        this._computeRowList()
        this._computePositionList()
    }
}

public recovery() {
    this.rowList = []
    this.positionList = []
}

private _computeRowList() {
    const innerWidth = this.draw.getInnerWidth()
    this.rowList = this.draw.computeRowList(innerWidth, this.elementList)
}

private _computePositionList() {
    const headerTop = this.getHeaderTop()
    const innerWidth = this.draw.getInnerWidth()
    const margins = this.draw.getMargins()
    const startX = margins[3]
    const startY = headerTop
    this.position.computePageRowPosition({
        positionList: this.positionList,
        rowList: this.rowList,
        pageNo: 0,
        startRowIndex: 0,
        startIndex: 0,
        startX,
        startY,
        innerWidth
    })
}

public getHeaderTop(): number {
    const {
        header: { top, disabled },
        scale
    } = this.options
    if (disabled) return 0
    return Math.floor(top * scale)
}

public getMaxHeight(): number {
    const {
        header: { maxHeightRadio }
    } = this.options

```

```

    const height = this.draw.getHeight()
    return Math.floor(height * maxHeightRadioMapping[maxHeightRadio])
  }
}

public getHeight(): number {
  const maxHeight = this.getMaxHeight()
  const rowHeight = this.getRowHeight()
  return rowHeight > maxHeight ? maxHeight : rowHeight
}

public getRowHeight(): number {
  return this.rowList.reduce((pre, cur) => pre + cur.height, 0)
}

public getExtraHeight(): number {
  // ~uw N ••• + [ž-EšØ - ~u—bN •••
  const margins = this.draw.getMargins()
  const headerHeight = this.getHeight()
  const headerTop = this.getHeaderTop()
  const extraHeight = headerTop + headerHeight - margins[0]
  return extraHeight <= 0 ? 0 : extraHeight
}

public render(ctx: CanvasRenderingContext2D, pageNo: number) {
  ctx.globalAlpha = 1
  const innerWidth = this.draw.getInnerWidth()
  const maxHeight = this.getMaxHeight()
  // •...Qúg Y'sØ^!N n2gÓ
  const rowList: IRow[] = []
  let curRowHeight = 0
  for (let r = 0; r < this.rowList.length; r++) {
    const row = this.rowList[r]
    if (curRowHeight + row.height > maxHeight) {
      break
    }
    rowList.push(row)
    curRowHeight += row.height
  }
  this.draw.drawRow(ctx, {
    elementList: this.elementList,
    positionList: this.positionList,
    rowList,
    pageNo,
    startIndex: 0,
    innerWidth,
    zone: EditorZone.HEADER
  })
}

```



} }  
}  
}

File Path: canvas-editor/src/editor/core/draw/frame/Margin.ts

```
import { PageMode } from '../../dataset/enum/Editor'
import { IEditorOption } from '../../interface/Editor'
import { Draw } from '../Draw'

export class Margin {
  private draw: Draw
  private options: Required<IEditorOption>

  constructor(draw: Draw) {
    this.draw = draw
    this.options = draw.getOptions()
  }

  public render(ctx: CanvasRenderingContext2D, pageNo: number) {
    const { marginIndicatorColor, pageMode } = this.options
    const width = this.draw.getWidth()
    const height =
      pageMode === PageMode.CONTINUITY
        ? this.draw.getCanvasHeight(pageNo)
        : this.draw.getHeight()
    const margins = this.draw.getMargins()
    const marginIndicatorSize = this.draw.getMarginIndicatorSize()
    ctx.save()
    ctx.translate(0.5, 0.5)
    ctx.strokeStyle = marginIndicatorColor
    ctx.beginPath()
    const leftTopPoint: [number, number] = [margins[3], margins[0]]
    const rightTopPoint: [number, number] = [width - margins[1], margins[0]]
    const leftBottomPoint: [number, number] = [margins[3], height - margins[2]]
    const rightBottomPoint: [number, number] = [
      width - margins[1],
      height - margins[2]
    ]
    // N ]æ
    ctx.moveTo(leftTopPoint[0] - marginIndicatorSize, leftTopPoint[1])
    ctx.lineTo(...leftTopPoint)
    ctx.lineTo(leftTopPoint[0], leftTopPoint[1] - marginIndicatorSize)
    // N SÓ
    ctx.moveTo(rightTopPoint[0] + marginIndicatorSize, rightTopPoint[1])
    ctx.lineTo(...rightTopPoint)
    ctx.lineTo(rightTopPoint[0], rightTopPoint[1] - marginIndicatorSize)
    // N ]æ
    ctx.moveTo(leftBottomPoint[0] - marginIndicatorSize, leftBottomPoint[1])
    ctx.lineTo(...leftBottomPoint)
    ctx.lineTo(leftBottomPoint[0], leftBottomPoint[1] + marginIndicatorSize)
```

```
// N SÓĐ
ctx.moveTo(rightBottomPoint[0] + marginIndicatorSize, rightBottomPoint[1])Đ
ctx.lineTo(...rightBottomPoint)Đ
ctx.lineTo(rightBottomPoint[0], rightBottomPoint[1] + marginIndicatorSize)Đ
ctx.stroke()Đ
ctx.restore()Đ
}Đ
}Đ
```

```

File Path: canvas-editor/src/editor/core/draw/frame/LineNumber.ts
import { FORMAT_PLACEHOLDER } from '../../dataset/constant/LineNumber'
import { NumberType } from '../../dataset/enum/Common'
import { PageMode } from '../../dataset/enum/Editor'
import { RowFlex } from '../../dataset/enum/Row'
import { DeepRequired } from '../../interface/Common'
import { IEditorOption } from '../../interface/Editor'
import { convertNumberToChinese } from '../../utils'
import { Draw } from '../Draw'

export class LineNumber {
  private draw: Draw
  private options: DeepRequired<IEditorOption>

  constructor(draw: Draw) {
    this.draw = draw
    this.options = draw.getOptions()
  }

  public render(ctx: CanvasRenderingContext2D, pageNo: number) {
    const {
      scale,
      pageMode,
      lineNumber: {
        size,
        font,
        color,
        rowFlex,
        numberType,
        format,
        startPageNo,
        fromPageNo
      }
    } = this.options
    if (pageNo < fromPageNo) return
    // Y t ~ux h<_
    let text = format
    const pageNoReg = new RegExp(FORMAT_PLACEHOLDER.PAGE_NO)
    if (pageNoReg.test(text)) {
      const realPageNo = pageNo + startPageNo - fromPageNo
      const pageNoText =
        numberType === NumberType.CHINESE
          ? convertNumberToChinese(realPageNo)
          : `${realPageNo}`
      text = text.replace(pageNoReg, pageNoText)
    }
  }
}

```

```

const pageCountReg = new RegExp(FORMAT_PLACEHOLDER.PAGE_COUNT)
if (pageCountReg.test(text)) {
  const pageCount = this.draw.getPageCount() - fromPageNo
  const pageCountText =
    numberType === NumberType.CHINESE
      ? convertNumberToChinese(pageCount)
      : `${pageCount}`
  text = text.replace(pageCountReg, pageCountText)
}
const width = this.draw.getWidth()
// 计算高度
const height =
  pageMode === PageMode.CONTINUITY
    ? this.draw.getCanvasHeight(pageNo)
    : this.draw.getHeight()
const pageNumberBottom = this.draw.getPageNumberBottom()
const y = height - pageNumberBottom
ctx.save()
ctx.fillStyle = color
ctx.font = `${size * scale}px ${font}`
// 计算x坐标
let x = 0
const margins = this.draw.getMargins()
const { width: textWidth } = ctx.measureText(text)
if (rowFlex === RowFlex.CENTER) {
  x = (width - textWidth) / 2
} else if (rowFlex === RowFlex.RIGHT) {
  x = width - textWidth - margins[1]
} else {
  x = margins[3]
}
ctx.fillText(text, x, y)
ctx.restore()
}
}

```

File Path: canvas-editor/src/editor/core/draw/frame/Placeholder.ts

```
import { IEditorOption, IElement } from '../..'
import { DeepRequired } from '../..../interface/Common'
import { IElementPosition } from '../..../interface/Element'
import { IRow } from '../..../interface/Row'
import { formatElementList } from '../..../utils/element'
import { Position } from '../..../position/Position'
import { Draw } from '../Draw'

export class Placeholder {
  private draw: Draw
  private position: Position
  private options: DeepRequired<IEditorOption>

  private elementList: IElement[]
  private rowList: IRow[]
  private positionList: IElementPosition[]

  constructor(draw: Draw) {
    this.draw = draw
    this.position = draw.getPosition()
    this.options = <DeepRequired<IEditorOption>>draw.getOptions()

    this.elementList = []
    this.rowList = []
    this.positionList = []
  }

  private _recovery() {
    this.elementList = []
    this.rowList = []
    this.positionList = []
  }

  public _compute() {
    this._computeRowList()
    this._computePositionList()
  }

  private _computeRowList() {
    const innerWidth = this.draw.getInnerWidth()
    this.rowList = this.draw.computeRowList(innerWidth, this.elementList)
  }

  private _computePositionList() {
    const headerExtraHeight = this.draw.getHeader().getExtraHeight()
  }
}
```

```

const innerWidth = this.draw.getInnerWidth()
const margins = this.draw.getMargins()
const startX = margins[3]
const startY = margins[0] + headerExtraHeight
this.position.computePageRowPosition({
  positionList: this.positionList,
  rowList: this.rowList,
  pageNo: 0,
  startRowIndex: 0,
  startIndex: 0,
  startX,
  startY,
  innerWidth
})
}
}
}

public render(ctx: CanvasRenderingContext2D) {
  const {
    placeholder: { data, font, size, color, opacity }
  } = this.options
  if (!data) return
  this._recovery()
  // g„^úQC} R ^h^vh<_ S
  this.elementList = [
    {
      value: data,
      font,
      size,
      color
    }
  ]
  formatElementList(this.elementList, {
    editorOptions: this.options
  })
  // ı{—
  this._compute()
  const innerWidth = this.draw.getInnerWidth()
  // ~ØR6
  ctx.save()
  ctx.globalAlpha = opacity
  this.draw.drawRow(ctx, {
    elementList: this.elementList,
    positionList: this.positionList,
    rowList: this.rowList,
    pageNo: 0,
    startIndex: 0,

```

```
        innerWidth
    })
    ctx.restore()
  }
}
```



File Path: canvas-editor/src/editor/core/draw/frame/Watermark.ts

```
import { IEditorOption } from '../..'
import { DeepRequired } from '../..interface/Common'
import { Draw } from '../Draw'
import {
  export class Watermark {
    private draw: Draw
    private options: DeepRequired<IEditorOption>

    constructor(draw: Draw) {
      this.draw = draw
      this.options = <DeepRequired<IEditorOption>>draw.getOptions()
    }

    public render(ctx: CanvasRenderingContext2D) {
      const {
        watermark: { data, opacity, font, size, color },
        scale
      } = this.options
      const width = this.draw.getWidth()
      const height = this.draw.getHeight()
      const x = width / 2
      const y = height / 2
      ctx.save()
      ctx.globalAlpha = opacity
      ctx.font = `${size * scale}px ${font}`
      ctx.fillStyle = color
      // yûR"R0N-_ÃOM•nQ•eË•
      const measureText = ctx.measureText(data)
      ctx.translate(x, y)
      ctx.rotate((-45 * Math.PI) / 180)
      ctx.fillText(
        data,
        -measureText.width / 2,
        measureText.actualBoundingBoxAscent - size / 2
      )
      ctx.restore()
    }
  }
}
```

File Path: canvas-editor/src/editor/core/draw/interactive/Search.ts

```
import { ZERO } from '../../../../dataset/constant/Common'
import { TEXTLIKE_ELEMENT_TYPE } from '../../../../dataset/constant/Element'
import { ControlComponent } from '../../../../dataset/enum/Control'
import { EditorContext } from '../../../../dataset/enum/Editor'
import { ElementType } from '../../../../dataset/enum/Element'
import { IEditorOption } from '../../../../interface/Editor'
import { IElement, IElementPosition } from '../../../../interface/Element'
import { ISearchResult, ISearchResultRestArgs } from '../../../../interface/Search'
import { getUUID } from '../../../../utils'
import { Position } from '../../../../position/Position'
import { Draw } from '../Draw'

export interface INavigateInfo {
  index: number
  count: number
}

export class Search {
  private draw: Draw
  private options: Required<IEditorOption>
  private position: Position
  private searchKeyword: string | null
  private searchNavigateIndex: number | null
  private searchMatchList: ISearchResult[]

  constructor(draw: Draw) {
    this.draw = draw
    this.options = draw.getOptions()
    this.position = draw.getPosition()
    this.searchNavigateIndex = null
    this.searchKeyword = null
    this.searchMatchList = []
  }

  public getSearchKeyword(): string | null {
    return this.searchKeyword
  }

  public setSearchKeyword(payload: string | null) {
    this.searchKeyword = payload
    this.searchNavigateIndex = null
  }

  public searchNavigatePre(): number | null {
    if (!this.searchMatchList.length || !this.searchKeyword) return null
  }
}
```

```

if (this.searchNavigateIndex === null) {
  this.searchNavigateIndex = 0
} else {
  let index = this.searchNavigateIndex - 1
  let isExistPre = false
  const searchNavigateId =
    this.searchMatchList[this.searchNavigateIndex].groupId
  while (index >= 0) {
    const match = this.searchMatchList[index]
    if (searchNavigateId !== match.groupId) {
      isExistPre = true
      this.searchNavigateIndex = index - (this.searchKeyword.length - 1)
      break
    }
    index--
  }
  if (!isExistPre) {
    const lastSearchMatch =
      this.searchMatchList[this.searchMatchList.length - 1]
    if (lastSearchMatch.groupId === searchNavigateId) return null
    this.searchNavigateIndex =
      this.searchMatchList.length - 1 - (this.searchKeyword.length - 1)
  }
}
return this.searchNavigateIndex
}
}

public searchNavigateNext(): number | null {
  if (!this.searchMatchList.length || !this.searchKeyword) return null
  if (this.searchNavigateIndex === null) {
    this.searchNavigateIndex = 0
  } else {
    let index = this.searchNavigateIndex + 1
    let isExistNext = false
    const searchNavigateId =
      this.searchMatchList[this.searchNavigateIndex].groupId
    while (index < this.searchMatchList.length) {
      const match = this.searchMatchList[index]
      if (searchNavigateId !== match.groupId) {
        isExistNext = true
        this.searchNavigateIndex = index
        break
      }
      index++
    }
    if (!isExistNext) {

```

```

        const firstSearchMatch = this.searchMatchList[0]
        if (firstSearchMatch.groupId === searchNavigateId) return null
        this.searchNavigateIndex = 0
    }
}
return this.searchNavigateIndex
}
}

public searchNavigateScrollIntoView(position: IElementPosition) {
    const {
        coordinate: { leftTop, leftBottom, rightTop },
        pageNo
    } = position
    const height = this.draw.getHeight()
    const pageGap = this.draw.getPageGap()
    const preY = pageNo * (height + pageGap)
    // R ^ú[šOM• p¹
    const anchor = document.createElement('div')
    anchor.style.position = 'absolute'
    // biY'd }"Œ: [øÿ O•Sĩ%œf Vôfô^•
    const ANCHOR_OVERFLOW_SIZE = 50
    anchor.style.width = `${rightTop[0] - leftTop[0] + ANCHOR_OVERFLOW_SIZE}px`
    anchor.style.height = `${
        leftBottom[1] - leftTop[1] + ANCHOR_OVERFLOW_SIZE
    }px`
    anchor.style.left = `${leftTop[0]}px`
    anchor.style.top = `${leftTop[1] + preY}px`
    this.draw.getContainer().append(anchor)
    // yûR"R0Sĩ%œf Vô
    anchor.scrollIntoView(false)
    anchor.remove()
}
}

public getSearchNavigateIndexList() {
    if (this.searchNavigateIndex === null || !this.searchKeyword) return []
    return new Array(this.searchKeyword.length)
        .fill(this.searchNavigateIndex)
        .map((navigate, index) => navigate + index)
}
}

public getSearchMatchList(): ISearchResult[] {
    return this.searchMatchList
}
}

public getSearchNavigateInfo(): null | INavigateInfo {
    if (!this.searchKeyword || !this.searchMatchList.length) return null
}

```

```

const index =
  this.searchNavigateIndex !== null
    ? this.searchNavigateIndex / this.searchKeyword.length + 1
    : 0
let count = 0
let groupId = null
for (let s = 0; s < this.searchMatchList.length; s++) {
  const match = this.searchMatchList[s]
  if (groupId === match.groupId) continue
  groupId = match.groupId
  count += 1
}
return {
  index,
  count
}
}
}

public compute(payload: string) {
  const keyword = payload.toLocaleLowerCase()
  const searchMatchList: ISearchResult[] = []
  // R ~Ä
  const elementListGroup: {
    type: EditorContext
    elementList: IElement[]
    index: number
  }[] = []
  const originalElementList = this.draw.getOriginalElementList()
  const originalElementListLength = originalElementList.length
  // gâb~^hh<b@W(OM•n
  const tableIndexList = []
  for (let e = 0; e < originalElementListLength; e++) {
    const element = originalElementList[e]
    if (element.type === ElementType.TABLE) {
      tableIndexList.push(e)
    }
  }
  let i = 0
  let elementIndex = 0
  while (elementIndex < originalElementListLength - 1) {
    const endIndex = tableIndexList.length
    ? tableIndexList[i]
    : originalElementListLength
    const pageElement = originalElementList.slice(elementIndex, endIndex)
    if (pageElement.length) {
      elementListGroup.push({

```

```

        index: elementIndex,
        type: EditorContext.PAGE,
        elementList: pageElement
    })
}
const tableElement = originalElementList[endIndex]
if (tableElement) {
    elementListGroup.push({
        index: endIndex,
        type: EditorContext.TABLE,
        elementList: [tableElement]
    })
}
elementIndex = endIndex + 1
i++
}
// d }"e±g,
function searchClosure(
    payload: string | null,
    type: EditorContext,
    elementList: IElement[],
    restArgs?: ISearchResultRestArgs
) {
    if (!payload) return
    const text = elementList
        .map(e =>
            !e.type ||
            (TEXTLIKE_ELEMENT_TYPE.includes(e.type) &&
                e.controlComponent !== ControlComponent.CHECKBOX)
            ? e.value
            : ZERO
        )
        .filter(Boolean)
        .join("")
        .toLocaleLowerCase()
    const matchStartIndexList = []
    let index = text.indexOf(payload)
    while (index !== -1) {
        matchStartIndexList.push(index)
        index = text.indexOf(payload, index + 1)
    }
    for (let m = 0; m < matchStartIndexList.length; m++) {
        const startIndex = matchStartIndexList[m]
        const groupId = getUUID()
        for (let i = 0; i < payload.length; i++) {
            const index = startIndex + i + (restArgs?.startIndex || 0)

```

```

        searchMatchList.push({
            type,
            index,
            groupId,
            ...restArgs
        })
    }
}
}
for (let e = 0; e < elementListGroup.length; e++) {
    const group = elementListGroup[e]
    if (group.type === EditorContext.TABLE) {
        const tableElement = group.elementList[0]
        for (let t = 0; t < tableElement.trList!.length; t++) {
            const tr = tableElement.trList![t]
            for (let d = 0; d < tr.tdList.length; d++) {
                const td = tr.tdList[d]
                const restArgs: ISearchResultRestArgs = {
                    tableIndex: group.index,
                    trIndex: t,
                    tdIndex: d,
                    tdId: td.id
                }
                searchClosure(keyword, group.type, td.value, restArgs)
            }
        }
    } else {
        searchClosure(keyword, group.type, group.elementList, {
            startIndex: group.index
        })
    }
}
this.searchMatchList = searchMatchList
}
}
public render(ctx: CanvasRenderingContext2D, pageIndex: number) {
    if (
        !this.searchMatchList ||
        !this.searchMatchList.length ||
        !this.searchKeyword
    ) {
        return
    }
    const { searchMatchAlpha, searchMatchColor, searchNavigateMatchColor } =
        this.options
    const positionList = this.position.getOriginalPositionList()

```

```

const elementList = this.draw.getOriginalElementList()Đ
ctx.save()Đ
ctx.globalAlpha = searchMatchAlphaĐ
for (let s = 0; s < this.searchMatchList.length; s++) {Đ
  const searchMatch = this.searchMatchList[s]Đ
  let position: IElementPosition | null = nullĐ
  if (searchMatch.type === EditorContext.TABLE) {Đ
    const { tableIndex, trIndex, tdIndex, index } = searchMatchĐ
    position =Đ
      elementList[tableIndex!]? .trList![trIndex!].tdList[tdIndex!]Đ
      ? .positionList![index]Đ
  } else {Đ
    position = positionList[searchMatch.index]Đ
  }Đ
  if (!position) continueĐ
  const {Đ
    coordinate: { leftTop, leftBottom, rightTop },Đ
    pageNoĐ
  } = positionĐ
  if (pageNo !== pageIndex) continueĐ
  // šØN@^v[šOM_SRMd }"ċİĐ
  const searchMatchIndexList = this.getSearchNavigateIndexList()Đ
  if (searchMatchIndexList.includes(s)) {Đ
    ctx.fillStyle = searchNavigateMatchColorĐ
    // f/T&f/{,N N*[W{&ÿ R yûR``R0Si%œÆf VôĐ
    const preSearchMatch = this.searchMatchList[s - 1]Đ
    if (!preSearchMatch || preSearchMatch.groupId !== searchMatch.groupId) {Đ
      this.searchNavigateScrollIntoView(position)Đ
    }Đ
  } else {Đ
    ctx.fillStyle = searchMatchColorĐ
  }Đ
  const x = leftTop[0]Đ
  const y = leftTop[1]Đ
  const width = rightTop[0] - leftTop[0]Đ
  const height = leftBottom[1] - leftTop[1]Đ
  ctx.fillRect(x, y, width, height)Đ
}Đ
ctx.restore()Đ
}Đ
}Đ

```



File Path: canvas-editor/src/editor/core/draw/particle/CheckboxParticle.ts

```
import { DeepRequired } from '../../../interface/Common'
import { IEditorOption } from '../../../interface/Editor'
import { IRowElement } from '../../../interface/Row'
import { Draw } from '../Draw'

export class CheckboxParticle {
  private options: DeepRequired<IEditorOption>

  constructor(draw: Draw) {
    this.options = draw.getOptions()
  }

  public render(
    ctx: CanvasRenderingContext2D,
    element: IRowElement,
    x: number,
    y: number
  ) {
    const {
      checkbox: { gap, lineWidth, fillStyle, fontStyle },
      scale
    } = this.options
    const { metrics, checkbox } = element
    // left top
    const left = Math.round(x + gap)
    const top = Math.round(y - metrics.height + lineWidth)
    const width = metrics.width - gap * 2 * scale
    const height = metrics.height
    ctx.save()
    ctx.beginPath()
    ctx.translate(0.5, 0.5)
    // ~ØR6Rp• r¶`
    if (checkbox?.value) {
      // •¹hF
      ctx.lineWidth = lineWidth
      ctx.strokeStyle = fillStyle
      ctx.rect(left, top, width, height)
      ctx.stroke()
      // €ifo,r
      ctx.beginPath()
      ctx.fillStyle = fillStyle
      ctx.fillRect(left, top, width, height)
      // Rþ• [ùS÷
      ctx.beginPath()
      ctx.strokeStyle = fontStyle
```

```
ctx.lineWidth = lineWidth * 2
ctx.moveTo(left + 2 * scale, top + 7 * scale)
ctx.lineTo(left + 7 * scale, top + 11 * scale)
ctx.moveTo(left + 6.5 * scale, top + 11 * scale)
ctx.lineTo(left + 12 * scale, top + 3 * scale)
ctx.stroke()
} else {
ctx.lineWidth = lineWidth
ctx.rect(left, top, width, height)
ctx.stroke()
}
ctx.closePath()
ctx.restore()
}
```

File Path: canvas-editor/src/editor/core/draw/particle/HyperlinkParticle.ts

```
import { IElement } from '../..'
import { EDITOR_PREFIX } from '../../dataset/constant/Editor'
import { IEditorOption } from '../../interface/Editor'
import { IElementPosition } from '../../interface/Element'
import { IRowElement } from '../../interface/Row'
import { Draw } from '../Draw'

export class HyperlinkParticle {
  private draw: Draw
  private options: Required<IEditorOption>
  private container: HTMLDivElement
  private hyperlinkPopupContainer: HTMLDivElement
  private hyperlinkDom: HTMLAnchorElement

  constructor(draw: Draw) {
    this.draw = draw
    this.options = draw.getOptions()
    this.container = draw.getContainer()
    const { hyperlinkPopupContainer, hyperlinkDom } = this._createHyperlinkPopupDom()
    this.hyperlinkDom = hyperlinkDom
    this.hyperlinkPopupContainer = hyperlinkPopupContainer
  }

  private _createHyperlinkPopupDom() {
    const hyperlinkPopupContainer = document.createElement('div')
    hyperlinkPopupContainer.classList.add(`${EDITOR_PREFIX}-hyperlink-popup`)
    const hyperlinkDom = document.createElement('a')
    hyperlinkDom.target = '_blank'
    hyperlinkDom.rel = 'noopener'
    hyperlinkPopupContainer.append(hyperlinkDom)
    this.container.append(hyperlinkPopupContainer)
    return { hyperlinkPopupContainer, hyperlinkDom }
  }

  public drawHyperlinkPopup(element: IElement, position: IElementPosition) {
    const {
      coordinate: {
        leftTop: [left, top]
      },
      lineHeight
    } = position
    const height = this.draw.getHeight()
    const pageGap = this.draw.getPageGap()
    const preY = this.draw.getPageNo() * (height + pageGap)
```

```

// OM•nĐ
this.hyperlinkPopupContainer.style.display = 'block'Đ
this.hyperlinkPopupContainer.style.left = `${left}px`Đ
this.hyperlinkPopupContainer.style.top = `${top + preY + lineHeight}px`Đ
// h {~Đ
const url = element.url || '#'Đ
this.hyperlinkDom.href = urlĐ
this.hyperlinkDom.title = urlĐ
this.hyperlinkDom.innerText = urlĐ
}Đ
Đ
public clearHyperlinkPopup() {Đ
  this.hyperlinkPopupContainer.style.display = 'none'Đ
}Đ
Đ
public openHyperlink(element: IElement) {Đ
  const newTab = window.open(element.url, '_blank')Đ
  if (newTab) {Đ
    newTab.opener = nullĐ
  }Đ
}Đ
Đ
public render(Đ
  ctx: CanvasRenderingContext2D,Đ
  element: IRowElement,Đ
  x: number,Đ
  y: numberĐ
) {Đ
  ctx.save()Đ
  ctx.font = element.styleĐ
  if (!element.color) {Đ
    element.color = this.options.defaultHyperlinkColorĐ
  }Đ
  ctx.fillStyle = element.colorĐ
  if (element.underline === undefined) {Đ
    element.underline = trueĐ
  }Đ
  ctx.fillText(element.value, x, y)Đ
  ctx.restore()Đ
}Đ
}Đ

```

File Path: canvas-editor/src/editor/core/draw/particle/ImageParticle.ts

```
import { IEditorOption } from '../../../interface/Editor'
import { IElement } from '../../../interface/Element'
import { convertStringToBase64 } from '../../../utils'
import { Draw } from '../Draw'

export class ImageParticle {
  private draw: Draw
  protected options: Required<IEditorOption>
  protected imageCache: Map<string, HTMLImageElement>

  constructor(draw: Draw) {
    this.draw = draw
    this.options = draw.getOptions()
    this.imageCache = new Map()
  }

  protected addImageObserver(promise: Promise<unknown>) {
    this.draw.getImageObserver().add(promise)
  }

  protected getFallbackImage(width: number, height: number): HTMLImageElement {
    const tileSize = 8
    const x = (width - Math.ceil(width / tileSize) * tileSize) / 2
    const y = (height - Math.ceil(height / tileSize) * tileSize) / 2
    const svg = `<svg xmlns="http://www.w3.org/2000/svg" width="${width}"
height="${height}" viewBox="0 0 ${width} ${height}">
    <rect width="${width}" height="${height}" fill="url(#mosaic)" />
    <defs>
      <pattern id="mosaic" x="${x}" y="${y}" width="${
      tileSize * 2
    }" height="${tileSize * 2}" patternUnits="userSpaceOnUse">
        <rect width="${tileSize}" height="${tileSize}" fill="#cccccc" />
        <rect width="${tileSize}" height="${tileSize}" fill="#cccccc"
transform="translate(${tileSize}, ${tileSize})" />
      </pattern>
    </defs>
  </svg>`
    const fallbackImage = new Image()
    fallbackImage.src = `data:image/svg+xml;base64,${convertStringToBase64(
      svg
    )}`
    return fallbackImage
  }

  public render()
```

```

ctx: CanvasRenderingContext2D,
element: IElement,
x: number,
y: number
) {
  const { scale } = this.options
  const width = element.width! * scale
  const height = element.height! * scale
  if (this.imageCache.has(element.id!)) {
    const img = this.imageCache.get(element.id!)!
    ctx.drawImage(img, x, y, width, height)
  } else {
    const imageLoadPromise = new Promise((resolve, reject) => {
      const img = new Image()
      img.setAttribute('crossOrigin', 'Anonymous')
      img.src = element.value
      img.onload = () => {
        ctx.drawImage(img, x, y, width, height)
        this.imageCache.set(element.id!, img)
        resolve(element)
      }
      img.onerror = error => {
        const fallbackImage = this.getFallbackImage(width, height)
        fallbackImage.onload = () => {
          ctx.drawImage(fallbackImage, x, y, width, height)
          this.imageCache.set(element.id!, fallbackImage)
        }
        reject(error)
      }
    })
    this.addImageObserver(imageLoadPromise)
  }
}

```

```

File Path: canvas-editor/src/editor/core/draw/particle/ListParticle.ts
import { ZERO } from '../../dataset/constant/Common'Đ
import { ulStyleMapping } from '../../dataset/constant/List'Đ
import { KeyMap } from '../../dataset/enum/KeyMap'Đ
import { ListStyle, ListType, UIStyle } from '../../dataset/enum/List'Đ
import { DeepRequired } from '../../interface/Common'Đ
import { IEditorOption } from '../../interface/Editor'Đ
import { IElement, IElementPosition } from '../../interface/Element'Đ
import { IRow } from '../../interface/Row'Đ
import { Draw } from '../Draw'Đ
Đ
export class ListParticle {Đ
  private options: DeepRequired<IEditorOption>Đ
Đ
  // —^• Xžh7_ v0c¥•ÔVbžØ«P<Đ
  private readonly UN_COUNT_STYLE_WIDTH = 20Đ
  private readonly MEASURE_BASE_TEXT = '0'Đ
  private readonly LIST_GAP = 10Đ
Đ
  constructor(draw: Draw) {Đ
    this.options = draw.getOptions()Đ
  }Đ
Đ
  public computeListStyle(Đ
    ctx: CanvasRenderingContext2D,Đ
    elementList: IElement[]Đ
  ): Map<string, number> {Đ
    const listStyleMap = new Map<string, number>()Đ
    let start = 0Đ
    let curListId = elementList[start].listIdĐ
    let curElementList: IElement[] = []Đ
    const elementLength = elementList.lengthĐ
    while (start < elementLength) {Đ
      const curElement = elementList[start]Đ
      if (curListId && curListId === curElement.listId) {Đ
        curElementList.push(curElement)Đ
      } else {Đ
        if (curElement.listId && curElement.listId !== curListId) {Đ
          // R ^h~Óg_Đ
          if (curElementList.length) {Đ
            const width = this.getListStyleWidth(ctx, curElementList)Đ
            listStyleMap.set(curListId!, width)Đ
          }Đ
          curListId = curElement.listIdĐ
          curElementList = curListId ? [curElement] : []Đ
        }Đ
      }
    }
  }Đ
}

```

```

    }
    start++
}
if (curElementList.length) {
    const width = this.getListStyleWidth(ctx, curElementList)
    listStyleMap.set(curListId!, width)
}
return listStyleMap
}
}

public getListStyleWidth(
    ctx: CanvasRenderingContext2D,
    listElementList: IElement[]
): number {
    const { scale } = this.options
    const startElement = listElementList[0]
    // —^• Xžh7_ •ÔVþVú[šP<
    if (
        startElement.listStyle &&
        startElement.listStyle !== ListStyle.DECIMAL
    ) {
        return this.UN_COUNT_STYLE_WIDTH * scale
    }
    // ı{—R ^hep'İ
    const count = listElementList.reduce((pre, cur) => {
        if (cur.value === ZERO) {
            pre += 1
        }
    }, 0)
    if (!count) return 0
    // Nă• Xžh7_ g Y'[½^!N:QÆ
    const text = `${this.MEASURE_BASE_TEXT.repeat(String(count).length)}${
        KeyMap.PERIOD
    }`
    const textMetrics = ctx.measureText(text)
    return Math.ceil((textMetrics.width + this.LIST_GAP) * scale)
}

public drawListStyle(
    ctx: CanvasRenderingContext2D,
    row: IRow,
    position: IElementPosition
) {
    const { elementList, offsetX, listIndex, ascent } = row
    const startElement = elementList[0]

```



```

if (startElement.value !== ZERO || startElement.listWrap) return
let text = ""
if (startElement.listType === ListType.UL) {
  text =
    ulStyleMapping[<UIStyle>(<unknown>startElement.listStyle)] ||
    ulStyleMapping[UIStyle.DISC]
} else {
  text = `${listIndex! + 1}${KeyMap.PERIOD}`
}
if (!text) return
const {
  coordinate: {
    leftTop: [startX, startY]
  }
} = position
const x = startX - offsetX
const y = startY + ascent
const { defaultFont, defaultSize, scale } = this.options
ctx.save()
ctx.font = `${defaultSize * scale}px ${defaultFont}`
ctx.fillText(text, x, y)
ctx.restore()
}
}

```

```

File Path: canvas-editor/src/editor/core/draw/particle/PageBreak.ts
import { IEditorOption } from '../../../interface/Editor'
import { IRowElement } from '../../../interface/Row'
import { Draw } from '../Draw'
import {
  export class PageBreakParticle {
    static readonly font: string = 'Yahei'
    static readonly fontSize: number = 12
    static readonly displayName: string = 'R ~u{&'
    static readonly lineDash: number[] = [3, 1]

    private draw: Draw
    private options: Required<IEditorOption>

    constructor(draw: Draw) {
      this.draw = draw
      this.options = draw.getOptions()
    }

    public render(
      ctx: CanvasRenderingContext2D,
      element: IRowElement,
      x: number,
      y: number
    ) {
      const { font, fontSize, displayName, lineDash } = PageBreakParticle
      const { scale, defaultRowMargin } = this.options
      const size = fontSize * scale
      const elementWidth = element.width!
      const offsetY =
        this.draw.getDefaultBasicRowMarginHeight() * defaultRowMargin
      ctx.save()
      ctx.font = `${size}px ${font}`
      const textMeasure = ctx.measureText(displayName)
      const halfX = (elementWidth - textMeasure.width) / 2
      // ~¿kμ
      ctx.setLineDash(lineDash)
      ctx.translate(0, 0.5 + offsetY)
      ctx.beginPath()
      ctx.moveTo(x, y)
      ctx.lineTo(x + halfX, y)
      ctx.moveTo(x + halfX + textMeasure.width, y)
      ctx.lineTo(x + elementWidth, y)
      ctx.stroke()
      // e‡[W
      ctx.fillText(

```

```
        displayName, Ð
        x + halfX, Ð
        y + textMeasure.actualBoundingBoxAscent - size / 2 Ð
    ) Ð
    ctx.restore() Ð
} Ð
} Ð
```

File Path: canvas-editor/src/editor/core/draw/particle/Separator.ts

```
import { IRowElement } from '../../../interface/Row'
export class SeparatorParticle {
  public render(
    ctx: CanvasRenderingContext2D,
    element: IRowElement,
    x: number,
    y: number
  ) {
    ctx.save()
    if (element.color) {
      ctx.strokeStyle = element.color
    }
    if (element.dashArray && element.dashArray.length) {
      ctx.setLineDash(element.dashArray)
    }
    ctx.translate(0, 0.5) // NÎ1Y n2gÓÿ ••QM~¿[½^!{INŽ3
    ctx.beginPath()
    ctx.moveTo(x, y)
    ctx.lineTo(x + element.width!, y)
    ctx.stroke()
    ctx.restore()
  }
}
```

File Path: canvas-editor/src/editor/core/draw/particle/Subscript.ts

```
import { IRowElement } from '../../../interface/Row'
export class SubscriptParticle {
  public render(
    ctx: CanvasRenderingContext2D,
    element: IRowElement,
    x: number,
    y: number
  ) {
    ctx.save()
    ctx.font = element.style
    if (element.color) {
      ctx.fillStyle = element.color
    }
    ctx.fillText(element.value, x, y + element.metrics.height / 2)
    ctx.restore()
  }
}
```

File Path: canvas-editor/src/editor/core/draw/particle/Superscript.ts

```
import { IRowElement } from '../../../interface/Row'
```

```
{
```

```
export class SuperscriptParticle {
```

```
  public render({
```

```
    ctx: CanvasRenderingContext2D,
```

```
    element: IRowElement,
```

```
    x: number,
```

```
    y: number
```

```
  }) {
```

```
    ctx.save()
```

```
    ctx.font = element.style
```

```
    if (element.color) {
```

```
      ctx.fillStyle = element.color
```

```
    }
```

```
    ctx.fillText(element.value, x, y - element.metrics.height / 2)
```

```
    ctx.restore()
```

```
  }
```

```
}
```

```

File Path: canvas-editor/src/editor/core/draw/particle/TextParticle.ts
import { IElement } from '../..'
import { PUNCTUATION_LIST } from '../../dataset/constant/Common'
import { LETTER_REG } from '../../dataset/constant/Regular'
import { IRowElement } from '../../interface/Row'
import { Draw } from '../Draw'

export interface IMeasureWordResult {
  width: number
  endElement: IElement
}

export class TextParticle {
  private ctx: CanvasRenderingContext2D
  private curX: number
  private curY: number
  private text: string
  private curStyle: string
  private curColor?: string
  public cacheMeasureText: Map<string, TextMetrics>

  constructor(draw: Draw) {
    this.ctx = draw.getCtx()
    this.curX = -1
    this.curY = -1
    this.text = ""
    this.curStyle = ""
    this.cacheMeasureText = new Map()
  }

  public measureWord(
    ctx: CanvasRenderingContext2D,
    elementList: IElement[],
    curIndex: number
  ): IMeasureWordResult {
    let width = 0
    let endElement: IElement = elementList[curIndex]
    let i = curIndex
    while (i < elementList.length) {
      const element = elementList[i]
      if (!LETTER_REG.test(element.value)) {
        endElement = element
        break
      }
      width += this.measureText(ctx, element).width
      i++
    }
  }
}

```

```

    }
    return {
        width,
        endElement
    }
}
}
}
public measurePunctuationWidth(
    ctx: CanvasRenderingContext2D,
    element: IElement
): number {
    if (!element || !PUNCTUATION_LIST.includes(element.value)) return 0
    return this.measureText(ctx, element).width
}
}
public measureText(
    ctx: CanvasRenderingContext2D,
    element: IElement
): TextMetrics {
    const id = `${element.value}${ctx.font}`
    const cacheTextMetrics = this.cacheMeasureText.get(id)
    if (cacheTextMetrics) {
        return cacheTextMetrics
    }
    const textMetrics = ctx.measureText(element.value)
    this.cacheMeasureText.set(id, textMetrics)
    return textMetrics
}
}
public complete() {
    this._render()
    this.text = ""
}
}
public record(
    ctx: CanvasRenderingContext2D,
    element: IRowElement,
    x: number,
    y: number
) {
    this.ctx = ctx
    // N;R"[Œb v,, 'Í¼•wYËp¹
    if (!this.text) {
        this._setCurXY(x, y)
    }
    // h7_ SÑu e9SØ

```



```

    if (Ð
        (this.curStyle && element.style !== this.curStyle) || Ð
        element.color !== this.curColor Ð
    ) { Ð
        this.complete() Ð
        this._setCurXY(x, y) Ð
    } Ð
    this.text += element.value Ð
    this.curStyle = element.style Ð
    this.curColor = element.color Ð
} Ð
Ð
private _setCurXY(x: number, y: number) { Ð
    this.curX = x Ð
    this.curY = y Ð
} Ð
Ð
private _render() { Ð
    if (!this.text || !~this.curX || !~this.curY) return Ð
    this.ctx.save() Ð
    this.ctx.font = this.curStyle Ð
    if (this.curColor) { Ð
        this.ctx.fillStyle = this.curColor Ð
    } Ð
    this.ctx.fillText(this.text, this.curX, this.curY) Ð
    this.ctx.restore() Ð
} Ð
} Ð

```

```

File Path: canvas-editor/src/editor/core/draw/particle/block/BlockParticle.ts
import { EDITOR_PREFIX } from '../../../dataset/constant/Editor'
import { ElementType } from '../../../dataset/enum/Element'
import { IRowElement } from '../../../interface/Row'
import { Draw } from '../Draw'
import { BaseBlock } from './modules/BaseBlock'

export class BlockParticle {
  private draw: Draw
  private container: HTMLDivElement
  private blockContainer: HTMLDivElement
  private blockMap: Map<string, BaseBlock>

  constructor(draw: Draw) {
    this.draw = draw
    this.container = draw.getContainer()
    this.blockMap = new Map()
    this.blockContainer = this._createBlockContainer()
    this.container.append(this.blockContainer)
  }

  private _createBlockContainer(): HTMLDivElement {
    const blockContainer = document.createElement('div')
    blockContainer.classList.add(`${EDITOR_PREFIX}-block-container`)
    return blockContainer
  }

  public getDraw(): Draw {
    return this.draw
  }

  public getBlockContainer(): HTMLDivElement {
    return this.blockContainer
  }

  public render(pageNo: number, element: IRowElement, x: number, y: number) {
    const id = element.id
    const cacheBlock = this.blockMap.get(id)
    if (cacheBlock) {
      cacheBlock.setClientRects(pageNo, x, y)
    } else {
      const newBlock = new BaseBlock(this, element)
      newBlock.render()
      newBlock.setClientRects(pageNo, x, y)
      this.blockMap.set(id, newBlock)
    }
  }
}

```

```

    }
}
}
public clear() {
    if (!this.blockMap.size) return
    const elementList = this.draw.getElementList()
    const blockElementIds: string[] = []
    for (let e = 0; e < elementList.length; e++) {
        const element = elementList[e]
        if (element.type === ElementType.BLOCK) {
            blockElementIds.push(element.id!)
        }
    }
    this.blockMap.forEach(block => {
        const id = block.getBlockElement().id!
        if (!blockElementIds.includes(id)) {
            block.remove()
            this.blockMap.delete(id)
        }
    })
}
}
}

```

File Path: canvas-editor/src/editor/core/draw/particle/block/modules/BaseBlock.ts

```
import { EDITOR_PREFIX } from '../../../dataset/constant/Editor'
import { BlockType } from '../../../dataset/enum/Block'
import { IRowElement } from '../../../interface/Row'
import { Draw } from '../../../Draw'
import { BlockParticle } from '../BlockParticle'
import { IFrameBlock } from './IFrameBlock'
import { VideoBlock } from './VideoBlock'
import {
  export class BaseBlock {
    private draw: Draw
    private element: IRowElement
    private block: IFrameBlock | VideoBlock | null
    private blockContainer: HTMLDivElement
    private blockItem: HTMLDivElement

    constructor(blockParticle: BlockParticle, element: IRowElement) {
      this.draw = blockParticle.getDraw()
      this.blockContainer = blockParticle.getBlockContainer()
      this.element = element
      this.block = null
      this.blockItem = this._createBlockItem()
      this.blockContainer.append(this.blockItem)
    }

    public getBlockElement(): IRowElement {
      return this.element
    }

    private _createBlockItem(): HTMLDivElement {
      const blockItem = document.createElement('div')
      blockItem.classList.add(`${EDITOR_PREFIX}-block-item`)
      return blockItem
    }

    public render() {
      const block = this.element.block!
      if (block.type === BlockType.IFRAME) {
        this.block = new IFrameBlock(this.element)
        this.block.render(this.blockItem)
      } else if (block.type === BlockType.VIDEO) {
        this.block = new VideoBlock(this.element)
        this.block.render(this.blockItem)
      }
    }
  }
}
```

```

public setClientRects(pageNo: number, x: number, y: number) {
  const height = this.draw.getHeight()
  const pageGap = this.draw.getPageGap()
  const preY = pageNo * (height + pageGap)
  // \:ø
  const { metrics } = this.element
  this.blockItem.style.width = `${metrics.width}px`
  this.blockItem.style.height = `${metrics.height}px`
  // OM•n
  this.blockItem.style.left = `${x}px`
  this.blockItem.style.top = `${preY + y}px`
}
}
public remove() {
  this.blockItem.remove()
}
}

```

File Path: canvas-editor/src/editor/core/draw/particle/block/modules/IFrameBlock.ts

```
import { IRowElement } from '../../../interface/Row'
export class IFrameBlock {
  private static readonly sandbox = [
    'allow-forms',
    'allow-scripts',
    'allow-same-origin',
    'allow-popups'
  ]
  private element: IRowElement
  constructor(element: IRowElement) {
    this.element = element
  }
  public render(blockItemContainer: HTMLDivElement) {
    const block = this.element.block!
    const iframe = document.createElement('iframe')
    iframe.sandbox.add(...IFrameBlock.sandbox)
    iframe.style.border = 'none'
    iframe.style.width = '100%'
    iframe.style.height = '100%'
    iframe.src = block.iframeBlock?.src || ''
    blockItemContainer.append(iframe)
  }
}
```

File Path: canvas-editor/src/editor/core/draw/particle/block/modules/VideoBlock.ts

```
import { IRowElement } from '../../../interface/Row'
export class VideoBlock {
  private element: IRowElement
  constructor(element: IRowElement) {
    this.element = element
  }
  public render(blockItemContainer: HTMLDivElement) {
    const block = this.element.block!
    const video = document.createElement('video')
    video.style.width = '100%'
    video.style.height = '100%'
    video.style.objectFit = 'contain'
    video.src = block.videoBlock?.src || ''
    video.controls = true
    video.crossOrigin = 'anonymous'
    blockItemContainer.append(video)
  }
}
```

File Path: canvas-editor/src/editor/core/draw/particle/date/DateParticle.ts

```
import { ElementType } from '../../../dataset/enum/Element'Đ
import { IElement, IElementPosition } from '../../../interface/Element'Đ
import { IRowElement } from '../../../interface/Row'Đ
import { formatElementContext } from '../../../utils/element'Đ
import { RangeManager } from '../../../range/RangeManager'Đ
import { Draw } from '../Draw'Đ
import { DatePicker } from './DatePicker'Đ
Đ
export class DateParticle {Đ
  private draw: DrawĐ
  private range: RangeManagerĐ
  private datePicker: DatePickerĐ
Đ
  constructor(draw: Draw) {Đ
    this.draw = drawĐ
    this.range = draw.getRange()Đ
    const i18n = draw.getI18n()Đ
    const t = i18n.t.bind(i18n)Đ
    this.datePicker = new DatePicker({Đ
      mountDom: draw.getContainer(),Đ
      onSubmit: this._setValue.bind(this),Đ
      getLang: () => ({Đ
        now: t('datePicker.now'),Đ
        confirm: t('datePicker.confirm'),Đ
        return: t('datePicker.return'),Đ
        timeSelect: t('datePicker.timeSelect'),Đ
        weeks: {Đ
          sun: t('datePicker.weeks.sun'),Đ
          mon: t('datePicker.weeks.mon'),Đ
          tue: t('datePicker.weeks.tue'),Đ
          wed: t('datePicker.weeks.wed'),Đ
          thu: t('datePicker.weeks.thu'),Đ
          fri: t('datePicker.weeks.fri'),Đ
          sat: t('datePicker.weeks.sat')Đ
        },Đ
        year: t('datePicker.year'),Đ
        month: t('datePicker.month'),Đ
        hour: t('datePicker.hour'),Đ
        minute: t('datePicker.minute'),Đ
        second: t('datePicker.second')Đ
      })Đ
    })Đ
  }Đ
Đ
  private _setValue(date: string) {Đ
```



```

if (!date) return
const range = this.getDateElementRange()
if (!range) return
const [leftIndex, rightIndex] = range
const elementList = this.draw.getElementList()
const startElement = elementList[leftIndex + 1]
// R –deçeö•ô
this.draw.spliceElementList(
  elementList,
  leftIndex + 1,
  rightIndex - leftIndex
)
this.range.setRange(leftIndex, leftIndex)
// cÖQee°eö•ô
const dateElement: IElement = {
  type: ElementType.DATE,
  value: "",
  dateFormat: startElement.dateFormat,
  valueList: [
    {
      value: date
    }
  ]
}
formatElementContext(elementList, [dateElement], leftIndex)
this.draw.insertElementList([dateElement])
}
}
public getDateElementRange(): [number, number] | null {
  let leftIndex = -1
  let rightIndex = -1
  const { startIndex, endIndex } = this.range.getRange()
  if (!~startIndex && !~endIndex) return null
  const elementList = this.draw.getElementList()
  const startElement = elementList[startIndex]
  if (startElement.type !== ElementType.DATE) return null
  // T ]ægåb~
  let preIndex = startIndex
  while (preIndex > 0) {
    const preElement = elementList[preIndex]
    if (preElement.dateld !== startElement.dateld) {
      leftIndex = preIndex
      break
    }
    preIndex--
  }
}

```

```

// T Sógáb~Ð
let nextIndex = startIndex + 1Ð
while (nextIndex < elementList.length) {Ð
    const nextElement = elementList[nextIndex]Ð
    if (nextElement.dateId !== startElement.dateId) {Ð
        rightIndex = nextIndex - 1Ð
        breakÐ
    }Ð
    nextIndex++Ð
}Ð
// c§NöW(g T Ð
if (nextIndex === elementList.length) {Ð
    rightIndex = nextIndex - 1Ð
}Ð
if (!~leftIndex || !~rightIndex) return nullÐ
return [leftIndex, rightIndex]Ð
}Ð
Ð
public clearDatePicker() {Ð
    this.datePicker.dispose()Ð
}Ð
Ð
public renderDatePicker(element: IElement, position: IElementPosition) {Ð
    const height = this.draw.getHeight()Ð
    const pageGap = this.draw.getPageGap()Ð
    const startTop = this.draw.getPageNo() * (height + pageGap)Ð
    const elementList = this.draw.getElementList()Ð
    const range = this.getDateElementRange()Ð
    const value = rangeÐ
    ? elementListÐ
        .slice(range[0] + 1, range[1] + 1)Ð
        .map(el => el.value)Ð
        .join("")Ð
    : ""Ð
    this.datePicker.render({Ð
        value,Ð
        element,Ð
        position,Ð
        startTopÐ
    })Ð
}Ð
Ð
public render(Ð
    ctx: CanvasRenderingContext2D,Ð
    element: IRowElement,Ð
    x: number,Ð

```

```
    y: number
  ) {
    ctx.save()
    ctx.font = element.style
    if (element.color) {
      ctx.fillStyle = element.color
    }
    ctx.fillText(element.value, x, y)
    ctx.restore()
  }
}
```

File Path: canvas-editor/src/editor/core/draw/particle/date/DatePicker.ts

```
import { EDITOR_PREFIX } from '../../../dataset/constant/Editor'
import { IElement, IElementPosition } from '../../../interface/Element'
import { datePicker } from '../../i18n/lang/zh-CN.json'
```

ð

```
export interface IDatePickerLang {ð
```

```
  now: stringð
```

```
  confirm: stringð
```

```
  return: stringð
```

```
  timeSelect: stringð
```

```
  weeks: {ð
```

```
    sun: stringð
```

```
    mon: stringð
```

```
    tue: stringð
```

```
    wed: stringð
```

```
    thu: stringð
```

```
    fri: stringð
```

```
    sat: stringð
```

```
  }ð
```

```
  year: stringð
```

```
  month: stringð
```

```
  hour: stringð
```

```
  minute: stringð
```

```
  second: stringð
```

```
}ð
```

ð

```
export interface IDatePickerOption {ð
```

```
  mountDom?: HTMLElementð
```

```
  onSubmit?: (date: string) => anyð
```

```
  getLang?: () => IDatePickerLangð
```

```
}ð
```

ð

```
interface IDatePickerDom {ð
```

```
  container: HTMLDivElementð
```

```
  dateWrap: HTMLDivElementð
```

```
  datePickerWeek: HTMLDivElementð
```

```
  timeWrap: HTMLUListElementð
```

```
  title: {ð
```

```
    preYear: HTMLSpanElementð
```

```
    preMonth: HTMLSpanElementð
```

```
    now: HTMLSpanElementð
```

```
    nextMonth: HTMLSpanElementð
```

```
    nextYear: HTMLSpanElementð
```

```
  }ð
```

```
  day: HTMLDivElementð
```

```
  time: {ð
```

```

    hour: HTMLListElement
    minute: HTMLListElement
    second: HTMLListElement
  }
  menu: {
    time: HTMLButtonElement
    now: HTMLButtonElement
    submit: HTMLButtonElement
  }
}
}
}
interface IRenderOption {
  value: string
  element: IElement
  position: IElementPosition
  startTop?: number
}
}
}
export class DatePicker {
  private options: IDatePickerOption
  private now: Date
  private dom: IDatePickerDom
  private renderOptions: IRenderOption | null
  private isDatePicker: boolean
  private pickDate: Date | null
  private lang: IDatePickerLang
}
constructor(options: IDatePickerOption = {}) {
  this.options = {
    mountDom: document.body,
    ...options
  }
  this.lang = datePickerLang
  this.now = new Date()
  this.dom = this._createDom()
  this.renderOptions = null
  this.isDatePicker = true
  this.pickDate = null
  this._bindEvent()
}
}
private _createDom(): IDatePickerDom {
  const datePickerContainer = document.createElement('div')
  datePickerContainer.classList.add(`${EDITOR_PREFIX}-date-container`)
  // title-R cb^tg 0 ^tg f>y:
  const dateWrap = document.createElement('div')

```

```

dateWrap.classList.add(`${EDITOR_PREFIX}-date-wrap`)
const datePickerTitle = document.createElement('div')
datePickerTitle.classList.add(`${EDITOR_PREFIX}-date-title`)
const preYearTitle = document.createElement('span')
preYearTitle.classList.add(`${EDITOR_PREFIX}-date-title__pre-year`)
preYearTitle.innerText = `<<`
const preMonthTitle = document.createElement('span')
preMonthTitle.classList.add(`${EDITOR_PREFIX}-date-title__pre-month`)
preMonthTitle.innerText = `<`
const nowTitle = document.createElement('span')
nowTitle.classList.add(`${EDITOR_PREFIX}-date-title__now`)
const nextMonthTitle = document.createElement('span')
nextMonthTitle.classList.add(`${EDITOR_PREFIX}-date-title__next-month`)
nextMonthTitle.innerText = `>`
const nextYearTitle = document.createElement('span')
nextYearTitle.classList.add(`${EDITOR_PREFIX}-date-title__next-year`)
nextYearTitle.innerText = `>>`
datePickerTitle.append(preYearTitle)
datePickerTitle.append(preMonthTitle)
datePickerTitle.append(nowTitle)
datePickerTitle.append(nextMonthTitle)
datePickerTitle.append(nextYearTitle)
// week-f g f>y:
const datePickerWeek = document.createElement('div')
datePickerWeek.classList.add(`${EDITOR_PREFIX}-date-week`)
const {
  weeks: { sun, mon, tue, wed, thu, fri, sat }
} = this.lang
const weekList = [sun, mon, tue, wed, thu, fri, sat]
weekList.forEach(week => {
  const weekDom = document.createElement('span')
  weekDom.innerText = `${week}`
  datePickerWeek.append(weekDom)
})
// day-Y)epf>y:
const datePickerDay = document.createElement('div')
datePickerDay.classList.add(`${EDITOR_PREFIX}-date-day`)
// eåg Q...[¹g,,^ú
dateWrap.append(datePickerTitle)
dateWrap.append(datePickerWeek)
dateWrap.append(datePickerDay)
// time-eö•ô• bé
const timeWrap = document.createElement('ul')
timeWrap.classList.add(`${EDITOR_PREFIX}-time-wrap`)
let hourTime: HTMLListElement
let minuteTime: HTMLListElement

```

```

let secondTime: HTMLListElement
const timeList = [this.lang.hour, this.lang.minute, this.lang.second]
timeList.forEach((t, i) => {
  const li = document.createElement('li')
  const timeText = document.createElement('span')
  timeText.innerText = t
  li.append(timeText)
  const ol = document.createElement('ol')
  const isHour = i === 0
  const isMinute = i === 1
  const endIndex = isHour ? 24 : 60
  for (let i = 0; i < endIndex; i++) {
    const time = document.createElement('li')
    time.innerText = `${String(i).padStart(2, '0')}`
    time.setAttribute('data-id', `${i}`)
    ol.append(time)
  }
  if (isHour) {
    hourTime = ol
  } else if (isMinute) {
    minuteTime = ol
  } else {
    secondTime = ol
  }
  li.append(ol)
  timeWrap.append(li)
})
// menu
const datePickerMenu = document.createElement('div')
datePickerMenu.classList.add(`${EDITOR_PREFIX}-date-menu`)
const timeMenu = document.createElement('button')
timeMenu.classList.add(`${EDITOR_PREFIX}-date-menu__time`)
timeMenu.innerText = this.lang.timeSelect
const nowMenu = document.createElement('button')
nowMenu.classList.add(`${EDITOR_PREFIX}-date-menu__now`)
nowMenu.innerText = this.lang.now
const submitMenu = document.createElement('button')
submitMenu.classList.add(`${EDITOR_PREFIX}-date-menu__submit`)
submitMenu.innerText = this.lang.confirm
datePickerMenu.append(timeMenu)
datePickerMenu.append(nowMenu)
datePickerMenu.append(submitMenu)
// g
datePickerContainer.append(dateWrap)
datePickerContainer.append(timeWrap)
datePickerContainer.append(datePickerMenu)

```

```

this.options.mountDom!.append(datePickerContainer)
return {
  container: datePickerContainer,
  dateWrap,
  datePickerWeek,
  timeWrap,
  title: {
    preYear: preYearTitle,
    preMonth: preMonthTitle,
    now: nowTitle,
    nextMonth: nextMonthTitle,
    nextYear: nextYearTitle
  },
  day: datePickerDay,
  time: {
    hour: hourTime!,
    minute: minuteTime!,
    second: secondTime!
  },
  menu: {
    time: timeMenu,
    now: nowMenu,
    submit: submitMenu
  }
}
}
}
}
private _bindEvent() {
  this.dom.title.preYear.onclick = () => {
    this._preYear()
  }
  this.dom.title.preMonth.onclick = () => {
    this._preMonth()
  }
  this.dom.title.nextMonth.onclick = () => {
    this._nextMonth()
  }
  this.dom.title.nextYear.onclick = () => {
    this._nextYear()
  }
  this.dom.menu.time.onclick = () => {
    this.isDatePicker = !this.isDatePicker
    this._toggleDateTimePicker()
  }
  this.dom.menu.now.onclick = () => {
    this._now()
  }
}

```



```

    this._submit()
  }
  this.dom.menu.submit.onclick = () => {
    this.dispose()
    this._submit()
  }
  this.dom.time.hour.onclick = evt => {
    if (!this.pickDate) return
    const li = <HTMLLIElement>evt.target
    const id = li.dataset.id
    if (!id) return
    this.pickDate.setHours(Number(id))
    this._setTimePick(false)
  }
  this.dom.time.minute.onclick = evt => {
    if (!this.pickDate) return
    const li = <HTMLLIElement>evt.target
    const id = li.dataset.id
    if (!id) return
    this.pickDate.setMinutes(Number(id))
    this._setTimePick(false)
  }
  this.dom.time.second.onclick = evt => {
    if (!this.pickDate) return
    const li = <HTMLLIElement>evt.target
    const id = li.dataset.id
    if (!id) return
    this.pickDate.setSeconds(Number(id))
    this._setTimePick(false)
  }
}
}
}
private _setPosition() {
  if (!this.renderOptions) return
  const {
    position: {
      coordinate: {
        leftTop: [left, top]
      },
      lineHeight
    },
    startTop
  } = this.renderOptions
  // OM•n
  this.dom.container.style.left = `${left}px`
  this.dom.container.style.top = `${top + (startTop || 0) + lineHeight}px`
}

```

```

    }
}
public isValidDate(value: Date): boolean {
    return value.toString() === 'Invalid Date'
}
private _setValue() {
    const value = this.renderOptions?.value
    if (value) {
        const setDate = new Date(value)
        this.now = this.isValidDate(setDate) ? new Date() : setDate
    } else {
        this.now = new Date()
    }
    this.pickDate = new Date(this.now)
}
private _setLang() {
    this.dom.menu.time.innerText = this.lang.timeSelect
    this.dom.menu.now.innerText = this.lang.now
    this.dom.menu.submit.innerText = this.lang.confirm
    const {
        weeks: { sun, mon, tue, wed, thu, fri, sat }
    } = this.lang
    const weekList = [sun, mon, tue, wed, thu, fri, sat]
    this.dom.datePickerWeek.childNodes.forEach((child, i) => {
        const childElement = <HTMLSpanElement>child
        childElement.innerText = weekList[i]
    })
    const hourTitle = <HTMLSpanElement>this.dom.time.hour.previousElementSibling
    hourTitle.innerText = this.lang.hour
    const minuteTitle = <HTMLSpanElement>(
        this.dom.time.minute.previousElementSibling
    )
    minuteTitle.innerText = this.lang.minute
    const secondTitle = <HTMLSpanElement>(
        this.dom.time.second.previousElementSibling
    )
    secondTitle.innerText = this.lang.second
}
private _update() {
    // g, W0^tg eå
    const localDate = new Date()
    const localYear = localDate.getFullYear()
    const localMonth = localDate.getMonth() + 1

```

```

const localDay = localDate.getDate()Đ
// • bé^tg eåĐ
let pickYear: number | null = nullĐ
let pickMonth: number | null = nullĐ
let pickDay: number | null = nullĐ
if (this.pickDate) {Đ
  pickYear = this.pickDate.getFullYear()Đ
  pickMonth = this.pickDate.getMonth() + 1Đ
  pickDay = this.pickDate.getDate()Đ
}Đ
// _SRM^tg eåĐ
const year = this.now.getFullYear()Đ
const month = this.now.getMonth() + 1Đ
this.dom.title.now.innerText = `${year}${this.lang.year} ${String(Đ
  monthĐ
).padStart(2, '0')}${this.lang.month}`Đ
// eåg ^eĴĐ
const curDate = new Date(year, month, 0) // _Sg eåg Đ
const curDay = curDate.getDate() // _Sg `;Y)epĐ
let curWeek = new Date(year, month - 1, 1).getDay() // _Sg {,N Y)f g QàĐ
if (curWeek === 0) {Đ
  curWeek = 7Đ
}Đ
const preDay = new Date(year, month - 1, 0).getDate() // N N*g Y)epĐ
this.dom.day.innerHTML = ''Đ
// n2gÓN N*g eåg Đ
const preStartDay = preDay - curWeek + 1Đ
for (let i = preStartDay; i <= preDay; i++) {Đ
  const dayDom = document.createElement('div')Đ
  dayDom.classList.add('disable')Đ
  dayDom.innerText = `${i}`Đ
  dayDom.onclick = () => {Đ
    const newMonth = month - 2Đ
    this.now = new Date(year, newMonth, i)Đ
    this._setDatePick(year, newMonth, i)Đ
  }Đ
  this.dom.day.append(dayDom)Đ
}Đ
// n2gÓ_Sg eåg Đ
for (let i = 1; i <= curDay; i++) {Đ
  const dayDom = document.createElement('div')Đ
  if (localYear === year && localMonth === month && localDay === i) {Đ
    dayDom.classList.add('active')Đ
  }Đ
  if (Đ
    this.pickDate &&Đ

```

```

    pickYear === year &&
    pickMonth === month &&
    pickDay === i
  ) {
    dayDom.classList.add('select')
  }
  dayDom.innerText = `${i}`
  dayDom.onclick = evt => {
    const newMonth = month - 1
    this.now = new Date(year, newMonth, i)
    this._setDatePick(year, newMonth, i)
    evt.stopPropagation()
  }
  this.dom.day.append(dayDom)
}
// n2gÓN g eåg
const nextEndDay = 6 * 7 - curWeek - curDay
for (let i = 1; i <= nextEndDay; i++) {
  const dayDom = document.createElement('div')
  dayDom.classList.add('disable')
  dayDom.innerText = `${i}`
  dayDom.onclick = () => {
    this.now = new Date(year, month, i)
    this._setDatePick(year, month, i)
  }
  this.dom.day.append(dayDom)
}
}
}
private _toggleDateTimePicker() {
  if (this.isDatePicker) {
    this.dom.dateWrap.classList.add('active')
    this.dom.timeWrap.classList.remove('active')
    this.dom.menu.time.innerText = this.lang.timeSelect
  } else {
    this.dom.dateWrap.classList.remove('active')
    this.dom.timeWrap.classList.add('active')
    this.dom.menu.time.innerText = this.lang.return
    // ¼•neöR yÖ• bé
    this._setTimePick()
  }
}
}
private _setDatePick(year: number, month: number, day: number) {
  this.now = new Date(year, month, day)
  this.pickDate?.setFullYear(year)
}

```

```

    this.pickDate?.setMonth(month)
    this.pickDate?.setDate(day)
    this._update()
  }
}

private _setTimePick(isIntoView = true) {
  const hour = this.pickDate?.getHours() || 0
  const minute = this.pickDate?.getMinutes() || 0
  const second = this.pickDate?.getSeconds() || 0
  const {
    hour: hourDom,
    minute: minuteDom,
    second: secondDom
  } = this.dom.time
  const timeDomList = [hourDom, minuteDom, secondDom]
  // n zz
  timeDomList.forEach(timeDom => {
    timeDom
    .querySelectorAll('li')
    .forEach(li => li.classList.remove('active'))
  })
  const pickList: [HTMLListElement, number][] = [
    [hourDom, hour],
    [minuteDom, minute],
    [secondDom, second]
  ]
  pickList.forEach(([dom, time]) => {
    const pickDom = dom.querySelector<HTMLLIElement>(`[data-id='${time}']`)!
    pickDom.classList.add('active')
    if (isIntoView) {
      this._scrollIntoView(dom, pickDom)
    }
  })
}

private _scrollIntoView(container: HTMLElement, selected: HTMLElement) {
  if (!selected) {
    container.scrollTop = 0
    return
  }
  const offsetParents: HTMLElement[] = []
  let pointer = <HTMLElement>selected.offsetParent
  while (pointer && container !== pointer && container.contains(pointer)) {
    offsetParents.push(pointer)
    pointer = <HTMLElement>pointer.offsetParent
  }
}

```

```

const top =
  selected.offsetTop +
  offsetParents.reduce((prev, curr) => prev + curr.offsetTop, 0)
const bottom = top + selected.offsetHeight
const viewRectTop = container.scrollTop
const viewRectBottom = viewRectTop + container.clientHeight
if (top < viewRectTop) {
  container.scrollTop = top
} else if (bottom > viewRectBottom) {
  container.scrollTop = bottom - container.clientHeight
}
}
}
}

private _preMonth() {
  this.now.setMonth(this.now.getMonth() - 1)
  this._update()
}
}

private _nextMonth() {
  this.now.setMonth(this.now.getMonth() + 1)
  this._update()
}
}

private _preYear() {
  this.now.setFullYear(this.now.getFullYear() - 1)
  this._update()
}
}

private _nextYear() {
  this.now.setFullYear(this.now.getFullYear() + 1)
  this._update()
}
}

private _now() {
  this.pickDate = new Date()
  this.dispose()
}
}

private _toggleVisible(isVisible: boolean) {
  if (isVisible) {
    this.dom.container.classList.add('active')
  } else {
    this.dom.container.classList.remove('active')
  }
}
}
}

```

```

private _submit() {
  if (this.options.onSubmit && this.pickDate) {
    const format = this.renderOptions?.element.dateFormat
    const pickDateString = this.formatDate(this.pickDate, format)
    this.options.onSubmit(pickDateString)
  }
}
}
}

public formatDate(date: Date, format = 'yyyy-MM-dd hh:mm:ss'): string {
  let dateString = ''
  const dateOption = {
    'y+': date.getFullYear().toString(),
    'M+': (date.getMonth() + 1).toString(),
    'd+': date.getDate().toString(),
    'h+': date.getHours().toString(),
    'm+': date.getMinutes().toString(),
    's+': date.getSeconds().toString()
  }
  for (const k in dateOption) {
    const reg = new RegExp('(' + k + ')').exec(format)
    const key = <keyof typeof dateOption>k
    if (reg) {
      dateString = dateString.replace(
        reg[1],
        reg[1].length === 1
          ? dateOption[key]
          : dateOption[key].padStart(reg[1].length, '0')
      )
    }
  }
  return dateString
}

}

public render(option: IRenderOption) {
  this.renderOptions = option
  if (this.options.getLang) {
    this.lang = this.options.getLang()
    this._setLang()
  }
  this._setValue()
  this._update()
  this._setPosition()
  this.isDatePicker = true
  this._toggleDateTimePicker()
  this._toggleVisible(true)
}

```

```
Ⓜ  
  public dispose() {Ⓜ  
    this._toggleVisible(false)Ⓜ  
  }Ⓜ  
}Ⓜ
```



File Path: canvas-editor/src/editor/core/draw/particle/latex/LaTeXParticle.ts

```
import { IElement } from '../../../interface/Element'
import { ImageParticle } from '../ImageParticle'
import { LaTeXSVG, LaTeXUtils } from '../utils/LaTeXUtils'

export class LaTeXParticle extends ImageParticle {
  public static convertLaTeXToSVG(laTeX: string): LaTeXSVG {
    return new LaTeXUtils(laTeX).svg({
      SCALE_X: 10,
      SCALE_Y: 10,
      MARGIN_X: 0,
      MARGIN_Y: 0
    })
  }

  public render(
    ctx: CanvasRenderingContext2D,
    element: IElement,
    x: number,
    y: number
  ) {
    const { scale } = this.options
    const width = element.width! * scale
    const height = element.height! * scale
    if (this.imageCache.has(element.value)) {
      const img = this.imageCache.get(element.value)!
      ctx.drawImage(img, x, y, width, height)
    } else {
      const latexLoadPromise = new Promise((resolve, reject) => {
        const img = new Image()
        img.src = element.latexSVG!
        img.onload = () => {
          ctx.drawImage(img, x, y, width, height)
          this.imageCache.set(element.value, img)
          resolve(element)
        }
        img.onerror = error => {
          reject(error)
        }
      })
      this.addImageObserver(latexLoadPromise)
    }
  }
}
```

File Path: canvas-editor/src/editor/core/draw/particle/latex/utils/LaTeXUtils.ts

```
import { HERSHEY } from './hershey'
```

```
import { SYMB, Symb, asciiMap } from './symbols'
```

```
␣
```

```
const CONFIG: Record<string, number> = {␣
```

```
  SUB_SUP_SCALE: 0.5,␣
```

```
  SQRT_MAG_SCALE: 0.5,␣
```

```
  FRAC_SCALE: 0.85,␣
```

```
  LINE_SPACING: 0.5,␣
```

```
  FRAC_SPACING: 0.4␣
```

```
}␣
```

```
␣
```

```
function tokenize(str: string): string[] {␣
```

```
  str = str.replace(/\n/g, ' ' )␣
```

```
  let i = 0␣
```

```
  const tokens: string[] = []␣
```

```
  let curr = ""␣
```

```
  while (i < str.length) {␣
```

```
    if (str[i] == ' ') {␣
```

```
      if (curr.length) {␣
```

```
        tokens.push(curr)␣
```

```
        curr = ""␣
```

```
      }␣
```

```
    } else if (str[i] == '\\') {␣
```

```
      if (curr.length == 1 && curr[0] == '\\') {␣
```

```
        curr += str[i]␣
```

```
        tokens.push(curr)␣
```

```
        curr = ""␣
```

```
      } else {␣
```

```
        if (curr.length) {␣
```

```
          tokens.push(curr)␣
```

```
        }␣
```

```
        curr = str[i]␣
```

```
      }␣
```

```
    } else if (/[A-Za-z0-9\.\-]/.test(str[i])) {␣
```

```
      curr += str[i]␣
```

```
    } else {␣
```

```
      if (curr.length && curr != '\\') {␣
```

```
        tokens.push(curr)␣
```

```
        curr = ""␣
```

```
      }␣
```

```
      curr += str[i]␣
```

```
      tokens.push(curr)␣
```

```
      curr = ""␣
```

```
    }␣
```

```
    i++␣
```

```

    }
    if (curr.length) tokens.push(curr)
    return tokens
  }
}
interface Bbox {
  x: number
  y: number
  w: number
  h: number
}
interface Expr {
  type: string
  text: string
  mode: string
  chld: Expr[]
  bbox: Bbox
}
function parseAtom(x: string): Expr {
  return {
    type: SYMB[x] ? 'symb' : 'char',
    mode: 'math',
    text: x,
    chld: [],
    // @ts-ignore
    bbox: null
  }
}
function parse(tokens: string[]): Expr {
  let i = 0
  let expr: Expr = {
    type: 'node',
    text: '',
    mode: 'math',
    chld: [],
    // @ts-ignore
    bbox: null
  }
}
function takeOpt(): Expr | null {
  if (tokens[i] !== '[') {
    return null
  }
}

```

```

let lvl = 0
let j = i
while (j < tokens.length) {
  if (tokens[j] == '[') {
    lvl++
  } else if (tokens[j] == ']') {
    lvl--
    if (!lvl) {
      break
    }
  }
  j++
}
const ret: Expr = parse(tokens.slice(i + 1, j))
i = j
return ret
}
}

function takeN(n: number): Expr[] {
  let j: number = i
  let j0: number = j
  let lvl = 0
  let cnt = 0
  const ret: Expr[] = []
  while (j < tokens.length) {
    if (tokens[j] == '{') {
      if (!lvl) {
        j0 = j
      }
      lvl++
    } else if (tokens[j] == '}') {
      lvl--
      if (!lvl) {
        ret.push(parse(tokens.slice(j0 + 1, j)))
        cnt++
        if (cnt == n) {
          break
        }
      }
    } else {
      if (lvl == 0) {
        ret.push(parseAtom(tokens[j]))
        cnt++
        if (cnt == n) {
          break
        }
      }
    }
  }
}

```

```

    }
  }
  j++
}
i = j
return ret
}
}
for (i = 0; i < tokens.length; i++) {
  const s: Symb = SYMB[tokens[i]]
  const e: Expr = {
    type: "",
    text: tokens[i],
    mode: 'math',
    chld: [],
    // @ts-ignore
    bbox: null
  }
  if (s) {
    if (s.arity) {
      i++
      e.type = 'func'
      let opt: Expr | null = null
      if (s.flags.opt) {
        opt = takeOpt()
        if (opt) i++
      }
      const chld: Expr[] = takeN(s.arity)
      e.chld = chld
      if (opt) {
        e.chld.push(opt)
      }
    } else {
      e.type = 'symb'
    }
  } else {
    if (tokens[i] === '{') {
      e.type = 'node'
      e.text = ""
      e.chld = takeN(1)
    } else {
      e.type = 'char'
    }
  }
  expr.chld.push(e)
}

```

```

    if (expr.chld.length == 1) {
        expr = expr.chld[0]
    }
    return expr
}
}
function environments(exprs: Expr[]) {
    let i = 0
    while (i < exprs.length) {
        if (exprs[i].text == '\\begin') {
            let j: number
            for (j = i; j < exprs.length; j++) {
                if (exprs[j].text == '\\end') {
                    break
                }
            }
            const es: Expr[] = exprs.splice(i + 1, j - (i + 1))
            environments(es)
            exprs[i].text = exprs[i].chld[0].text
            exprs[i].chld = es
            exprs.splice(i + 1, 1)
        }
        i++
    }
}
function transform(
    expr: Expr,
    sclx: number,
    scly: number,
    x: number,
    y: number,
    notFirst?: boolean
) {
    if (scly == null) {
        scly = sclx
    }
    if (!expr.bbox) return
    if (notFirst) {
        expr.bbox.x *= sclx
        expr.bbox.y *= scly
    }
    expr.bbox.w *= sclx
    expr.bbox.h *= scly
    for (let i = 0; i < expr.chld.length; i++) {
        transform(expr.chld[i], sclx, scly, 0, 0, true)
    }
}

```

```

    }
    expr.bbox.x += x
    expr.bbox.y += y
  }
}

function computeBbox(exprs: Expr[]): Bbox {
  let xmin = Infinity
  let xmax = -Infinity
  let ymin = Infinity
  let ymax = -Infinity
  for (let i = 0; i < exprs.length; i++) {
    if (!exprs[i].bbox) {
      continue
    }
    xmin = Math.min(xmin, exprs[i].bbox.x)
    ymin = Math.min(ymin, exprs[i].bbox.y)
    xmax = Math.max(xmax, exprs[i].bbox.x + exprs[i].bbox.w)
    ymax = Math.max(ymax, exprs[i].bbox.y + exprs[i].bbox.h)
  }
  return { x: xmin, y: ymin, w: xmax - xmin, h: ymax - ymin }
}

function group(exprs: Expr[]): Expr {
  if (!exprs.length) {
    // @ts-ignore
    return null
  }
  const bbox: Bbox = computeBbox(exprs)
  // console.log(exprs, bbox);
  for (let i = 0; i < exprs.length; i++) {
    if (!exprs[i].bbox) {
      continue
    }
    exprs[i].bbox.x -= bbox.x
    exprs[i].bbox.y -= bbox.y
  }
  const expr: Expr = {
    type: 'node',
    text: '',
    mode: 'math',
    chld: exprs,
    bbox
  }
  return expr
}

```

```

function align(exprs: Expr[], alignment = 'center'): void {
  for (let i = 0; i < exprs.length; i++) {
    if (exprs[i].text == '^' || exprs[i].text == '\") {
      let h = 0
      let j = i
      while (
        j > 0 &&
        (exprs[j].text == '^' || exprs[j].text == '_' || exprs[j].text == '\")
      ) {
        j--
      }
      h = exprs[j].bbox.y
      if (exprs[i].text == '\") {
        exprs[i].bbox.y = h
      } else {
        // @ts-ignore
        transform(exprs[i], CONFIG.SUB_SUP_SCALE, null, 0, 0)
        if (SYMB[exprs[j].text] && SYMB[exprs[j].text].flags.big) {
          exprs[i].bbox.y = h - exprs[i].bbox.h
        } else if (exprs[j].text == '\\int') {
          exprs[i].bbox.y = h
        } else {
          exprs[i].bbox.y = h - exprs[i].bbox.h / 2
        }
      }
    } else if (exprs[i].text == '_') {
      let h = 1
      let j = i
      while (
        j > 0 &&
        (exprs[j].text == '^' || exprs[j].text == '_' || exprs[j].text == '\")
      ) {
        j--
      }
      h = exprs[j].bbox.y + exprs[j].bbox.h
      // @ts-ignore
      transform(exprs[i], CONFIG.SUB_SUP_SCALE, null, 0, 0)
      if (SYMB[exprs[j].text] && SYMB[exprs[j].text].flags.big) {
        exprs[i].bbox.y = h
      } else if (exprs[j].text == '\\int') {
        exprs[i].bbox.y = h - exprs[i].bbox.h
      } else {
        exprs[i].bbox.y = h - exprs[i].bbox.h / 2
      }
    }
  }
}

```



```

function searchHigh(
  i: number,
  l: string,
  r: string,
  dir: number,
  lvl0: number
): number[] {
  let j = i
  let lvl = lvl0
  let ymin = Infinity
  let ymax = -Infinity
  while (dir > 0 ? j < exprs.length : j >= 0) {
    if (exprs[j].text == l) {
      lvl++
    } else if (exprs[j].text == r) {
      lvl--
      if (lvl == 0) {
        break
      }
    } else if (exprs[j].text == '^' || exprs[j].text == '_') {
      //skip
    } else if (exprs[j].bbox) {
      ymin = Math.min(ymin, exprs[j].bbox.y)
      ymax = Math.max(ymax, exprs[j].bbox.y + exprs[j].bbox.h)
    }
    j += dir
  }
  return [ymin, ymax]
}

for (let i = 0; i < exprs.length; i++) {
  if (exprs[i].text == '\\left') {
    const [ymin, ymax] = searchHigh(i, '\\left', '\\right', 1, 0)
    if (ymin != Infinity && ymax != -Infinity) {
      exprs[i].bbox.y = ymin
      transform(exprs[i], 1, (ymax - ymin) / exprs[i].bbox.h, 0, 0)
    }
  } else if (exprs[i].text == '\\right') {
    const [ymin, ymax] = searchHigh(i, '\\right', '\\left', -1, 0)
    if (ymin != Infinity && ymax != -Infinity) {
      exprs[i].bbox.y = ymin
      transform(exprs[i], 1, (ymax - ymin) / exprs[i].bbox.h, 0, 0)
    }
  } else if (exprs[i].text == '\\middle') {
    const [lmin, lmax] = searchHigh(i, '\\right', '\\left', -1, 1)
    const [rmin, rmax] = searchHigh(i, '\\left', '\\right', 1, 1)
    const ymin = Math.min(lmin, rmin)
  }
}

```

```

    const ymax = Math.max(lmax, rmax)
    if (ymin != Infinity && ymax != -Infinity) {
      exprs[i].bbox.y = ymin
      transform(exprs[i], 1, (ymax - ymin) / exprs[i].bbox.h, 0, 0)
    }
  }
}
}
if (!exprs.some(x => x.text == '&' || x.text == '\\\\')) {
  return
}
const rows: Expr[][] = []
let row: Expr[] = []
let cell: Expr[] = []
for (let i = 0; i < exprs.length; i++) {
  if (exprs[i].text == '&') {
    row.push(cell)
    cell = []
  } else if (exprs[i].text == '\\\\') {
    if (cell.length) {
      row.push(cell)
      cell = []
    }
    rows.push(row)
    row = []
  } else {
    cell.push(exprs[i])
  }
}
if (cell.length) {
  row.push(cell)
}
if (row.length) {
  rows.push(row)
}
const colws: number[] = []
const erows: Expr[][] = []
for (let i = 0; i < rows.length; i++) {
  const erow: Expr[] = []
  for (let j = 0; j < rows[i].length; j++) {
    const e: Expr = group(rows[i][j])
    if (e) {
      colws[j] = colws[j] || 0
      colws[j] = Math.max(e.bbox.w + 1, colws[j])
    }
  }
  erows[i] = erow
}

```

```

    }Ð
    erow[j] = eÐ
  }Ð
  erows.push(erow)Ð
}Ð
Ð
const ybds: number[][] = []Ð
for (let i = 0; i < erows.length; i++) {Ð
  let ymin = InfinityÐ
  let ymax = -InfinityÐ
  for (let j = 0; j < erows[i].length; j++) {Ð
    if (!erows[i][j]) {Ð
      continueÐ
    }Ð
    ymin = Math.min(ymin, erows[i][j].bbox.y)Ð
    ymax = Math.max(ymax, erows[i][j].bbox.y + erows[i][j].bbox.h)Ð
  }Ð
  ybds.push([ymin, ymax])Ð
}Ð
Ð
for (let i = 0; i < ybds.length; i++) {Ð
  if (ybds[i][0] == Infinity || ybds[i][1] == Infinity) {Ð
    ybds[i][0] = i == 0 ? 0 : ybds[i - 1][1]Ð
    ybds[i][1] = ybds[i][0] + 2Ð
  }Ð
}Ð
Ð
for (let i = 1; i < erows.length; i++) {Ð
  const shft = ybds[i - 1][1] - ybds[i][0] + CONFIG.LINE_SPACINGÐ
  for (let j = 0; j < erows[i].length; j++) {Ð
    if (erows[i][j]) {Ð
      erows[i][j].bbox.y += shftÐ
    }Ð
  }Ð
  ybds[i][0] += shftÐ
  ybds[i][1] += shftÐ
}Ð
Ð
exprs.splice(0, exprs.length)Ð
for (let i = 0; i < erows.length; i++) {Ð
  let dx = 0Ð
  for (let j = 0; j < erows[i].length; j++) {Ð
    const e: Expr = erows[i][j]Ð
    if (!e) {Ð
      dx += colws[j]Ð
      continueÐ
    }
  }
}

```

```

    }
    e.bbox.x += dx
    dx += colws[j] - e.bbox.w
    // e.bbox.w = colws[j];
    if (alignment == 'center') {
        e.bbox.x += (colws[j] - e.bbox.w) / 2
    } else if (alignment == 'left') {
        //ok
    } else if (alignment == 'right') {
        e.bbox.x += colws[j] - e.bbox.w
    } else if (alignment == 'equation') {
        if (j != erows[i].length - 1) {
            e.bbox.x += colws[j] - e.bbox.w
        }
    }
    }
    exprs.push(e)
}
}
}
function plan(expr: Expr, mode = 'math'): void {
    const tmd: string =
    {
        '\\text': 'text',
        '\\mathnormal': 'math',
        '\\mathrm': 'rm',
        '\\mathit': 'it',
        '\\mathbf': 'bf',
        '\\mathsf': 'sf',
        '\\mathtt': 'tt',
        '\\mathfrak': 'frak',
        '\\mathcal': 'cal',
        '\\mathbb': 'bb',
        '\\mathscr': 'scr',
        '\\rm': 'rm',
        '\\it': 'it',
        '\\bf': 'bf',
        '\\sf': 'sf',
        '\\tt': 'tt',
        '\\frak': 'frak',
        '\\cal': 'cal',
        '\\bb': 'bb',
        '\\scr': 'scr'
    }[expr.text] ?? mode
    if (!expr.chld.length) {
        if (SYMB[expr.text]) {

```

```

if (SYMB[expr.text].flags.big) {Đ
  if (expr.text == '\\lim') {Đ
    expr.bbox = { x: 0, y: 0, w: 3.5, h: 2 }Đ
  } else {Đ
    expr.bbox = { x: 0, y: -0.5, w: 3, h: 3 }Đ
  }Đ
} else if (SYMB[expr.text].flags.txt) {Đ
  let w = 0Đ
  for (let i = 1; i < expr.text.length; i++) {Đ
    w += HERSHEY(asciiMap(expr.text[i], 'text')).wĐ
  }Đ
  w /= 16Đ
  expr.bbox = { x: 0, y: 0, w: w, h: 2 }Đ
} else if (SYMB[expr.text].glyph) {Đ
  let w = HERSHEY(SYMB[expr.text].glyph).wĐ
  w /= 16Đ
  if (expr.text == '\\int' || expr.text == '\\oint') {Đ
    expr.bbox = { x: 0, y: -1.5, w: w, h: 5 }Đ
  } else {Đ
    expr.bbox = { x: 0, y: 0, w: w, h: 2 }Đ
  }Đ
} else {Đ
  expr.bbox = { x: 0, y: 0, w: 1, h: 2 }Đ
}Đ
} else {Đ
  let w = 0Đ
  for (let i = 0; i < expr.text.length; i++) {Đ
    if (!HERSHEY(asciiMap(expr.text[i], tmd))) {Đ
      continueĐ
    }Đ
    if (tmd == 'tt') {Đ
      w += 16Đ
    } else {Đ
      w += HERSHEY(asciiMap(expr.text[i], tmd)).wĐ
    }Đ
  }Đ
  w /= 16Đ
  expr.bbox = { x: 0, y: 0, w: w, h: 2 }Đ
}Đ
expr.mode = tmdĐ
returnĐ
}Đ
if (expr.text == '\\frac') {Đ
  const a: Expr = expr.chld[0]Đ
  const b: Expr = expr.chld[1]Đ
  const s: number = CONFIG.FRAC_SCALEDĐ

```

```

plan(a)
plan(b)
a.bbox.x = 0
a.bbox.y = 0
b.bbox.x = 0
b.bbox.y = 0
const mw: number = Math.max(a.bbox.w, b.bbox.w) * s
// @ts-ignore
transform(a, s, null, (mw - a.bbox.w * s) / 2, 0)
transform(
  b,
  s,
  // @ts-ignore
  null,
  (mw - b.bbox.w * s) / 2,
  a.bbox.h + CONFIG.FRAC_SPACING
)
expr.bbox = {
  x: 0,
  y: -a.bbox.h + 1 - CONFIG.FRAC_SPACING / 2,
  w: mw,
  h: a.bbox.h + b.bbox.h + CONFIG.FRAC_SPACING
}
} else if (expr.text == '\\binom') {
  const a: Expr = expr.chld[0]
  const b: Expr = expr.chld[1]
  plan(a)
  plan(b)
  a.bbox.x = 0
  a.bbox.y = 0
  b.bbox.x = 0
  b.bbox.y = 0
  const mw: number = Math.max(a.bbox.w, b.bbox.w)
  // @ts-ignore
  transform(a, 1, null, (mw - a.bbox.w) / 2 + 1, 0)
  // @ts-ignore
  transform(b, 1, null, (mw - b.bbox.w) / 2 + 1, a.bbox.h)
  expr.bbox = { x: 0, y: -a.bbox.h + 1, w: mw + 2, h: a.bbox.h + b.bbox.h }
} else if (expr.text == '\\sqrt') {
  const e: Expr = expr.chld[0]
  plan(e)
  const f: Expr = expr.chld[1]
  let pl = 0
  if (f) {
    plan(f)
    pl = Math.max(f.bbox.w * CONFIG.SQRT_MAG_SCALE - 0.5, 0)
  }

```

```

    // @ts-ignore
    transform(f, CONFIG.SQRT_MAG_SCALE, null, 0, 0.5)
  }
  // @ts-ignore
  transform(e, 1, null, 1 + pl, 0.5)
  expr.bbox = {
    x: 0,
    y: 2 - e.bbox.h - 0.5,
    w: e.bbox.w + 1 + pl,
    h: e.bbox.h + 0.5
  }
} else if (SYMB[expr.text] && SYMB[expr.text].flags.hat) {
  const e: Expr = expr.chld[0]
  plan(e)
  const y0 = e.bbox.y - 0.5
  e.bbox.y = 0.5
  expr.bbox = { x: 0, y: y0, w: e.bbox.w, h: e.bbox.h + 0.5 }
} else if (SYMB[expr.text] && SYMB[expr.text].flags.mat) {
  const e: Expr = expr.chld[0]
  plan(e)
  expr.bbox = { x: 0, y: 0, w: e.bbox.w, h: e.bbox.h + 0.5 }
} else {
  let dx = 0
  let dy = 0
  let mh = 1
  for (let i = 0; i < expr.chld.length; i++) {
    const c: Expr = expr.chld[i]
    // @ts-ignore
    const spac: number =
      {
        '\\quad': 2,
        '\\,': (2 * 3) / 18,
        '\\.': (2 * 4) / 18,
        '\\;': (2 * 5) / 18,
        '\\!': (2 * -3) / 18
      }[c.text] ?? null
    if (c.text == '\\\\') {
      dy += mh
      dx = 0
      mh = 1
      continue
    } else if (c.text == '&') {
      continue
    } else if (spac != null) {
      dx += spac
    }
  }
}

```

```

    continueĐ
} else {Đ
    plan(c, tmd)Đ
    // @ts-ignoreĐ
    transform(c, 1, null, dx, dy)Đ
    if (c.text == '^' || c.text == '_' || c.text == '\\') {Đ
        let j: number = iĐ
        while (Đ
            j > 0 &&Đ
            (expr.chld[j].text == '^' ||Đ
            expr.chld[j].text == '_' ||Đ
            expr.chld[j].text == '\\')Đ
        ) {Đ
            j--Đ
        }Đ
        const wasBig =Đ
            SYMB[expr.chld[j].text] && SYMB[expr.chld[j].text].flags.bigĐ
        if (c.text == '\\') {Đ
            let k = j + 1Đ
            let nth = 0Đ
            while (k < i) {Đ
                if (expr.chld[k].text == '\\') {Đ
                    nth++Đ
                }Đ
                k++Đ
            }Đ
            c.bbox.x =Đ
                expr.chld[j].bbox.x + expr.chld[j].bbox.w + c.bbox.w * nthĐ
            dx = Math.max(dx, c.bbox.x + c.bbox.w)Đ
        } else {Đ
            if (wasBig) {Đ
                const ex =Đ
                    expr.chld[j].bbox.x +Đ
                    (expr.chld[j].bbox.w - c.bbox.w * CONFIG.SUB_SUP_SCALE) / 2Đ
                c.bbox.x = exĐ
                dx = Math.max(Đ
                    dx,Đ
                    expr.chld[j].bbox.x +Đ
                    expr.chld[j].bbox.w +Đ
                    (c.bbox.w * CONFIG.SUB_SUP_SCALE - expr.chld[j].bbox.w) / 2Đ
                )Đ
            } else {Đ
                c.bbox.x = expr.chld[j].bbox.x + expr.chld[j].bbox.wĐ
                dx = Math.max(dx, c.bbox.x + c.bbox.w * CONFIG.SUB_SUP_SCALE)Đ
            }Đ
        }Đ
    }Đ
}Đ

```



```

    } else {
        dx += c.bbox.w
    }
    if (mode == 'text') {
        dx += 1
    }
    mh = Math.max(c.bbox.y + c.bbox.h - dy, mh)
}
dy += mh
const m2s: Record<string, string[]> = {
    bmatrix: ['[', ']'],
    pmatrix: ['(', ')'],
    Bmatrix: ['\\{', '\\}'],
    cases: ['\\{']
}
const alt: string = {
    bmatrix: 'center',
    pmatrix: 'center',
    Bmatrix: 'center',
    cases: 'left',
    matrix: 'center',
    aligned: 'equation'
}[expr.text] ?? 'left'
const hasLp = !!m2s[expr.text]
const hasRp = !!m2s[expr.text] && m2s[expr.text].length > 1
align(expr.chld, alt)
const bb = computeBbox(expr.chld)
if (expr.text == '\\text') {
    bb.x -= 1
    bb.w += 2
}
for (let i = 0; i < expr.chld.length; i++) {
    // @ts-ignore
    transform(expr.chld[i], 1, null, -bb.x + (hasLp ? 1.5 : 0), -bb.y)
}
expr.bbox = {
    x: 0,
    y: 0,
    w: bb.w + 1.5 * Number(hasLp) + 1.5 * Number(hasRp),
    h: bb.h
}

```

```

    }
    if (hasLp) {
      expr.chld.unshift({
        type: 'symb',
        text: m2s[expr.text][0],
        mode: expr.mode,
        chld: [],
        bbox: { x: 0, y: 0, w: 1, h: bb.h }
      })
    }
    if (hasRp) {
      expr.chld.push({
        type: 'symb',
        text: m2s[expr.text][1],
        mode: expr.mode,
        chld: [],
        bbox: { x: bb.w + 2, y: 0, w: 1, h: bb.h }
      })
    }
    if (hasLp || hasRp || expr.text == 'matrix') {
      expr.type = 'node'
      expr.text = ''
      expr.bbox.y -= (expr.bbox.h - 2) / 2
    }
  }
}
function flatten(expr: Expr) {
  function flat(expr: Expr, dx: number, dy: number): Expr[] {
    const ff: Expr[] = []
    if (expr.bbox) {
      dx += expr.bbox.x
      dy += expr.bbox.y
      if (expr.text == '\\frac') {
        const h: number =
          expr.chld[1].bbox.y - (expr.chld[0].bbox.y + expr.chld[0].bbox.h)
        const e: Expr = {
          type: 'symb',
          mode: expr.mode,
          text: '\\bar',
          bbox: {
            x: dx,
            y: dy + (expr.chld[1].bbox.y - h / 2) - h / 2,
            w: expr.bbox.w,
            h: h
          },
        }
      }
    }
  }
}

```

```

    chld: []
  }
  ff.push(e)
} else if (expr.text == '\\sqrt') {
  const h: number = expr.chld[0].bbox.y
  const xx: number = Math.max(
    0,
    expr.chld[0].bbox.x - expr.chld[0].bbox.h / 2
  )
  const e: Expr = {
    type: 'symb',
    mode: expr.mode,
    text: '\\sqrt',
    bbox: {
      x: dx + xx,
      y: dy + h / 2,
      w: expr.chld[0].bbox.x - xx,
      h: expr.bbox.h - h / 2
    },
    chld: []
  }
  ff.push(e)
  ff.push({
    type: 'symb',
    text: '\\bar',
    mode: expr.mode,
    bbox: {
      x: dx + expr.chld[0].bbox.x,
      y: dy,
      w: expr.bbox.w - expr.chld[0].bbox.x,
      h: h
    },
    chld: []
  })
} else if (expr.text == '\\binom') {
  const w = Math.min(expr.chld[0].bbox.x, expr.chld[1].bbox.x)
  const e: Expr = {
    type: 'symb',
    mode: expr.mode,
    text: '(',
    bbox: {
      x: dx,
      y: dy,
      w: w,
      h: expr.bbox.h
    },
  },

```

```

    chld: []
  }
  ff.push(e)
  ff.push({
    type: 'symb',
    text: ')',
    mode: expr.mode,
    bbox: {
      x: dx + expr.bbox.w - w,
      y: dy,
      w: w,
      h: expr.bbox.h
    },
    chld: []
  })
} else if (SYMB[expr.text] && SYMB[expr.text].flags.hat) {
  const h: number = expr.chld[0].bbox.y
  const e: Expr = {
    type: 'symb',
    mode: expr.mode,
    text: expr.text,
    bbox: {
      x: dx,
      y: dy,
      w: expr.bbox.w,
      h: h
    },
    chld: []
  }
  ff.push(e)
} else if (SYMB[expr.text] && SYMB[expr.text].flags.mat) {
  const h: number = expr.chld[0].bbox.h
  const e: Expr = {
    type: 'symb',
    text: expr.text,
    mode: expr.mode,
    bbox: {
      x: dx,
      y: dy + h,
      w: expr.bbox.w,
      h: expr.bbox.h - h
    },
    chld: []
  }
  ff.push(e)
} else if (expr.type !== 'node' && expr.text !== '^' && expr.text !== '_') {

```

```

const e: Expr = {
  type: expr.type == 'func' ? 'symb' : expr.type,
  text: expr.text,
  mode: expr.mode,
  bbox: {
    x: dx,
    y: dy,
    w: expr.bbox.w,
    h: expr.bbox.h
  },
  chld: []
}
ff.push(e)
}
}
for (let i = 0; i < expr.chld.length; i++) {
  const f = flat(expr.chld[i], dx, dy)
  ff.push(...f)
}
return ff
}
const f = flat(expr, -expr.bbox.x, -expr.bbox.y)
expr.type = 'node'
expr.text = ""
expr.chld = f
}
}
function render(expr: Expr): number[][][] {
  const o: number[][][] = []
  for (let i = 0; i < expr.chld.length; i++) {
    const e: Expr = expr.chld[i]
    let s = e.bbox.h / 2
    let isSmallHat = false
    if (
      SYMB[e.text] &&
      SYMB[e.text].flags.hat &&
      !SYMB[e.text].flags.xfl &&
      !SYMB[e.text].flags.yfl
    ) {
      s *= 4
      isSmallHat = true
    }
    if (SYMB[e.text] && SYMB[e.text].glyph) {
      const d = HERSHEY(SYMB[e.text].glyph)
      for (let j = 0; j < d.polylines.length; j++) {
        const l: number[][] = []

```

```

    }
    for (let k = 0; k < d.polylines[j].length; k++) {
        let x = d.polylines[j][k][0]
        let y = d.polylines[j][k][1]
    }
    if (SYMB[e.text].flags.xfl) {
        x = ((x - d.xmin) / Math.max(d.xmax - d.xmin, 1)) * e.bbox.w
        x += e.bbox.x
    } else if ((d.w / 16) * s > e.bbox.w) {
        x = (x / Math.max(d.w, 1)) * e.bbox.w
        x += e.bbox.x
    } else {
        x = (x / 16) * s
        const p = (e.bbox.w - (d.w / 16) * s) / 2
        x += e.bbox.x + p
    }
    if (SYMB[e.text].flags.yfl) {
        y = ((y - d.ymin) / Math.max(d.ymax - d.ymin, 1)) * e.bbox.h
        y += e.bbox.y
    } else {
        y = (y / 16) * s
        if (isSmallHat) {
            const p = (d.ymax + d.ymin) / 2
            y -= (p / 16) * s
        }
        y += e.bbox.y + e.bbox.h / 2
    }
    l.push([x, y])
    o.push(l)
}
} else if ((SYMB[e.text] && SYMB[e.text].flags.txt) || e.type == 'char') {
    let x0 = e.bbox.x
    const isVerb = !(SYMB[e.text] && SYMB[e.text].flags.txt)
    for (let n = Number(isVerb); n < e.text.length; n++) {
        const d = HERSHEY(asciiMap(e.text[n], isVerb ? 'text' : e.mode))
        if (!d) {
            console.warn('unmapped character: ' + e.text[n])
            continue
        }
        for (let j = 0; j < d.polylines.length; j++) {
            const l: number[][] = []
            for (let k = 0; k < d.polylines[j].length; k++) {
                let x = d.polylines[j][k][0]
                let y = d.polylines[j][k][1]
                x /= 16
            }
        }
    }
}

```

```

    y /= 16Đ
    x *= sĐ
    y *= sĐ
    if (e.mode == 'tt') {Đ
        if (d.w > 16) {Đ
            x *= 16 / d.wĐ
        } else {Đ
            x += (16 - d.w) / 2 / 16Đ
        }Đ
    }Đ
    x += x0Đ
    y += e.bbox.y + e.bbox.h / 2Đ
    l.push([x, y])Đ
}Đ
o.push(l)Đ
}Đ
if (e.mode == 'tt') {Đ
    x0 += sĐ
} else {Đ
    x0 += (d.w / 16) * sĐ
}Đ
}Đ
}Đ
}Đ
return oĐ
}Đ
Đ
interface ExportOpt {Đ
    MIN_CHAR_H?: numberĐ
    MAX_W?: numberĐ
    MAX_H?: numberĐ
    MARGIN_X?: numberĐ
    MARGIN_Y?: numberĐ
    SCALE_X?: numberĐ
    SCALE_Y?: numberĐ
    STROKE_W?: numberĐ
    FG_COLOR?: stringĐ
    BG_COLOR?: stringĐ
}Đ
Đ
function nf(x: number): number {Đ
    return Math.round(x * 100) / 100Đ
}Đ
Đ
export interface LaTeXSVG {Đ
    svg: stringĐ

```

```

width: numberĐ
height: numberĐ
}Đ
Đ
export class LaTeXUtils {Đ
  _latex: stringĐ
  _tree: ExprĐ
  _tokens: string[]Đ
  _polylines: number[][][]Đ
Đ
  constructor(latex: string) {Đ
    this._latex = latexĐ
    this._tokens = tokenize(latex)Đ
    this._tree = parse(this._tokens)Đ
    environments(this._tree.chld)Đ
    plan(this._tree)Đ
    flatten(this._tree)Đ
    this._polylines = render(this._tree)Đ
  }Đ
Đ
  private resolveScale(opt?: ExportOpt): number[] {Đ
    if (opt == undefined) {Đ
      return [16, 16, 16, 16]Đ
    }Đ
    let sclx: number = opt.SCALE_X ?? 16Đ
    let scly: number = opt.SCALE_Y ?? 16Đ
Đ
    if (opt.MIN_CHAR_H != undefined) {Đ
      let mh = 0Đ
      for (let i = 0; i < this._tree.chld.length; i++) {Đ
        const c: Expr = this._tree.chld[i]Đ
        if (Đ
          c.type == 'char' ||Đ
          (SYMB[c.text] &&Đ
            (SYMB[c.text].flags.txt || !Object.keys(SYMB[c.text].flags).length))Đ
        ) {Đ
          mh = Math.min(c.bbox.h, mh)Đ
        }Đ
      }Đ
      const s: number = Math.max(1, opt.MIN_CHAR_H / mh)Đ
      sclx *= sĐ
      scly *= sĐ
    }Đ
    if (opt.MAX_W != undefined) {Đ
      const s0 = sclxĐ
      sclx = Math.min(sclx, opt.MAX_W / this._tree.bbox.w)Đ
    }
  }
}

```



```

    sclx *= sclx / s0
  }
  if (opt.MAX_H !== undefined) {
    const s0 = sclx
    sclx = Math.min(sclx, opt.MAX_H / this._tree.bbox.h)
    sclx *= sclx / s0
  }
  const px: number = opt.MARGIN_X ?? sclx
  const py: number = opt.MARGIN_Y ?? sclx
  return [px, py, sclx, sclx]
}
}
polylines(opt?: ExportOpt): number[][] {
  if (!opt) opt = {}
  const polylines: number[][] = []
  const [px, py, sclx, sclx] = this.resolveScale(opt)
  for (let i = 0; i < this._polylines.length; i++) {
    polylines.push([])
    for (let j = 0; j < this._polylines[i].length; j++) {
      const [x, y] = this._polylines[i][j]
      polylines[polylines.length - 1].push([px + x * sclx, py + y * sclx])
    }
  }
  return polylines
}
}
pathd(opt?: ExportOpt): string {
  if (!opt) opt = {}
  let d = ""
  const [px, py, sclx, sclx] = this.resolveScale(opt)
  for (let i = 0; i < this._polylines.length; i++) {
    for (let j = 0; j < this._polylines[i].length; j++) {
      const [x, y] = this._polylines[i][j]
      d += !j ? 'M' : 'L'
      d += `${nf(px + x * sclx)} ${nf(py + y * sclx)} `
    }
  }
  return d
}
}
svg(opt: ExportOpt): LaTeXSVG {
  if (!opt) opt = {}
  const [px, py, sclx, sclx] = this.resolveScale(opt)
  const w = nf(this._tree.bbox.w * sclx + px * 2)
  const h = nf(this._tree.bbox.h * sclx + py * 2)
  let o = `<svg

```

```

    xmlns="http://www.w3.org/2000/svg"
    width="$w" height="$h"
    fill="none" stroke="${opt.FG_COLOR ?? 'black'}" stroke-width="${
    opt.STROKE_W ?? 1
    }"
    stroke-linecap="round" stroke-linejoin="round"
  >
  if (opt.BG_COLOR) {
    o += `<rect x="${0}" y="${0}" width="$w" height="$h" fill="${
    opt.BG_COLOR
    }" stroke="none"></rect>`
  }
  o += `<path d="`
  for (let i = 0; i < this._polylines.length; i++) {
    o += 'M'
    for (let j = 0; j < this._polylines[i].length; j++) {
      const [x, y] = this._polylines[i][j]
      o += nf(px + x * sclx) + ' ' + nf(py + y * scly) + ' '
    }
  }
  o += `"/>`
  o += `</svg>`
  return {
    svg: `data:image/svg+xml;base64,${window.btoa(o)}`,
    width: Math.ceil(w),
    height: Math.ceil(h)
  }
}
}
}
pdf(opt: ExportOpt): string {
  if (!opt) opt = {}
  const [px, py, sclx, scly] = this.resolveScale(opt)
  const width = nf(this._tree.bbox.w * sclx + px * 2)
  const height = nf(this._tree.bbox.h * scly + py * 2)
  let head = `%PDF-1.1\n%%¥±ë\n1 0 obj\n<< /Type /Catalog\n/Pages 2 0
R\n>>endobj
2 0 obj\n<< /Type /Pages\n/Kids [3 0 R]\n/Count 1\n/MediaBox [0 0 ${width}
${height}]\n>>\nendobj
3 0 obj\n<< /Type /Page\n/Parent 2 0 R\n/Resources\n<< /Font\n<< /F1\n<< /Type /
Font
/Subtype /Type1\n/BaseFont /Times-Roman\n>>\n>>\n>>\n/Contents [`
let pdf = ""
let count = 4
for (let i = 0; i < this._polylines.length; i++) {
  pdf += `${count} 0 obj \n<< /Length 0 >>\n stream\n 1 j 1 J ${

```

```

    opt.STROKE_W ?? 1
  } w\n`
  for (let j = 0; j < this._polylines[i].length; j++) {
    const [x, y] = this._polylines[i][j]
    pdf += `${nf(px + x * sclx)} ${nf(height - (py + y * scly))} ${
      j ? 'l' : 'm'
    }`
  }
}
pdf += '\nS\nendstream\nendobj\n'
head += `${count} 0 R `
count++
}
head += ']\n>>\nendobj\n'
pdf += '\ntrailer\n<< /Root 1 0 R \n /Size 0\n >>startxref\n\n%%EOF\n'
return head + pdf
}
}
boxes(opt: ExportOpt): Bbox[] {
  if (!opt) opt = {}
  const [px, py, sclx, scly] = this.resolveScale(opt)
  const bs: Bbox[] = []
  for (let i = 0; i < this._tree.chld.length; i++) {
    const { x, y, w, h } = this._tree.chld[i].bbox
    bs.push({ x: px + x * sclx, y: py + y * scly, w: w * sclx, h: h * scly })
  }
  return bs
}
}
}
box(opt: ExportOpt): Bbox {
  if (!opt) opt = {}
  const [px, py, sclx, scly] = this.resolveScale(opt)
  return {
    x: px + this._tree.bbox.x * sclx,
    y: py + this._tree.bbox.y * scly,
    w: this._tree.bbox.w * sclx,
    h: this._tree.bbox.h * scly
  }
}
}
}
const _impl: Record<string, Function> = {
  tokenize,
  parse,
  environments,
  plan,
  flatten,

```

```
    renderĐ  
  }Đ  
Đ  
export { CONFIG, _impl }Đ
```

File Path: canvas-editor/src/editor/core/draw/particle/latex/utils/hershey.ts

```
interface HersheyEntry {  
  w: number  
  xmin: number  
  xmax: number  
  ymin: number  
  ymax: number  
  polylines: Array<Array<Array<number>>>  
}  
  
const ordR = 'R'.charCodeAt(0)  
  
export function HERSHEY(i: number): HersheyEntry {  
  if (data[i] == null) {  
    compile(i)  
  }  
  return data[i]  
}  
  
function compile(i: number): void {  
  const entry: string = raw[i]  
  if (entry == null) {  
    return  
  }  
  const bound: string = entry.substring(3, 5)  
  const xmin: number = 1 * bound.charCodeAt(0) - ordR  
  const xmax: number = 1 * bound.charCodeAt(1) - ordR  
  const content: string = entry.substring(5)  
  
  const polylines: Array<Array<Array<number>>> = []  
  let ymin = Infinity  
  let ymax = -Infinity  
  let zmin = Infinity  
  let zmax = -Infinity  
  let j = 0  
  while (j < content.length) {  
    const digit: string = content.substring(j, j + 2)  
    if (digit == ' R') {  
      polylines.push([])  
    } else {  
      const x: number = digit.charCodeAt(0) - ordR - xmin  
      const y: number = digit.charCodeAt(1) - ordR  
      ymin = Math.min(y, ymin)  
      ymax = Math.max(y, ymax)  
      zmin = Math.min(x, zmin)  
      zmax = Math.max(x, zmax)  
    }  
  }  
}
```

```

    polylines[polylines.length - 1].push([x, y])
  }
  j += 2
}
data[i] = {
  w: xmax - xmin,
  xmin: xmin,
  xmax: xmax,
  ymin: ymin,
  ymax: ymax,
  polylines: polylines
}
}
const data: Record<number, HersheyEntry> = {}
const raw: Record<number, string> = {
  1: ' 9MWRMNV RRMVV RPSTS',
  2: ' 16MWOMOV ROMSMUNUPSQ ROQSQRUUSVOV',
  3: ' 11MXVNTMRMPNOPOSPURVTVVU',
  4: ' 12MWOMOV ROMRMTNUPUSTURVOV',
  5: ' 12MWOMOV ROMUM ROQSQ ROVUV',
  6: ' 9MVOMOV ROMUM ROQSQ',
  7: ' 15MXVNTMRMPNOPOSPURVTVVUVR RSRVR',
  8: ' 9MWOMOV RUMUV ROQUQ',
  9: ' 3PTRMRV',
  10: ' 7NUSMSTRVPVOTOS',
  11: ' 9MWOMOV RUMOS RQQUV',
  12: ' 6MVOMOV ROVUV',
  13: ' 12LXNMNV RNMRV RVMRV RVMVV',
  14: ' 9MWOMOV ROMUV RUMUV',
  15: ' 14MXRMPNOPOSPURVSVUUVSVPUNSMRM',
  16: ' 10MWOMOV ROMSMUNUQSROR',
  17: ' 17MXRMPNOPOSPURVSVUUVSVPUNSMRM RSTVW',
  18: ' 13MWOMOV ROMSMUNUQSROR RRRUV',
  19: ' 13MWUNSMQMONOOPPTRUSUUSVQVOU',
  20: ' 6MWRMRV RNMVM',
  21: ' 9MXOMOSPURVSVUUVSVM',
  22: ' 6MWNMRV RVMRV',
  23: ' 12LXNMPV RRMPV RRMTV RVMTV',
  24: ' 6MWOMUV RUMOV',
  25: ' 7MWNMRQRV RVMRQ',
  26: ' 9MWUMOV ROMUM ROVUV',
  27: ' 9MWRMNV RRMVV RPSTS',
  28: ' 16MWOMOV ROMSMUNUPSQ ROQSQRUUSVOV',
  29: ' 6MVOMOV ROMUM',
  30: ' 9MWRMNV RRMVV RNVVV'
}

```

31: ' 12MWOMOV ROMUM ROQSQ ROVUV',Ð  
32: ' 9MWUMOV ROMUM ROVUV',Ð  
33: ' 9MWOMOV RUMUV ROQUQ',Ð  
34: ' 20MXRMPNOPOSPURVSVUUVSVPUNSMRM RQQTR RTQQR',Ð  
35: ' 3PTRMRV',Ð  
36: ' 9MWOMOV RUMOS RQQUV',Ð  
37: ' 6MWRMNV RRMVV',Ð  
38: ' 12LXNMNV RNMRV RVMRV RVMVV',Ð  
39: ' 9MWOMOV ROMUV RUMUV',Ð  
40: ' 12MWOMUM RPQTR RTQPR ROVUV',Ð  
41: ' 14MXRMPNOPOSPURVSVUUVSVPUNSMRM',Ð  
42: ' 9MWOMOV RUMUV ROMUM',Ð  
43: ' 10MWOMOV ROMSMUNUQSROR',Ð  
44: ' 10MWOMRQOV ROMUM ROVUV',Ð  
45: ' 6MWRMRV RNMVM',Ð  
46: ' 15MWNONNOMPMQNRPRV RVOVNUMTMSNRP',Ð  
47: ' 13LXRMRV RPONPNSPTTTVSVPTOPO',Ð  
48: ' 6MWOMUV RUMOV',Ð  
49: ' 12LXRMRV RNOOPOSQTSTUSUPVO',Ð  
50: ' 13MXOVQVOROPPNRMSMUNVPVRTVVV',Ð  
200: ' 12MWRMPNOPOSPURVTUUSUPTNRM',Ð  
201: ' 4MWPORMRV',Ð  
202: ' 9MWONQMSMUNUPTROVUV',Ð  
203: ' 15MWONQMSMUNUPSQ RRQSQRUUSVQVOU',Ð  
204: ' 7MWSMSV RSMNSVS',Ð  
205: ' 14MWPMOQQPRPTQUSTURVQVOU RPMTM',Ð  
206: ' 14MWTMRMPNOPOSPURVTUUSTQRPPQOS',Ð  
207: ' 6MWUMQV ROMUM',Ð  
208: ' 19MWQMONOPQQSQUPUNSMQM RQQOROUQVSVUUURSQ',Ð  
209: ' 14MWUPTRRSPROPPNRMTNUPUSTURVPV',Ð  
210: ' 6PURURVSVSURU',Ð  
211: ' 7PUSVRVRUSUSWRY',Ð  
212: ' 12PURPRQSQSPRP RRURVSVSURU',Ð  
213: ' 13PURPRQSQSPRP RSVRVRUSUSWRY',Ð  
214: ' 12PURMRR RSMSR RRURVSVSURU',Ð  
215: ' 17NWPNRMSMUNUPRQRRSRSQUP RRURVSVSURU',Ð  
216: ' 3PTRMRQ',Ð  
217: ' 6NVPMPQ RTMTQ',Ð  
218: ' 10NVQMPNPPQQSQPTNSMQM',Ð  
219: ' 16MWUNSMQMONOPQQTRUSUUSVQVOU RRLRW',Ð  
220: ' 3MWVLNW',Ð  
221: ' 7OVTLRNQPQSRUTW',Ð  
222: ' 7NUPLRNSPSSRUPW',Ð  
223: ' 3PTRLRW',Ð  
224: ' 3LXNRVR',Ð  
225: ' 6LXRNRV RNRVR',Ð

226: ' 6LXNPVP RNTVT',Ð  
227: ' 6MWOOUU RUOUU',Ð  
228: ' 9MWRORU ROPUT RUPOT',Ð  
229: ' 6PURQRRSRSQRQ',Ð  
230: ' 7PUSMRORQSQSPRP',Ð  
231: ' 7PUSNRNRMSMSORQ',Ð  
232: ' 7LXSOVRSU RNRVR',Ð  
233: ' 12MXRLPW RULSW ROPVP ROSVS',Ð  
234: ' 21LXVRURTSSURVOVNUNSORRQSPSNRMPMONOPQSSUUVVV',Ð  
235: ' 20LXNNOQOSNV RVNUQUSVV RNNQOSOYN RNVQUSUVV',Ð  
501: ' 9I[RFJ[ RRFZ[ RMTWT',Ð  
502: ' 24G\\KFK[ RKFTFWGXHYJYLXNWOTP RKPTPWQXRYTYWXYWZT[K',Ð  
503: ' 19H]ZKYIWGUFGQFOGMILKKNKSLVMXOZQ[U[WZYXZV',Ð  
504: ' 16G\\KFK[ RKFRFUGWIXKYNYSXVWXUZR[K',Ð  
505: ' 12H[LFL[ RLFYF RLPTP RL[Y',Ð  
506: ' 9HZLFL[ RLFYF RLPTP',Ð  
507: ' 23H]ZKYIWGUFGQFOGMILKKNKSLVMXOZQ[U[WZYXZVZS RUSZS',Ð  
508: ' 9G]KFK[ RYFY[ RKPYP',Ð  
509: ' 3NVRFR',Ð  
510: ' 11JZVFVVUYTZR[P[NZMYLVLT',Ð  
511: ' 9G\\KFK[ RYFKT RPOY',Ð  
512: ' 6HYLFL[ RL[X',Ð  
513: ' 12F^JFJ[ RJFR[ RZFR[ RZFZ',Ð  
514: ' 9G]KFK[ RKFY[ RYFY',Ð  
515: ' 22G]PFNGLIKKJNJSKVLXNZP[T[VZXXYVZSZNYKXIVGTFFP',Ð  
516: ' 14G\\KFK[ RKFTFWGXHYJYMXOWPTQKQ',Ð  
517: ' 25G]PFNGLIKKJNJSKVLXNZP[T[VZXXYVZSZNYKXIVGTFFP RSWY',Ð  
518: ' 17G\\KFK[ RKFTFWGXHYJYLXNWOTPKP RRPY',Ð  
519: ' 21H\\YIWGTFFPMGKIKLMMNOOUQWRXSYUYXWZT[P[MZKX',Ð  
520: ' 6JZRFR[ RKFYF',Ð  
521: ' 11G]KFKULXNZQ[S[VZXXYUYF',Ð  
522: ' 6I[JFR[ RZFR',Ð  
523: ' 12F^HFM[ RRFM[ RRFW[ R\\FW',Ð  
524: ' 6H\\KFY[ RYFK',Ð  
525: ' 7I[JFRPR[ RZFRP',Ð  
526: ' 9H\\YFK[ RKFYF RK[Y',Ð  
527: ' 9I[RFJ[ RRFZ[ RMTWT',Ð  
528: ' 24G\\KFK[ RKFTFWGXHYJYLXNWOTP RKPTPWQXRYTYWXYWZT[K',Ð  
529: ' 6HYLFL[ RLFXF',Ð  
530: ' 9I[RFJ[ RRFZ[ RJ[Z',Ð  
531: ' 12H[LFL[ RLFYF RLPTP RL[Y',Ð  
532: ' 9H\\YFK[ RKFYF RK[Y',Ð  
533: ' 9G]KFK[ RYFY[ RKPYP',Ð  
534: ' 25G]PFNGLIKKJNJSKVLXNZP[T[VZXXYVZSZNYKXIVGTFFP ROPUP',Ð  
535: ' 3NVRFR',Ð  
536: ' 9G\\KFK[ RYFKT RPOY',Ð



537: ' 6I[RFJ[ RRFZ[' ,Đ  
538: ' 12F^JFJ[ RJFR[ RZFR[ RZFZ[' ,Đ  
539: ' 9G]KFK[ RKFY[ RYFY[' ,Đ  
540: ' 9I[KFYF ROPUP RK[Y[' ,Đ  
541: ' 22G]PFNGLIKKJNJSKVLXNZP[T[VZXXYVZSZNYKXIVGTFFP' ,Đ  
542: ' 9G]KFK[ RYFY[ RKFYF' ,Đ  
543: ' 14G\\KFK[ RKFTFWGXHYJYMXOWPTQKQ' ,Đ  
544: ' 10I[KFRPK[ RKFYF RK[Y[' ,Đ  
545: ' 6JZRFR[ RKFYF' ,Đ  
546: ' 19I[KKKILGMFOFPGQIRMR[ RYKYIXGWFUFTGSIRM' ,Đ  
547: ' 21H\\RFR[ RPKMLLMKOKRLTMUPVTVWUXTYRYOXMWLTCPK' ,Đ  
548: ' 6H\\KFY[ RK[YF' ,Đ  
549: ' 18G]RFR[ RILJLKMLQMSNTQUSUVTWSXQYMZL[L' ,Đ  
550: ' 17H\\K[O[LTKPKLLINGQFSFVGXIYLYPXTU[Y[' ,Đ  
551: ' 20G[G[IZLWOSSLV FV[UXSUQSNQLQKRKTLVNXQZT[Y[' ,Đ  
552: '  
41F]SHTITLSPRSQUOXMZK[J[IZIWJRKOLMNJPHRGUFXFZG[I[KZMYNWOTP  
RSPTPWQXRYTYWXYWZU[R[PZOX' ,Đ  
553: ' 24H\\TLTMUNWNMZYKZIYGVFTFQGOIMLLNKRKVLVMZO[Q[TZVXWV' ,Đ  
554: ' 35G^TFRGQIPMOSNVMXKZI[G[FZFXGWIWKXMZP[S[VZXXZT[O[KZHYGVFT  
FRHRJSMUPWRZT\\U' ,Đ  
555: ' 28H\\  
\\VJVKWLYLZKZIYGVFRFOGNINLONPOSPPPMQLRKTWLYMZP[S[VZXXYV' ,Đ  
556: ' 28H\\RLPLNKMINGQFTFXG[G]F RXGVNTTRXPZN[L[JZIXIVJULUNV RQPZP' ,Đ  
557: '  
29G^G[IZMVPQQNRJRGQFPFOGNINLONQOUOXNYMZKZQYVXXVZS[O[LZJXIVIT' ,Đ  
558: ' 38F^MMKLJJJIKGMFNFPGQIQKPNULYJ[H[GZGX RMRVOXN[L]J^H^G]F\\  
\\FZHXLVRUWUZV[W[YZZY\\V' ,Đ  
559: ' 25IZWVUTSQROQLQIRGSFUFVGWIWLVQTVSXQZO[M[KZJXJVKUMUOV' ,Đ  
560: ' 25JYT^R[PVOPOJPGRFTFUGVJVMURR[PaOdNfLgKfKdLaN^P\\SZWX' ,Đ  
561: ' 39F^MMKLJJJIKGMFNFPGQIQKPNULYJ[H[GZGX R^H^G]F\\  
\\FZGXIVLTNROPO RROSQSXTZU[V[XZYY[V' ,Đ  
562: ' 29I\\  
\\MRORSQVOXMYKYHXFVFUGTISNRSQVPXNZL[J[IZIXJWLWNXQZT[V[YZ[X' ,Đ  
563: ' 45@aEMCLBJBICGEFFFHGIIKHPGTE[ RGTJLLHMGOFPFGRGSISKRPQTO[  
RQTTLVHWGYFZF\\G]I]K\\PZWZZ[\\^Z\_YaV' ,Đ  
564: ' 32E]JMH LGJGIHGJFKFMGNINKMPLTJ[ RLTOLQHRGTFVFXGYIYKXPVWVZ  
W[X[ZZ[Y]V' ,Đ  
565: '  
29H]TFQGOIMLLNKRKVLVMZO[Q[TZVXXUYSZOKYHXGVFTFRHRKSNUQWSZU\\  
\\V' ,Đ  
566: ' 31F\_SHTITLSPRSQUOXMZK[J[IZIWJRKOLMNJPHRGUFZF\\G]H^J^M]O\\  
\\PZQWQUPTO' ,Đ  
567: ' 32H^ULTNSOQPOPNNNLOIQGTFWFYGGIZMYPWSSWPYNZK[I[HZHXIWKW  
MXPZS[V[YZ[X' ,Đ  
568: ' 38F\_SHTITLSPRSQUOXMZK[J[IZIWJRKOLMNJPHRGUFYF[G\\H]J]M\\  
\\O[PYQVQSPTQUSUXVZX[ZZ[Y]V' ,Đ

569: ' 28H\  
\H[JZLXOTQQSMTJTGSFRFQGPIPKQMSOVQXSYUYWXYWZT[P[MZKXJVJT',Ð  
570: ' 25H[RLPLNKMINGQFTFXG[G]F RXGVNTTRXPZN[L[JZIXIVJULUNV',Ð  
571: ' 33E]JMHLGJGIHGJFKFMGNINKMOLRKVKXLZN[P[RZSYUUXMZ  
RXMWQVWVZW[X[ZZ[Y]V',Ð  
572: ' 32F]KMILHJHIIGKFLFNGOIOKNOMRLVLYM[O[QZTWVTPYPMZIZGYFXFWGV  
IVKWNYP[Q',Ð  
573: ' 25C\_HMFLEJEIFGHFIFKGLILLK[ RUFK[ RUFS[ RaF\_G\\JYNVTS['',Ð  
574: ' 36F^NLLLKKKILGNFPFRGSISLQUQXRZT[V[XZYXYVXUVU R]I]G\  
\FZFXGVITLPUNXLZJ[H[GZGX',Ð  
575: ' 38F]KMILHJHIIGKFLFNGOIOKNOMRLVLXMZN[P[RZTXVUWSYM  
R[FYMWVT]RbPfNgMfMdNaP^S[VY[V',Ð  
576: ' 40H]ULTNSOQPOPNNLOIQGTFWFYGZIZMYPWTTWPZN[K[JZJXKWNWPX  
QYR[R^QaPcNfLgKfKdLaN^Q[TYZV',Ð  
583: ' 9I[JFR[ RZFR[ RJFZF',Ð  
601: ' 18\\XMX[ RXPVNTMQMONMPLSLUMXOZQ[T[VZXX',Ð  
602: ' 18H[LFL[ RLPNNPMSMUNWPXSXUWXUZS[P[NZLX',Ð  
603: ' 15I[XPVNTMQMONMPLSLUMXOZQ[T[VZXX',Ð  
604: ' 18\\XFX[ RXPVNTMQMONMPLSLUMXOZQ[T[VZXX',Ð  
605: ' 18I[LSXSXQWOVNTMQMONMPLSLUMXOZQ[T[VZXX',Ð  
606: ' 9MYWFUFSGRJR[ ROMVM',Ð  
607: ' 23\\XMX]W`VaTbQbOa RXPVNTMQMONMPLSLUMXOZQ[T[VZXX',Ð  
608: ' 11\\MFM[ RMQPNRMUMWNXQX['',Ð  
609: ' 9NVQFRGSFREQF RRM[R',Ð  
610: ' 12MWRFSGTFSERF RSMS^RaPbNb',Ð  
611: ' 9IZMFM[ RWMMW RQSX['',Ð  
612: ' 3NVRFR['',Ð  
613: ' 19CaGMG[ RGQJNLMOQMNRQR[ RRQUNWMZM\\N]Q][',Ð  
614: ' 11\\MMM[ RMQPNRMUMWNXQX['',Ð  
615: ' 18\\QMONMPLSLUMXOZQ[T[VZXXYUYSXPVNTMQM',Ð  
616: ' 18H[LMLb RLPNNPMSMUNWPXSXUWXUZS[P[NZLX',Ð  
617: ' 18\\XMXb RXPVNTMQMONMPLSLUMXOZQ[T[VZXX',Ð  
618: ' 9KXOMO[ ROSPPRNTMWM',Ð  
619: ' 18J[XPWNTMQMNMPNRPSUTWUXWXXWZT[Q[NZMX',Ð  
620: ' 9MYRFRWSZU[W[ ROMVM',Ð  
621: ' 11\\MMMWNZP[S[UZXW RXXM['',Ð  
622: ' 6JZLMR[ RXMR['',Ð  
623: ' 12G]JMN[ RRMN[ RRMV[ RZMV['',Ð  
624: ' 6J[MMX[ RXMM['',Ð  
625: ' 10JZLMR[ RXMR[P\_NaLbKb',Ð  
626: ' 9J[XMM[ RMMXM RM[X['',Ð  
627: ' 24H]QMONMPLRKUKXLZN[P[RZUWWTYPZM RQMSMTNUPWXXZY[Z['',Ð  
628: ' 31I\\UFSGQIOMNPMTLZKb RUFWFYHYKXMWNUORO  
RROTPVRWTWWVYUZS[Q[OZNYMV',Ð  
629: ' 17I\\JPLNNMOMQNRORSVR[ RZMYPXRR[P\_Ob',Ð  
630: ' 24I[TMQMONMPLSLVMYNZP[R[TZVXWUWRVOTMRKQIQGRFTFVGXI',Ð

631: ' 19JZWOVNTMQMONOPPRSS RSSOTMVMXNZP[S[UZXW',Ð  
632: ' 23JYTFRGQHQRJUKXK RXKTMQONRMUMWNYP[S]T\_TaSbQbP',Ð  
633: ' 19H\IQJOLMNMONOPNTL[ RNTPPRNTMVMXOXRWWTb',Ð  
634: ' 27G\  
\HQIOKMMMNNNPMUMXNZO[Q[SZUWVUWRXMXJWGUFsFRHRJSMUPWRZT',Ð  
635: ' 9LWRMPTOXOZP[R[TYUW',Ð  
636: ' 19I[OMK[ RYNXMWMUNQROSNS RNSPTQUSZT[U[VZ',Ð  
637: ' 9JZKFMFOGPHX[ RRML['',Ð  
638: ' 21H[OMIb RNQMVMYO[Q[SZUXWT RYMWTVXVZW[Y[[Y\W',Ð  
639: ' 14I[LMOMNSMXL[ RYMXPWRUURXOZL['',Ð  
640: ' 29JZTFRGQHQRJUKXK RUKRLPMOOOQQSTTVT RTTPUNVMXMZO\  
\S^T\_TaRbPb',Ð  
641: ' 18J[RMPNNPMSMVNYOZQ[S[UZXWXXUXRWOVNTMRM',Ð  
642: ' 13G]PML[ RUMVSWXX[ RIPKNNM[M',Ð  
643: ' 19I[MSMVNYOZQ[S[UZXWXXUXRWOVNTMRMPNNPMSIb',Ð  
644: ' 18I][MQMONMPLSLVMYNZP[R[TZVXWUWRVOUNSM',Ð  
645: ' 8H\SMP[ RJPLNOMZM',Ð  
646: ' 16H\IQJOLMNMONOPMVMYO[Q[TZVXXTYPYM',Ð  
647: ' 21G]ONMOKQJTJWKYLZN[Q[TZWXUYZRZOXMVMTORSPXMB',Ð  
648: ' 14I[KMMMOOU`WbYb RZMYOWRM]K`Jb',Ð  
649: ' 20F]VFNb RGQHOJMLMMNMPLULXMZO[Q[TZVXXUZP[M',Ð  
650: ' 23F]NMLNJQITIWIJZK[M[OZQW RRSQWRZS[U[WZYWZTQYNXM',Ð  
651: ' 22L\UUTSRRPRNSMTLVLXMZO[Q[SZTXVRUWUZV[W[YZZY\W',Ð  
652: ' 23M[MVOSRNSLTITGSFQGPIOMNTNZO[P[RZTXUUURVWWYV',Ð  
653: ' 14MXTTSSRQROSNTMVMXNZP[S[VYXV',Ð  
654: ' 24L\UUTSRRPRNSMTLVLXMZO[Q[SZTXZF RVRUWUZV[W[YZZY\W',Ð  
655: ' 17NXOYQXRWSUSSRRQROSNUNXOZQ[S[UZVYXV',Ð  
656: ' 24OWOVSQUNVLWIWGVFTGSIQQNZKaJdJfKgMfNcOZP[R[TZUYWV',Ð  
657: ' 28L[UUTSRRPRNSMTLVLXMZO[Q[SZTY RVRTYPdOfMgLfLdMaP^S\U[XY[V',Ð  
658: ' 29M\  
\MVOSRNSLTITGSFQGPIOMNSM[ RM[NXOVQSSRURVSVUUXUZV[W[YZZY\W',Ð  
659: ' 16PWSMSNTNTMSM RPVRRPXPZQ[R[TZUYWV',Ð  
660: ' 20PWSMSNTNTMSM RPVRRldKflgHfHdlaL^O\Q[TYWV',Ð  
661: ' 33M[MVOSRNSLTITGSFQGPIOMNSM[ RM[NXOVQSSRURVSVUTVQV  
RQVSWTZU[V[XZYY[V',Ð  
662: ' 18OWOVQSTNULVIVGUFSGRIQMPTPZQ[R[TZUYWV',Ð  
663: ' 33E^EVGSIRJSJTIXH[ RIXJVLsnRPRQSQTpxO[ RPXQVSSURWRXSXUWX  
WZX[Y[[Z\Y^V',Ð  
664: ' 23J\JVLsnROSOTNXM[ RNXOVQSSRURVSVUUXUZV[W[YZZY\W',Ð  
665: ' 23LZRRPRNSMTLVLXMZO[Q[SZTYUWUUTSRRQSQRWTXWXYWZV',Ð  
666: ' 24KZKVMSNQMUGg RMUNSPRRRTSUUUWTYSZQ[ RMZO[R[UZWYZV',Ð  
667: ' 27L[UUTSRRPRNSMTLVLXMZO[Q[SZ RVRUUSZPaOdOfPgRfScS\U[XY[V',Ð  
668: ' 15MZMVOSPQPSSSTTTVSYSZT[U[WZXYZV',Ð  
669: ' 16NYNVPSQQQSSVTXTZR[ RNZP[T[VZWYYV',Ð  
670: ' 16OXOVQSSO RVFPXPZQ[S[UZVYXV RPNWN',Ð  
671: ' 19L[LVNRLXLZM[O[QZSXUU RVRTXTZU[V[XZYY[V',Ð

672: ' 17L[LVNRMWMZN[O[RZTXUUUR RURVVWWYW[V',Ð  
673: ' 25I^LRJTIWIYJ[L[NZPX RRRPXPZQ[S[UZWXXUXR RXRYVZW\\W^V',Ð  
674: ' 20JZJVL SNRPRQSQR[U[XYZV RWSVRTRSSOZN[L[KZ',Ð  
675: ' 23L[LVNRLXLZM[O[QZSXUU RVRP dOfMgLfLdMaP^S\\U[XY[V',Ð  
676: ' 23LZLVNSPRRRTTTVSXQZN[P\\Q^QaPdOfMgLfLdMaP^S\\WYZV',Ð  
677: ' 22J\\K[NZQXSVUSWOXKXIWGUFSGRHQJPOPTQXRZT[V[XZYY',Ð  
683: '  
26I[WUWRVOUNSMQMONMPLSLVMYNZP[R[TZVXWUXPXKWHVGTFRFPGNI',Ð  
684: ' 16JZWNUMRMPNPNMSMVNYOZQ[T[VZ RMTUT',Ð  
685: ' 23J[TFRGPJOLNOMTMXNZO[Q[SZUWVUWRXMXIWGVFTF RNPWP',Ð  
686: ' 21H\\VFNb RQMNNLPKSKVLXNZQ[S[VZXXYUYRXPVNSMQM',Ð  
687: ' 16I[XOWNTMQMNNMOLQLSMUOWSZT\\T^S\_Q\_',Ð  
700: ' 18H\\QFNGLJKOKRLWNZQ[S[VZXWYRYOXJVGSFQF',Ð  
701: ' 5H\\NJPISFS[,Ð  
702: ' 15H\\LKLJMHNGPFTFVGWHXJXLWNUQK[Y[,Ð  
703: ' 16H\\MFXFRNUNWOXPYSYUXXVZS[P[MZLYKW',Ð  
704: ' 7H\\UFKTZT RUFU[,Ð  
705: ' 18H\\WFMFLOMNPMSMVNX PYSYUXXVZS[P[MZLYKW',Ð  
706: ' 24H\\XIWGTFRFOGMJLOLTMXOZR[S[VZXXYUYTXQVOSNRNOOMQLT',Ð  
707: ' 6H\\YFO[ RKFYF',Ð  
708: ' 30H\\PFMGLILKMMONSOVPXRYTYWXYWZT[P[MZLYKWKTLRNPQOUNWMX  
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709: ' 24H\\XMWPURRSQSNRLPKMKLLINGQFRFUGWIXMXRWWUZR[P[MZLX',Ð  
710: ' 6MWR YQZR[SZRY',Ð  
711: ' 9MWSZR[QZRYSZS\\R^Q\_',Ð  
712: ' 12MWRMQNROS NRMR RRYQZR[SZRY',Ð  
713: ' 15MWRMQNROS NRMR RSZR[QZRYSZS\\R^Q\_',Ð  
714: ' 9MWR FRT RRYQZR[SZRY',Ð  
715: ' 21I[LKLJMHNGPFTFVGWHXJXLWNVORQRT RRYQZR[SZRY',Ð  
716: ' 3NVRFRM',Ð  
717: ' 6JZNFNM RVFVM',Ð  
718: ' 14KYQFOGNINKOMQNSNUMVKVIUGSFQF',Ð  
719: ' 27H\\PBP\_ RTBT\_  
RYIWGTFFPMGKIKKLMMNOOUQWRXSYUYXWZT[P[MZKX',Ð  
720: ' 3G][Bib',Ð  
721: ' 11KYVBTD RGP KOPOTPYR]T`Vb',Ð  
722: ' 11KYNBPDRGTKUPUTTYR]P`Nb',Ð  
723: ' 3NVRBRb',Ð  
724: ' 3E\_IR[R',Ð  
725: ' 6E\_RIR[ RIR[R',Ð  
726: ' 6E\_IO[O RIU[U',Ð  
727: ' 6G]KKYY RYKKY',Ð  
728: ' 9JZRLRX RMOWU RWOMU',Ð  
729: ' 6MWRQQRRSSRRQ',Ð  
730: ' 8MWSFRGQIQKRLSKRJ',Ð  
731: ' 8MWRHQGRFSGSIRKQL',Ð

732: ' 9E\_UMXP[RXTUW RIR[R',Ð  
733: ' 12H]SBLb RYBRb RLOZO RKUYU',Ð  
734: ' 35E\_\\O\\N[MZMYNXPVUTXRZP[L[JZiyHWHUISJRQNRMSKSIRGPFNGMIMK  
NNPQUXWZY[[[\\Z\\Y',Ð  
735: ' 28G]IJKKOKUJYI[ R[IZKYOYUZY[[ RIJKJOKUKYJ[I RI[KZOYUYYZ[[',Ð  
737: ' 6KYOBO[ RUBU[,Ð  
738: ' 6F^RBR[ RI[[[,Ð  
739: ' 4F^BI[[[,Ð  
740: ' 18E\_RIQJRKSJRI RIYHZI[JZiy R[YZZ[[\\Z[Y',Ð  
741: ' 33F^RHNLKPJSJUKWMXOXQWRU RRHVLPZSZUYWWXUXSWRU  
RRUQYP\\ RRUSYT\\ RP\\T\\',Ð  
742: ' 26F^RNQKPINHMHKIJJKJOKRLTNWR\\ RRNSKTIVHWHYIZKZOYRXTVWR\\',Ð  
743: ' 20F^RGPJLOIR RRG TJXO[R RIRLUPZR] R[RXUTZR]',Ð  
744: ' 48F^RTTWVXXXZW[U[SZQXPVPSQ RSQUOVMVKUISHQHOKNKNMOOQQ  
RQQNPLPJQISIUJWLXNXPWRT RRTQYP\\ RRTSYT\\ RP\\T\\',Ð  
745: ' 55F^RRR[Q\\ RRVQ\\ RRIQHONNINKONRR RRISHUHVIVKUNRR  
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746: ' 55F^ISJSLTMVMXLZ RISIRJQLQMRNTNWMYLZ RRGPIOLOOQUQXPZR\\  
RRGTIULUOSUSXTZR\\ R[S[RZQXQWRVTVWWYXZ R[SZSXTWVWXXZ RKVYV',Ð  
750: ' 18PSSRRSQSPRPQQPRPSQSSRUQV RQQQRRRRQQQ',Ð  
751: ' 16PTQPPQPSQTSTTSTQSPQP RRQQRSSRRQ',Ð  
752: ' 9NVPOTU RTOPU RNRVR',Ð  
753: ' 28MWRKQMOPMR RRKSMUPWR RRMOQ RRMUQ RROPQ RROTQ  
RQQSQ RMRWR',Ð  
754: ' 26MWMRMQNOONQMSMUNVOWQWR RPNTN ROOUO RNPVP RNQVQ  
RMRWR',Ð  
755: ' 14LRLFLRRRLF RLIPQ RLLOR RLOMQ',Ð  
756: ' 10MWRKQMOPMR RRKSMUPWR',Ð  
757: ' 11MWWRWQVOUNSMQMONNOMQMR',Ð  
758: ' 13G]JR]P\\MZJWHTGPGMHJJHMGPR',Ð  
759: ' 11MWMRMSNUOVQWSWUVVUWSWR',Ð  
760: ' 7LXLPNRQSSSVRXP',Ð  
761: ' 6RURUTTUTPRO',Ð  
762: ' 7RVRRUPVNVLUKTK',Ð  
763: ' 7NRRROPNNNLOKPK',Ð  
764: ' 21MWWHVGTGFQFOGNHJMMLNNOOUSVTWVWXVZU[S\\P\\N[MZ',Ð  
765: ' 21G]IWHVGTGQHOINKMMMONPOTUUVWWYV[V\\U]S]P\\N[M',Ð  
766: ' 31G]RRTUUVWWYV[V\\U]S]Q\\  
\\O[NYMWMUNTOPUOVMMWKWIVHUGSGQHOINKMMMONPORR',Ð  
767: ' 22H\\KFK[ RHF[FQP[Z RZV[Y\\[ RZVZY RWYZY RWYZZ\\[,Ð  
768: ' 30KYUARBPCNELHKLKRLUNWQXSXVWXUYR  
RKPLMNKQJSJVKXMPYVXZV]T\_R`Oa',Ð  
796: ' 3>f>RfR',Ð  
797: ' 3D`D``D',Ð  
798: ' 3RRR>Rf',Ð  
799: ' 3D`DD``',Ð

800: ' 3D`DR`R',Ð  
801: ' 3F^FY^K',Ð  
802: ' 3KYK^YF',Ð  
803: ' 3RRRDR`,Ð  
804: ' 3KYKFY^',Ð  
805: ' 3F^FK^Y',Ð  
806: ' 3KYKRYR',Ð  
807: ' 3MWMWWM',Ð  
808: ' 3RRRKRY',Ð  
809: ' 3MWMWWM',Ð  
810: ' 8GRRGPGMHJJHMGPR',Ð  
811: ' 8GRGRGTHWJZM\`P]R]',Ð  
812: ' 8R]R]T]W\`ZZ\`W]T]R',Ð  
813: ' 8R]]R]P\`MZJWHTGRG',Ð  
814: ' 9D`DOGQKSPTTTYQ`O',Ð  
815: ' 9PUUDSGQKPPPTQYS]U`,Ð  
816: ' 9OTODQGSKTPTTSYQ]O`,Ð  
817: ' 9D`DUGSKQPPTPYQ]S`U',Ð  
818: ' 5KYRJYNKVRZ',Ð  
819: ' 5JZJRNVYZR',Ð  
820: ' 5KYKVKNYVYN',Ð  
821: ' 5JZLXJPZTXL',Ð  
822: ' 23JZJ]L]O\`Q[TXUVVSVOUTJSIQIPJOLNONSOVPXS[U\`X]Z]',Ð  
823: ' 23I]]Z]X\`U[SPVOSNONLOJPIQISJTLUOVSVVUXT[Q\`O]L]J',Ð  
824: ' 23JZZGXGUHSIPLONNQNUOXQZQ[S[TZUXVUVQUNTLQIOHLGJG',Ð  
825: ' 23G[GJGLHOIQLTNUQVUVXUQT[S[QZPXOUNQNNOLPISHUGXGZ',Ð  
826: ' 21E[EPFRHTJUMVQVUUXSZP[NZLWLSMQNNPLSKVKYL\`M^',Ð  
827: ' 19EYETHVKWPWSVVTXQYNYLXKVKSLPNNQMTMYN\`P\_',Ð  
828: ' 26OUQOOQOSQUSUUSUQSOQO RQPPQPSQTSTTSTQSPQP  
RRQQRSSRRQ',Ð  
829: ' 11RWRMSMUNVOWQWSVUUVSWRW',Ð  
830: ' 9D`DRJR RORUR RZR`R',Ð  
831: ' 5D`DUDO`O`U',Ð  
832: ' 6JZRDJR RRDZR',Ð  
833: ' 9D`DR`R RJYZY RP`T`,Ð  
834: ' 9D`DR`R RDRRb R`RRb',Ð  
840: ' 18KYQKNLLNKQKSLVNXQYSYVXXVYSYQXNVLSKQK',Ð  
841: ' 6LXLLLXXXXLLL',Ð  
842: ' 5KYRJKVYVRJ',Ð  
843: ' 6LXRHLRR\`XRRH',Ð  
844: ' 12JZRIPOJOOSMYRUWYUSZOTORI',Ð  
845: ' 6KYRKRY RKRYR',Ð  
846: ' 6MWMWWM RWMMW',Ð  
847: ' 9MWRLRX RMOWU RWOMU',Ð  
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851: ' 27NVNNNVVVVNNN ROOOU RPOPU RQOQU RRORU RSOSU RTOTU  
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852: ' 17MWRLMUWURL RROOT RROUT RRRQT RRRST',Ð  
853: ' 17LULRUWUMLR RORTU RORTO RRRTS RRRTQ',Ð  
854: ' 17MWRXWOMORX RRUUP RRUOP RRRSP RRRQP',Ð  
855: ' 17OXXROMOWXR RURPO RURPU RRRPQ RRRPS',Ð  
856: ' 22LXLRLNWXPVWRL RRRRL RRRLP RRRNW RRRVW RRRXP',Ð  
857: ' 11RYRKRY RRKYNRQ RSMVNSO',Ð  
860: ' 13MWRLRX ROOUO RMUOWQXSXUWWU',Ð  
861: ' 11LXLRLX RLQMOWOXQ RPWTW',Ð  
862: ' 14KYMNWX RWNMX ROLLOKQ RULXOYQ',Ð  
863: ' 18I[NII[ RVI[[ RMM[[ RWMI[ RNIVI RMMWM',Ð  
864: ' 21I[RGRV RMJWP RWJMP RIVL\\ R[VX\\ RIV[V RL\\X\\',Ð  
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866: ' 14LXLPLPLPTPTPTXTXTTXXPTPTLPL',Ð  
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870: ' 64JZRMRS RRSQ\\ RRS\\ RQ\\S\\ RRMQJPHNG RQJNG RRMSJTHVG  
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871: ' 94JZRIRK RRNRP RRSRU RRYQ\\ RRY\\ RQ\\S\\ RRGQIPJ RRGSIJ  
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872: ' 40JZRYQ\\ RRY\\ RQ\\S\\ RRYUZXZZXZUYTWTYRZOYMWLUMVJUHSGQG  
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874: ' 15I[IPKR RLKNP RRGRO RXKVP R[PYR',Ð  
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903: ' 18KYQKNLLNKQKSLVNXQYSYVXXVYSYQXNVLSKQK',Ð  
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999: ' 3JZJZJ',Ð  
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1010: ' 19LXSKSURWQx RTKTUSWQXPxNWMUNTOUNV RQKVx',Ð  
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RTXYx',Ð  
1012: ' 14KXOKOX RPKPx RMKRK RMXWXWTVx',Ð  
1013: ' 30\\MKMx RNNRx RNKRu RWKRx RWKWx RXKXX RKKNK RWKZK  
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1014: ' 21JZNKNx ROMVx ROKVV RVKVx RLKOK RTKXX RLXPx',Ð  
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1019: ' 32KZVMWKWOVMULSKQKOLNMNOOPQQTRVSWT  
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1021: ' 20J[NKNUOWQXTXVWWUWK ROKOUPWQx RLKQK RUKYx',Ð  
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1024: ' 21KZNKVx ROKWx RWKNx RLKQK RTKYx RLXQx RTXYx',Ð  
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1030: ' 15KYRKLx RRMWx RRKXX RMWVW RLXXX',Ð



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1070: ' 16KZTKPX RUKQX RPKNNOKZKYNYK RNXSX',Ð  
1071: ' 20JPKMUMWOXSXUWVUYK RQKNUNWOX RNKSK RWK[K',Ð  
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1103: ' 24LXVQUQURVRVQUPSOQOOPNRNUOWQXSXUWV  
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1104: ' 32L[VKVX RWKWX RVRUPSOQOOPNRNUOWQXSXUWV  
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1106: ' 20LWTKULUMVMVLTKRKPMXP RPKQMQX RNOSO RNXSX',Ð  
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1179: ' 27J[WKQKOLNNNX RQKPLONOX RUKVLVX RWKWX RLOVO RLXQX  
RTXYX',Ð  
1180: ' 48F\_PKQLQMRMLPKMKKLJNJX RMKLLKNKX RYKZL[L[KUKSLRNRX  
RUKTLSNSX RZOZX R[O[X RHO[O RHXMX RPXUX RXX]X',Ð  
1181: ' 46F\_PKQLQMRMLPKMKKLJNJX RMKLLKNKX R[KUKSLRNRX  
RUKTLSNSX RYKZLZX R[K[X RHOZO RHXMX RPXUX RXX]X',Ð  
1182: ' 12NWRORX RSOSX RPOSO RPXUX',Ð  
1184: ' 21LXVPTOROPPOQNSNUOWQXSXUW RROPQOSOVQX ROSSS',Ð  
1185: ' 35LYSKQLPMOONRNUOWPXRXTWUVVTWQWNVLUKSK  
RSKQMPPOSOVPX RRXTVUTVPVMUK ROQVQ',Ð  
1186: ' 34KZTKQ\ RUKP\ RQONPMRMUNWQXTXWWXUXRWPTOQO  
RQOOPNRNUOWQX RTXVWWUWRVPTO',Ð  
1187: ' 22LXUPVRVQUPSOQOOPNRNTOVRX RQOOQOTPVRSYS[R\P\',Ð  
1191: ' 45I[VKWLXLVKSQQLPMOOLYK[J\ RSKQMPOMYL[J\H\H[I\  
RZK[L[KYKWLVSNSYR[Q\ RYKXLWNTYS[Q\O\O[P\ RLOYO',Ð  
1192: ' 38IZVKWLXLXKSKQLPMOOLYK[J\ RSKQMPOMYL[J\H\H[I\  
RVOTVTWUXWXXWYU RWOUVUWVX RLOWO',Ð  
1193: ' 38IZVKWL RXKSKQLPMOOLYK[J\ RSKQMPOMYL[J\H\H[I\  
RWKTVTWUXWXXWYU RXKUVUWVX RLOVO',Ð  
1194: ' 63F^SKTLTM RULSKPKNLMMLOIYH[G\ RPKNMMOJYI[G\E\E[F\ RZK[L\L\  
\KWKUL RTMSOPYO[N\ RWKUMTOQYP[N\L\L[M\ RZOXVXWYX[X\W]U  
R[OYVYWZX RIO[O',Ð  
1195: ' 63F^SKTLTM RULSKPKNLMMLOIYH[G\ RPKNMMOJYI[G\E\E[F\ RZK[L R\  
\KWKUL RTMSOPYO[N\ RWKUMTOQYP[N\L\L[M\ R[KXVXWYX[X\W]U R\  
\KYVYWZX RIOZO',Ð  
1196: ' 20MWNROPPOROSPSRRURWSX RQORPRRQUQWRXTXUWVU',Ð  
1200: ' 28LYQKOLNONTOWQXTXVWWTWOVLTKQK RQKPLOOOTPWQX  
RTXUWVTVOULTK',Ð  
1201: ' 10LYPNSKXSX RRLRX ROXVX',Ð  
1202: ' 35LYOMONNNNMOLQKTKVLWNVPTQQROSNNUNX RTKULVNUPTQ  
RNWOVPVSWVWWWV RPSXVXWVWU',Ð  
1203: ' 39LYOMONNNNMOLQKTKVLWNVPTQ RTKULVNUPTQ  
RRQTQVRWTWUVWTXQXOWNVNUOUOV RTQURVTUUWWTX',Ð  
1204: ' 13LYSMSX RTKTX RTKMTXT RQXVX',Ð  
1205: ' 33LYOKNQ ROKVK ROLSLVK

RNQOPQOTOVPWRWUVWTXQXOWNVNUOUOV RTOUPVRVUUWTX',Ð  
1206: ' 36LYVMVNWWMVLTKRKPLMNPNUOWQXTXVWWUWSVQTPQPNR  
RRKPMOPOUPWQX RTXUWVUVSUQTP',Ð  
1207: ' 22LYNKNO RVMRTPX RWKTQQX RNMPKRKUM RNMPLRLUMVM',Ð  
1208: ' 51LYQKOLNNOPQQTQVPWNVLTKQK RQKPLONPPQQ RTQUPVNULTK  
RQQORNTNUOWQXTXVWWUWTVRTQ RQQPROTOUPWQX RTXUWVUVTURTQ',Ð  
1209: ' 36LYOVOUNUNVOWQXSXUWVWVSWNVLTQKQKOLNNNPORQSTSWQ  
RSXUVVSVNULTK RQKPLONOPPRQS',Ð  
1210: ' 6NVRVQWRXSWRV',Ð  
1211: ' 8NVSWRXQWRVSWSYQ',Ð  
1212: ' 12NVROQPRQSPRO RRVQWRXSWRV',Ð  
1213: ' 14NVROQPRQSPRO RSWRXQWRVSWSYQ',Ð  
1214: ' 15NVRKQLRSSLRK RRLRO RRVQWRXSWRV',Ð  
1215: ' 29LYNNONONONNOLQKTKVLWNWOVQSRRSRTST RTKVMVPUQSR  
RRWRXSXSWRW',Ð  
1216: ' 6OVRKRP RSKRP',Ð  
1217: ' 12LXOKOP RPKOP RUKUP RVKUP',Ð  
1218: ' 10MWQKPLPNQOSOTNTLSKQK',Ð  
1219: ' 9MWRJRP ROKUO RUKOO',Ð  
1220: ' 3KZXHM',Ð  
1221: ' 16MWUHSJQMPPTQWSZU\\ RSJRLQPQTRXSZ',Ð  
1222: ' 16MWOHQJSMTPTTSWQZO\\ RQJRLSPSTRXQZ',Ð  
1223: ' 12MWPHP\\ RQH\\ RPHUH RP\\U',Ð  
1224: ' 12MWSHS\\ RTHT\\ ROHTH RO\\T',Ð  
1225: ' 38LWSHQIPJPLRNSP RQIPL RSNRQ RPJQLSNSPRQPRRSSTSVQXPZ  
RSSV RPXQ[ RSTRVPXPZQ[S',Ð  
1226: ' 38MXQHSITJTLRNQP RSITL RQNRQ RTJSLQNQPRQTRRSQTQVSXTZ  
RRSQV RTXS[ RQTRVXTZS[Q',Ð  
1227: ' 4MWITHPRT',Ð  
1228: ' 4MWPHTRP',Ð  
1229: ' 3OURHR',Ð  
1230: ' 6MWPHP\\ RTHT',Ð  
1231: ' 3I[LRXR',Ð  
1232: ' 6I[RLRX RLRXR',Ð  
1233: ' 9JZRMRX RMRWR RMXWX',Ð  
1234: ' 9JZRMRX RMMWM RMRWR',Ð  
1235: ' 6JZMMWW RWMMW',Ð  
1236: ' 6NVRQQRRSSRRQ',Ð  
1237: ' 15I[RLQMRNSMRL RLRXR RRVQWRXSWRV',Ð  
1238: ' 6I[LPXP RLTXT',Ð  
1239: ' 9I[WLMX RLPXP RLTXT',Ð  
1240: ' 9I[LNXN RLRXR RLVXV',Ð  
1241: ' 4JZWLMRWX',Ð  
1242: ' 4JZMLWRMX',Ð  
1243: ' 10JZWKMOWS RMTWT RMXWX',Ð  
1244: ' 10JZMKWOMS RMTWT RMXWX',Ð

1245: ' 21H[YUWUUTTSRPQOONNNLOKQKRLTNUOUQTRSTPUOWNYN',Ð  
1246: ' 16JZLTLMPOPUSWSXR RLRMQOQUTWTXRX',Ð  
1247: ' 8JZMSRPWS RMSRQWS',Ð  
1248: ' 7NVSKPO RSKTLPO',Ð  
1249: ' 7NVQKTO RQKPLTO',Ð  
1250: ' 14LXNKOMQNSNUMVK RNKONQOSOUNVK',Ð  
1251: ' 8NVSLRMQLRKSLSNQP',Ð  
1252: ' 8NVSKQMQRPSORNQO',Ð  
1253: ' 8NVQLRMSLRKQLQNSP',Ð  
1254: ' 8NVQKSMSORPQORNSO',Ð  
1256: ' 11JZWMQMONNOMQMSNUOVQWWW',Ð  
1257: ' 11JZMMSNUOVQWSWUVVUWSWM',Ð  
1258: ' 11JZMMSMUNVOWQWSVUUVSWMW',Ð  
1259: ' 11JZMWMQNOONQMSMUNVOWQWW',Ð  
1260: ' 14JZWMQMONNOMQMSNUOVQWWW RMRUR',Ð  
1261: ' 13I[TOUPXRUTTU RUPWRUT RLRWR',Ð  
1262: ' 13MWRMRX ROPPORLTOUP RPORMTO',Ð  
1263: ' 13I[POOPLROTPU ROPMROT RMRXR',Ð  
1264: ' 13MWRLRW ROTPURXTUUT RPURWTU',Ð  
1265: ' 37KYVSUPSOQOOPNQMSMUNWPXRXTWUVVTWQWNVLTKQKPLQLRK  
RQOOQNSNVPX RRXTVUTVQVNULTK',Ð  
1266: ' 15JZLKRX RMKRV RXKRX RLKXK RNLWL',Ð  
1267: ' 10G[IOLORW RKORX R[FRX',Ð  
1268: ' 26I[XIXJYJYIXHVHTJSLROQUPYO[ RUITKSORUQXPZN\L\K[KZLZL]',Ð  
1269: ' 40I[XIXJYJYIXHVHTJSLROQUPYO[ RUITKSORUQXPZN\L\  
K[KZLZL[ RQNOONQNSOUQVSUUUVSVQUOSNQN',Ð  
1270: ' 26H\  
VZRYTWUVUTTSSQPPONNMNKOJQJRKTMMUNUPTQSSPTOVNWNWYOZQZR',Ð  
1271: ' 26JZXKLX ROKPLPNOOMOLNLLMKOKSLVLXK  
RUTTUTWUXWXXWXUWTUT',Ð  
1272: ' 41J[YPXPXQYQYPXOWOVPUTTVSWQXOXMWLVLTMSORRPSNSLRKPKOL  
ONPQUWWXXXYW ROXMVMTOR RONPPVWWX',Ð  
1273: ' 29J[UPSOQOPQPRQTSTUS  
RUOUSVTXTYRYQXNVLSKRKOLMNLQLRMUOWRXSXVW',Ð  
1274: ' 34KZQHQ\ RHT\ RWLVLMWMMWLKPKNLNNOPVSWT  
RNNOOVRWTWVWWTXQXOWNVNUOUOVNV',Ð  
1275: ' 12KYRKN\ RVKR\ RNQWQ RMVVV',Ð  
1276: ' 40LXTLSLSMTMTLSKQKPLPNQPTRUS RPNQOTQUSUUSW  
RQPOROTPVXSXTY ROTPUSWTYT[S\Q\P[PZQZQ[P]',Ð  
1277: ' 29LXRKQLRMSLRK RRMQR RRQQSRVSSRQ RRV\R\  
RPOONNOOPPOTOUNVOUPTO',Ð  
1278: ' 42LXRMSLRKQLRMRQQR SURV RRQSRQURVRZQ[R\S[RZ  
RPOONNOOPPOTOUNVOUPTO RPXOWNXOYPXTXUWVXUYTX',Ð  
1279: ' 12LYVKVX RNKVK RQQVQ RNXVX',Ð  
1281: ' 24H\QKNLLNKQKSLVNXQYSYVXXVYSYQXNVLSKQK RRQQRSSRRQ',Ð  
1282: ' 33LYQKPLPMQN RTKULUMTN RRNPOOQORPTRUSUUTVRVQUOSNRN

RRURY RSUSY ROWVW',Ð  
1283: ' 23LYRKPLONOOQRRSRUQVOVNULSKRK RRRRX RSRSX ROUVU',Ð  
1284: ' 24H\QKNLLNKQKSLVNXQYSYVXXVYSYQXNVLSKQK RRKRY RKRYR',Ð  
1285: ' 25JYRRPQOQMRLTLUMWOXPXRWSUSTRR RWMRR RRMWMWR  
RRMVNWR',Ð  
1286: ' 25JZLLMKOKQLRNRPQRPSNT ROKPLQNNQQPS RVKUX RWKTX RNTXT',Ð  
1287: ' 27JYNKNU ROKNR RNROPQOSOUPVQVTTVTXUYVYWX RSOUQU TTV  
RLKOK',Ð  
1288: ' 27LYONRKRQ RVNSKSQ RRQPROTOUPWRXSXUWVUVTURS  
RTRUSUSTRT',Ð  
1289: ' 27JZRKRY RMKMPNRPSTSVRWPWK RLMMKNM RQMRKSM RVMWKXM  
ROVUV',Ð  
1290: ' 27JYNKNX ROKOX RLKSKVLWNWOVQSROR RSKULVNVOUQSR  
RLXVXVUUX',Ð  
1291: ' 20LYWKTKQLONNQN SOVQXTYWY RWKTLRNQQQSRVTXWY',Ð  
1292: ' 23JZRRPQOQMRLTLUMWOXPXRWSUSTRR RSLQQ RWMRR RXQSS',Ð  
1293: ' 12KYPMTW RTMPW RMPWT RWPMT',Ð  
1294: ' 34J[OUMULVLXMYOYPXPVNTMRMONMOLQKTKVLWMXOXRWTUVUXVYX  
YYXYVXUVU NMPLULWM',Ð  
1295: ' 34J[OOMOLNLLMKOKPLPNNPMRMUNWOXQYTYVXWWWXUXRWPUNULVK  
XKYLYNXOVO RNWPXUXWW',Ð  
1401: ' 21F^KHK\ RLHL\ RXHX\ RYHY\ RHH\H RH\O\ RU\ \ \ \ \',Ð  
1402: ' 20H]KHRQJ\ RJHQQ RJHYHZMXH RK[X[ RJ\Y\ZWX\',Ð  
1403: ' 20KYVBTD RGPOTPYR]T`Vb RTDRHQKPPPTQYR\T`',Ð  
1404: ' 20KYNBPD RGTKUPUTTYR]P`Nb RPD RH SKTPTTSYR\`P`',Ð  
1405: ' 12KYOBOb RBPb ROVBb RobVb',Ð  
1406: ' 12KYTB Tb RUBUb RNBUB RNbUb',Ð  
1407: ' 40KYTBRCQDPFP HQJRKSMSOQQ  
RRCQE QGRISJTLTNSPORSTTVTXSZR[Q]Q\_Ra RQSSUSWRYQZP\`P^Q`RaTb',Ð  
1408: ' 40KYPBRCSDTFTHSJRKQM QOSQ  
RRCSESGRIQJPLPNQPURQTPVPXQZR[S]S\_Ra RSSQUQWRYSZT\T^S`RaPb',Ð  
1409: ' 24KYU@RCPFOIOLPOSVTYT\`S\_Ra RRCQE PHPKQNTUUXU[T^RaOd',Ð  
1410: ' 24KYO@RCTFUIULTOQVPYP\`Q\_Ra RRCSETHTKSNPUOXO[P^RaUd',Ð  
1411: ' 13AXCRGRR` RGSRa RFSRb RX:Rb',Ð  
1412: ' 32F^[CZD[E\D\C[BYBWCUETGSJRNPZO^N`  
RVDUFTJRVQZP]O\_MaKblbHaH`I\_J`Ia',Ð  
2001: ' 18H\RFK[ RRFY[ RRIX[ RMUVU RI[O[ RU[[[',Ð  
2002: ' 45G]LFL[ RMFM[ RIFUFXGYHZJZLYNXOUP RUFWGXHYJYLXNW OUP  
RMPUPXQYRZTZWYXZU[I[ RUPWQXRYTYWXYWZU]',Ð  
2003: ' 32G\XIYLYFXIVGSFQFNGLIKKJNJSKVLXNZQ[S[VZXXYV  
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2004: '  
30G]LFL[ RMFM[ RIFS FVGXIYKZNZSYVXXVZS[I[ RSFUGWIXKYNYSXVWXUZS]',Ð  
2005: ' 22G\LFL[ RMFM[ RSLST RIFYFYLXF RMPSP RI[Y[YUX]',Ð  
2006: ' 20G[LFL[ RMFM[ RSLST RIFYFYLXF RMPSP RI[P]',Ð  
2007: ' 40G^XIYLYFXIVGSFQFNGLIKKJNJSKVLXNZQ[S[VZXX



RQFOGMILKKNKSLVMXOZQ[ RXSX[ RYSY[ RUS\\S',Ð  
2008: ' 27F^KFK[ RLFL[ RXFX[ RYFY[ RHFOF RUF\\F RLPXP RH[O[ RU\\['',Ð  
2009: ' 12MXRFR[ RSFS[ ROFVF RO[V['',Ð  
2010: ' 20KZUFUWTZR[P[NZMXMVNUOVNW RTFTWSZR[ RQFXF',Ð  
2011: ' 27F\\KFK[ RLFL[ RYFLS RQOY[ RPOX[ RHFOF RUF[F RH[O[ RU[[['',Ð  
2012: ' 14I[NFN[ ROFO[ RKFRF RK[Z[ZUY['',Ð  
2013: ' 30F\_KFK[ RLFRX RKFR[ RYFR[ RYFY[ RZFZ[ RHFLF RYF]F RH[N[ RV[[['',Ð  
2014: ' 21G^LFL[ RMFY RMHY[ RYFY[ RIFMF RVF\\F RI[O['',Ð  
2015: ' 44G]QFNGLIKKJOJRKVLXNZQ[S[VZXXYVZRZOYKXIVGSFQF  
RQFOGMILKKOKRLVMXOZQ[ RS[UZWXXVYRYOXKWIUGSF',Ð  
2016: ' 29G]LFL[ RMFM[ RIFUFXGYHZJZMYOXPUQMQ RUFWGXHYJYMXOWPUQ  
RI[P['',Ð  
2017: ' 64G]QFNGLIKKJOJRKVLXNZQ[S[VZXXYVZRZOYKXIVGSFQF  
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RNYNXOVQURUTVUXV\_W`Y`Z^Z] RUXV\\W^X\_Y\_Z^',Ð  
2018: ' 45G]LFL[ RMFM[ RIFUFXGYHZJZLYNXOUPMP RUFWGXHYJYLXNWOU  
RI[P[ RRPTQURXYZZZ[Y RTQUSWZX[Z][Y[X',Ð  
2019: ' 34H\\XIYFYLXIVGSFPFMGKIKLMMNOOUQWRYT  
RKKMMONUPWQXRYTYXWZT[Q[NZLXKUK[LX',Ð  
2020: ' 16\\RFR[ RSFS[ RLFKLKFZFZLYF RO[V['',Ð  
2021: ' 23F^KFKULXNZQ[S[VZXXYUYF RLFLUMXOZQ[ RHFOF RVF\\F',Ð  
2022: ' 15H\\KFR[ RLFRX RYFR[ RIFOF RUF[F',Ð  
2023: ' 24F^JFN[ RKFNV RRFN[ RRFV[ RSFVV RZFV[ RGFNF RWF]F',Ð  
2024: ' 21H\\KFX[ RLFY[ RYFK[ RIFOF RUF[F RI[O[ RU[[['',Ð  
2025: ' 20H]KFRQR[ RLFSQS[ RZFSQ RIFOF RVF\\F RO[V['',Ð  
2026: ' 16H\\XFK[ RYFL[ RLFKLKFYF RK[Y[YUX['',Ð  
2027: ' 18H\\RFK[ RRFY[ RRIX[ RMUVU RI[O[ RU[[['',Ð  
2028: ' 45G]LFL[ RMFM[ RIFUFXGYHZJZLYNXOUP RUFWGXHYJYLXNWOU  
RMPUPXQYRZTZWYYXZU[I] RUPWQXRYTYWXYWZU['',Ð  
2029: ' 14I[NFN[ ROFO[ RKZFZLYF RK[R['',Ð  
2030: ' 15H\\RFJ[ RRFZ[ RRIY[ RKZYZ RJ[Z['',Ð  
2031: ' 22G\\LFL[ RMFM[ RSLST RIFYFYLF RMPSP RI[Y[YUX['',Ð  
2032: ' 16H\\XFK[ RYFL[ RLFKLKFYF RK[Y[YUX['',Ð  
2033: ' 27F^KFK[ RLFL[ RXFX[ RYFY[ RHFOF RUF\\F RLPXP RH[O[ RU\\['',Ð  
2034: ' 56G]QFNGLIKKJOJRKVLXNZQ[S[VZXXYVZRZOYKXIVGSFQF  
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ROPUP ROQUQ',Ð  
2035: ' 12MXRFR[ RSFS[ ROFVF RO[V['',Ð  
2036: ' 27F\\KFK[ RLFL[ RYFLS RQOY[ RPOX[ RHFOF RUF[F RH[O[ RU[[['',Ð  
2037: ' 15H\\RFK[ RRFY[ RRIX[ RI[O[ RU[[['',Ð  
2038: ' 30F\_KFK[ RLFRX RKFR[ RYFR[ RYFY[ RZFZ[ RHFLF RYF]F RH[N[ RV[[['',Ð  
2039: ' 21G^LFL[ RMFY RMHY[ RYFY[ RIFMF RVF\\F RI[O['',Ð  
2040: ' 36G]KEJJ RZEYJ RONNS RVNUS RKWJ\\ RZWY\\ RKGYG RKHYH ROPUP  
ROQUQ RKYYY RKZYZ',Ð  
2041: ' 44G]QFNGLIKKJOJRKVLXNZQ[S[VZXXYVZRZOYKXIVGSFQF  
RQFOGMILKKOKRLVMXOZQ[ RS[UZWXXVYRYOXKWIUGSF',Ð

2042: ' 21F^KFK[ RLFL[ RXFX[ RYFY[ RHF\F RH[O[ RU[\]',Đ  
2043: ' 29G]LFL[ RMFM[ RIFUFXGYHZJZMYOXPUQMQ RUFWGXHYJYMXOWPUQ  
RI[P]',Đ  
2044: ' 20H]KFRPJ[ RJFQP RJFYFZLXF RKZXZ RJ[Y[ZUX]',Đ  
2045: ' 16\\RFR[ RSFS[ RLFKLKFZFZLYF RO[V]',Đ  
2046: ' 33\\KKKILGMFOFPGQIRMR[ RKIMGOGQI  
RZKZIYGXFVFUGTISMS[ RZIXGVGTI RO[V]',Đ  
2047: ' 48H]RFR[ RSFS[ RPKMLLMKOKRLTMUPVUVXUYTZRZOYMXLUKPK  
RPKNLMMLOLRMTNUPV RUVWUXTYRYOXMWLUK ROFVF RO[V]',Đ  
2048: ' 21H\\KFX[ RLFY[ RYFK[ RIFO F RUF[F RI[O[ RU[[]',Đ  
2049: ' 41G^RFR[ RSFS[ RIMJLLMMQNSOTQU  
RJLKM LQMSNTQUTUWTXSYQZM[L RTUVTWSXQYM[L\\M ROFVF RO[V]',Đ  
2050: ' 43G]JXK[O[MWKSJPLKIMGPFTFWGYIZLPYSWWU[YZX  
RMWLT KPKLLINGPF RTFVGXIYLPXTWW RKZNZ RVZYZ',Đ  
2051: ' 18H\\UFH[ RUFV[ RTHU[ RLUUU RF[L] RR[X]',Đ  
2052: ' 41F^OFI[ RPFJ[ RLFWFZG[I[KZNYOVP RWFY GZIZKYNXOVP  
RMPVPXQYSYUXXVZR[F] RVPWQXSXUWXUZR]',Đ  
2053: ' 34H]ZH[H\\F[L]JZHYGWFTFQGOIMLLOKSKVLYMZP[S[UZWXXV  
RTFRGPINLMOLSLVMYNZP]',Đ  
2054: '  
30F]OFI[ RPFJ[ RLFUFXGYHZKZOYSWWUYSSO[F] RUFWGXHYKYOXSVWTYRZO]',Đ  
2055: ' 22F]OFI[ RPFJ[ RTLRT RLF[FZLZF RMPSP RF[U[WVT]',Đ  
2056: ' 20F\\OFI[ RPFJ[ RTLRT RLF[FZLZF RMPSP RF[M]',Đ  
2057: ' 42H^ZH[H\\F[L]JZHYGWFTFQGOIMLLOKSKVLYMZP[R[UZWXYT  
RTFRGPINLMOLSLVMYNZP[ RR[TZVXXT RUT\\T',Đ  
2058: ' 27E\_NFH[ ROFI[ R[FU[ R\\FV[ RKFRF RXF\_F RLPXP RE[L] RR[Y]',Đ  
2059: ' 12LYUFO[ RVFP[ RRFYF RL[S]',Đ  
2060: ' 21I[XFSWRYQZO[M[KZJXJVKULVKW RWFRWQYO[ RTF[F',Đ  
2061: ' 27F]OFI[ RPFJ[ R]FLS RSOW[ RROV[ RLFSF RYF\_F RF[M] RS[Y]',Đ  
2062: ' 14H\\QFK[ RRFL[ RNFUF RH[W[YUV]',Đ  
2063: ' 30E^NFH[ RNFO[ ROFPY R\\FO[ R\\FV[ R]FW[ RKFOF R\\F`F RE[K] RS[Z]',Đ  
2064: ' 21F\_OFI[ ROFVX ROIV[ R\\FV[ RLFOF RYF\_F RF[L]',Đ  
2065: ' 42G]SFPGNILLKOJSJVKYLZN[Q[TZVXXUYRZNZKYHXGVFSF  
RSFQGOIMLLOKSKVLYN[ RQ[SZUXWUXRYNYKXHVF',Đ  
2066: ' 27F]OFI[ RPFJ[ RLFXF[G\\\\K[NYPUQMQ RXFZG[I[KZNXPUQ RF[M]',Đ  
2067: ' 61G]SFPGNILLKOJSJVKYLZN[Q[TZVXXUYRZNZKYHXGVFSF  
RSFQGOIMLLOKSKVLYN[ RQ[SZUXWUXRYNYKXHVF  
RLYLX MVOUPURVSXS\_T`V`W^W] RSXT^U\_V\_W^',Đ  
2068: ' 42F^OFI[ RPFJ[ RLFWFZG[I[KZNYOV PMP RWFY GZIZKYNXOVP  
RRPTQURVZW[Y[ZYZX RURWYXZYZZY RF[M]',Đ  
2069: ' 35G^ZH[H\\F[L]JZHYGVFRFOGMIMKNMONVRXT  
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2070: ' 16H]UFO[ RVFP[ ROFLN F]F\\L\\F RL[S]',Đ  
2071: ' 25F\_NFKQUJXKZN[R[UZWXXU\\F ROFLQKUKXLZN[ RKFRF RYF\_F',Đ  
2072: ' 15H\\NFO[ ROFPY R\\FO[ RLFRF RXF^F',Đ  
2073: ' 24E\_MFK[ RNFLY RUFK[ RUF S[ RVFTY R]FS[ RJFQF RZF`F',Đ

2074: ' 21G]NFU[ ROFV[ R\|FH[ RLFRF RXF^F RF[L[ RR[X]',Đ  
2075: ' 20H]NFRPO[ ROFSPP[ R]FSP RLFRF RYF\_F RL[S]',Đ  
2076: ' 16G][FH[ R\|FI[ ROFLN\F RH[V[XUU]',Đ  
2077: ' 46H\KILKXWYYY[ RLLXX RKIKKLMXYY[ RPPLTKVKXLZK[ RKVMZ  
RLTLVMXMZK[ RSSXN RVIVLWNYNYLWKVI RVIWLYN',Đ  
2101: ' 39I]NONPMPMONNPMTMVNWOXQXXYZZ[ RWOWXXZZ[[[ RWQVRPSMTLV  
LXMZP[S[UZWX RPSNTMVMXNZP]',Đ  
2102: ' 33G\LFL[ RMFM[ RMPONQMSMVNXPYSYUXXVZS[Q[OZMX  
RSMUNWPXSXUWXUZS[ RIFMF',Đ  
2103: ' 28H[WPVQWRXQXPVNTMQMNNLPKSKULXNZQ[S[VZXX  
RQMONMPLSLUMXOZQ]',Đ  
2104: ' 36H]WFW[ RXFX[ RWPUNSMQMNNLPKSKULXNZQ[S[UZWX  
RQMONMPLSLUMXOZQ[ RTFXF RW[[',Đ  
2105: ' 31H[LSXSXQWOVNTMQMNNLPKSKULXNZQ[S[VZXX RWSWPVN  
RQMONMPLSLUMXOZQ]',Đ  
2106: ' 22KXUGTHUIVHVGUFSGGPI[ RSFRGQIQ[ RMMUM RM[T]',Đ  
2107: ' 60\QMONNOMQMSNUOVQWSWUVVUWSWQVOUNSMQM RONNPNTOV  
RUVVTVPUN RVOWNYMYNWN RNUMVLXLYM[P\|U\X]Y^ RLYMZP[U[X\  
\Y^Y\_XaUbObLaK\_K^L\O]',Đ  
2108: ' 28G]LFL[ RMFM[ RMPONRMTMWNXPX[ RTMVNWPW[ RIFMF RI[P[ RT[[',Đ  
2109: ' 18MXRFQGRHSGRF RRM[R[ RSMS[ ROMSM RO[V]',Đ  
2110: ' 25MXSFRGSHTGSF RTMT\_SaQbObNaN`O\_P`Oa RSMS\_RaQb RPMTM',Đ  
2111: ' 27G\LFL[ RMFM[ RWMW RRSX[ RQSW[ RIFMF RTMZM RI[P[ RT[Z]',Đ  
2112: ' 12MXRFR[ RSFS[ ROFSF RO[V]',Đ  
2113: '  
44BcGMG[ RHHM[ RHPJNMMOMRNSPS[ ROMQNRPR[ RSPUNXMZM]N^P^[ RZM\  
\N]P][ RDMHM RD[K[ RO[V[ RZ[a]',Đ  
2114: ' 28G]LML[ RMMM[ RMPONRMTMWNXPX[ RTMVNWPW[ RIMMM RI[P[ RT[[',Đ  
2115: ' 36H\QMMNNLPKSKULXNZQ[S[VZXXYUYSXPVNSMQM  
RQMONMPLSLUMXOZQ[ RS[UZWXUXSWPUNSM',Đ  
2116: ' 36G\LMLb RMMMb RMPONQMSMVNXPYSYUXXVZS[Q[OZMX  
RSMUNWPXSXUWXUZS[ RIMMM RibPb',Đ  
2117: ' 33H\WMWb RXMXb RWPUNSMQMNNLPKSKULXNZQ[S[UZWX  
RQMONMPLSLUMXOZQ[ RTb[b',Đ  
2118: ' 23IZNMN[ ROMO[ ROSPPRNTMWMXNXOWPVOWN RKMOM RK[R]',Đ  
2119: ' 32J[WOXMXQWOVNTMPMNNMOMQNRPSUUWVXW  
RMPNQPRUTWUXVXYWZU[Q[OZNYMWM[NY',Đ  
2120: ' 16KZPFPWQZS[U[WZXX RQFQWRZS[ RMMUM',Đ  
2121: ' 28G]LMLXMZP[R[UZWX RMMM[XNZP[ RWMW[ RXMX[ RIMMM RTMXM  
RW[[',Đ  
2122: ' 15I[LMR[ RMMRY RXMR[ RJMPM RTMZM',Đ  
2123: ' 24F^JMN[ RKMNX RRMN[ RRMV[ RSMVX RZMV[ RGMNM RWM]M',Đ  
2124: ' 21H\LMW[ RMMX[ RXML[ RJMPM RTMZM RJ[P[ RT[Z]',Đ  
2125: ' 22H[LMR[ RMMRY RXMR[P\_NaLbKbJaK`La RJMPM RTMZM',Đ  
2126: ' 16I[WML[ RXMM[ RMMLQLMXM RL[X[XWW]',Đ  
2127: ' 40G^QMMNNLPKRJUJXKZN[P[RZUWWTYPZM  
RQMONMPLRKUKXLZN[ RQMSMUNVPXXYZZ[ RSMTNUPWXXZZ[[',Đ

2128: ' 57G\\TFQGOIMMLPKTJZlb RTFRGPINMMPLTKZJb  
RTFVFXGYHYKXMWNTOP RVFXHXKWMVNT  
RPOTPVRWTWWVYUZR[P[NZMYLV RPOSPURVTWUYTZR[';Đ  
2129: ' 28H\\IPKNMMOMQNRORSVRZOb RJOLNPNO RZMYPXRSYP^Nb  
RYMXPWRSY';Đ  
2130: ' 44I\\VNTMRMONMQLTLWMYNZP[R[UZWWTXQWOSJRHRFSEUEWFYH  
RRMPNNQMTMXNZ RR[TZVWWTWPVNTKSISGTFVYH';Đ  
2131: ' 32I[XPVNTMPMNNPPRSS RPMONOPQRSS RSSNTLVLMZP[S[UZWX  
RSSOTMVMXNZP[';Đ  
2132: ' 31I[TFRGQHQRJUKZKZJWKSMPOMLULWMYP[S]T\_TaSbQbPa  
RULQONRMUMWNYP[';Đ  
2133: '  
32G]HQIOKMNMNOPNTL[ RMMNNNPMTK[ RNTPPRNTMVMXNYOYRXWUb  
RVMXOXRWWTb';Đ  
2134: ' 44F]GQHOJMMMNNNPMUMXNZO[ RLMMNMPLULXMZO[Q[SZUXWUXRYM  
YIXGVFTFRHRJSMUPWRZT RSZUWVUWRXMXIWGVF';Đ  
2135: ' 15LXRMPTOXOZP[S[UYVW RSMQTPXPZQ[';Đ  
2136: ' 29H\\NMJ[ ROMK[ RXMYNZNYMWMUNQROSMS  
ROSQTSZT[ ROSPTRZS[U[WZYW';Đ  
2137: ' 23H\\KFMFOGPHQJWXXZY[ RMFOHPJVXWZY[Z[ RRMJ[ RRMK[';Đ  
2138: ' 28F]MMGb RNMHb RMPLVLYN[P[RZTXVU RXMUXUZV[Y[Y\\W  
RYMVXVZW[';Đ  
2139: ' 24H\\NML[ ROMNSMXL[ RYMXQVU RZMYPXRVUTWQYOZL[ RKMOM';Đ  
2140: ' 45IZTFRGQHQRJUKXK RUKQLOMNONQPSSTVT RUKRLPMOOOQQSST  
RSTOUMVLXLZN\\S^T\_TaRbPb RSTPUNVMXMZO\\S^';Đ  
2141: ' 32I[RMONMQLTLWMYNZP[R[UZWWTXQWOVNTMRM  
RRMPNNQMTMXNZ RR[TZVWWTWPVN';Đ  
2142: ' 22G]PNL[ RPNM[ RVNV[ RVNW[ RIPKNNM[M RIPKONN[N';Đ  
2143: ' 31H[LVMYNZP[R[UZWWTXQWOVNTMRMONMQLTHb RR[TZVWWTWPVN  
RRMPNNQMTIb';Đ  
2144: ' 35H][MQMNNLQKTKWLYMZO[Q[TZVWWTWQVOUNSM  
RQMONMQLTLXMZ RQ[SZUWVTVPUN RUN[N';Đ  
2145: ' 16H\\SNP[ RSNQ[ RJPLNOMZM RJPLOONZN';Đ  
2146: ' 31H\\  
\\IQJOLMOMPNNPNVNYP[ RNMONOPMVMYNZP[Q[TZVXXUYRYOXMWNXOYR  
RXUYO';Đ  
2147: ' 37G]ONMOKQJTJWKYLZN[Q[TZWXYUZRZOXMVMTORSPXMb  
RJWLYNZQZTYWWYU RZOXNVNTPRSPYNb';Đ  
2148: ' 23I[KMMMONPPU\_VaWb RMMNNOPT\_UaWbYb RZMYOWRM]K'Jb';Đ  
2149: ' 34F]UFOb RVFNb RGQHOJMMMNNNPMUMXOZRZTYWVYS  
RLMMNMPLULXMZO[R[TZVXXUYS[M';Đ  
2150: ' 44F]JQLOONNMLNJQITIWJZK[M[OZQWRT RIWJYKZMZYOYQW  
RQTQWRZS[U[WZYWZTZYXNMWNYOZQ RQWRYSZUZWYYW';Đ  
2151: ' 39H]XMVTUXUZV[Y[Y\\W  
RYMWTVXVZW[ RVTVQUNSMQMNNLQKTKWLYMZO[Q[SZUWVT  
RQMONMQLTLXMZ';Đ

2152: ' 36H[PFLSLVMYNZ RQFMS  
RMSNPPNRMTMVNWOXQXTWWUZRP[NZMWMS RVNWPWTVWTZR[ RMFQF',Ð  
2153: ' 25I[WPWQXQXPWNUMRMONMQLTLWMYNZP[R[UZWW  
RRMPNNQMTMXNZ',Ð  
2154: ' 42H]ZFVTUXUZV[Y[[Y\\W  
R[FWTVXVZW[ RVTVQUNSMQMNNLQKTKWLYMZO[Q[SZUWVT  
RQMONMQLTLXMZ RWF[F',Ð  
2155: ' 26I[MVQUTTWRXPWNUMRMONMQLTLWMYNZP[R[UZWX  
RRMPNNQMTMXNZ',Ð  
2156: ' 35KZZGYHZI[H[GZFXFVGUHTJSMP[O\_Na  
RXFVHUJTNRWQ[P^O`NaLbJblal`J\_K`Ja ROMYM',Ð  
2157: ' 43H\\YMU[T^RaObLbJaI`I\_J^K\_J` RXMT[S^QaOb  
RVTVQUNSMQMNNLQKTKWLYMZO[Q[SZUWVT RQMONMQLTLXMZ',Ð  
2158: '  
31H]PFJ[ RQFK[ RMTOPQNSMUMWNXOXQVWVZW[ RUMWOWQUWUZV[Y[[Y\\W  
RMFQF',Ð  
2159: ' 26LYUFTGUHVGUF  
RMQNOPMSMTNTQRWRZS[ RRMSNSQQWQZR[U[WYXW',Ð  
2160: ' 32LYVFUGVHWGVF RNQOOQMTMUNUQR[Q^P`OaMbKbJaJ`K\_L`Ka  
RSMTNTQQ[P^O`Mb',Ð  
2161: ' 34H\\PFJ[ RQFK[ RXNWOXPYOYNXMWMUNQROSMS  
ROSQTSZT[ ROSPTRZS[U[WZYW RMFQF',Ð  
2162: ' 18MYUFQTPXPZQ[T[VYWW RVFRTQXQZR[ RRFVF',Ð  
2163: ' 52AbBQCOEMHMINIPHTF[ RGMHNHPGTE[ RHTJPLNNMPMRNSOSQP[ RP  
MRORQO[ RRTTPVNXMZM\\N]O]Q[W[Z\\ RZM\\O\\QZWZZ[[^`YaW',Ð  
2164: ' 37F]GQHOJMMMNNNPMTK[ RLMMNMPLTJ[ RMTOPQNSMUMWNXOXQVW  
VZW[ RUMWOWQUWUZV[Y[[Y\\W',Ð  
2165: ' 32I[RMONMQLTLWMYNZP[R[UZWWXTXQWOVNTMRM  
RRMPNNQMTMXNZ RR[TZVWWTWPVN',Ð  
2166: ' 42G\\HQIOKMNMNONPNTJb RMMNNNPMTiB  
RNTQQNSMUMWNXOYQYTXWVZS[Q[OZWNWT RWNXPXTWWUZS[ RFbMb',Ð  
2167: ' 33H\\XMRb RYMSb RVTVQUNSMQMNNLQKTKWLYMZO[Q[SZUWVT  
RQMONMQLTLXMZ RObVb',Ð  
2168: '  
26IZJQKOMMPMQNPPTN[ ROMPNPPOTM[ RPTRPTNVMXMYNYOXPWoxN',Ð  
2169: ' 28J[XOXPYPYOXNUMRMONNONQORVWWW  
RNPOQVUWVWYVZS[P[MZLYLXMXMY',Ð  
2170: ' 18KYTFPTOXOZP[S[UyVW RUFQTPXPZQ[ RNMWM',Ð  
2171: ' 37F]GQHOJMMMNNNQLWLYN[ RLMMNMQKWLYLN[P[RZTXVT  
RXMVTUXUZV[Y[[Y\\W RYMWTVXVZW['',Ð  
2172: ' 26H\\  
\\IQJOLMOMPNPQNWNYP[ RNMONOQMWMYNZP[Q[TZVXXUYQYMXMYO',Ð  
2173: ' 41C`DQEOGMJMKNKQIWIYK[ RIMJNJQHHWHYIZK[M[OZQXRV  
RTMRVRYSZU[W[YZ[X\\V]R]M\\M]O RUMSVSYU['',Ð  
2174: ' 42H\\KQMNMOMRMSOSR RQMRORRQVPXNZL[K]JZJYKXLYKZ  
RQVQYR[U[WZYW RYNXOYPZOZNYMXMVNTPSRRVRYS['',Ð

2175: ' 41G\\HQIOKMNMONOQMWMYO[ RMMNNNNQLWLYMZO[Q[SZUXWT  
RZMV[U^SaPbMbKaJ`J\_K^L\_K` RYMU[T^RaPb',Ð  
2176: ' 31H\\YMXOVQNWLYK[ RLQMOOMRMVO RMOONRNVOXO  
RLYNRZUZWY RNYR[U[WYXW',Ð  
2177: ' 43G^VGHVHWHWGUF RFOGMILL[ RRFPGNIMLM[ R\\G[H\\I]H]G\\  
\\FZFXGWIW[ RZFYGXIX[ RIM[M RI[P[ RT[[',Ð  
2178: '  
33G]WGVHWHWGUF RFOGMILL[ RRFPGNIMLM[ RWMW[ RXMX[ RIMXM  
RI[P[ RT[[',Ð  
2179: ' 35G]VGHVHWHWGUF  
RXFRFOGMILL[ RRFPGNIMLM[ RWHW[ RXFX[ RIMWM RI[P[ RT[[',Ð  
2180: ' 54BcRGQHRISHRGPFMFJGHIGLG[ RMFKGIIHLH[ R]G\\  
\\H]I^H]G[FXFUGSIRLR[ RXFVGTISLS[ R]M][ R^M^ RDM^M RD[K[ RO[V[ RZ[a',Ð  
2181: ' 56BcRGQHRISHRGPFMFJGHIGLG[ RMFKGIIHLH[ R\\G[H\\I]H]G[F  
R^FXFUGSIRLR[ RXFVGTISLS[ R]H][ R^F^ RDM]M RD[K[ RO[V[ RZ[a',Ð  
2182: ' 12MXRMR[ RSMS[ ROMSM RO[V',Ð  
2184: ' 25IZWNUMRMONMPLSLVMYNZQ[T[VZ RRMPNNPMSMVNYOZQ[ RMTUT',Ð  
2185: ' 43I\\TFQGOJNLMO TLXMZO[Q[TZVWWUXRYMYIXGVFTF  
RTFRGPJOLNOMTMXNZO[ RQ[SZUWVUWRXMXIWGVF RNPWP',Ð  
2186: ' 42G]UFOB RVFNb RQMMNKPJSJVKXMZP[S[WZYXZUZRYPWNTMQM  
RQMNNLPKSKVLXNZP[ RS[VZXXYUYRXPVNTM',Ð  
2187: ' 27I[TMVNXPXOWNTMQMNNMOLQLSMUOWSZ RQMONNOMQMSNUSZT\\  
\\T^S\_Q\_',Ð  
2190: ' 45G]LMKNJPJRKUOYP[ RJRKTOXP[P]O`MbLbKaJ\_J\\  
\\KXMTQQRNTMVMYNZPZTYXWZU[T[SZSXTWUXTY RVMXNYPYTXWZ',Ð  
2191: ' 69E\_YGXHYIZHYGWFTFQGOINKMNL RJ[I\_Ha  
RTFRGPIOKNNLWK[J^I`HaFbDbCaC`D\_E`Da R\_G^H\_I`H`G\_F]F[GZHYJXMU[T\_Sa  
R]F[HZJYNWWV[U^T`SaQbObNaN`O\_P`Oa RIM^M',Ð  
2192: ' 52F^GZH[I\\H[GXFUFRGPIOKNNMRK[J\_Ia  
RUFSGQIPKONMWL[K^J`IaGbEbDaD`E\_F`Ea RYMWTVXVZW[Z[\\Y]W  
RZMXTWXWZX[ RJMZM',Ð  
2193: ' 54F^YGXHYIZHZGXF R\\FUFGRGPIOKNNMRK[J\_Ia  
RUFSGQIPKONMWL[K^J`IaGbEbDaD`E\_F`Ea R[FWTVXVZW[Z[\\Y]W R\\  
\\FXTWXWZX[ RJMYM',Ð  
2194: ' 86@cTGSHTIUHTGRFOFLGJIIKHNGRE[D\_Ca  
ROFMGKIJKINGWF[E^D`CaAb?b>a>`?\_@`?a  
R`G\_H`IaH`G]FZFWGUITKSNRRP[O\_Na  
RZFXGVIUKTNRWQ[P^O`NaLbJblaI`J\_K`Ja R^M\\T[X[Z\\[\_[aYbW R\_M]T\\X\\Z]  
[ RDM\_M',Ð  
2195: ' 88@cTGSHTIUHTGRFOFLGJIIKHNGRE[D\_Ca  
ROFMGKIJKINGWF[E^D`CaAb?b>a>`?\_@`?a R^G]H^I\_H\_G]F  
RaFZFWGUITKSNRRP[O\_Na RZFXGVIUKTNRWQ[P^O`NaLbJblaI`J\_K`Ja R`F\\T[X[Z\\  
\\[\_[aYbW RaF]T\\X\\Z][ RDM^M',Ð  
2196: ' 20LYMQNOPMSMTNTQRWRZS[ RRMSNSQQWQZR[U[WYXW',Ð  
2200: ' 40H\\QFNGLJKOKRLWNZQ[S[VZXWYRYOXJVG SFQF  
RQFOGNH MJLOLRMWNYOZQ[ RS[UZVYWWXR XOWJVHUGSF',Ð

2201: ' 11H\\NJPISFS[ RRGR[ RN[W[';Ð  
2202: ' 45H\\  
\\LJMKLLKKKJLHMGPFTFWGXHYJYLXNUPPRNSLUKXK[ RTFVGWHXJXLWNTPPR  
RKYLXNXSZVZXYXX RNXS[W[XZYXYV';Ð  
2203: ' 47H\\LJMKLLKKKJLHMGPFTFWGXIXLWNTQO RTFVGWIWLVNTO  
RTOVPXRYTYWXYWZT[P[MZLYKWKVLUMVLW RWQXTXWWYVZT[';Ð  
2204: ' 13H\\THT[ RUFU[ RUFJUZU RQ[X[';Ð  
2205: ' 39H\\MFKP RKPMNPMSMVNXPYSYUXXVZS[P[MZLYKWKVLUMVLW  
RSMUNWPXSXUWXUZS[ RMFWF RMGRGWF';Ð  
2206: ' 48H\\  
\\WIVJWKXJXIWGUFRFOGMILKKOKULXNZQ[S[VZXXYUYTXQVOSNRNOOMQLT  
RRFPGNIMKLOLUMXOZQ[ RS[UZWXXUXTWQUOSN';Ð  
2207: ' 31H\\KFKL RKJLHNFPFUIWIXHYF RLHNGPGUI  
RYFYIXLTQSSRVR[ RXLSQRSQVQ[';Ð  
2208: ' 63H\\PFMGLILLMNPOTOWNXLXIWGTFPF RPFNGMIMLNNPO  
RTOVNWLWIVGTF RPOMPLQKSKWLYMZP[T[WZXYYWYSXQWPTO  
RPONPMQLSLWMYNZP[ RT[VZWYXWXSXWQVPTO';Ð  
2209: ' 48H\\  
\\XMWPURRSQSNRLPKMKLLINGQFSFVGXIYLYRXVWXUZR[O[MZLXLWMVNWMMX  
RQSORMPLMLLMIOGQF RSFUGWIXLXRWVVTZR[';Ð  
2210: ' 6MWR YQZR[SZRY';Ð  
2211: ' 8MWR[QZRY SZS\\R^Q\_';Ð  
2212: ' 12MWRMQNROS NRM RRYQZR[SZRY';Ð  
2213: ' 14MWRMQNROS NRM RR[QZRY SZS\\R^Q\_';Ð  
2214: ' 15MWR FQHRTSHRF RRHRN RRYQZR[SZRY';Ð  
2215: ' 32I[MJNKMLLKLJMHNGPFSFVGWHXJXLWNVORQRT  
RSFUGVHWJWLVTNP RRYQZR[SZRY';Ð  
2216: ' 6NVR FQM RSFQM';Ð  
2217: ' 12JZN FMM ROFMM RVFUM RWFUM';Ð  
2218: ' 14KYQFOGNINKOMQNSNUMVKVIUGSFQF';Ð  
2219: ' 9JZR FR RMIWO RWIMO';Ð  
2220: ' 3G][Bib';Ð  
2221: ' 20KYVBTD RGP KOPOTPYR]T`Vb RTDRHQKPPPTQYR\\T`';Ð  
2222: ' 20KYNBPD RGT KUPUTTYR]P`Nb RPDRHSKTPTTSYR\\P`';Ð  
2223: ' 12KYOBOb RPB Pb ROVB RObVb';Ð  
2224: ' 12KYTB Tb RUBUb RNBUB RNbUb';Ð  
2225: ' 40KYTBRCQDPFPHQJRKSMSOQQ  
RRCQE QGRISJTLTNSPORSTTVTXSZR[Q]Q\_Ra RQSSUSWRYQZP\\P^Q`RaTb';Ð  
2226: ' 40KYPBRCSDTFTHSJRKQM QOSQ  
RRCSESGRIQJLPNQPURQTPVPXQZR[S]S\_Ra RSSQUQWRYSZT\\T^S`RaPb';Ð  
2227: ' 4KYUBNRUb';Ð  
2228: ' 4KYOBVROb';Ð  
2229: ' 3NVRBRb';Ð  
2230: ' 6KYOBOb RUBUb';Ð  
2231: ' 3E\_IR[R];Ð  
2232: ' 6E\_RIR[ RIR[R];Ð

2233: ' 9F^RJR[ RJRZR RJ[Z]',Ð  
2234: ' 9F^RJR[ RJJZJ RJRZR',Ð  
2235: ' 6G]KKYY RYKKY',Ð  
2236: ' 6MWRQQRRSSRRQ',Ð  
2237: ' 15E\_RIQJRKSJRI RIR[R RRYQZR[SZRY',Ð  
2238: ' 6E\_IO[O RIU[U',Ð  
2239: ' 9E\_YIK[ RIO[O RIU[U',Ð  
2240: ' 9E\_IM[M RIR[R RIW[W',Ð  
2241: ' 4F^ZIJRZ['',Ð  
2242: ' 4F^JIZRJ['',Ð  
2243: ' 10F^ZFJMZT RJVZV RJ[Z['',Ð  
2244: ' 10F^JFZMJT RJVZV RJ[Z['',Ð  
2245: ' 21F\_[WYWWVUTRPQOONMNKOJQJSKUMVOVQURTUPWNYM[M',Ð  
2246: ' 24F^IUISJPLONOPPTSVTXTZS[Q RISJQLPNPPQTTVUXUZT[Q[O',Ð  
2247: ' 8G]JTROZT RJTRPZT',Ð  
2248: ' 7LXTFOL RTFUGOL',Ð  
2249: ' 7LXPFUL RPFUGUL',Ð  
2250: ' 18H\\KFLHNJQKSKVJXHYF RKFLINKQLSLVKXIYF',Ð  
2251: ' 8MWRHQGRFSGSIRKQL',Ð  
2252: ' 8MWSFRGQIQKRLSKRJ',Ð  
2253: ' 8MWRHSGRFQGQIRKSL',Ð  
2254: ' 8MWQFRGSISKRLQKRJ',Ð  
2255: ' 10E[HMLMRY RKMR[ R[BR['',Ð  
2256: ' 13F^ZJSJOKMLKNJQJSKVMXOYSZZZ',Ð  
2257: ' 13F^JJQKULWNYQZSZVYXWYUZQZJ',Ð  
2258: ' 13F^JJQJUKWLYNZQZSYVWXUYQZJZ',Ð  
2259: ' 13F^JZJSKOLMNKQJSJVXMYOZSZZ',Ð  
2260: ' 16F^ZJSJOKMLKNJQJSKVMXOYSZZZ RJRVR',Ð  
2261: ' 11E\_XP[RXT RUMZRUW RIRZR',Ð  
2262: ' 11JZPLRITL RMORJWO RRJR['',Ð  
2263: ' 11E\_LPIRLT ROMJROW RJR[R',Ð  
2264: ' 11JZPXR[TX RMURZWU RRIRZ',Ð  
2265: ' 44I\\  
\\XRWOVNTMRMONMQLTLWMYNZP[R[UZWXXUYPYKXHWGUFRFPGOHOIPIPH  
RRMPNNQMTMXNZ RR[TZVXWUXPKXWHUF',Ð  
2266: ' 15H\\JFR[ RKFRY RZFR[ RJFZF RKGYG',Ð  
2267: ' 10AbDMIMRY RHNR[ Rb:R['',Ð  
2268: ' 32F^[CZD[E\\D\\C[BYBWCUETGSJRNPZO^N`  
RVDUFTJRVQZP]O\_MaKblbHaH`I\_J`Ia',Ð  
2269: ' 50F^[CZD[E\\D\\C[BYBWCUETGSJRNPZO^N`  
RVDUFTJRVQZP]O\_MaKblbHaH`I\_J`Ia  
RQKNLLNKQKSLVNXQYSYVXXVYSYQXNVLSKQK',Ð  
2270: ' 26F\_\\S[UUVVVUUTTQPPONNLNJOIQISJULVNVPUQTTPUOWNYN[O\\Q\\  
\\S',Ð  
2271: ' 32F^[FI[ RNFPHPJOLMMKMIKIJGLFNFPGSHVHYG[F  
RWTUUTWTYV[X[ZZ[X[VYTW',Ð



2272: ' 49F\_[NZO[P\O\  
N[MZMYNXPVUTXRZP[M[JZIXIUJSPORMSKSIRGPFNGMIMKNNPQUXWZZ[[[Z\Y  
RM[KZJXJUKSMQ RMKNMVXXZZ[';Ð  
2273: ' 56E`WNVLTQKQKOLNMMPMSPNUPVSVUUVS RQKOMNPNSOUPV  
RWKVSUUXVZV\T]Q]O\L[JYHWGTFQFNGLHJJILHOHRIUJWLYNZQ[T[WZYYZX  
RXKWSWUXV';Ð  
2274: ' 42H\BPB\_ RTBT\_ RXIWJXKYJYIWGTFFPMGKIKKLMMNOOUQWRYT  
RKKMMONUPWQXRYTYXWZT[P[MZKXKWLVMWLX';Ð  
2275: ' 12H]SFLb RYFRb RLQZQ RKWYW';Ð  
2276: ' 46JZUITJUKVJVIUGSFQFOGNINKOMQOVR ROMTPVRWTWVVXTZ  
RPNNPMRMTNVPXU[ RNVSYU[V]V\_UaSbQbOaN\_N^O]P^O\_';Ð  
2277: ' 30JZRFQHRJSHRF RRFRb RRQQRbSTRQ RLMNNPMNLLM RLMXM  
RTMVNXMVLTM';Ð  
2278: ' 56JZRFQHRJSHRF RRFRT RRPQRSVRXQVSRRP RRTRb RR^Q`RbS`R^  
RLMNNPMNLLM RLMXM RTMVNXMVLTM RL[N\P[NZL[ RL[X[ RT[V\X[VZT[';Ð  
2279: ' 12\XFX[ RKFXF RPPXP RK[X[';Ð  
2281: ' 38E`QFNGKIILHOHRIUKXNZQ[T[WZZX\U]R]O\LZIWGTFFQF  
RROQPQQRRTQTPSORO RRPRQSQSPRP';Ð  
2282: ' 45J[PFNGOIQJ RFOGOI RUFWGVITJ RUFVGV  
RQJOKNLMMNQNSOTQUTUVTWSXQXNWLVTJQJ RRUR[ RSUS[ RNXXW';Ð  
2283: ' 27\RFQGMILLMMPORRSSSVRXPYMYLXIVGSFRF  
RRSR[ RSSS[ RNWWW';Ð  
2284: ' 28D`PFMGJIHLGOGSHVJYM[P\T\W[Z\Y\]S]O\LZIWGTFFP RRFR\  
RGQ]Q';Ð  
2285: ' 31G`PMMNKPJSJTKWMYPZQZTYVWWTWSVPTNQMPM R]GWG[HUN  
R]G]M\IVO R\HVN';Ð  
2286: ' 28F\IIJGLFOFQGRIRLQOPQNSKU ROFPGQIQMPPNS  
RVFT[ RWFS[ RKUYU';Ð  
2287: ' 30\MFMU RNFMQ RMQNOONQMTMWNXPXRWTUV  
RTMVNWPWRTXTZU[W[Y Y RKFN';Ð  
2288: ' 44\RNQOMQLTLUMXOZR[S[VZXXYUYTXQVOSNRN RRHNJRFRN  
RSHWJSFSN RRSQTQURVSVTUTTSSRS RRTRUSUSTRT';Ð  
2289: ' 37G^QHRFR[ RTHSFS[ RJHKFKMLPNRQSRS RMHLFLNMQ  
R[HZFZMYPWRTSSS RXHYFYXQ RNWWW';Ð  
2290: ' 31G]LFL[ RMFM[ RIFUFXGYHZJZMYOXPUQMQ RUFWGXHYJYMXOWPUQ  
RI[Y[YVX[';Ð  
2291: ' 24H[YGUGQHNJLMKPKSLVNYQ[U\Y\ RYGVHSJQMPPPSQVSYV[Y\';Ð  
2292: ' 27F\_OQMQRJSIUIWJYKZM[O[QZRYSWSURSQROQ RSHPQ RZJRR R\  
QST';Ð  
2293: ' 12H\OKUY RUKOY RKOYU RYOKU';Ð  
2294: ' 48F^NVLUKUIVHXHYI[K\L\  
N[OYOXNVKRJOJMKJMHGPGTGWYHJZMZOYRVVUXUYV[X\Y\[[Y\X[VYUXUVV  
RJMCKMIPHTHWIYKZM';Ð  
2295: ' 48F^NMLNKNIMHKKJHKGGLGNHOJOKNMKQJTVKYM[P\T\  
W[YYZVZTYQVMUKUJVHXYGYG[H\J\K[MYNXNVM RJVKXMZP[T[WZYXZV';Ð  
2301: ' 40F\_JMILIJHLGNPHQIRKSP RIJMHMOIPJQLRPR[ R[M\L

\\J[HYGWGUHTISKRP R\\JZHxHVIUJTLSPS[';Ð  
2302: ' 51F^IGJJKMMOPPTPWOYmZK[G RIGJJKLMNPOTOWNYLZJ[G  
RPONPMQLSLVMXOZQ[S[UZWXXVXSWQVPTO RPPNQMSMVNY  
RVYVWWSVQTP';Ð  
2303: ' 30F^MJMV RNKNU RVKVU RWJWV RIGKIMJPKTKWJYI[G  
RIYKWMVPUTUWVYW[Y';Ð  
2304: ' 48F^\\ILIJILINJPLQNQPPQNQLPJ[J RIMJOKPMQ RQMPKOJMI  
RIXXXZW[U[SZQXPVPTQSSSUTWIW R[TZRYQWP RSTTVUWWX';Ð  
2305: ' 48F]OUMTLTJUIWIXJZL[M[OZPXPWOUJPINIKJILHOGSGWHYJZLZOYRVUU  
WUYV[X[YZZX RMSKPJNJKKILH RSGVHXJYLYOXRvu';Ð  
2306: ' 48G\_HKKHMKMV RJILLV RMKPHRKRU ROIQLQU  
RRKUHWKW[ RTIVLV[ RWKZH[J\\M\\P[SZUXWUYP[ RYIZJ[M[PZSYUWWTYP[';Ð  
2307: ' 41F^ISMSLRKOKMLJNHQGSgvHXJYMYOXRWS[S  
RITOTMRLOLMMJOHQG RSGUHWJXMXOWRUT[T RKXYX RKYyy';Ð  
2308: ' 30F\_GLJIMLMX RIJLMLX RMLPISLSX ROJRMRX RSLVIYLYW[Y  
RUJXMXXZZ]W';Ð  
2309: ' 33G]ZIJY RZIWJQJ RXKUKQJ RZIYLYR RXKXNYR RQRJR RPSMSJR  
RQRQY RPSPVQY';Ð  
2310: ' 33F^HOJKOU RJMOWRPWPZO[M[KZIXHWHUITKTMUPVRWUWXUZ  
RWHVIUKUMWQXTXWWYUZ';Ð  
2311: ' 36F^IOLLPN RKMOORLUN RQMTOWLYN RVMXO[L RIULRPT  
RKSOURRUT RQSTUWRYT RVsXu[R';Ð  
2312: ' 48F^JHNJPLQOQRPUNWJY RJHMIOJQLRO RRRQUOWMXJY  
RZHwIUJSLRO RRRSUUWWXZY RZHVJTLsOSRTUVWZY RIP[P RIQ[Q';Ð  
2317: ' 12NVQQQSSSSQQQ RQQSS RSQQS';Ð  
2318: ' 18JZMPQRTTVVWYw[V]U^ RMQST RMRPSTUVWWY';Ð  
2319: ' 18JZWKVMTOPQMR RSPMS RUFVGWIWKVNTpQRMT';Ð  
2320: ' 36H\\SMONLPKRKTLNVWQWUVXTYRYPXNVMSM RXNSM RVMQNLP  
RONKR RLVQW RNWSVXT RUVYR';Ð  
2321: ' 36H\\SMONLPKRKTLNVWQWUVXTYRYPXNVMSM RXNSM RVMQNLP  
RONKR RLVQW RNWSVXT RUVYR';Ð  
2322: ' 34J[SMPNPNMRMTNVPWRWUVWTXRXpWNUMSM ROPUM RNRVN  
RMTWO RNUXP ROVWR RPWVT';Ð  
2323: ' 18JZOGO^ RUFU] RMNWL RMOWM RMWWU RMXWV';Ð  
2324: ' 18JZNfNX RVLV^ RNNVL RNOVM RNWVU RNxVV';Ð  
2325: ' 25JZNBW RNNQLTLVMWOWQVSSUQVNW RNNQMTMVN  
RUMVOVQUSSU';Ð  
2326: ' 18E\_HIHL R\\\\L RH\\I RHJ\\J RHK\\K RHL\\L';Ð  
2327: ' 18JZNMmq RWNWQ RMNWN RMOWO RMPWP RMQWQ';Ð  
2328: ' 49JZMLWX RMLONQOTOVNWMWKUKUMTO RONTORQOWM RVKVN  
RULWL RWXUVSUPUNVMWMyOYOWPU RUVPU Rsumw RNVNY RMXOX';Ð  
2329: ' 26JZPOOMOKMKMMNNPOSOUNWL RNKNN RMLOL RMMSO RPOUN  
RWLWY';Ð  
2330: ' 86A^GfHfIeldHcGcFdFfGhIiKiNhPfQdR`RUQ;Q4R/S-U,V,X-Y/Y3X6W8U;P?  
JCHEFHEJDNDREVGyJ[N\\R\\V[XZZW[T[PZMYKWITHPHMIKKJNJRKUMW  
RGdGeHeHdGd RU;Q?LCIFGIFKENERFVGXJ[ RR\\U[WZYWZTZPYMXKVITH';Ð

2331: '103EfNSOUQVSVUUVSVQUOSNQNOONPMSMVNYP[S\\V\\Y[[Y\\W]T]P\\  
\\MZJXIUHRHOIMJKLIOHSHXI]KaMcPeTfYf]e`cba RKLJNIRIXJ\\L`NbQdUeYe]d\_cba  
RPOTO ROPUP RNQVQ RNRVR RNSVS ROTUT RPUTU RaLaNcNcLaL RbLbN  
RaMcM RaVaXcXcVaV RbVbX RaWcW',Ð  
2332: ' 30D`H@Hd RM@Md RW@Wd R\\@\\d RMMWK RMNWL RMOWM RMWWU  
RMXWV RMYWW',Ð  
2367: ' 12NVQQQSSSSQQQ RQQSS RSQQS',Ð  
2368: ' 18JZMPQRTTVVWYW[V]U^ RMQST RMRPSTUVWWY',Ð  
2369: ' 18JZWKVMTOPQMR RSPMS RUFVGWIWKVNTPQRMT',Ð  
2370: ' 32H\\PMMNLOKQKSLUMVPWTWWVXUYSYQXOWNTMPM  
RMNLPLSMUNVPW RWVXTXQWOVNTM',Ð  
2371: ' 36H\\SMONLPKRKTLVNWQWUVXTYRYPXNVMSM RXNSM RVMQNLP  
RONKR RLVQW RNWSVXT RUVYR',Ð  
2372: ' 34J[SMPNNPMRMTNVPWRWUVWVWTRXPWNUMSM ROPUM RNRVN  
RMTWO RNUXP ROVWR RPWVT',Ð  
2373: ' 18JZOGO^ RUFUJ RMNWL RMOWM RMWWU RMXWV',Ð  
2374: ' 18JZNFNX RVLV^ RNNVL RNOVM RNWVU RNXVV',Ð  
2375: ' 25JZBNBW RNNQLTLMWOWQVSSUQVNW RNNQMTMVN  
RUMVOVQUSSU',Ð  
2376: ' 18E\_HIHL R\\\\L RH\\L RHJ\\J RHK\\K RHL\\L',Ð  
2377: ' 18JZNMNQ RWNWQ RMNWN RMOWO RMPWP RMQWQ',Ð  
2378: ' 36JZQCVMRTRU RULQS RTITKPRRUUY RW\\UYSXQXOYN[N]O\_Ra RW  
\\UZSYOYO]P\_Ra RSXPZN]',Ð  
2379: ' 26JZPOOMOKMKMMNNPOSOUNWL RNKNN RMLOL RMMSO RPOUN  
RWLSY',Ð  
2380: ' 86A^GfHfIeldHcGcFdFfGhIiKiNhPfQdR`RUQ;Q4R/S-U,V,X-Y/Y3X6W8U;P?  
JCHEFHEJDNDREVGYYJ[N\\R\\V[XZZW[T[PZMYKWITHPHMIKKJNJRKUMW  
RGdGeHeHdGd RU;Q?LCIFGIFKENERFVGXJ[ RR\\U[WZYWZTZPYMXKVITH',Ð  
2381: ' 89IjNQOOQNSNUOVQVSUUSVQVOUNTMQMNNKPISHWH[I^K`NaRaW'[\_]]  
ZcVfQiMk RWHZI]K\_N`R`W\_[^]\\`YcTgQi RPOTO ROPUP RNQVQ RNRVR RNSVS  
ROTUT RPUTU ReLeNgNgLeL RfLfN ReMgM ReVeXgXgVeV RfVfX ReWgW',Ð  
2382: ' 85D`H>Hf RI>If RM>Mf RQBSBSDQDQAR?T>W>Y?[A\\D\\  
\\I[LYNWOUOSNRLQNOQNROSQVRXSVUWUYV[X\\[\\`[cYeWfTfReQcQ`S`SbQb  
RRBRD RQCSC RY?ZA[D[IZLYN RRLRNPQNRPSVRX RYVZX[[[`ZcYe RR`Rb  
RQaSa',Ð  
2401: ' 21AcHBHb RIBIb R[B[b R\\B\\b RDB`B RDbMb RWb`b',Ð  
2402: ' 23BaGBQPFb RFBPP REBPQ REB\\B^I[B RGa\\a RFb\\b^[[b',Ð  
2403: ' 28I[X+U1R8P=OANFMNMVN^OcPgRIUsXy  
RU1S6Q<P@OFNNNVO^PdQhSnUs',Ð  
2404: ' 28I[L+O1R8T=UAVFWNWVV^UcTgRIOsLy  
RO1Q6S<T@UFVNVVU^TdShQnOs',Ð  
2405: ' 14I[M+MRMy RN+NRNy RM+X+ RMyXy',Ð  
2406: ' 14I[V+VRVy RW+WRWy RL+W+ RLyWy',Ð  
2407: ' 48I[V+S-Q/P1O4O8P<TDUGUJTMRP RS-  
Q0P4P8Q;UCVGVJUMRPNRRTUWVZV]UaQiPiPpQtSw  
RRTTWUZU]T`PhOIOPsPsQuSwVy',Ð

2408: ' 48I[N+Q-S/T1U4U8T<PDOGOJPMRP RQ-  
S0T4T8S;OCNGNJOMRPVRRRTOWNZN]OaSiTITpStQw  
RRTPWOZO]P`ThUIUpTsSuQwNy',Ð  
2409: ' 32I[V.S1Q4O8N=NCOIPMSXT\UbUgTISoQs  
RS1Q5P8O=OBPHQLTWU[VaVgUISpQsNv',Ð  
2410: ' 32I[N.Q1S4U8V=VCUITMQXP\ObOgPIQoSs  
RQ1S5T8U=UBTHSLPWO[NaNgOIQpSsVv',Ð  
2411: ' 147Z:RARRo R@RQo R?RRr RZ"VJRr',Ð  
2412: ' 57Ca].\.[/[0\1]1^0^.[,+Y+W,U.T0S3R:QJQjPsOv R\0]0]/V RR:Rj  
RU.T1S:SZRjQqPtOvMxKylyGxFvFtGsHsItluHvGv RGtGuHuHtGt',Ð  
2501: ' 20H\RfJ[ RRIK[J[ RRIY[Z[ RRFZ[ RMUWU RLVXV',Ð  
2502: ' 44H\LFL[ RMGMZ RLFTFWGXHYJYMXOWPTQ RMGTGWHXJXMWOTP  
RMPTPWQXRYTYWXYWZT[L[ RMQTQWRXTXWWYTZMZ',Ð  
2503: ' 38H]ZKYIWGUFGQFOGMILKKNKSLVMXOZQ[U[WZYXZV  
RZKYKXIWHUGQGOHMKLNL SMVOYQZUZWYXXYVZV',Ð  
2504: ' 32H]LFL[ RMGMZ  
RLFSFVGXIYKZNZSYVXXVZS[L[ RMGSGVHWIXKYNYSXVWXVYSZMZ',Ð  
2505: ' 27I\MFM[ RNGNZ RMFYF RNYGYF RNPTPTQ RNQTQ RNZYZY[ RM[Y]',Ð  
2506: ' 21I[MFM[ RNGN[M[ RMFYF RNYGYF RNPTPTQ RNQTQ',Ð  
2507: ' 44H]ZKYIWGUFGQFOGMILKKNKSLVMXOZQ[U[WZYXZVZRUR  
RZKYKXIWHUGQGOHNIMKLNL SMVNXYOYQZUZWYXXYVYSUSUR',Ð  
2508: ' 22G]KFK[ RKFLFL[K[ RYFXFX[Y[ RYFY[ RLPXP RLQXQ',Ð  
2509: ' 8NWRFR[S[ RRFSFS]',Ð  
2510: ' 20J[VFVVUYSZQZOYNVMV RVFWFWVYUZZS[Q[OZNYMV',Ð  
2511: ' 22H]LFL[M[ RLFMFM[ RZFYFMR RZFMS RPOY[Z[ RQOZ]',Ð  
2512: ' 14IZMFM[ RMFNFNZ RNZYZY[ RM[Y]',Ð  
2513: ' 26F^JFJ[ RKKK[J[ RKKR[ RJFRX RZFRX RYKR[ RYKY[Z[ RZFZ]',Ð  
2514: ' 20G]KFK[ RLIL[K[ RLII[ RKFX RXFX RXFYFY]',Ð  
2515: ' 40G]PFNGLIKKJNJSKVLXNZP[T[VZXXYVZSZNYKXIVGTFFP  
RQGNHLKKNKSLVNYQZSZVYXVYSYNXKVHSGQG',Ð  
2516: ' 27H\LFL[ RMGM[L[ RLFUFWGXHYJYMXOWPUQMQ  
RMGUGWHXJXMWOUPMP',Ð  
2517: ' 48G]PFNGLIKKJNJSKVLXNZP[T[VZXXYVZSZNYKXIVGTFFP  
RQGNHLKKNKSLVNYQZSZVYXVYSYNXKVHSGQG RSXX[Y] RSXTXY]',Ð  
2518: ' 34H\LFL[ RMGM[L[ RLFTFWGXHYJYMXOWPTQMQ  
RMGTGWHXJXMWOTPMP RRQX[Y[ RSQY]',Ð  
2519: ' 43H\YIWGTFFPMGKIKLMMNOOTQVRWSXUXWYTZPZNYMXXKX  
RYIWIVHTGPGMHLILKMMONTVPQXSYUYXWZT[P[MZKX',Ð  
2520: ' 15J[RGR[ RSGS[R[ RLFYFYG RLFLGYG',Ð  
2521: ' 24G]KFKULXNZQ[S[VZXXYUYF RKFLFLUMXNYQZSZVYWXUXFYF',Ð  
2522: ' 14H\JFR[ RJFKFRX RZFYFRX RZFR]',Ð  
2523: ' 26E\_GFM[ RGFHFMX RRFMX RRIM[ RRIW[ RRFWX R]F\FWX R]FW]',Ð  
2524: ' 16H\KFX[Y[ RKFLFY[ RYFXFK[ RYFL[K]',Ð  
2525: ' 17I\KFRPR[S[ RKFLFSP RZFYFRP RZFSPS]',Ð  
2526: ' 20H\XFK[ RYFL[ RKFYF RKFKGXG RLZYZY[ RK[Y]',Ð  
2551: ' 38E\XfvHTKQPOSLWIZG[E[DZDXEWFXY  
RXFWJUTT[ RXFU[ RT[TYSVRTPRNQLQKRKTLWOZR[V[XZ',Ð

2552: ' 70F^UGTHSJQOOUNWLZJ[ RTHSKQSPVOXMZJ[H[GZGXHWIXHY  
ROLNNMOKOJNJLKJMHOGRFXFZG[I[KZMXNTORO RXFYGZIZKYMXXN  
RTOWPXQYSYVXYWZU[S[RZRXSU RTOVPWQXSXVWYU[';Ð  
2553: ' 41H]KHJJJLKNNOQOUNWMYKZIZGYFWFTGQJOMMQLULXMZP[R[UZWXX  
VXTWRURSSRU RWFUGRJPMNQMUMXNZP[';Ð  
2554: ' 43F]UGTHSJQOOUNWLZJ[ RTHSKQSPVOXMZJ[H[GZGXHWJWLXNZP[S[U  
ZWXYTZOZLYIWGUFPFMGKIJKJMKNMNNMOK';Ð  
2555: ' 49I\\WIVJVLWMYMKZIZYGWFTFRGQHPJPLQNSO RTFRHQJQMSO  
RSOQONPLRKTWLYMZO[R[UZWXXVXTWRURSSRU RQOOPMRLTLXMZ';Ð  
2556: ' 46G\\WHVJTORUQWOZM[ RQLPNNOLOKMKKLINGQF[FXGWHVKTSSVRX  
PZM[K[I ZHYHXIWJXIY RSFWGXG ROSPRRQVQXPZMXT';Ð  
2557: ' 53G]JIIKIMJOLPOPOTNWXHXGWVFTGRIQKPNPQQSSTUTWSYQZO  
RWFUGSIRKQNRST RZOYSWWUYSZO[L[JZIXIWJVKWJX RYSWWUXRZO[';Ð  
2558: ' 55F^LLKKKILGOFRFOQMWLYKZI[G[FZFXGWHXGY  
RRFOONRLWKYI[ RJTKSMRVOXN[L]J^H^G]F\\FZGXJWLURTVTYV[W[YZ[X R\\  
\\FZHXLVRUVUYV[';Ð  
2559: ' 33IYWHUKSPQUPWNZL[ RYLWNTQQOONNLNJOHQGUFYFWHVJTPRVQX  
OZL[J[I ZIXJWKXJY';Ð  
2560: ' 34IZYFWHUKSPPYN]  
RYMWOTPQPOONMNKOIQGUFYFWIVKSTQXPZN]M^K\_J^J\\KZMXOWRVVU';Ð  
2561: ' 59F^LLKKKIMGPFRFOQMWLYKZI[G[FZFXGWHXGY  
RRFOONRLWKYI[ RZGWKUMSNPO R]G\\H]I^H^G]F\\FZGWLVMTNPO  
RPOSPTRUYV[ RPORPSRTYV[W[YZ[X';Ð  
2562: ' 40I[MILKLMMOOPRPUOWNZK[H[GZFYFWGVHTKPUOWMZK[ RVHTLRSQV  
PXNZK[I[I HZHIXWKWMXPZR[U[WZYX';Ð  
2563: ' 49D`RFNOKUIXGZE[C[BZBXCWDXC  
RRFPMOQNVNZP[ RRFQJPOOVOZP[ R[FWORXP[ R[FYMXQWVWZY[Z[\\Z^X  
R[FZJYOXVXZY[';Ð  
2564: ' 38G^RFQJOPMULWJZH[F[EZEXFWGXFY  
RRFRKSVT[ RRFSTVT[ R`G\_H`IaHaG`F^F\\GZJYLWQUWT[';Ð  
2565: '  
34H]SFQGOIMLLNKRKVLVMZO[Q[TZVXXUYSZOKYHXGWGUHSJQNPSPV  
RQGOJMNLRRLVMO[';Ð  
2566: ' 53F]UGTHSJQOOUNWLZJ[ RTHSKQSPVOXMZJ[H[GZGXHWIXHY  
ROLNNMOKOJNJLKJMHOGRFVFGZH[J[MZOYPVQTQRP  
RVFXGYHZJZMYOXPVQ';Ð  
2567: ' 43H]UJULTNSOQPOPNNLOIQGTFWFYGZIZMYPWSSWPYNZK[I[I HZHIXW  
KWMXPZS[V[XZZX RWFXYGYIMXPVSSVOYK[';Ð  
2568: ' 65F^UGTHSJQOOUNWLZJ[ RTHSKQSPVOXMZJ[H[GZGXHWIXHY  
ROLNNMOKOJNJLKJMHOGRFWFZG[I[KZMYNVORO RWFYGZIZKYMXXNVO  
RROUPVRWYX[ RROTPURVYX[Y[[Z]X';Ð  
2569: ' 36H\\NIMKMMNOPPSPOXN[K\\H\\  
\\G[FZFXGWHVJUMSTRWPZN[ RVJUNTUSXQZN[K[I ZHXHWIVJWIX';Ð  
2570: ' 38I[YHXJVOTUSWQZO[ RSLRNPONOMMMKNIPGSF\\  
\\FZGYHXKVSUVTXRZO[M[KZJYJXKWLXKY RUFYGGZG';Ð  
2571: ' 39G]HJJGLFMFOHOKNNKVLYL[ RMFNHNKKSJVJYL[N[PZSWUTVR

RZFVRUVUYW[X[ZZ\X R[FWRVVVYW[';Ð  
2572: ' 36G\\HJJGLFMFOHOKNOLVLYM[ RMFNHNKLRKVKYM[N[QZTWVTPYPMZIZ  
GYFXFWGVIVLWNYP[Q]Q[';Ð  
2573: ' 41F]ILHLGKGIHGJFNFMHLLKUJ[ RLLLUK[ RVFTHRLOUMYK[ RVFUHTLSU  
R[ RTLTUS[ R`F^G\\IZLUUYS[';Ð  
2574: ' 52H\\PKOLMLLKLIMGOFQFSGTITLSPQUOXMZJ[H[GZGXHWIXHY  
RQFRGSISLRPPUNXLZJ[ R]G\\H]I^H^G]F[FYGWIULSPRURXSZT[U[WZYX[';Ð  
2575: ' 42G]JJLGNFOFQGGQIOOORPT ROFPGPINONRPTRTUSWQYNZL R\  
FZLWTUX R]F[LYQWUUXSZP[L]JZIXIWJVKWJX[';Ð  
2576: ' 44G\\ZHYJWOVRUTSWQYOZL[ RSLRNPNOMMMKNIPGSF]F[GZHYKXOV  
UTXQZL[H[GZGXHWJWLXOZQ[T[WZYX RVFZG[G[';Ð  
2601: ' 36H\\WMW[X[ RWMXMX[ RWPUNSMPMNNLPKSKULXNZP[S[UZWX  
RWPSNPNNOMPLSLUMXNYPZSZWX[';Ð  
2602: ' 36H\\LFL[M[ RLFMFM[ RMPONQMTMVNXPYSYUXXVZT[Q[OZMX  
RMPQNTNVOWPXSXUWXVYTZQZMX[';Ð  
2603: ' 32I[XPVNTMQMONMPLSLUMXOZQ[T[VZXX  
RXPWQVOTNQNOONPMSMUNXOYQZTZVYWWXX[';Ð  
2604: ' 36H\\WFW[X[ RWFXXF[ RWPUNSMPMNNLPKSKULXNZP[S[UZWX  
RWPSNPNNOMPLSLUMXNYPZSZWX[';Ð  
2605: ' 36I[MTXTXQWOVNTMQMONMPLSLUMXOZQ[T[VZXX  
RMSWSWQVOTNQNOONPMSMUNXOYQZTZVYWWXX[';Ð  
2606: ' 24LZWUFUSGRJR[S[ RFWWGUGSH RTGSJS[ ROMVMVN ROMONVN[';Ð  
2607: ' 48H\\XMWMW\\V\_U`SaQaO`N\_L\_ RXMX\\W\_UaSbPbNaL\_  
RWPUNSMPMNNLPKSKULXNZP[S[UZWX RWPSNPNNOMPLSLUMXNYPZSZWX[';Ð  
2608: ' 25H\\LFL[M[ RLFMFM[ RMQPNRMUMWNXQX[ RMQPORNTNVOWQW[X[';Ð  
2609: ' 24NWRFGQGHRISITHTGSFRF RRGRHSHSGRG RRM[R[S[ RRMSMS[';Ð  
2610: ' 24NWRFGQGHRISITHTGSFRF RRGRHSHSGRG RRM[RbSb RRMSMSb[';Ð  
2611: ' 22H[LFL[M[ RLFMFM[ RXMWMW RXMMX RPTV[X[ RQSX[';Ð  
2612: ' 8NWRFR[S[ RRFSS[';Ð  
2613: ' 42CbGMG[H[ RGMHMH[ RHQKNMMPMRNSQS[ RHQKOMNONQORQR[S[ R  
SQVNXM[M]N^Q^ RSQVOXNZN\\O]Q][^[';Ð  
2614: ' 25H\\LML[M[ RLMMM[ RMQPNRMUMWNXQX[ RMQPORNTNVOWQW[X[';Ð  
2615: ' 36I\\QMONMPLSLUMXOZQ[T[VZXXYUYSXPVNTMQM  
RQNOONPMSMUNXOYQZTZVYWWXXUXSWPVOTNQN[';Ð  
2616: ' 36H\\LMLbMb RLMMMb RMPONQMTMVNXPYSYUXXVZT[Q[OZMX  
RMPQNTNVOWPXSXUWXVYTZQZMX[';Ð  
2617: ' 36H\\WMWbXb RWMXMXb RWPUNSMPMNNLPKSKULXNZP[S[UZWX  
RWPSNPNNOMPLSLUMXNYPZSZWX[';Ð  
2618: ' 21KYOMO[P[ ROMPMP[ RPSQPSNUMXM RPSQQSOUNXNXM[';Ð  
2619: ' 50J]XPWNTMQMNNMPNRPSUUWV RVUWWWXVZ RWYTZQZNY  
ROZNXMX RXPWPVN RWOTNQNN RONNPOR  
RNQPRUTWUXWXXWZT[Q[NZMX[';Ð  
2620: ' 16MXRFR[S[ RRFSS[ ROMVMVN ROMONVN[';Ð  
2621: ' 25H\\LMLWMZO[R[TZWW RLMMMWNYPZRZTYWW  
RWMW[X[ RWMXMX[';Ð  
2622: ' 14JZLMR[ RLMMMY RXMWMRY RXMR[';Ð

2623: ' 26F^IMN[ RIMJMNX RRMNX RRPn[ RRPV[ RRMVX R[MZMVX R[MV[';Đ  
2624: ' 16I[LMW[X[ RLMMM[X[ RXMWML[ RXMM[L[';Đ  
2625: ' 17JZLMR[ RLMMMY RXMWMRYNb RXMR[ObNb';Đ  
2626: ' 20I[VNL[ RXMNZ RLMXM RLMLNVN RNZXZX[ RL[X[';Đ  
2651: ' 33K[UUTSRPRNSMTLVLXMZO[Q[SZTX  
RPRNTMVMYO[ RVRTXTZV[XZYY[V RWRUXUZV[';Đ  
2652: ' 23LZLVNSPO RSFMXMZO[P[RZTXUUURVWWXWZV RTFNXNZO[';Đ  
2653: ' 22LXTSSTTTTSSRQROSNTMVMXNZP[S[VYXV RQROTNVNYP[';Đ  
2654: ' 33K[UUTSRPRNSMTLVLXMZO[Q[SZTX  
RPRNTMVMYO[ RZFTXTZV[XZYY[V R[FUXUZV[';Đ  
2655: ' 23LXOYQXRWSUSSRRQROSNTMVMXNZP[S[VYXV RQROTNVNYP[';Đ  
2656: ' 27OXRRUOWLXIXGWFUGTIKdKfLgNfOcPZQ[S[UZVYXV RTISNRRO[M`Kd';Đ  
2657: ' 38K[UUTSRPRNSMTLVLXMZO[Q[SZTX RPRNTMVMYO[ RVRPd  
RWRT[R`PdOfMgLfLdMaO\_R]V[YY[V';Đ  
2658: ' 30L[LVNSPO  
RSFL[ RTFM[ ROUQSSRTRVSVUUXUZV[ RTRUSUUTXTZV[XZYY[V';Đ  
2659: ' 19NVSLRMSNTMSL RQROXOZQ[SZTYVV RRRPXPZQ[';Đ  
2660: ' 24NVSLRMSNTMSL RQRKd RRRO[M`KdJfHgGfGdHaJ\_M]Q[TYVV';Đ  
2661: ' 31LZLVNSPO RSFL[ RTFM[ RURUSVSURTRTOU  
ROURVSZT[ ROUQVRZT[U[XYZV';Đ  
2662: ' 17NVNVPSRO RUFOXOZQ[SZTYVV RVFPXPZQ[';Đ  
2663: ' 45E^EVGSIRKSKU[ RIRJSJUH[ RKUMSORPRRSRUP[ RPRQSQUO[ RRUTS  
VRWRYSYUXXXZY[ RWRXSXUWXWZY[[Z\Y^V';Đ  
2664: ' 32I[IVKSMROSOU[ RMRNSNUL[ ROUQSSRTRVSVUUXUZV[ RTRUSUUTX  
TZV[XZYY[V';Đ  
2665: ' 29KYRRPRNSMTLVLXMZO[Q[SZTYUWUUTSRRQSQRWTVXXWYV  
RPRNTMVMYO[';Đ  
2666: ' 30L[LVNSPO RQLHg RRLIg  
ROUQSSRTRVSVUUXUZV[ RTRUSUUTXTZV[XZYY[V';Đ  
2667: ' 35K[UUTSRPRNSMTLVLXMZO[Q[SZ  
RPRNTMVMYO[ RVRPdPfQgSfTcT[V[YY[V RWRT[R`Pd';Đ  
2668: ' 24LZLVNSPRRSRUP[ RPRQSQUO[ RRUTSVRWRVU RVRVUWWXWZV';Đ  
2669: ' 22NZNVPSQQQSTUWUYTZR[ RQSSUTWTYR[ RNZP[U[XYZV';Đ  
2670: ' 20NVNVPSRO RUFOXOZQ[SZTYVV RVFPXPZQ[ RPNVN';Đ  
2671: ' 27K[NRLXLZN[O[QZSXUU RORMXMZN[ RVRTXTZV[XZYY[V RWRUXUZV[';Đ  
2672: ' 23KZNRMTLWLZN[O[RZTXUUUR RORNTMWMZN[ RURVWWXWZV';Đ  
2673: ' 36H]LRJTIWIZK[L]NZPX RMRKTJWJZK[ RRRPXPZR[S[UZWXXUXR  
RSRQXQZR[ RXRYVZW[W]V';Đ  
2674: ' 42JZJVLSNRPRQSQUPOXOZM[L[KZKYLYKZ  
RWSVTWTWSVRURSSRUQXQZR[U[XYZV RQSRU RSSQU RPXQZ RQXOZ';Đ  
2675: ' 32K[NRLXLZN[O[QZSXUU RORMXMZN[ RVRPd  
RWRT[R`PdOfMgLfLdMaO\_R]V[YY[V';Đ  
2676: ' 38LYLVNSPRRRRTSTVSPZN[ RRRSSSVRXPZ RN[P\  
\\Q^QaPdNfLgKfKdLaO^R\\VYYY RN[O\\P^PaOdNf';Đ  
2700: ' 42H\\QFNGLJKOKRLWNZQ[S[VZXWYRYOXJVGsfQF ROGMJLOLRMWOZ  
RNYQZSZVY RUZWWXRXOWJUG RVHSGQGdNH';Đ

2701: ' 12H\\NJPIFS[ RNJNKPJRHR[S]',Ð  
2702: ' 34H\\LKLMHNGPFTFVGWHXJXLWNUQL[ RLKMKMJNHPGTGVHWJWLNT  
QK[ RLZYZY[ RK[Y]',Ð  
2703: ' 48H\\MFXFQO RMFMGWG RWFPO  
RQNSNVOXQYTYUXXVZS[P[MZLYKWLW RPOSOVPXS RTOWQXTXUWXTZ  
RXVVYSZPZMYLW ROZLX',Ð  
2704: ' 18H\\UIU[V[ RVFV[ RVFKVZV RUILV RLUZUZV',Ð  
2705: ' 53H\\MFLO RNGMN RMFWFWG RNGWG  
RMNPMSMVNXPYSYUXXVZS[P[MZLYKWLW RLOMOONSNVOXR  
RTNWPXSXUWXTZ RXVVYSZPZMYLW ROZLX',Ð  
2706: ' 62H\\VGWIXIWGTFRFOGMJLOLTMXOZR[S[VZXXYUYTXQVOSNRNOOMQ  
RWHTGRGOH RPGNJMOMTNXQZ RMVOYRZSZVYXV RTZWXXUXTWQTO  
RXSVPSOROOMS RQONQMT',Ð  
2707: ' 12H\\KFYFO[ RKFKGXG RXFN[O]',Ð  
2708: ' 68H\\PFMGLILKMMNNPOTPVQWRXTXWWYTZPZMYLWLTMRNQPTOVN  
WMXKXIWGTFPF  
RNGMIMKNMPNTOVPXRYTYWXYWZT[P[MZLYKWKTLRNPPOTNVMWKWIVG  
RWHTGPGMH RLXOZ RUZXX',Ð  
2709: ' 62H\\  
\\WPURRSQSNRLPKMKLLINGQFRFUGWIXMXRWWUZR[P[MZLXMXNZ RWMVPSR  
RWNUQRRQRNQLN RPRMPLMLLMIPG RLKNHQGRGUHWK RSGVIWMWRVWTZ  
RUYZPZMY',Ð  
2710: ' 16MXRXQYQZR[S[TZTYSXRX RRYRZSZSYRY',Ð  
2711: ' 24MXTZS[R[QZQYRXSXTYT\\S^Q\_ RRYRZSZSYRY RS[T\\ RTZS^',Ð  
2712: ' 32MXRMQNRQORPSPTOTNSMRM RRNROSOSNRN  
RRXQYQZR[S[TZTYSXRX RRYRZSZSYRY',Ð  
2713: ' 40MXRMQNRQORPSPTOTNSMRM RRNROSOSNRN  
RTZS[R[QZQYRXSXTYT\\S^Q\_ RRYRZSZSYRY RS[T\\ RTZS^',Ð  
2714: ' 24MXRFRTST RRFST RRYRZSZSYRY',Ð  
2715: ' 58\\LKLMHNGQFTFWGXHYJYLNWOUPRQ  
RLKMKMJNHQGTGWHXJXLWNUORP RMIPG RUGXI RXMTP RRPRTSTSP  
RRXQYQZR[S[TZTYSXRX RRYRZSZSYRY',Ð  
2716: ' 24MXTFRGQILRMSMTLTJSJRJK RKRSLSLSKRK RRGQK RQIRJ',Ð  
2717: ' 24MXTHSIRIQHQGRFSFTGTJSLQM RRGRHSHSGRG RSITJ RTHSL',Ð  
2718: ' 71F\_\\MZMXNWPUVTXSYQZMZKYJWJUKSLRQOSMTKTISGQFPFNGMIMK  
NNPQUWXZZ[\\ R\\M\\NZNXO RYNXPVVUXSZQ[M[KZJYIWIUJSLQQNRMSKSIRG  
RSHQGPGNH ROGNINKONQQVWXYZZ\\Z\\',Ð  
2719: ' 51\\RBR\_S\_ RRBSBS\_  
RWIYIWGTFQFNGLILKMMNNVRWSXUXWWYTZQZOYNX  
RWIVHTGQGNHMIMKNMVQXSYUYWXYWZT[Q[NZLXNX RXXUZ',Ð  
2720: ' 8G^BIBJb R[B\\BJb',Ð  
2721: ' 24KYUBSDQGOKNPNTQYQ]S`UbVb RUBVBTDRGPKOPOTPYR]T`Vb',Ð  
2722: ' 24KYBNPDRGTKUPUTTYR]P`NbOb RNBOBQDSGUKVPVTUYS]Q`Ob',Ð  
2723: ' 39JZRFQGSQRR RRFRR RRFSGQRR RMINIVOWO RMIWO  
RMIMJWNWO RWIVINOMO RWIMO RWIWMJMNMO',Ð  
2724: ' 8F\_JQ[Q[R RJQJR[R',Ð



2725: ' 16F\_RIRZSZ RRISISZ RJQ[Q[R RJQJR[R',Ð  
2726: ' 16F\_JM[M[N RJMJN[N RJU[U[V RJUJV[V',Ð  
2727: ' 11NWSFRGRM RSGRM RSFTGRM',Ð  
2728: ' 22I[NFMGMM RNGMM RNFOGMM RWFVGVM RWGVM RFXGVM',Ð  
2729: ' 30KYQFOGNINKOMQNSNUMVKVIUGSFQF RQFNIOMSNVKUGQF  
RSFOGNKQNUMVISF',Ð  
2750: ' 42H]TFQGOIMLLOKSKVLYMZO[Q[TZVXXUYRZNZKYHXGVFTF  
RTFRGPINLMOLSLVMO[ RQ[SZUXWUXRYNYKXHVF',Ð  
2751: ' 15H]TJO[ RVFP[ RVFSIPKNL RUIQKNL',Ð  
2752: '  
42H]OJPKOLNKNJOHPGSFVFYGGIZKYMWOTQPSMUKWI[ RVFXGYIYKXMVOPS  
RJKXMXRZUZWYXW RMXR[U[WZXW',Ð  
2753: ' 50H]OJPKOLNKNJOHPGSFVFYGGIZKYMVOSP RVFXGYIYKXMVO  
RQPSPVQWRXTXWWYVZS[O[LZKYJWJVKULVKW RSPUQVRWTWWVYUZS',Ð  
2754: ' 10H]XGR[ RYFS[ RYFJUJU',Ð  
2755: ' 39H]QFLP RQF[F RQGVG[F  
RLPMOPNSNVOWPXRUXUWUZR[O[LZKYJWJVKULVKW RSNUOVPWRWUVXTZR',Ð  
2756: ' 46H]YIXJYKZJZIYGWFTFQGOIMLLOKSKWLYMZO[R[UZWXXVXSWQVPTO  
QOOPMRLT RTFRGPINLMOLSLXMZ RR[TZVXWVWRVP',Ð  
2757: ' 30H]NFL R[FZIXLSRQUPWO[ RXLRPUOWN[ RMIPFRFWI  
RNHPGRGWIYIZH[F',Ð  
2758: ' 63H]SFPGOHNJNMOOQPTPXOYNZLZIYGVFSF RSFQGGPHOJOMPOQP  
RTPWOXNYLYIXGVF RQPMQKSJUJXKZN[R[VZWYXWXTWRVQTP  
RQPNQLSKUKXLZN[ RR[UZVYWWWSVQ',Ð  
2759: ' 46H]YMXOVQTRQROQNPMNMKNIPGSFVFXGYHZJZNYRXUVXTZQ[N[LZK  
XKWLVMWLX ROQNONKOIQGSF RXGYIYNXRWUUXSZQ',Ð  
2760: ' 6MXPYOZP[QZPY',Ð  
2761: ' 8MXP[OZPYQZQ[P]N\_',Ð  
2762: ' 11MXSMRNSOTNSM RPYOZP[QZ',Ð  
2763: ' 14MXSMRNSOTNSM RP[OZPYQZQ[P]N\_',Ð  
2764: ' 17MXUFTGRS RUGRS RUFVGRS RPYOZP[QZPY',Ð  
2765: ' 34H]OJPKOLNKNJOHPGSFWFZG[I[KZMYNSPQQQSRTTT  
RWFYGGIZKYMVNVO RPYOZP[QZPY',Ð  
2766: ' 8MXVFTHSJSKTLUKTJ',Ð  
2767: ' 8MXUHTGUFVGVHUJSL',Ð  
2768: ' 55E\_\\N[O\\P]O]N\\M[MYNWPRXPZN[K[HZGXGVHTISKRPPTROTUKUITGR  
FPGOIOLPRQUSXUZW[Y[ZYZX RK[IZHXHVITJSP ROLPQQTSWUYWZYZZY',Ð  
2769: ' 41H]TBL\_ RYBQ\_ RZJYKZL[K[JZHYGVFRFOGMIMKNMONVRXT  
RMKOMVQWRXTXWWYVZS[O[LZKYJWJVKULVKW',Ð  
2770: ' 3G]\_BEb',Ð  
2771: ' 20KZZBVESHQKOONTNXO]P`Qb RVESIQMPPOUOZP\_Qb',Ð  
2772: ' 20JYSBTUGVLVPUUSYQ\\N\_Jb RSBTEUJUOTTSWQ[N\_',Ð  
2773: ' 9J[TFTR ROIYO RYIOO',Ð  
2774: ' 3E\_IR[R',Ð  
2775: ' 6E\_RIR[ RIR[R',Ð  
2776: ' 6E\_IO[O RIU[U',Ð

2777: ' 6NWUFMS RVFSM',Ð  
2778: ' 12I[PFNM RQFNM RYFWM RZFWM',Ð  
2779: ' 14KZSFQGPIPKQMSNUNWMXKXIWGUFSF',Ð  
2801: ' 18H\RFK[ RRFY[ RRIX[ RMUVU RI[O[ RU[[',Ð  
2802: ' 31G]LFL[ RMFM[ RIFYFYLXF  
RMPUPXQYRZTZWYYXZU[I[ RUPWQXRYTYWXYWZU[' ,Ð  
2803: ' 45G]LFL[ RMFM[ RIFUFXGYHZJZLYNXOUP RUFWGXHYJYLNWOUP  
RMPUPXQYRZTZWYYXZU[I[ RUPWQXRYTYWXYWZU[' ,Ð  
2804: ' 14I[NFN[ ROFO[ RKFZFZLYF RK[R[' ,Ð  
2805: ' 31F^NFMNLT LXKZJ[ RXFX[ RYFY[ RKF\F RG[\ RG[Gb RH[Gb R[\b R[\b',Ð  
2806: ' 22G\LFL[ RMFM[ RSLST RIFYFYLXF RMPSP RI[Y[YUX[' ,Ð  
2807: ' 71CbRFR[ RSFS[ ROFVF RGGHHGIFHFGGFHFIGJIKMLONPWPYOZM[I\G]F^F\_G\_H^I]H^G RNPLQKSJXIZH[ RNPMQLSKXJZI[G[FZEX RWPYQZS[X\Z]  
[ RWPXQYSZX[Z\[\_Z^X RO[V[' ,Ð  
2808: ' 45H\LIKFKLLINGPFTFWGXIXLWNTQO RTFVGWIWLVNTO  
RTOVPXRYTYWXYWZT[O[MZLYKWKVLUMVLW RWQXTXWWYVZT[' ,Ð  
2809: ' 27F^KFK[ RLFL[ RXFX[ RYFY[ RHFOF RUF\F RXHLY RH[O[ RU[\[' ,Ð  
2810: ' 37F^KFK[ RLFL[ RXFX[ RYFY[ RHFOF RUF\F RXHLY RH[O[ RU[\ RN@N?  
M?M@NBPCTCVBW@',Ð  
2811: ' 43F^KFK[ RLFL[ RHFOF RLPSPUOVMWIXGYFZF[G[HZIYHZG  
RSPUQVSWXXZY[ RSPTQUSVXWZX[Z[Z\X RH[O[' ,Ð  
2812: ' 25E^MFMLLT KXJZI[H[GZGYHXIYHZ RXFX[ RYFY[ RJF\F RU[\[' ,Ð  
2813: ' 30F\_KFK[ RLFRX RKFR[ RYFR[ RYFY[ RZFZ[ RHFLF RYF]F RH[N[ RV[[],Ð  
2814: ' 27F^KFK[ RLFL[ RXFX[ RYFY[ RHFOF RUF\F RLPXP RH[O[ RU[\[' ,Ð  
2815: ' 44G]QFNGLIKKJOJRKVLXNZQ[S[VZXXYVZRZOYKXIVGSFQF  
RQFOGMILKKOKRLVMXOZQ[ RS[UZWXXVYRYOXKWIUGSF',Ð  
2816: ' 21F^KFK[ RLFL[ RXFX[ RYFY[ RHF\F RH[O[ RU[\[' ,Ð  
2817: ' 29G]LFL[ RMFM[ RIFUFXGYHZJZMYOXPUQMQ RUFWGXHYJYMXOWPUQ  
RI[P[' ,Ð  
2818: ' 32G\XIYLYFXIVGSFQFNGLIKKJNJSKVLXNZQ[S[VZXXYV  
RQFOGMILKKKNKSLVMXOZQ[' ,Ð  
2819: ' 16\RFR[ RSFS[ RLFKLKFZFZLYF RO[V[' ,Ð  
2820: ' 24H]KFRV RLFSV RZFSVQYPZN[M[LZLYMXNYMZ RIFOF RVF\F',Ð  
2821: ' 48F\_RFR[ RSFS[ ROFVF RPILJJLIOIRJULWPXUXYW[U\R\O[LYJUUPI  
RPIMJKLJOJRKUMWPX RUXXWZU[R[OZLXJUI RO[V[' ,Ð  
2822: ' 21H\KFX[ RLFY[ RYFK[ RIFOF RUF[F RI[O[ RU[[],Ð  
2823: ' 27F^KFK[ RLFL[ RXFX[ RYFY[ RHFOF RUF\F RH[\ R[\b R[\b',Ð  
2824: ' 28F]KFKQLSOTRTUSWQ RLFLQMSOT RWFV[ RXFX[ RHFOF RTF[F RT[[],Ð  
2825: ' 30BcGFG[ RHFH[ RRFR[ RSFS[ RJF][ R^F^ RDKF ROFVF RZFaF RD[a],Ð  
2826: ' 36BcGFG[ RHFH[ RRFR[ RSFS[ RJF][ R^F^ RDKF ROFVF RZFaF  
RD[a] R`[ab Ra[ab',Ð  
2827: ' 31F`PFP[ RQFQ[ RIFHLHFTF RQPXP[Q\R]T]W\Y[ZX[M[ RXPZQ[R\T\W\YZZX[' ,Ð  
2828: ' 41CaHFH[ RIFI[ REFLF  
RIPPPSQTRUTUWTYSZP[E[ RPPRQSRTTTWSYRZP[ R[F[ R\F\ RXF\_F RX[\_],Ð  
2829: ' 29H]MFM[ RNFN[ RJFQF  
RNPUPXQYRZTZWYYXZU[J[ RUPWQXRYTYWXYWZU[' ,Ð

2830: ' 39H]LIKFKLLINGQFSFVGXIYKZNZSYVXXVZS[P[MZLYKWKVLUMVLW  
RSFUGWIXKYNYSXVWXUZS[ RPPYP',Đ  
2831: ' 59CbHfH[ RIFI[ REFLF  
RE[L[ RVFSGQIPKOOORPVQXSZV[X[[Z]X^V\_R\_O^K]I[GXFVF  
RVFTGRIQKPOPRQVRXTZV[ RX[ZZ\X]V^R^O]K\IZGXF RIPOP',Đ  
2832: ' 45G]WFW[ RXFX[ R[FOFLGKHJJJLKNLOOPWP ROFMGLHKJKLLNMOOP  
RRPPQORLYKZJZIY RPQOSMZL[J[IYIX RT[[',Đ  
2901: ' 39I]NONPMPMONNPMTMVNWOXQXXYZZ[ RWOWXXZZ[[ RWQVRPSMTLV  
LXMZP[S[UZWX RPSNTMVMXNZP',Đ  
2902: ' 48H\XFWGQINKLNKQKULXNZQ[S[VZXXYUYSXPVNSMQMNNLPKS  
RXFWHUIQJNLLN RQMONMPLSLUMXOZQ[ RS[UZWXXUXSWPUNSM',Đ  
2903: ' 37H\MMM[ RNMN[ RJMUMXNYPYQXSUT RUMWNXPXQWSUT  
RNTUTXUYWYXXZU[J[ RUTWUXWXXWZU',Đ  
2904: ' 14HZMMM[ RNMN[ RJMXMXRWM RJ[Q',Đ  
2905: ' 22F]NMNQMWLZK[ RWMW[ RXMX[ RKM[M RI[H`H[[[ `Z',Đ  
2906: ' 31H[LSXSXQWOVNTMQMNNLPKSKULXNZQ[S[VZXX RWSWPVN  
RQMONMPLSLUMXOZQ',Đ  
2907: ' 59E`RMR[ RSMS[ ROMVM RJNIOHNIMJMKNMNRNSPTUTWSXRZN[M\M]N  
\O[N RPTNUMVKZJ[ RPTNLVZK[I[HZGX RUTWUXVZZ[ RUTWVYZZ[\]]Z^X RO[V',Đ  
2908: ' 42I[MOLMLQMONNPMTMVNXPXQWSTT RTMVNWPWQVSTT  
RQTTTWUXWXXWZT[P[MZLXLWMVNW MX RTTVUWWWXVZT',Đ  
2909: ' 27G]LML[ RMMM[ RWMW[ RXMX[ RIMPM RTM[M RI[P[ RT[[[ RWNMZ',Đ  
2910: ' 37G]LML[ RMMM[ RWMW[ RXMX[ RIMPM RTM[M RI[P[ RT[[[ RWNMZ  
ROGOFNFNGOIQJSJUIVG',Đ  
2911: ' 38H\MMM[ RNMN[ RJMQM RNTPTSSTRVNWMXMYNXOWN  
RPTSUTVVZW[ RPTRUSVUZV[X[YZZX RJ[Q',Đ  
2912: ' 22G]NMNQMWLZK[J[IJZYKZ RWMW[ RXMX[ RKM[M RT[[',Đ  
2913: ' 30G^LML[ RLMR[ RMMRY RXMR[ RXMX[ RYMY[ RIMMM RXM\M RI[O[ RU[  
\',Đ  
2914: ' 27G]LML[ RMMM[ RWMW[ RXMX[ RIMPM RTM[M RMTWT RI[P[ RT[[',Đ  
2915: ' 36H\QMNLPKSKULXNZQ[S[VZXXYUYSXPVNSMQM  
RQMONMPLSLUMXOZQ[ RS[UZWXXUXSWPUNSM',Đ  
2916: ' 21G]LML[ RMMM[ RWMW[ RXMX[ RIM[M RI[P[ RT[[',Đ  
2917: ' 36G\LMLb RMMMb RMPONQMSMVNXPYSYUXXVZS[Q[OZMX  
RSMUNWPXSXUWXUZS[ RIMMM RibPb',Đ  
2918: ' 28H[WPVQWRXQXPVNTMQMNNLPKSKULXNZQ[S[VZXX  
RQMONMPLSLUMXOZQ',Đ  
2919: ' 16I\RMR[ RSMS[ RMMLRLMYMYRXM RO[V',Đ  
2920: ' 22I[LMR[ RMMRY RXMR[P\_NaLbKbJaK`La RJMPM RTMZM',Đ  
2921: ' 52H]RFRb RSFSb ROFSF RRPQNPMNMLNKQKWLN[P[QZRX  
RNMMNLQLWMZN[ RWMXNYQYWXZW[ RSPTNUMWWMYNZQZWYZW[U[TZSX  
RObVb',Đ  
2922: ' 21H\LMW[ RMMX[ RXML[ RJMPM RTMZM RJ[P[ RT[Z',Đ  
2923: ' 23G]LML[ RMMM[ RWMW[ RXMX[ RIMPM RTM[M RI[[[ `Z',Đ  
2924: ' 28G]LMLTMVPWRWUVWT RMMMTNVPW RWMW[ RXMX[ RIMPM RTM[M  
RT[[',Đ

2925: ' 30CbHMH[ RIMI[ RRM[R RSMS[ R\M\ R]M][ REMLM ROMVM RYM`M RE['',Đ  
2926: ' 32CbHMH[ RIMI[ RRM[R RSMS[ R\M\ R]M][ REMLM ROMVM RYM`M  
RE['`\_['',Đ  
2927: ' 27H]QMQ[ RRM[R RLMKRKMUM  
RRTVTYUZWZXYZV[N[ RVTXUYWYXXZV['',Đ  
2928: ' 37E\_JMJ[ RKM[K RGMNM  
RKTOTRUSWSXRZO[G[ ROTQURWRXQZO[ RYMY[ RZMZ[ RVM]M RV[[['',Đ  
2929: ' 25J[OMO[ RPMP[ RLMSM RPTTTWUXWXXWZT[L[ RTTVUWWWXVZT['',Đ  
2930: ' 34\MOLMLQMONNPMSMVNXPYSYUXXVZS[P[NZLXLWMVNWMMX  
RSMUNWPXSXUWXUZS[ RRTXT',Đ  
2931: ' 51DaIMI[ RJMJ[ RFMMM  
RF[M[ RVMSNQPPSPUQXSZV[X[[Z]X^U^S]P[NXMVM  
RVMTNRPQSQRXTZV[ RX[ZZ\X]U]S\PNXM RJTPT',Đ  
2932: ' 40G\VMV[ RWMW[ RZMOMLNKPKQLSOTVT ROMMNLPLQMSOT  
RTTQUPVNZM[ RTTRUQVOZN[L[KZJX RS[Z['',Đ  
3001: ' 36H\RFKZ RQIW[ RRIX[ RRFY[ RMOVU  
RI[O[ RT[[[ RKZJ[ RKZM[ RWZU[ RWYV[ RXYZ['',Đ  
3002: ' 78G[LFL[ RMGMZ RNFN[ RIFUFXGYHZJZLYNXOUP RXHYJYLN  
RUFWGXIXMWOU RNPUPXQYRZTZWYXXZU[[[ RXRYTYWXY  
RUPWQXSXXWZU[ RJFLG RKFLH ROFNH RPFNG RLZJ[ RLYK[ RNYO[ RNZP['',Đ  
3003: ' 37G\XIYFYLXIVGTFQFNGLIKKJNJSKVLXNZQ[T[VZXXYV  
RMILKKNKSLVMX RQFOGMJLNLSMWOZQ['',Đ  
3004: ' 62G[LFL[ RMGMZ  
RNFN[ RIFSFVGXIYKZNZSYVXXVZS[[[ RWIXKYNYSXVWX  
RSFUGWJXNXSWWUZS[ RJFLG RKFLH ROFNH RPFNG  
RLZJ[ RLYK[ RNYO[ RNZP['',Đ  
3005: ' 83G\LFL[ RMGMZ RNFN[ RIFYFYL RNPTP RTLTT RI[Y[YU RJFLG RKFLH  
ROFNH RPFNG RTFYG RVFYH RWFYI RXFYL RTLSPTT RTNRPTR RTOPPTQ  
RLZJ[ RLYK[ RNYO[ RNZP[ RT[YZ RV[YY RW[YX RX[YU',Đ  
3006: ' 70G[LFL[ RMGMZ RNFN[ RIFYFYL RNPTP RTLTT RI[Q[ RJFLG RKFLH  
ROFNH RPFNG RTFYG RVFYH RWFYI RXFYL RTLSPTT RTNRPTR RTOPPTQ  
RLZJ[ RLYK[ RNYO[ RNZP['',Đ  
3007: ' 60G^XIYFYLXIVGTFQFNGLIKKJNJSKVLXNZQ[T[VZXZY[YS  
RMILKKNKSLVMX RQFOGMJLNLSMWOZQ[ RXTXY RWSWYVZ RTS\S RUSWT  
RVSWU RZSYU R[SYT',Đ  
3008: ' 81F^KFK[ RLGLZ RMFM[ RFWF[ RXGXZ RYFY[ RHFPF RTF\F RMPWP  
RH[P[ RT[\[ RIFKG RJFKH RNFMH ROFMG RUFWG RVFWH RZFYH R[FYG  
RKZI[ RKYJ[ RMYN[ RMZO[ RWZU[ RWYV[ RYYZ[ RYZ[[['',Đ  
3009: ' 39LXQFQ[ RRGRZ RSFS[ RNVFV RN[V[ ROFQG RPFQH RTFSH RUFSG  
RQZO[ RQYP[ RSYT[ RSZU['',Đ  
3010: ' 45JYSFSWRZQ[ RTGTWSZ RUFUWTZQ[O[MZLXLVMUNUOVOWNXMX  
RMVMWNWNVMV RPFXF RQFSG RRFSH RVFUH RWFUG',Đ  
3011: ' 69F\KFK[ RLGLZ RMFM[ RXGMR RPPW[ RQPX[ RQNY[ RHFPF RUF[F  
RH[P[ RT[[[ RIFKG RJFKH RNFMH ROFMG RWFYG RZFXG  
RKZI[ RKYJ[ RMYN[ RMZO[ RWYU[ RWYZ['',Đ  
3012: ' 52I[NFN[ ROGOZ RFPF[ RKFSF RK[Z[ZU RLFNG RMFNH RQFPH RRFPG

RNZL[ RNYM[ RPYQ[ RPZR[ RU[ZZ RW[ZY RX[ZX RY[ZU',Ð  
3013: ' 63E\_JFJZ RJFQ[ RKFX RLFRX RFXQ[ RFXF[ RYGYZ RZFZ[ RGFLF  
RFXF[ RG[M[ RU[[[ RHFG R[FZH R\FZG RJZH[ RJZL[ RXZV[ RXYW[ RZY[[ RZZ\['],Ð  
3014: ' 39F^KFKZ RKFY[ RLFXX RMFYX RYGY[ RHFMF RVF\F RH[N[ RIFKG  
RWFYG R[FYG RKZI[ RKZM['],Ð  
3015: ' 54G]QFNGLIKKJOJRKVLXNZQ[S[VZXXYVZRZOYKXIVGSFQF  
RMILKKNKSLVMX RWXXVYSYNXKW  
RQFOGMJLNLMSWOZQ[ RS[UZWXXSXNWJUGSF',Ð  
3016: ' 59G]LFL[ RMGMZ RNFN[ RIFUFXGYHZJZMYOXPUQNN RXHYJYMXO  
RUFWGXIXNWPUQ RI[Q[ RJFLG RKFLH ROFNH RPFNG  
RLZJ[ RLYK[ RNYO[ RNZP['],Ð  
3017: ' 77G]QFNGLIKKJOJRKVLXNZQ[S[VZXXYVZRZOYKXIVGSFQF  
RMILKKNKSLVMX RWXXVYSYNXKW  
RQFOGMJLNLMSWOZQ[ RS[UZWXXSXNWJUGSF RNXOVQURUTVUXV^W`Y`Z^Z\  
RV\W^X\_Y\_ RUXW]X^Y^Z['],Ð  
3018: ' 80G]LFL[ RMGMZ RNFN[ RIFUFXGYHZJZLYNXOUPNP RXHYJYLYN  
RUFWGXIXMWOU RPTQUSWYX[Z[[Y[W RWWXYZZZ RTQURXXYYZY[X  
RI[Q[ RJFLG RKFLH ROFNH RPFNG RLZJ[ RLYK[ RNYO[ RNZP['],Ð  
3019: ' 44H\XIYFYLVXIVGSFPMGKIKLLNOPURWSXUXWZ RLLMNOOUQWRXT  
RMGLILKMMONUPXRYTYWXYWZT[Q[NZLXKUK[LX',Ð  
3020: ' 57H\JFJL RQFQ[ RRGRZ RSFS[ RZFZL RJFZF RN[V[ RKFJL RLFJI RMFJH  
ROFJG RUFZG RWFZH RFXZI RYFZL RQZO[ RQYP[ RSYT[ RSZU['],Ð  
3021: ' 45F^KFKULXNZQ[S[VZXXYUYG RLGLVMX RMFMVNYOZQ[ RHFPF RVF\F  
RIFKG RJFKH RNFMH ROFMG RWFYG R[FYG',Ð  
3022: ' 34H\KFR[ RLFRXR[ RMFSX RYGR[ RIFPF RUF[F RJFLH RNFMH ROFMG  
RWFYG RZFYG',Ð  
3023: ' 55F^JFN[ RKFNVN[ RLFOV RRFOVN[ RRFV[ RSFVVV[ RTFWV  
RZGWVV[ RGFOF RRFTF RWF[F RHFKG RIFKH RMFLH RNFLG RFXZG R\FZG',Ð  
3024: ' 54H\KFW[ RLFX[ RMFY[ RXGLZ RIFPF RUF[F RI[O[ RT[[[ RJFMH RNFMH  
ROFMG RVFXG RZFXG RLZJ[ RLZN[ RWZU[ RWYV[ RWYZ['],Ð  
3025: ' 48G]JFQQQ[ RKFRQRZ RLFSQS[ RYGSQ RHFOF RVF\F RN[V[ RIFKG  
RNFLG RWFYG R[FYG RQZO[ RQYP[ RSYT[ RSZU['],Ð  
3026: ' 41H\YFKFKL RWFK[ RXFL[ RYFM[ RK[Y[YU RLFLK RMFKI RNFKH RPFKG  
RT[YZ RV[YY RW[YX RX[YU',Ð  
3051: ' 38H\UFIZ RSJT[ RTHUZ RUFUHVYV[ RLUTU  
RF[L[ RQ[X[ RIZG[ RIZK[ RTZR[ RTYS[ RVYW['],Ð  
3052: ' 78F^OFI[ RPFJ[ RQFK[ RLFWFZG[I[KZNYOVP RYGZIZKYNXO  
RWFXYIYKXNVP RNPVPXQYSYUXXVZR[F[ RWQXSXUWXUZ  
RVPWRWUVXTZR[ RMFPG RNFOH RRFPH RSFPG RJZG[ RJYH[ RKYL[ RJZM['],Ð  
3053: ' 41H]ZH[H\F[LJZHYGWFTFQGOIMLLOKSKVLYMZP[S[UZWXXV  
RQHOJNLMOLSLWY RTFRGPJOLNOMSMXNZP['],Ð  
3054: '  
63F]OFI[ RPFJ[ RQFK[ RLFUFXGYHZKZOYSWWUYSZO[F[ RWGXHYKYOXSVWTY  
RUFWHXKXOWSUWRZO[ RMFPG RNFOH RRFPH RSFPG  
RJZG[ RJYH[ RKYL[ RJZM['],Ð  
3055: ' 80F]OFI[ RPFJ[ RQFK[ RULST RLF[FZL RNPTP RF[U[VV RMFPG RNFOH

RRFPH RSFPG RWFZG RXFZH RYFZI RZFZL RULSPST RTNRPSR RTOQPSQ  
RJZG[ RJYH[ RKYL[ RJZM[ RP[UZ RR[UY RUYWV',Ð

3056: ' 70F\OFI[ RPFJ[ RQFK[ RULST RLF[FZL RNPTP RF[N[ RMFPG RNFOH  
RRFPH RSFPG RWFZG RXFZH RYFZI RZFZL RULSPST RTNRPSR RTOQPSQ  
RJZG[ RJYH[ RKYL[ RJZM[';Ð

3057: ' 65H^ZH[H\F[L[JZHYGWFTFQGOIMLLOKSKVLYMZP[R[UZWXYT  
RQHOJNLMOLSLWMY RVXWWXT RTFRGPJOLNOMSMXNZP[ RR[TZVWWT RTT\T  
RUTWU RVTWW RZTXV R[TXU',Ð

3058: ' 81E\_NFH[ ROFI[ RPFJ[ RZFT[ R[FU[ R\FV[ RKFSF RWF\_F RLPXP  
RE[M[ RQ[Y[ RLFOG RMFNH RQFOH RRFOG RXF[G RYFZH R]F[H R^F[G  
RIZF[ RIYG[ RJYK[ RIZL[ RUZR[ RUYS[ RVYW[ RUZX[';Ð

3059: ' 39KYTFN[ RUFO[ RVFP[ RQFYF RK[S[ RRFUG RSFTH RWFUH RXFUG  
ROZL[ ROYM[ RPYQ[ ROZR[';Ð

3060: ' 47I\WFRWQYO[ RXFTSSVRX RYFUSSXQZO[M[KZJXJVKULUMVMWLXKX  
RKVKWLWLVKV RTF\F RUFYG RVFWH RZFXH R[FXG',Ð

3061: ' 72F]OFI[ RPFJ[ RQFK[ R\GMR RQOU[ RROV[ RSNWZ RLFTF RYF\_F  
RF[N[ RR[Y[ RMFPG RNFOH RRFPH RSFPG RZF\G R^F\G  
RJZG[ RJYH[ RKYL[ RJZM[ RUZS[ RUYT[ RVYX[';Ð

3062: ' 49H\QFK[ RRFL[ RSFM[ RNFFV RH[W[YU ROFRG RPFQH RTFRH RUFRG  
RLZI[ RLYJ[ RMYN[ RLZO[ RR[WZ RT[XX RV[YU',Ð

3063: ' 68D`MFGZ RMGNYN[ RNFOY ROFPX R[FPXN[ R[FU[ R\FV[ R]FW[ RJFOF  
R[F`F RD[J[ RR[Z[ RKFMG RLFMH R^F\H R\_F\G  
RGZE[ RGZI[ RVZS[ RVYT[ RWYX[ RVZY[';Ð

3064: ' 43F\_OFIZ ROFV[ RPFVX RQFWX R\GWXV[ RLFQF RYF\_F RF[L[ RMFPG  
RNFPH RZF\G R^F\G RIZG[ RIZK[';Ð

3065: ' 56G]SFPGNILLKOJSJVKYLZN[Q[TZVXXUYRZNZKYHGXGVFSF  
ROIMLLOKSKWLY RUXWUXRYNYJXH  
RSFQGOJNLMOLSLXMZN[ RQ[SZUWVUWRXNXIWGVF',Ð

3066: ' 60F]OFI[ RPFJ[ RQFK[ RLFXF[G\K[NYPUQMQ RZG[I[KZNX  
RXFYGZIZKYNWPUQ RF[N[ RMFPG RNFOH RRFPH RSFPG  
RJZG[ RJYH[ RKYL[ RJZM[';Ð

3067: ' 78G]SFPGNILLKOJSJVKYLZN[Q[TZVXXUYRZNZKYHGXGVFSF  
ROIMLLOKSKWLY RUXWUXRYNYJXH  
RSFQGOJNLMOLSLXMZN[ RQ[SZUWVUWRXNXIWGVF  
RLXMVOUPURVSXT]U^V^W] RT^U\_V\_RSXS\_T`V`W]W\',Ð

3068: ' 78F^OFI[ RPFJ[ RQFK[ RLFWFZG[I[KZNYOVNP RYGGIZKYNXO  
RWFXYIYKXNVP RRPTQURWXXYYZX RYXZYX RUVZW[YZXZW  
RF[N[ RMFPG RNFOH RRFPH RSFPG RJZG[ RJYH[ RKYL[ RJZM[';Ð

3069: ' 44G^ZH[H\F[L[JZHYGVFRFOGMIMLNNPPVSWUWXVZ RNLONVRWT  
ROGNINKOMUPWRXTXWWYVZS[O[LZKYJWJUI[JYKY',Ð

3070: ' 54G]TFN[ RUFO[ RVFP[ RMFKL R]F\L RMF]F RK[S[ RNFKL RPFLI RRFMG  
RYF\G RZF\H R[F\I R\F\L ROZL[ ROYM[ RPYQ[ ROZR[';Ð

3071: ' 48F\_NFKQUJXKZN[R[UZWXXU\G ROFLQKUKYLZ RPFMQLULYN[ RKFSF  
RYF\_F RLFOG RMFNH RQFOH RRFOG RZF\G R^F\G',Ð

3072: ' 35H\NFNHOYO[ ROGPX RPFQW R[GO[ RLFSF RXF^F RMFNH RQFPH  
RRFOG RYF[G R]F[G',Ð

3073: ' 57E\_MFMHKYK[ RNGLX ROFMW RUFMWK[ RUFUHSYS[ RVGTX RWFUW  
R]GUWS[ RJFRF RUFWF RZF`F RKFNG RLFMH RPFNI RQFNG R[F]G R\_F]G',Ð  
3074: ' 54G]NFT[ ROFU[ RPFV[ R[GIZ RLFSF RXF^F RF[L[ RQ[X[ RMFOH RQFPH  
RRFPG RYF[G R]F[G RIZG[ RIZK[ RTZR[ RTYS[ RUYW['',Ð  
3075: ' 51G]MFQPN[ RNFRPO[ ROFSPP[ R\\GSP RKFRF RYF\_F RK[S[ RLFNG  
RPFOH RQFNG RZF\\G R^F\\G ROZL[ ROYM[ RPYQ[ ROZR['',Ð  
3076: ' 35G]ZFH[ R[FI[ R\\FJ[ R\\FNFL RH[V[XU ROFLL RPFMI RRFNG RR[VZ  
RT[WX RU[XU',Ð  
3101: ' 54I]NPNOOOOQMOMONNPMTMVNWOXQXXYZZ[ RVOWQWXXZ  
RTMUNVPVXWZZ[[[ RVRUSPTMULWLMZP[S[UZVX RNUMWMXNZ  
RUSQTOUNWNXOZP['',Ð  
3102: ' 47G\\LFL[MZOZ RMGMY RIFNFNZ  
RNPNQMSMVNXPSYUXXVZS[Q[OZNX RWPXR XVW  
RSMUNVOWRWV VYUZS[ RJFLG RKFLH',Ð  
3103: ' 34H[WQWPVPVRXRPVNTMQMNNLPKSKULXNZQ[S[VZXX RMPLRLVMX  
RQMONNOMRMVN YOZQ['',Ð  
3104: ' 52H]VFV[[[ RWGWZ RSFXFX[ RVPUNSMQMNNLPKSKULXNZQ[S[UZVX  
RMPLRLVMX RQMONNOMRMVN YOZQ[ RTFVG RUFVH RXY Y[ RXZZ['',Ð  
3105: ' 41H[MSXSXQWOVNSMQMNNLPKSKULXNZQ[S[VZXX RWRWQVO  
RMPLRLVMX RVSVPUNSM RQMONNOMRMVN YOZQ['',Ð  
3106: ' 40KYWHWGVGVIXXGWFTFRGQHPKP[ RRHQKQZ RTFSGRIR[ RMMVM  
RM[U[ RPZN[ RPYO[ RRY S[ RRZT['',Ð  
3107: ' 89I\\XNYOZNYMXMVNUO  
RQMONNOMQMSNUOVQWSWUVVUWSWQVOUNSMQM ROONQNSOU  
RUUVSVQUO RQMPNOPOTPVQW RSWTVUTUPTNSM RNUMVLXLYM[N\\  
\\Q]U]X^Y\_ RN[Q\\U\\X] RLYMZP[U[X\\Y^Y\_XaUbObLaK\_K^L\\O[ RObMaL\_L^M\\O['',Ð  
3108: ' 65G^LFL[ RMGMZ RIFNFN[ RNQOOPNRMUMWNXOYRY[ RWOXR XZ  
RUMVNWQW[ RI[Q[ RT[\\[ RJFLG RKFLH  
RLZJ[ RLYK[ RNYO[ RNZP[ RWZU[ RWYV[ RYYZ[ RYZ['',Ð  
3109: ' 43LXQFQHSHSFQF RRFRH RQGSG RQMQ[ RRNRZ  
RNMSMS[ RN[V[ ROMQN RPMQO RQZO[ RQYP[ RSYT[ RSZU['',Ð  
3110: ' 41KXRFRHTHTFRF RSFSH RRG TG RMR^QaPb RSNSJR`  
ROMTMT]S`RaPbMbLaL\_N\_NaMaM` RPMRN RQMRO',Ð  
3111: ' 61G]LFL[ RMGMZ RIFNFN[ RWN NW RRSY[ RRTX[ RQTW[ RTM[M  
RI[Q[ RT[[[ RJFLG RKFLH RUMWN RZMWN  
RLZJ[ RLYK[ RNYO[ RNZP[ RYU[ RYZ['',Ð  
3112: ' 31LXQFQ[ RRGRZ RNFSFS[ RN[V[ ROFQG RPFQH  
RQZO[ RQYP[ RSYT[ RSZU['',Ð  
3113: ' 99AcFMF[ RGNGZ RCMHMH[ RHQIOJNLMOMQNROSRS[ RQORRRZ  
ROMPNQQQ[ RSQTOUNWMZM\\N]O^R^ R\\O]R]Z RZM[N\\Q\\  
\\ RC[K[ RN[V[ RY[a[ RDMFN REMFO  
RFZD[ RFYE[ RHYI[ RHZJ[ RQZO[ RQYP[ RSYT[ RSZU[ R\\ZZ[ R\\Y[[ R^Y\_ R^Z`['',Ð  
3114: ' 65G^LML[ RMNMZ RIMNMN[ RNQOOPNRMUMWNXOYRY[ RWOXR XZ  
RUMVNWQW[ RI[Q[ RT[\\[ RJMLN RKML O  
RLZJ[ RLYK[ RNYO[ RNZP[ RWZU[ RWYV[ RYYZ[ RYZ['',Ð  
3115: ' 46H\\QMNNLPKSKULXNZQ[S[VZXXYUYSXPVNSMQM RMPLRLVMX

RWXXVXRWP RQMONNOMRMVNYOZQ[ RS[UZVYVWVRVOUNSM',Ð  
3116: ' 60G\\LMLb RMNMa RIMNMNb RNPONQMSMVNXPYSYUXXVZS[Q[OZNX  
RWPXR XVW RSMUNVOWRWVVYUZS[ RibQb RJMLN RKMLO RLaJb RL`Kb  
RN`Ob RNaPb',Ð  
3117: ' 55H\\VNVb RWOWa RUNWNXMXb  
RVPUNSMQMNNLPKSKULXNZQ[S[UZVX RMPLRLVMX  
RQMONNOMRMVNYOZQ[ RSb[b RVaTb RV`Ub RX`Yb RXaZb',Ð  
3118: ' 43IZNMN[ RONOZ RKMPMP[ RWOWNVNVPPXPNWMUMSNQPPS  
RK[S[ RLMNN RMMNO RNZL[ RNYM[ RPYQ[ RPZR['',Ð  
3119: ' 43J[WOXMXQWOVNTMPMNNMOMQNSPTUUVVXY RNNMQ  
RNRPSUTWU RXVWZ RMONQPRUSWTXVXYWZU[Q[OZNYMWM[NY',Ð  
3120: ' 22KZPHPVQYRZT[V[XZYX RQHQRWY RPHRFWRWSZT[ RMMVM',Ð  
3121: ' 43G^LMLVMYNZP[S[UZVYWW RMNMWNY RIMNMNWOZP[ RWMW[\  
\\ RXNXZ RTMYMY[ RJMLN RKMLO RYYZ[ RYZ[['',Ð  
3122: ' 31I[LMR[ RMMRY RNMSY RXNSYR[ RJMQM RTMZM RKMNO RPMNN  
RVMXN RYMXN',Ð  
3123: ' 45F^JMN[ RKMNX RLMOX RRMoxN[ RRMV[ RSMVX RRMTMWX  
RZNWXV[ RGMOM RWM]M RHMKN RNMLN RXMZN R\\MZN',Ð  
3124: ' 48H\\LMV[ RMMW[ RNMX[ RWNMZ RJMQM RTMZM RJ[P[ RS[Z[ RKMMN  
RPMNN RUMWN RYMW N RMZK[ RMZO[ RVZT[ RWZY['',Ð  
3125: ' 40H[LMR[ RMMRY RNMSY RXNSYP\_NaLbJblal\_K\_KaJaJ` RJMQM RTMZM  
RKMNO RPMNN RVMXN RYMXN',Ð  
3126: ' 41I[VML[ RWMM[ RXMN[ RXMLMLQ RL[X[XW RMMLQ RNMLP ROMLO  
RQMLN RS[XZ RU[X Y RV[XX RW[XW',Ð  
3151: ' 50G]WMUTUXVZW[Y[[Y\\W RXMVTVZ RWMYMWTVX  
RUTUQTNRMPMMNKQJTJVKYLZN[P[RZSYTWUT RNNLQKTKWLY  
RPMNOMQLTLWMZN['',Ð  
3152: ' 52I\\PFNMMSMWNYOZQ[S[VZXWYTYRXOWNUMSMQNPOOQNT  
RQFOMNQNWoz RYVWWXTXQWO RMFRFPMNT RS[UYVWWTWQVNUM RNFQG  
ROFPH',Ð  
3153: ' 34I[WQWPVPVRXRXPWNUMRMONMQLTLVMYNZP[R[UZWW  
ROONQMTMWN Y RRMPOOQNTNWOZP['',Ð  
3154: ' 58G]YFVQUUUXVZW[Y[[Y\\W RZFWQVUVZ RVF[FWTVX  
RUTUQTNRMPMMNKQJTJVKYLZN[P[RZSYTWUT RMOLQKTKWLY  
RPMNOMQLTLWMZN[ RWFZG RXFYH',Ð  
3155: ' 33I[MVQUTTWRXPWNUMRMONMQLTLVMYNZP[R[UZWX  
ROONQMTMWN Y RRMPOOQNTNWOZP['',Ð  
3156: ' 45JZZHZGYGYI[[GZFXFVG TISKRNQRO[N^M`Kb RTJSMRRP[O^  
RXFVHUJTMSRQZP]O\_MaKblbHaH\_J\_Jalal` RNMYM',Ð  
3157: ' 57H]XMT[S^QaOb RYMU[S\_ RXMZMV[T\_RaObLbJal`I^K^K`J`J\_  
RVTVQUNSMQMNNLQKTKVLYMZO[Q[SZTYUWVT RNOMQLTLWMY  
RQMOONQMTMWNZO['',Ð  
3158: ' 41G]OFI[K[ RPFJ[ RLFQFK[ RMTOPQNSMUMWNXPXSVX RWNWRVWVZ  
RWPUUUXVZW[Y[[Y\\W RMFPG RNFOH',Ð  
3159: ' 35KXSFSHUHUF SF RTFTH RSGUG RLQMOOMQMRNSPSSQX  
RRNRQVQZ RRPPUPXQZR[T[VYWW',Ð



3160: ' 45KXUFUHHWHWFUF RVFVH RUGWG  
RMQNOPMRMSNTPTSRZQ]P\_NaLbJblal\_K\_KaJaJ` RSNSSQZP]O\_  
RSP RTP[O^N`Lb',Ð  
3161: ' 49G]OFI[K[ RPFJ[ RLFQFK[ RYOYNXNXPZPZNYMWMUNQROS  
RMSOSQTRUTYUZWZ RQUSY TZ ROSPTRZS[U[WZYW RMFPG RNFOH',Ð  
3162: ' 26LXTFQQPUPXQZR[T[VYWW RUFRQQQUQZ RQFVFRTQX RRFUG  
RSFTH',Ð  
3163: ' 61@cAQBODMFMGNHPHSF[ RGNGSE[ RGPFTD[F[ RHSJPLNNMPMRNSP  
SSQ[ RRNRSP[ RRPQTO[Q[ RSSUPWNYM[M]N^P^S\X R]N]R\W\Z R]P[U[X\Z]  
[\_[aYbW',Ð  
3164: '  
42F^GQHOJMLMMNNPNSL[ RMNMSK[ RMPLTJ[L[ RNSPPRNTMVMXNYPYSWX  
RXNXRWVWZ RXPVUVXWZX[Z[\Y]W',Ð  
3165: ' 46H\QMNNLQKTKVLYMZP[S[VZXWYTYRXOWNTMQM RNOMQLTLWMY  
RVYWWXTXQWO RQMOONQMTMWNZP[ RS[UUVWWTWQVNTM',Ð  
3166: ' 66G]HQIOKMMMNNNOPOSNWKb RNNNSMWJb RNPMTIb  
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RVMWNXQXTWWVYT[ RFbNb RJaGb RJ`Hb RK`Lb RJaMb',Ð  
3167: ' 57G\WMQb RXMRb RWMYMSb  
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RPMNOMQLTLWMZN[ RNbVb RRaOb RR`Pb RS`Tb RRaUb',Ð  
3168: ' 30I[JQKOMMOMP NQPQTO[ RPNPTN[ RPPOTM[O[ RYOYNXNXPZPZNYMW  
MUNSPQT',Ð  
3169: ' 47J]XPXOWOWQYQYQXNUMRMONNONQOSQTTUVVWX RONNQ  
RORQSTTVU RWVWZ RNOOQQRTSVTWVWXVZS[P[MZLYLWNWNYMYMX',Ð  
3170: ' 23KYTFQQPUPXQZR[T[VYWW RUFRQQQUQZ RTFVFRTQX RNMXM',Ð  
3171: ' 42F^GQHOJMLMMNNPNSLX RMNMRVLZ RMPKUKXLZN[P[RZTXVU  
RXMVUVXWZX[Z[\Y]W RYMWUWZ RXMZMXTWX',Ð  
3172: ' 29H\IQJOLMNMONPPPSNX RONORNVNZ  
ROP MUMXNZP[R[TZVXXUYQYMXMXNYP',Ð  
3173: ' 48CaDQEOGMIMJNKPKSIX RJNJRIVIZ RJPHUHXIZK[M[OZQXRU  
RTMRURXSZU[W[YZ[X]U^Q^M]M]N^P RUMSUSZ RTMVMTT SX',Ð  
3174: ' 51G]JQLNNMPMRNSPSR RPMQNQR PVOXMZK[I[HZHXJXJZIZY  
RRORRQVQY RZOZNYNYP[P[NZMXMVNTPSRRVRZS[ RPVPXQZS[U[WZYW',Ð  
3175: ' 49G]HQIOKMMMNNNOPOSMX RNNRMVMZ RNPLULXMZO[Q[SZUXWT  
RYMU[T^RaPb RZMV[T\_ RYM[MW[U\_SaPbMbKaJ`J^L^L`K`K\_',Ð  
3176: ' 39H\YMXOVQNWLYK[ RXOOOMPLR RVORNONNO RVORMOMMOLR  
RLYUYWXXV RNYRZUZVY RNYR[U[WYXV',Ð  
3200: ' 50H\QFNG LJKOKRLWNZQ[S[VZXWYRYOXJVG SFQF RNHMJLNL SMWNY  
RVYWWXSXNWJVH RQFOGNIMNMSNXOZQ[ RS[UZVXWSWNVIUGSF',Ð  
3201: ' 28H\QHQ[ RRHRZ RSFS[ RSFPINJ RM[W[ RQZO[ RQYP[ RSYT[ RSZU',Ð  
3202: ' 62H\LJLKM KMJLJ  
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RTFVGWJWL VNTPPR RXYLXNXSYWYYX RNXSZWZXY RNXS[W[XZYXYV',Ð  
3203: ' 76H\LJLKM KMJLJ RLIMINJNKMLLLKKKJLHMGPFTFWGXIXLWNT  
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3204: ' 28H\\SIS[ RTHTZ RUFU[ RUFJUZU RP[X[ RSZQ[ RSYR[ RUYV[ RUZW[' ,Ð  
3205: ' 55H\\MFKPMNPM SMVNXPYSYUXXVZS[P[MZLYKWKVLUMUNVNWMXLX  
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RMHQHUGWF',Ð  
3206: ' 69H\\VIVJWJWIVI RWHVHUIUJVKWKXJXIWGUFRFOGMILKKOKULXNZQ[S[  
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RRFPGOHNJMN MUNXOZQ[ RS[UZVYVWVSVPUOSN',Ð  
3207: ' 43H\\KFKL  
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RMHNGPGRH RKJLINHPHUI',Ð  
3208: ' 79H\\PFMGLILLMNPOTOWNXLXIWGTFPF RNGMIMLNN RVNWLWIVG  
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RPONPMSMWNPZ[ RT[VZWWWVSVPTO',Ð  
3209: ' 69H\\MWMXNXNWMW RWOVQURSSQSNRLPKMKLLINGQFSFVGXIYLYRX  
VWXUZR[O[MZLXLWMVNVOWOXNYMY RMPLNLKMI RVHWIXLXRWWVX  
RQSORNQMN MNHOGQF RSFUGVIWLWSVWUYTZR[' ,Ð  
3210: ' 16MXRXQYQZR[S[TZTYSXRX RRYRZSZSYRY',Ð  
3211: ' 24MXTZS[R[QZQYRXSXTYT\\S^Q\_ RRYRZSZSYRY RS[T\\ RTZS^',Ð  
3212: ' 32MXRMQNQORPSPTOTNSMRM RRNROSOSNRN  
RRXQYQZR[S[TZTYSXRX RRYRZSZSYRY',Ð  
3213: ' 40MXRMQNQORPSPTOTNSMRM RRNROSOSNRN  
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3214: ' 34MXRFQGGIRQ RRFRTST RRFST RSFTGTISQ  
RRXQYQZR[S[TZTYSXRX RRYRZSZSYRY',Ð  
3215: ' 52I\\MKMJN JNLLLLJMHNGPFTFWGXHYJYLXNWOSQ RWHXIXMWN  
RTFVGWIWMVOUP RRQRTSTSQRQ RRXQYQZR[S[TZTYSXRX RRYRZSZSYRY',Ð  
3216: ' 24MXTFRGQIQLRMSMTLTKSJ RJQK RKRSLSLSKRK RRGQK RQIRJ',Ð  
3217: ' 24MXTHSIRIQHQGRFSFTGTJSLQM RRGRHSHSGRG RSITJ RTHSL',Ð  
3218: ' 74E\_[O[NZNZP\\P\\  
\\N[MZMYNXPVUTXRZP[L[JZIXIUJSPORMSKSIRGPFNGMIMLNOPRTWWZY[[[\\Y\\X  
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RMINMQQUVXYZZ[Z\\Y',Ð  
3219: ' 56H\\PBP\_ RTBT\_  
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RMGLILKMMONUPXRYTYWXYWZT[P[MZLYKWKUMUMWLWL',Ð  
3220: ' 8G^[BibJb R[B\\BJb',Ð  
3221: ' 27KYUBSDQGOKNPNTQYQ]S`Ub RQHPKOOOUPYQ\\  
RSDRFQIPOPUPQ[R^S`',Ð  
3222: ' 27KYOBQDSGUKVPVTUYS]Q`Ob RSHTKUOUUTYS\\  
RQDRFSITOTUS[R^Q`',Ð  
3223: ' 39JZRFQGSQRR RRFRR RRFSGQRR RMINIVOWO RMIWO  
RMIMJWNWO RWIVINOMO RWIMO RWIWMJMNMO',Ð  
3224: ' 8F\_JQ[Q[R RJQJR[R',Ð

3225: ' 16F\_RIRZSZ RRISISZ RJQ[Q[R RJQJR[R',Ð  
3226: ' 16F\_JM[M[N RJMJN[N RJU[U[V RJUJV[V',Ð  
3227: ' 11NWSFRGRM RSGRM RSFTGRM',Ð  
3228: ' 22I[NFMGMM RNGMM RNFOGMM RWFVGVM RWGVM RFXGVM',Ð  
3229: ' 30KYQFOGNINKOMQNSNUMVKVIUGSFQF RQFNIOMSNVKUGQF  
RSFOGNKQNUMVISF',Ð  
3250: ' 58H]TFQGOIMLLOKSKVLYMZO[Q[TZVXXUYRZNZKYHXGVFTF  
RQHOJNLMOLESLWY RTYVWWUXRYNYJXH  
RTFRGPJOLNOMSMXNZO[ RQ[SZUWVUWRXNXIWGVF',Ð  
3251: ' 20H]TJO[Q[ RWFUJP[ RWFQ[ RWFTIQKOL RTJRKOL',Ð  
3252: ' 52H]OKOJPJPLNLNJOHPGSFVFYGGZIKYMWOMUKWI[ RXGYIYKXMOVOSQ  
RVFWGXIXKWMUOMU RJKXMXRYWYXX RMXRZWZ RMXR[U[WZXXXW',Ð  
3253: ' 64H]OKOJPJPLNLNJOHPGSFVFYGGZIKYMXNVOSP RXGYIYKXMW  
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RVRWTWWVY RSPUQVSVWUYTZR',Ð  
3254: ' 15H]WJR[T[ RZFXJS[ RZFT[ RZFJUZU',Ð  
3255: ' 49H]QFLP RQF[F RQGYG RPHUHYG[F  
RLPMOPNSNVOWPXRUXUWUZQ[N[LZKYJWJULULWKWKV RVPWRWUVXTZ  
RSNUOVQVUUXSZQ',Ð  
3256: ' 61H]YJYIXIXKZKIYGWFTFQGOIMLLOKSKVLYMZO[R[UZWXXVXSWQVPT  
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RTFRGPJOLNOMSMXNZO[ RR[TZUYVVVRUPTO',Ð  
3257: ' 39H]NFL R[FZIXLTQRTQWP[ RRSPWO[ RXLRRPUOWN[P[ RMIPFRFWI  
ROGRGWI RMIOHRHWIYIZH[F',Ð  
3258: '104H]SFGOHJNMOOQPTPWOYNZLZIYGWFSF RUFPG RPHOJONPO  
ROORP RSPWO RXNYLYIXG RYGUI RSFQHPJPNQP RTPVOWNXLXHW  
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RVYWWWTVR RVQSP RQPOQMSLULXMZN[ RR[TZUYVWVSUQTP',Ð  
3259: ' 61H]XNWPVQTRQROQNPMNMKNIPGSFVFXGYHZKZNYRXUVXTZQ[N[LZK  
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RVFWGXIXNWRVUWWSZQ',Ð  
3260: ' 16MXPXOYOZP[Q[RZRYQXPX RPYPZQZQYPY',Ð  
3261: ' 22MXQ[P[OZOYPXQXRYR[Q]P^N\_ RPYPZQZQYPY RQ[Q\\P^',Ð  
3262: ' 32MXSMRNROSPTPUOUNTMSM RSNSOTOTNSN  
RPXOYOZP[Q[RZRYQXPX RPYPZQZQYPY',Ð  
3263: ' 38MXSMRNROSPTPUOUNTMSM RSNSOTOTNSN  
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3264: ' 34MXVFUFTGRT RVGUGRT RVGVHRT RVFWGWHRT  
RPXOYOZP[Q[RZRYQXPX RPYPZQZQYPY',Ð  
3265: ' 59H]OKOJPJPLNLNJOHPGSFWFZG[[KZMYNWOSPQQQSSTTT RUFZG  
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RPYPZQZQYPY',Ð  
3266: ' 22MXWFUGTHSJSMTMUMVLVKUJTJ RUGTITJ RTKTLULUKTK',Ð  
3267: ' 22MXVIUITHTGUFVFWGWIVKULSM RUGUHVHVHVGUG RVIVJUL',Ð  
3268: ' 72E\_\\O\\N[N[P]P]N\\M[MYNWPRXPZN[K[HZGXGVHTISKRPPTMUKUITG  
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RK[JZIXIVJTKSMRRO ROLPOQRSVUYWZXZYY',Ð  
3269: ' 52H]TBL\_ RYBQ\_ RZKZJYJYL[LJZHYGVRFOGMIMLNNPPVSWUWXVZ  
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3270: ' 8G^\_BEbFb R\_B`BFb',Ð  
3271: ' 32JZZBXCUERHPKNOMSMXN\\O\_Qb RSHQKOONTN\\  
RZBWDTGRJQLPOOSN\\ RNT0]P`Qb',Ð  
3272: ' 32JZSBUEVHWLWQVUTYR\\O\_LaJb RVHVP UUSYQ\\ RSBTDUGVP  
RVHUQTUSXRZP]M`Jb',Ð  
3273: ' 39J[TFSGUQTR RTFTR RTFUGSQTR ROIPIXOYO ROIYO ROIOJYNYO  
RYIXIPOOO RYIOO RYIYJONOO',Ð  
3274: ' 8F\_JQ[Q[R RJQJR[R',Ð  
3275: ' 16F\_RIRZSZ RRISISZ RJQ[Q[R RJQJR[R',Ð  
3276: ' 16F\_JM[M[N RJMJN[N RJU[U[V RJUJV[V',Ð  
3277: ' 11MWUFTGRM RUGRM RUFVGRM',Ð  
3278: ' 22H\\PFOGMM RPGMM RPFQGMM RZFYGWM RZGWM RZF[GWM',Ð  
3279: ' 30KZSFQGPQMSNUNWMXKXIWGUFSF RSFPIQMUNXKWGSF  
RUFQGPKSNWMXIUF',Ð  
3301: ' 62F^IHJIIHIIIGKFMFOGPHQKQOPRNTLUIV ROHPKPPOR  
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3302: '101E\_GQGRHSJSLRLOKMIJIHKF RKOIK  
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\\U[XYZV[S[PZJWIWHX RXNYN[P RVNYO[Q\\S RTZRZLWKW  
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3303: ' 79F^RHPFNFLGJJINIRJVLNZQ[T[WZYY[W RLHKJJMJRKVMYPZ  
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3304: ' 79E\_HLHKIIKGNFRFUGWHYJ[M\\Q\\U[XYZV[S[PZJWIWHX  
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RMKMMOQOSNUMVKVJUJT',Ð  
3305: ' 95F^RHPFNFLGJJINIRJVLNZQ[T[WZYY[W RLHKJJMJRKVMYPZ  
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RQIQJRLUNVPVRUTSURUPTOR RUFVGXHZH RUGVHWH RTGVIXIZH[G RUNYK  
RYKZL\\L RXLYMZM RWMXNZN\\L',Ð  
3306: ' 94F^MNKMJKJIKGNFQFTGXI RKHMGRGUH RJKKIMHRHXIZI[H[GZFYF  
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\\JZJWLTLRKQ RL\\K[KWLU RO^M]L[LWMTMRLQJQIRIS RUPYL RYLZM\\M  
RXMYNZN RWNXOZO\\M',Ð  
3307: ' 99E\_UJTHSGQFNFKGIJHNHRIUJWLYNZQ[T[WZYY[W\\T\\Q[NYL  
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RTOYLZJ R\\FZJ RYG]I R\\F[GYZGHZJ[I]\\H\\F',Ð  
3308: ' 92F\_RFPGNIMKMMNOPQQSQU RNLNMQQQR  
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RPGQHSIUIXG RRPYK RYK[N\Q\T[WYYYVZR[ RXLZN[Q[UZW  
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3309: ' 83F\_PPNPLOKNJLJJKHLGOFQFTGWJYK RLHNGRGTHUI  
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RLVMWNYP\Q]S^V^X]Y\ZZZWYUWRVPVO RYXYWVRVQ  
RX]Y[YYXWVTURUPWNYNZOZP',Ð  
3310: ' 83F\_PPNPLOKNJLJJKHLGOFQFTGWJYK RLHNGRGTHUI  
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RLVMWNYP\Q]S^V^X]Y\ZZZWYUWRVPVO RYXYWVRVQ  
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3311: ' 81E\_[KZIXGUFRFOGMILKLNMQPWPYN[ RMNMOPUPV  
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RSPWYY[\X',Ð  
3312: ' 73G^ZSYTVTUSUQVOXLYJYH RVQVPYLYK  
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3313: '128BbEQERFSHSJRJOIMGJGHIF RIOGK  
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R\_K\M[NZQZT[X][^ X R\N[P[T\W^Z R\_K]M\O\S]W\_Y',Ð  
3314: ' 96D`GQGRHSJSLRLOKMIJIHKF RKOIK  
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\K R\KYMXXNWQWTXXZ][X RYNXPXTYW[Z R\KZMYOYSZW\Y',Ð  
3315: ' 72D`PFNGLIKKMMQMS RLLLMMOMP RLILKNONQMSLTJTISIR  
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RSZQZKWJW RYYWZTZQYMWJVHVXGXGZH[IZHY',Ð  
3316: '100E`HQHRISKSMRMOLMJJJHLF RLOJK  
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ROFPGQJQU RQWQ\P^O\_ RSJXF RXFZI[K\O\R[UYXV[ RWGZK[N]O  
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3317: ' 88D`PFNGLIKKMMQMS RLLLMMOMP RLILKNONQMSLTJTISIR  
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\P RSZQZKWJW RXZTZQYMWJVHVXGXGZH[IZHY RTXVVXV\Z]Z RWWXW[Z  
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3318: ' 96D`GQGRHSJSLRLOKMIJIHKF RKOIK  
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\K RYHZJ RWFXYGYZK\K R\KRP RTOXYZ][X RUOYX[Z RVNZX[Y\Y',Ð  
3319: ' 83E`\H[G\F]G]\KZKVISHOHKIIK RYJVHSGOGLH R]\  
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R]Q[OYOWPUSSTQTOSNQNOOMQL',Ð

3320: ' 81F\_LNJKMIKIJGMFRFUGYJ[J\I RJHLGRGUHXJ RIKJILHRHUIYK[K\I\G[FZG[H RUIRLQNQPSTSV RRORPSRSS RRLNTRTTSVRWPWVOT  
RJYKZJ[IZIXJVLVOWSYVZY[Z[Y RLWMWSZUZ RIXJWKWMXQZT[W[ZZ\X',Ð  
3321: ' 45G]JHKHLILWJX RKGMMHXPZ RIILFNHNWPYRY RJXKXMYO[RYVV  
RTHUHVIVYX[[X RUGWHWYYZ RSIVFYHXIXXYZY',Ð  
3322: '100D`GQGRHSJSLRLOKMIJHKF RKOIK  
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RWMXN[P\R\W[XYZW[S[PZJWIWHX RTZRZLWKW  
RZYXZUZRYNWKVIVHXHZI[JZIY',Ð  
3323: '143BcEQERFSHSJRJOIMGJGHIF RIOGK  
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RNGPFSFUG RWFTGSI SMPVSWUWWVY RTMTNWSWT  
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RQ[OZLWJVG VFXFZG[HZGY RWFZF\G^J\_K R\H]J RZF[G\J]K\_K  
R]K[KZLZN[P^R\_T R[O^Q RZM[N^P\_R\_W^Y]Z[[X[UZ RYZXZVY R^Y\ZZZXYWX',Ð  
3324: ' 86F^KHMHOIPJQMQRQQQUPXM[KZI[ RNZLYKY  
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RMPWP RKSMQQQ RSQWQYM',Ð  
3325: ' 74E\_HQHRISKSMRMOLMJJJHLF RLOJK  
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ROFPGQJQPPTOVRYUV RSJ[F RYGYZX] RZGZXY[ R[F[VZZY\W^T\_P\_M^K\JZKYLZK]',Ð  
3326: ' 74F^NIOGQFTFVGWHXJXMWOVPTQ RQQOPNN RVHWIWNVO  
RTFUGVIVNUPTQ RMUNSORQQTQWRYTZVZZY\W^T\_P\_N^KZJY RXTYVYZX\RTQWSXUX[W]V^T\_ RO^N]LZKY RR\_P^O]MZLYIYHZN\I]J]',Ð  
3401: ' 46J[TMQNOONPMSMVNYO[UX RNVOYPZ RQNOPNSNUOXQZ  
RRNSOUPUYW[ZX RSNVPVXXZ RTMUNWOXO RWPXO RWPWXXYYY',Ð  
3402: ' 50J[LHMINK RTFQGOINKNXMY RPIOKOXRZ RTFRGQHPKXPXYSZ  
RMYNYPZQ[TZ RPPVMWOXR XUWXYTZ RUNVOWQ RTNVPWSWUVXTZ',Ð  
3403: ' 27KXRNTPVOTMRNOPNRNWOYQ[UY RSNUO RPPOROWPYQZ  
RQOPQPVQXSZ',Ð  
3404: ' 47J[QFNINKOLSNVPWRWUVXTZ ROJOKSMVOWP  
ROHOIPJUMWOXR XUWXTZQ[ RRNNPNXMY ROPOXRZ RPOPXYSZ  
RMYNYPZQ]',Ð  
3405: ' 27KXPUVQSMOPNRNWOYQ[UY RUQRN RPPOROWPYQZ  
RTRROQOPQPVQXSZ',Ð  
3406: ' 49LYXFWGUGSFQFPHPMOONP RVHTHRGQG RXFWHVITIRHQHPI  
RPKQMRNTOVOVP RNPPP RRPVP RPPPTQ` RSOPOQNNQ[ RRPRTQ'',Ð  
3407: ' 53J[TMQNOONPMSMVNYO[UX RNWOYPZ RQNOPNSNUOXQZ  
RRNSOUPUXV[V]U\_ RSNVPVZ RTMUNWOXO RWPXO RWPW\W^U\_S^P^N\_M^M]N]N^',Ð  
3408: ' 50J[LHMINK RTFQGOINKNXMY RPIOKOYPZ RTFRGQHPKXPXYRY  
RMYOZP[SX RPPVMWOXSXWWZV\T^Q` RUNVOWR RTNVQWTWWV[T^',Ð  
3409: ' 39MWRFGGQHRISHSGRF RQGSX RQHSX ROOPOQPQYS[VX

RPNRORXTZ RNPQMRNTO RSPTO RSPSXTYUY',Ð  
3410: ' 45MWRFGGQHRISHSGRF RQGSB RQHSB ROOPOQPQ[P^O\_M`  
RPNROR[Q] RNPQMRNTO RSPTO RSPS[R]P\_M` RS[T]U^',Ð  
3411: ' 63KYNHOIPK RUFSGQIPKPMOONP RPPXOY RRIQKQM  
RQOPOQMXXSZ RUFHRKRO RPRXSYTY ROYQZR[UX RRLVIWJWLUNSO  
RUJVKVLUN RROWOWP RNPPP RRPWP',Ð  
3412: ' 29MWOHPK RWFTRGRIKQXPY RSIRKRYTZ RWFUGTHSKSXTYUY  
RPYRZS[VX',Ð  
3413: ' 74E\_GOHOIPIXHYJ[ RHNJPJXIYJZKYJX  
RFPIMKOKXLYJ[ RNNPOQQQXPYR[ RPNQORQRXQYRZSYRX  
RKPNNPMRNSPSXTYR[ RVNWOYPYY[[^X RWNZPZX\Z RSPVNXMYN[O\O R[P\O  
R[P[X\Y]Y',Ð  
3414: ' 49I[KOLOMPMXLYN[ RLNNPNXMYNZOYNX  
RJPMMOOXPYN[ RRNSOUPUYW[Z RSNVPVXXZ ROPRNTMUNWOXO RWPXO  
RWPWXXYYY',Ð  
3415: ' 41J[NPNXMY ROPOXRZ RQOPPPXRYSZ RMYNYPZQ[TZ  
RNPQOVMWOXRUXUVYVYZ RUNVOWQ RTNVPWSWUVXTZ',Ð  
3416: ' 57J[OJMLMNNQNXLZ RNYO` RNMNNOQO[ RNKNLONPQPXQXSYTZ  
RPO` RSZQY RTZR[PY RNYLZ RPPVMWOXRUXUVYVYZ RUNVOWQ  
RTNVPWSWUVXTZ',Ð  
3417: ' 43J[TMQNOONPMSMVNYO[UX RNWOYPZ RQNOPNSNUOXQZ  
RRNSOUPUXV` RSNVPV[ RTMUNWOXO RWPXO RWPWV`',Ð  
3418: ' 32KYNNOOPPPXOY RONQPQYSZ RMPPMRORXSYTY ROYQZR[UX  
RTNUPWVOMRO RUNVO',Ð  
3419: ' 42LWXFWGUGSFQFHPMOONP RVHTRGQG RXFWHVITIRHQHPI  
RPKRP RPPPTQ` RQOPOQNN[ RRPRTQ` RNPPP',Ð  
3420: ' 37LXSIRLQNPONP RSISOVOVP RNPQP RSPVP RQPQXPY  
RROQORMRXTZ RSPSXTYUY RPYRZS[VX',Ð  
3421: ' 47I[KOLOMPMXLY RLNNPNXPZ RJPMMOOOXQYRZ RLYMYOZP[RZUX  
RVMTOUNUYW[Z RVPWVNUOVVXXZ RVMXOWPWXXYYY',Ð  
3422: ' 47J[OKMMMONRNXMY RNNNOOROXRZ RNLNMOOPRPXRYSZ  
RMYNYPZQ[TZ RPPVMWOXRUXUVYVYZ RUNVOWQ RTNVPWSWUVXTZ',Ð  
3423: ' 72F\_KKIMIOJRJXIYK[ RJNJOKRKXJYKZLYKX  
RJJLMKOLRLXMYK[ RONQORQRXQY RQNROSQSXVZ RLPONQMSNTPTXVYWZ  
RQYRYTZU[XZ RTPZM[O\R\T[XZYXZ RYNZO[Q RXNZP[S[UZZXZ',Ð  
3424: ' 44KZOPOQPQXPXNYM[M]N\_P`S`V\_V^U^U\_ RPNRPRXUZ  
RNPQMSOSXUYVZ RXYT[SZQYOYM[ RUNVPXOWMSO RVNWO',Ð  
3425: ' 47J[OKMMMONRNXMY RNNNOOROYQZ RNLNMOOPRPXQYRY  
RMYOZP[SX RPPVMWOXSXWWZV\T^Q` RUNVOWR RTNVQWTWWV[T^',Ð  
3426: ' 43KYNPSMUNVPVRUTQV RSNUO RRNTOUQURTTSU  
RSUUWVYV[U\_S`Q`O\_N]N[OYQXWV RRVTWUY RQVTXUZU]T\_S`,Ð  
3427: ' 61JZRMPNMPMRNU RPNPROT RPNOOORPT RPNROTVNWMWKVJTJ  
RQNSN RRMTNVN RNUVRWUWWVYR[ RUSVUVXUY RTSUUUXTZ  
RTZRYOYL[ RSZQZ RR[PZNZL['],Ð  
3428: ' 78J[VFUGSGQFOFNHMMOLP RTHRHPGOG RVFUHTIRIPHONI RNKPP  
RNPNTO` ROONOONO[ RPPPTO` RLPNP RPPUMWNXPXRWTSV RUNWO

RTNVOWQWRVTUU RUUWVXXX[W]U\_R` RUVWW RSVTVVWWYW\W^,Ð

3429: ' 62J[PIOLNNMOKP RPIPXYO[ ROONNOXNYOZPYOX  
RKPNNXMYO[ RPPUMWNXPXRWTSV RUNWO RTNVOWQWRVTUU  
RUUWVXXX[W]U\_R` RUVWW RSVTVVWWYW\W^,Ð

3501: ' 60G]LINGPFRFSGZW[X]X RQGRHYXZZ[YYX RNGPGQHXXYZZ[[[X  
RLMMLOKPKQL RPLPM RMLOLPN RG[IYKXNXPY RJYNYOZ RG[JZMZN[PY  
RRJLX RNSVS',Ð

3502: '110F^HHJFMFOGQF RKGNG RHHJGLHOHQF  
RMKLLKNKOIOHPHRIQKQKW RLMLU RIPLP RMKMTLVKW RRIQJPLPU RQKQS  
RRIRRQTPU RRIXFZG[I[KYMUO RXGZIZK RVGXHYIYLWN RWNZP[R[X RYPZRZW  
RWNXOYQYX RJ[MYPXTXWY RLZOYTYVZ RJ[NZSZU[WYYX[X RUOUX RURYR  
RUUYU',Ð

3503: ' 69E]NGLHJJILHOHSIVJXMZP[S[VZXYZW[U RJKINISKWNYQZTZWY  
RNGLIKKJNJRKUNXQYTYWXYW[U RPJPV RQJQT RRIRSQUPV  
RPJRIUFWGYGZF RTGVHXX RSHUIWIYHZF RWIWX',Ð

3504: ' 72G^IFWFGZIX RKGWGYIYW RIFJGLHWHXIXX  
ROKNLMNMOKOJPJRKQMOMV RNMNT RKPNN ROKOSNUMV RI[LYOXSXVY  
RKZNYSYUZ RI[MZRZT[VYXXZX RRHRX RRMTNVNXM RRSTRVRXS',Ð

3505: ' 94G]IHKFMFOGQF RLGNG RIHKGMHOHQF RNKMLLNLOJOIPIRJJQLQLW  
RMMM U RJPMP RNKNTMVLW RQMRJSHTGVFXF[G RTHVGXGZH  
RRJSIUHWHYI[G RQURRSPTOVOXP RTPVPWQ RRRSQUQVRXP RK[NYRXWX[Y  
RMZPYWYZZ RK[OZVZY[[Y RQMQX',Ð

3506: ' 91F]JHLFOFQGSF RMGPG RJHLGNHQHSF  
RPKOLNNNOLOKPKRLQNQNV ROMOT RLPOP RPKPSOUNV  
RSJSYRZQZMXKXIYG[ RTJTX RTPXP RPZOZMYJY RUIUOXO  
RXQUQUWTYP[N[LZZG[ RSJUIXFZG\G]F RWGYH[H RVHXIZI\H]F RXIXW',Ð

3507: ' 87E^NGLHJJILHOHRIUJWLYNZQ[U[XZZX[V[SZQYPWOUO RJKINISJV  
RNGLIKKJNJSKVLXNZ RYXZWZSYQ RU[WZXYYWYSXQWPUO RPJPW RQJQU  
RRIRTQVPW RPJRIUFWGYGZF RTGVHXX RSHUIWIYHZF RYHUOU[ RUSYS  
RUVVY',Ð

3508: '112F^HHJFMFOGQF RKGNG RHHJGLHOHQF  
RMKLLKNKOIOHPHRIQKQKW RLMLU RIPLP RMKMTLVKW RJ[MYPXSXUY  
RLZOYRYTZ RJ[NZQZS[UY RRIQJPLPU RQKQS RRIRRQTPU RRITGVFXFZG  
RWGXGYH RTGVGXIZG RUOWNYLZM[P[TZXX[ RXMYNZPZUYX  
RWNXNYPYUX[ RUOUY RURYR RUUYU',Ð

3509: ' 67I\LNHFQFTGVF ROGSG RLHNGQHTHVF  
RSKRLQNQOONPNROQQQV RRMRT ROPRP RSKSSRUQV  
RYHWJVMVXUZSZOXMXKI[ RWKWW RRZQZOYLY RYHXJXVWXUZS[P[NZKZI',Ð

3510: ' 65H\LNHFQFTGVF ROGSG RLHNGQHTHVF  
RSKRLQNQOONPNROQQQV RRMRT ROPRP RSKSSRUQV RYHWJVMVXUZ  
RWKWW RYHXJXVWXUZR[O[LZJXJVKULUMVLWKW RJVMV',Ð

3511: '115F^HHJFMFOGQF RKGNG RHHJGLHOHQF  
RMKLLKNKOIOHPHRIQKQKW RLMLU RIPLP RMKMTLVKW RJ[MYPXSXUY  
RLZNYRYTZ RJ[NZQZS[UY RRIQJPLPU RQKQS RRIRRQTPU RRITGVFXFZG  
RWGXGYH RTGVGXIZG RUOXLYM[N RWMYN[N R[NYQWSUU RWSYTX[Z\Z  
RYVZZ RWSXTYZZ[[[RUOUY',Ð



3512: ' 85G]IHKFNFPGRF RLGOG RIHKGMHPHRF RNKMLLNLOJOIPIRJQLQLW  
RMMMU RJPMP RNKNTMVLW RK[NYRXWX[Y RMZPYWYZZ RK[OZVZY[[Y  
RSIRJQLQU RKRRS RSISRRTQU RSIUGWFYF[G RXGYGZH RUGWGYI[G  
RWGWX',Ð

3513: '107D`LJKKJMJOHOGPGRHQJQJU RKLKS RHPKP RLJLRKTJU  
RE[GYIXKXMYNYOX RHYKYMZ RE[GZJZL[M[NZOX RLJPFTJTWUYVY  
RPGSJSXRYSZTYSX RPPSP RNHOHRKROOO ROQRQRXQYS[VYWX RTJXF\J\  
\W]Y^Y RXG[J[X]Z RXP[P RVHWHZKZOWO RWQZQZY\[^Y ROHOX RWHWX',Ð

3514: ' 84E^GIIGKFMFOGQJVUXXY RMGOIPKVVWYZ  
RIGKGMHOKTVVYWZY[ RVHXIZI\H]F RWGYH[H RVHXFZG\G]F  
RKOIOHPHRIQKQ RIPKP RG[IYKXNXPY RJYMYOZ RG[JZMZN[PY RKGKX  
RYIY[ RRLSMUNWNYM RKTMSQSST',Ð

3515: ' 79E\_NFLGJIIKHNHRIUJWLYNZQ[S[VZXYZW[U\R\N[KZIXGVFUGRIOJ  
RJJIMISJV RNFLHKJMJMSKVLXNZ RZV[S[MYIXH RVZXXYVZSZMYKWHUG  
ROJOW RPJPU RQJQTPVOW RUGUZ RUMWNXNZM RUSWRXRZS',Ð

3516: ' 70H^KFLGMIMOKOJPJRKMOMYJ[MZMbO` RMHNJN` RKPMP  
RKFMGNHOJO` ROKRIVFZJZX RVGYJYX RTHUHXKXY RRXUXXY RSYUYWZ  
RRZTZV[XYZX RRIR\_ RRMTNVNXM RRSTRVRXS',Ð

3517: ' 99E\_NFLGJIIKHNHRIUJWLYNZP[T[VZXYZW[U\R\N[KZIXGVFUGRIOJ  
RJJIMISJV RNFLHKJMJMSKVLXNZ RZV[S[MYIXH RVZXXYVZSZMYKWHUG  
ROJOW RPJPU RQJQTPVOW RUGUZ RUMWNXNZM RUSWRXRZS  
RP[QZRZT[X`Za[a RT\V\_XaYa RRZS[VaXbZb[a',Ð

3518: '108F^HHJFMFOGQF RKGNG RHHJGLHOHQF  
RMKLLKNKOIOHPHRIQKQKW RLMLU RIPLP RMKMTLVKW RJ[MYPXRXUY  
RLZNYRYTZ RJ[NZQZS[UY RRIQJPLPU RQKQS RRIRRQTPU  
RRIUGWFYFGIZLYNXOTQRR RWGXGYIYMXN RUGWHXJXMWOTQ  
RTQVRWSZX[Y\Y RWTYX[Z RTQVSXYZ[\Y',Ð

3519: ' 94G^UITHRGOF RVHTG RWGSFOFLGKHJJKLLMONWNYOZPZRYU  
RKKLLOMXMZN[O[QZS RKHKJLKOLYL[M\O\QYUU[ RIOJPLQUQVRVSUU  
RJQLRTRUS RIOIPJRLSSSUTUU RI[LYPXSXVY RKZNYRYUZ RI[MZRZU[ RWGUISL  
RRNPQ ROSMUKVJVJUKV',Ð

3520: ' 71E]JJILHOHSIVKYMZP[S[VZXYZW[U RISJVLXNYQZTZWY  
RJJIMIQTTLWNXQYTYWXYW[U RHIIGKFOFUGYGF[RPGTHXH  
RHIIHKGNGTIWIYH[F RSIRJPKPV RQKQT RRJRSQUPV RWIWX',Ð

3521: ' 89F^HHJFLFOGQF RKGNG RHHJGMHOHQF  
RKJJLIOISJVKXMZP[S[VZXYZ[\Y RJSKVNYQZTZ RKJJNJQKTLVNXQYUYXX  
RUIQJPLPV RQKQT RRJRSQUPV RUIWHYFZG\HZIZW[Y\Y RYIZHYGXHYIYX[Z  
RWHXIXX RUIUY RUNXN RURXR',Ð

3522: ' 72G^JFKGLILOJOIPIRJQLQLXJY RLHMJMX RJPMP RNYQYSZ  
RJFLGMHNJNXRXUY RJYMYPZR[UYXXZX RRJUIWHYFZG\HZIZX  
RYIZHYGXHYIYW RWHXIXX RRJRXX RRMTNVNXM RRSTRVRXS',Ð

3523: ' 95E`HFIGJJOHOGPGRHQJQJXHY RJHKJKX RHPKP RLYNYPZ  
RHFJGKHLJLXOXQY RHYKYNZO[QYTXVYW[Y\X ROHRFTHTXWXY RRGSHSX  
ROHQHRIRXQY RWYXZ RWHZF\H\X RZG[H[X RWHYHZIZXYY ROHOX RWHWX  
RONRN RORRR RWNZN RWRZR',Ð

3524: ' 65G]HIJGLFNFOGWYXZZZ RMGNHVVWZ RJGLGMHUZV[X[ZZ\X

RWFGY[G\F RWGXHZH RVHWIYI[H\F RH[IYKXMXNY RJYLYMZ  
RH[IZKZM[ RWFSO RQRM[ RLPPP RSPXP',Ð  
3525: ' 86G^JFKGLILOJOIPIRJQLQLXJY RLHMJMX RJPMP RNYQYSZ  
RJFLGMHNJNXRXUY RJYMYPZR[UYXX RRJUIWHYFZG\\HZIZ^Y`WbUaQ`L`  
RYIZHYGXHYIYY RWHXIXXZ[ RXaV`S` RY`V\_P\_L` RRJRX RRMTNVNXM  
RRSTRVRXS',Ð  
3526: ' 57H\\XGWIROOSMWJ[ RVKNV RZFWJUNRRMXLZ RJHLFOGUGZF  
RKGOHSHWG RJHNIRIVHXG RLZNYRXVXZY RMZQYUYYZ RJ[OZUX[ZY RMPQP  
RTPXP',Ð  
3601: ' 53J[PRNTMVMXNZP[RYUX RMVNXOYQZ RNTNVOXQYRY  
RNPPPSOUNVMXOWPWXXYYY RONNOQO RTOWOVNVYWZ  
RMOOMPNUOUYUW[YY RMORT',Ð  
3602: ' 44I[LHMJMXKY RNJMHNGNXQZ RLHOFOXQYRZ RKYMYOZP[RZUYWY  
ROPROTNUMVNXOYOWPWY RTNVOVX RROSOUPUY',Ð  
3603: ' 35JXNONXLYMYOZP[ ROOOYQZ RPOPXRYSYQZP[ RNORNTMUNWOXO  
RSNTOVO RPORNTVPXO',Ð  
3604: ' 41IZRMPNMOMXKY RNONXQZ RRMOOOXQYRZ RKYMYOZP[RZUYWY  
RMHPFQIWOWY RPINHOGPIVOVX RMHUPUY',Ð  
3605: ' 32JXNONXLYMYOZP[ ROOOYQZ RPOPXRYSYQZP[ RNORNTMWQURPU  
RSNVQ RPORNUR',Ð  
3606: ' 41JWNHNXLYMYOZP[ ROHOYQZ RPHPXRYSYQZP[ RNHQGSFTGVHWH  
RRGSHUH RPHQGSUIWH RKMMN RPMTM',Ð  
3607: ' 56I[MOMXKYLYNZO[PZRYUX RNPYPZ ROOOXQYRY  
RMOOORNTMUNWOYOWPW\\V\_TaRbQaO`M` RSNVPV\\ RSaQ`P`  
RRNSOUPUZV[V\_RTaS`Q\_O\_M`,Ð  
3608: ' 47I[LHMJMXKYLYNZO[ RNJMHNGNYPZ  
RLHOFOXQYO[ ROPROTNUMVNXOYOWPWYU[T]  
RTNVOVYU[ RROSOUPUYT]T`UbVbT`,Ð  
3609: ' 35MWRFPHRITHRF RRGQHSHRG RRMQNOOQPQYS[UY  
RRPSORNQORPRYSZ RRMSNUOSPSXTYUY',Ð  
3610: ' 39MWRFPHRITHRF RRGQHSHRG RRMQNOOQPQYS[T]  
RRPSORNQORPRYS[ RRMSNUOSPSYT]T`RbPbPaRb',Ð  
3611: ' 50IZLHMJMXKYLYNZO[ RNJMHNGNYPZ  
RLHOFOXQYO[ ROPRNTMVPSROU RSNUP RRNTQ RSRTSVXWYXY RSSTTUYVZ  
RRSSTTYV[XY',Ð  
3612: ' 22MWP HQJQXOYPYRZS[ RRJQHRGRYTZ RPHSFSXUYVYTZS[,Ð  
3613: ' 67E\_GOHOIPIXGYHYJZK[ RINJOJYLZ  
RGOIMKOKXMYK[ RKPNO PNQMSOSXUYS[ RPNRORYTZ  
RNOOOQPQXPYRZS[ RSPVOXNYMZN\\O]O[P[X\\Y]Y RXNZOZY[Z  
RVOWOYPYY[[Y',Ð  
3614: ' 45I[KOLOMPMXKYLYNZO[ RMNNONYPZ  
RKOMMOOXQYO[ ROPROTNUMVNXOYOWPWXXYYY RTNVOVYWZ  
RROSOUPUYW[YY',Ð  
3615: ' 40I[MOMXKY RNPNXQZ ROOOXQYRZ RKYMYOZP[RZUYWY  
RMOOORNTMUNWOYOWPWY RSNVPVX RRNSOUPUY',Ð  
3616: ' 54I[LMMOMXKMYMb RMNNONaO`N^ RNYOYQZ RLMNNOOOXQYRZ

ROZP[RZUYWY ROZO^P`Mb ROPROTNUMVNXOYOWPWY RTNVOVX  
RROSOUPUY',Ð

3617: ' 44I[MOMXKY RNPNYMZ ROOOXQYRY RKYLYNZO[PZRYUX  
RMOOORNTMUNWOYOWPWb RSNVPVaU`V^ RRNSOUPU^T`Wb',Ð

3618: ' 38JXLONPNXLYMYOZP[ RMNOOOYQZ  
RLONMPOPXRYSYQZP[ RPOTMUNWOXO RSNTOVO RRNTPVPXO',Ð

3619: ' 59JZMOMSOTUTWUWY RNONS RVUVY RPNOOOSQT RSTUUUYTZ  
RMOPNRMTNVNWM RQNSN RPNROTOVN RWYTZR[PZNZL[ RSZQZ  
RTZRYOYL[ RWMVOTROWL',Ð

3620: ' 28MWP HQJQXOYPYRZS[ RRJQHRGRYTZ RPHSFSXUYVYTZS[ RNMQM  
RSMVM',Ð

3621: ' 47I[KOLOMPMXKY RLNNONYPZ RKOMMOOOXQYRY RKYLYNZO[PZRYUX  
RUMVNXOYOWPWXXYYY RTNVOVYWZ RUMSOUPUYW[YY',Ð

3622: ' 36I[LMMOMXP[RYUXWX RMNNONXQZ RLMNNOOOWPXRY  
RUMVNXOYOWPWX RTNVOVW RUMSOUPUX',Ð

3623: ' 57E\_HMIOIXL[NYQX RINJOJXMZ RHMJNKOKWLXNY  
RQMOOQPQXT[VYYX[X RPNRORXUZ RQMRNTOSPSWTXVY RYMZN\O]O[P[X  
RXNZOZW RYMWOYPYX',Ð

3624: ' 59H[KOLONPOQSYTZV[XY RMNOOTYVZ RKOMMONPOTWUXWYXY  
RRSUMVNXNYM RUNVOWO RTOVPXOYM RQUN[MZKZJ[ RNZMYLY  
ROYMXKYJ[ RMTPT RSTVT',Ð

3625: ' 60I[KOLOMPMXKY RLNNONYPZ RKOMMOOOXQYRY RKYLYNZO[PZRYUX  
RUMVNXOYOWPW\V\_TaRbQaO`M` RTNVOV\ RSaQ`P` RUMSOUPUZV[V\_  
RTaS`Q\_O\_M',Ð

3626: ' 38I[XML[ RLONPQPTOXM RMNOOSO RLONMPNTNXM RL[PYSXVXXY  
RQYUYWZ RL[PZTZV[XY RNTVT',Ð

3700: ' 42H\LHLXJY RMIMXPZ RNHNXPYQZ RLHNHSGUF RSGTHVIVY  
RTGWIWX RUFVGXHZHXIXY RJYLYNZO[QZVYXY',Ð

3701: ' 27H\OHPIQKQXOY RQIPHQGRIRYTZ ROHRFSHSXUYVY  
ROYPYRZS[TZVY',Ð

3702: ' 48H\LHNHPGQFSGVHXH RPHRG RLHNIPIRHSG RVHVP RWIWO  
RXHXPQPNQLSKVK[ RK[OYSXVXZY RNZQYVYYZ RK[PZUZ[XZY',Ð

3703: ' 57H\LHMHOGPFRGVHXH ROHQG RLHNIPIRG RVHVO RWIWN  
RXHXOVOSPQQ RQPSQVRXRY RWSWX RVRVY RXYMXOXQYRZ ROYQZ  
RKYMYOZP[RZVYXY',Ð

3704: ' 41H\UFKPKUTU RVUZU[V[TZU RLPLT RMNMMU RTGTXY  
RUJVVHUGUYWZ RUFWHVJVXXYYY RRYSYUZV[WZYY',Ð

3705: ' 53H\LFLORLFXF RMGVG RLHUHWGXF RVLUMSNOOLO RSNTNVOVY  
RUMWNWX RVLWMYNZNXOXY RXYMXOXQYRZ ROYQZ RKYMYOZP[RZVYXY',Ð

3706: ' 59H\LHLXJY RMIMXPZ RNHNXPYQZ RLHNHRGTFUGWHXH RSGUH  
RRGTIVIXH RNPOPSOUNVM RSOTOVPVY RUNWPWX RVMWNYOZOXPXY  
RJYLYNZO[QZVYXY',Ð

3707: ' 38H\KHMFPUGGZF RLGOHTHWG RKHOIRIVHZF  
RZFYHWKSOQRPUPXQ[ RRQQTQWRZ RUMSPRSRVSYQ',Ð

3708: ' 71H\LILO RMJMN RNINO RLINISHUGVF RSHTHVIVO RUGWHWN  
RVFWGYHZHXIXO RLONOVRRX RXOVONRLR RLRLXJY RMSMXPZ RNRNXPYQZ

RVRVY RWSWX RXXRY RJYLYNZO[QZVYXY',Ð  
3709: ' 60H\\LHLQJR RMIMROS RNHNQPRQR RLHNHSGUF RSGTHVIVY  
RTGWIWX RUFVGXHZHXIXY RJRKMSNTOSQRUQVQ RKYMXOXQYRZ ROYQZ  
RKYMYOZP[RZVYXY',Ð  
3710: ' 11LXRX PZR[TZRX RRYQZSZRY',Ð  
3711: ' 14LXR^R\\PZRXSZS\\R^P\_ RRYQZR[RY',Ð  
3712: ' 22LXRMPORPTORM RRNQOSORN RXPZR[TZRX RRYQZSZRY',Ð  
3713: ' 25LXRMPORPTORM RRNQOSORN RR^R\\PZRXSZS\\R^P\_ RRYQZR[RY',Ð  
3714: ' 30LXRFQGOHQIRT RRISHRGQHRIRT RRFSGUHSIRT RXPZR[TZRX  
RRYQZSZRY',Ð  
3715: ' 51I[LJMHNGQFSFVGWHXJXLWNUPSQ RMJNH RVHWIWMVN  
RLJNKNIQGQF RSFUGVIVMUOSQ RRQRTSQQRT RXPZR[TZRX RRYQZSZRY',Ð  
3716: ' 14LXTRFGQIQKRMTRIRG RRJRLSKRJ',Ð  
3717: ' 14LXRLRJPHRFSHSJRLPM RRGQHRIRG',Ð  
3718: ' 62E\_YNZO[O\\N RXOYP[P RXPYQZQ[P\\N RYNST RRUL[HVNP  
ROOSKOFJLPRTXVZX[Z[[Z\\X RLZIV RRKOG RKLPQTWVYXZ[Z RMZIU RRLNG  
RKKQQUWVXXY[Y\\X',Ð  
3719: ' 60H\\PBP\_ RTBT\_  
RTFVGWIWKYJXHWGTFPFMGKIKLLNOPURWSXUXXWZ RXJWH  
RLLMNOOUQWRXT RMYLW  
RMGLILKMMONUPXRYTYWXYWZT[P[MZLYKWMVMXNZP['',Ð  
3720: ' 8G^\\BibJb R[B\\Bjb',Ð  
3721: ' 27KYUBSDQGOKNPNTQYQ]S`Ub RQHPKOOOUPYQ\\  
RSDRFQIPOPQUQ[R^S`',Ð  
3722: ' 27KYOBQDSGUKVPVTUYS]Q`Ob RSHTKUOUUTYS\\  
RQDRFSITOTUS[R^Q`',Ð  
3723: ' 39JZRFQGSQRR RRFRR RRFSGQQRR RMINIVOWO RMIWO  
RMIMJWNWO RWIVINOMO RWIMO RWIWJMNMO',Ð  
3724: ' 8F\_JQ[Q[R RJQJR[R',Ð  
3725: ' 16F\_RIRZSZ RRISISZ RJQ[Q[R RJQJR[R',Ð  
3726: ' 16F\_JM[M[N RJMJN[N RJU[U[V RJUJV[V',Ð  
3727: ' 11NWSFRGRM RSGRM RSFTGRM',Ð  
3728: ' 22I[NFMGMM RNGMM RNFOGMM RWFVGVM RWGVM RWFVGVM',Ð  
3729: ' 30KYQFOGNINKOMQNSNUMVKVIUGSFQF RQFNIOMSNVKUGQF  
RSFOGNKQNUMVISF',Ð  
3801: ' 52E\_NHLIKIMHPHSIUKV RJLIOISJU  
RNHLJKLJOJRKVXJZH[ RVHXXHYVY RYHYY RZGZZ RHFKGQHVHZG\\F RJPXP  
RH[KZQYVYZZ\\['',Ð  
3802: ' 65E\_LGLZ RMGMZ RPFNGNZP[ RHJJHLGPFUFXGZIZKYM RXHYIYKXM  
RUFWGXIXKWL RQUOTNRNPONPMSLVLYM[O\\Q\\T[WYYWZT[P[LZJYHW  
RZO[Q[UZW RVLYNZQZUYXWZ',Ð  
3803: ' 60E\_\\F[HZJXHVGSGFQFNGLHJJILHOHRIUJWLYNZQ[S[VZXYZW[Y  
\\[ R[HZMZT[Y RZKYJ RZNYKXIVG RJKINISJV RGLIKKJNJSKV LXNZ RYWZV  
RVZXXYVZS',Ð  
3804: ' 46E\_KGKZ RLGLZ RNFMGMZN[ RHKIIKGNFSFVGXHZJ[L\\O\\  
\\R[UZWXYVZS[N[KZIXHV RZK[N[SVZ RVGXIIKZNZSYVXXVZ',Ð

3805: ' 86E\_\\F[HZJXHVG SFQFNG LHJJILHOHRIUJWLYNZQ[S[VZXYZW[Y\\  
\\ R[HZMZT[Y RZKYJ RZMXIVG RJKINISJV RNLICKJNJSKVLXNZ RYWZV  
RVZXXYVZS RJPKONOUXQZP RPPRQURWRYQ RMORRUSWSYRZP  
RZMYLXLWMXNYM',Ð

3806: ' 69E\_JHJZ RMGKHKY ROFMGLILYNY RHJJHLGOF SFVGXHY\\F R\\  
\\F[HZLZO[S\\U RZIYK RVGXLYLZO RLPMOOOTPWPYO RQPTQVQXP  
RNOTRVRXQYOYLXKWKVLWML RH[JZNYSSYZ\\',Ð

3807: ' 90E\_\\F[HZJXHVG SFQFNG LHJJILHOHRIUJWLYNZQ[T[VZXYXZV[Y\\  
\\ R[HZMZT[Y RZKYJ RZNYKXIVG RJKINISJV RNLICKJNJSKVLXNZ RXXYVYR  
RVZWYXVXQ RKSRLMSLT KTJS RJPKNMMOMRNUPWQ RKOMNONROTP  
RJPLOOOUQYQZP',Ð

3808: ' 50E\_JGJZH[ RKHKZ RNHLHLZ RHFJGNHSHYG\\F RLPMNOLRKVKYL[N\\Q\\  
\\T[UUV RZN[P[SZU RVKXYLMZOZSYVYXZZ\\ RH[LZPZU]',Ð

3809: ' 23E\_QIQY RRJR XRSISY RHFLHPITIXH\\F RH[KZOYUYYZ\\',Ð

3810: ' 42E\_TIVIVXUZS[ RWIWXVY RXHXY RHFLHPITIXH\\F  
RIOHQHUIXKZN[S[VZXYZW\\T RIUJXKY RHSJUKXLZN]',Ð

3811: ' 70E\_JGJZH[ RKHKZ RNHLHLZ RHFJGNHSHYG\\F  
RLPMNOLRKUKXLYMYOXPSRQSPTPUQVRUQT RWLXMXOWP RUKWMWOVPSR  
RSRVRYSZUZWYX RWSYUYW RSRVSXUYXZZ[\\ RH[LZPZU]',Ð

3812: ' 45E\_JGJZ RKHKY RNHLHLYNY R\\KZNYPSXUYW[X RZOYRYUZW R\\  
\\K[MZQZT[X\\ RH[FJGNHSHYG\\F RH[JZNYSSYZ\\',Ð

3813: ' 68E\_QIQY RRJR XRSISY RNYLWJVUIHRHMIJHKMGPFTEFWGYH[J\\M\\  
\\R[UZVXWVY RJUIRIMJJ RLWKUJRJLKIMG RZJ[M[RZU RWGYIZLZRYUXW  
RHFLHPITIXH\\F RH[KZOYUYYZ\\',Ð

3814: ' 48E\_JHJZH[ RLHKIKZ ROFMGLILZ RHJJHLGOF SFVGXHZJ[L\\O\\S[UUV  
RZK[N[RZU RVGXIKZKNZRYVYXZZ[\\ RH[LZPZU]',Ð

3815: ' 54E\_QFNG LHJJILHOHRIUJWLYNZQ[S[VZXYZW[U\\R\\O[LZJXHVG SFQF  
RJKINISJV RNLICKJNJSKVLXNZ RZV[S[NZK RVZXXYVZSZNYKXIVG',Ð

3816: ' 51E\_JIJZ RMHKJKY RQFOGMILKLYNY RHKJINGQFTFWGYH[J\\M\\  
\\O[RYTVURUOTMRLO RZJ[L[PZR RWGYIZLZPYSVU RH[JZNYSSYZ\\',Ð

3817: ' 74E\_QFNG LHJJILHOHRIUJWLYNZQ[S[VZXYZW[U\\R\\O[LZJXHVG SFQF  
RJKINISJV RNLICKJNJSKVLXNZ RZV[S[NZK RVZXXYVZSZNYKXIVG  
RJSKUNVTW[W\\X\\Z[[[Z\\Y RPWRW RKUNWQXSXTW',Ð

3818: ' 69E\_JIJZH[ RKIKZ RLHLZ RHKJILHNGQFUFYG[I\\K\\N[PZQ RYHZI[K[NZP  
RUFWGYIZKZOYQ RXRUSRSPRPPROUOXPR\\U\\W[XZX RXQYR[V[WZT  
RTOVPXRYTZ[X\\ RH[LZPZU]',Ð

3819: ' 94E\_TFZG\\F[H[JYHWGTFPFMGJJIMIOJRLTOURUTTUSVQVP R[GZH[J  
RJPKRLSOTRTTS RKIKJKNKPMRPSRSTRVPWOXO  
RLQMQNPPNRMUMWNYPZRZUYXWZ RPMRLULXMZO[R[UZW RIWJYIZ  
RNPNOOMPLRKUKXL[O\\R\\T[WYYWZT[P[MZKYIWIYH[JZP]',Ð

3820: ' 66E\_QHMHKIJILHOHSIVJXKYMZP[S[VZXYZW[U\\R\\N[KYIWH  
RUHTITKULVKUJ RISJVLXNYQZTZWY RJJINIQTJLWNXQYTYWXYW[T\\R RHFKI  
RKHLG RIGJGKFMGQHWHZG\\F',Ð

3821: ' 51E\_LHJJILHOHRIUJWLYNZQ[U[XZZY RKJJLIOISJV  
RKILJLKKMJPJSKVLXNZ RVHXHXXWZU[ RYHYXXY RZGZY\\ RHFKGQHVHZG\\F',Ð

3822: ' 31E\_HFR[ RIGJHQWRY RJGKHRWSX R\\FR[ RWNUS RYLUQTTTV

RHFJGOHUHZG\F',Ð

3823: ' 67E\_LHJJILHOHRIUJWLYNZQ[S[VZXYZW[U\R\O[LZJXH RJLIOIRJUKW  
RJJKKKLJOJRKVLXNZ RYWZU[R[OZL RVZXXYVZRZOYLYKZJ RQIQ[ RRJRZ  
RSIS[ RHFLHPITIXH\F',Ð

3824: ' 41E\_HFXYYZ RIGKHZZ RLH\ R\FSP RQRJZ RPSMULW RQRMTLUKWKY  
RHFLHPITIXH\F RH[JZNYSYYZ\['',Ð

3825: ' 47E\_XHXZ RYHYY RZGZY RKHIJHMHPIISKUMVPWSWVVXU RLUOVUV  
RHPIRKTNUTUVV RHFLHPITIXH\F RHWJYLZP[T[XZ\X',Ð

3826: ' 73E\_HFIGKHNHSFVFGZIZKYM RXGYIYKXM RVFWGXIXL  
RXNTOROPNPLRKTXXL RTKVLWMVNTQ RYM[O\R\  
\T[WYYWZT[P[MZKYIWHTHRIOJNLNMNPNPPOQNPOO RXMZO[Q[UZW  
RXNYOZQZUYXWZ',Ð

3901: ' 42J[PQMTMXP[TY RNTNXPZ ROROWRZ RRSMMNNMONNO  
RONSNUMWOWXXY RUNVOVXUYVZWYVX RSNUPUXTYV[XY',Ð

3902: ' 31IZNHLFMJMXP[UYWX RNHNXPZ RNHPFOJOWRZ ROOTMWPWX  
RTNVPVX RRNUQUY',Ð

3903: ' 23KWNPNNYP[RY ROPOYPZ RPOPXQYRY RNPTMVOTPRN RSNUO',Ð

3904: ' 32JZRMMPMXP[RZUYWY RNPNNXPZ ROOOWRZ RPIPFQIWPWY RPIVPVX  
RPIMIPJUPUY',Ð

3905: ' 25KXNNPNYP[RY ROPOYPZ RPOPXQYRY RNPTMWQPU RSNVQ RRNUR',Ð

3906: ' 32KWOIOXNYP[ RPIPXOYPZQYPX RQHGXRYP[ ROIUFWHUISG RTGVH  
RLMOM RQMUM',Ð

3907: ' 41J[MPMXP[UY RNPNNXPZ ROOOWRZ  
RMPOOTMWPW]V\_U`SaQaO`MaObQa RTNVPV]U\_ RPaNa RRNUQU^T`Sa',Ð

3908: ' 42I[NHLFMJMXLYN[ RNHNXMYNZOYNX  
RNHPFOJOXPYN[ ROORNTMWPWYT]T`UbVbT` RTNVPVYU[ RRNUQUZT]',Ð

3909: ' 37MWRFPHRJTHRF RRGQHRISHRG  
RRMPOQPQXPYR[ RRPSONRQORPRXQYRZSYRX RRMTOSPSXTYR['',Ð

3910: ' 37MWRFPHRJTHRF RRGQHRISHRG RRMPOQPQYT]  
RRPSORNQORPRYS[ RRMTOSPSZT]T`RbPaPbRb',Ð

3911: ' 51IZNHLFMJMXLYN[ RNHNXMYNZOYNX  
RNHPFOJOXPYN[ ROPRNTMVPSROU RSNUP RRNTQ RRSSTTYV[XY  
RSSTUUYVZ RSRTSVXWYXY',Ð

3912: ' 21MWRHPFQJQXPYR[ RRHRXQYRZSYRX RRHTFSJSXTYR['',Ð

3913: ' 66E\_GOHOIPIXHYJ[ RINJOJXIYJZKYJX  
RGOIMKOKXLYJ[ RKONNPMSOSXTYR[ RPNRORXQYRZSYRX  
RNNQPQXPYR[ RSOVNXM[O[X\YYZ[ RXNZOZXYYZZ[YZX RVNYPYXXYZ['',Ð

3914: ' 44I[KOLOMPMXLYN[ RMNNONXMYNZOYNX  
RKOMMOOOXPYN[ ROORNTMWOWXXYV[ RTNVOVXUYVZWYVX RRNUPUXTYV['',Ð

3915: ' 28JZMPMXP[UYWX RNPNNXPZ ROOOWRZ RMPOOTMWPWX RTNVPVX  
RRNUQUY',Ð

3916: ' 47IZLMMOMXKMYM\_LbN` RNON` RLMNNOOOXQYRZ RNYOYQZ  
ROZP[UYWX ROZO\_PbN` ROORNTMWPWX RTNVPVX RRNUQUY',Ð

3917: ' 31J[MPMXP[UY RNPNNXPZ ROOOWRZ RMPOOTMWPW\_XbV` RTNVPV`  
RRNUQU\_TbV',Ð

3918: ' 31KXMONOOPOXNYP[ RONPOPXOYPZQYPX

RMOOMQOQXRYP[ RQOUMWOUPSN RTNVO',Ð  
3919: ' 41JZMPMSOUURWTWX RNPNSOT ROOSPT RUSVTVX RTSUTUY  
RMPSMVNTOQN RRNUN RWXQ[MYOXSZ ROYQZ',Ð  
3920: ' 27MWRHPFQJQXPYR[ RRHRXQYRZSYRX RRHTFSJSXTYR[ RNMQM  
RSMVM',Ð  
3921: ' 40I[KOLOMPMYP[UY RMNNONYPZ KOMMMOOXRZ RVMXOWPWXXYYY  
RVPWOVNUOVPVYWZ RVMTOUPUYW[YY',Ð  
3922: ' 36I[LMMOMXQ[SYWW RMNNONXQZ RLMNNOOOWRYSY RVMXOWPWW  
RVPWOVNUOVPVW RVMTOUPUX',Ð  
3923: ' 59E\_HMIOIXM[OYQX RINJOJXMZ RHMJNKOKWNYOY  
RRMPOQPQXU[WY[W RRPSORNQORPRXUZ RRMTOSPSWVYWY RZM\\O[P[W  
RZP[OZNYOZPZW RZMXOYPYX',Ð  
3924: ' 39I[LONPUZV[XY RMNOOUYWZ RLMONVXXY RXMVMVOXOXMVOSS  
RQUNYL[N[NYLYL[ RNTQT RSTVT',Ð  
3925: ' 49I[KOLOMPMYP[UY RMNNONYPZ KOMMMOOXRZ  
RVMXOWPW]V\_U`SaQaO`MaObQa RVPWOVNUOVPV^U\_ RPaNa  
RVMTOUPU^T`Sa',Ð  
3926: ' 43L[RNOPOORNTMWOWSRU RTNVOVS RRNUPUSTT  
RRUWWW]V\_U`SaQaO`MaObQa RVWV^U\_ RPaNa RTVUWU^T`Sa'Ð  
}Ð

File Path: canvas-editor/src/editor/core/draw/particle/latex/utils/symbols.ts

/\*

[https://oeis.org/wiki/List\\_of\\_LaTeX\\_mathematical\\_symbols](https://oeis.org/wiki/List_of_LaTeX_mathematical_symbols)

<https://en.wikibooks.org/wiki/LaTeX/Mathematics>

\*/

export interface Symb {

  glyph: number

  arity?: number

  flags: Record<string, boolean>

}

const SYMB: Record<string, Symb> = {

  '\frac': { glyph: 0, arity: 2, flags: {} },

  '\binom': { glyph: 0, arity: 2, flags: {} },

  '\sqrt': {

    glyph: 2267,

    arity: 1,

    flags: { opt: true, xfl: true, yfl: true } }

},

  '^': { glyph: 0, arity: 1, flags: {} },

  '\_': { glyph: 0, arity: 1, flags: {} },

  '(': { glyph: 2221, arity: 0, flags: { yfl: true } },

  ')': { glyph: 2222, arity: 0, flags: { yfl: true } },

  '[': { glyph: 2223, arity: 0, flags: { yfl: true } },

  ']': { glyph: 2224, arity: 0, flags: { yfl: true } },

  '\langle': { glyph: 2227, arity: 0, flags: { yfl: true } },

  '\rangle': { glyph: 2228, arity: 0, flags: { yfl: true } },

  '|': { glyph: 2229, arity: 0, flags: { yfl: true } },

  '\|': { glyph: 2230, arity: 0, flags: { yfl: true } },

  '\{': { glyph: 2225, arity: 0, flags: { yfl: true } },

  '\}': { glyph: 2226, arity: 0, flags: { yfl: true } },

  '\#': { glyph: 2275, arity: 0, flags: {} },

  '\\$': { glyph: 2274, arity: 0, flags: {} },

  '\&': { glyph: 2273, arity: 0, flags: {} },

  '\%': { glyph: 2271, arity: 0, flags: {} },

  /\*semantics\*/

  '\begin': { glyph: 0, arity: 1, flags: {} },

  '\end': { glyph: 0, arity: 1, flags: {} },

  '\left': { glyph: 0, arity: 1, flags: {} },

  '\right': { glyph: 0, arity: 1, flags: {} },

  '\middle': { glyph: 0, arity: 1, flags: {} },

  /\*operators\*/



$\cdot$ : { glyph: 2236, arity: 0, flags: {} },  
 $\pm$ : { glyph: 2233, arity: 0, flags: {} },  
 $\mp$ : { glyph: 2234, arity: 0, flags: {} },  
 $\times$ : { glyph: 2235, arity: 0, flags: {} },  
 $\div$ : { glyph: 2237, arity: 0, flags: {} },  
 $\leqq$ : { glyph: 2243, arity: 0, flags: {} },  
 $\geqq$ : { glyph: 2244, arity: 0, flags: {} },  
 $\leq$ : { glyph: 2243, arity: 0, flags: {} },  
 $\geq$ : { glyph: 2244, arity: 0, flags: {} },  
 $\propto$ : { glyph: 2245, arity: 0, flags: {} },  
 $\sim$ : { glyph: 2246, arity: 0, flags: {} },  
 $\equiv$ : { glyph: 2240, arity: 0, flags: {} },  
 $\dagger$ : { glyph: 2277, arity: 0, flags: {} },  
 $\ddagger$ : { glyph: 2278, arity: 0, flags: {} },  
 $\ell$ : { glyph: 662, arity: 0, flags: {} },  
  
 /\*accents\*/  
 $\vec{\phantom{x}}$ : {  
     glyph: 2261,  
     arity: 1,  
     flags: { hat: true, xfl: true, yfl: true }  
 },  
 $\overrightarrow{\phantom{x}}$ : {  
     glyph: 2261,  
     arity: 1,  
     flags: { hat: true, xfl: true, yfl: true }  
 },  
 $\overleftarrow{\phantom{x}}$ : {  
     glyph: 2263,  
     arity: 1,  
     flags: { hat: true, xfl: true, yfl: true }  
 },  
 $\bar{\phantom{x}}$ : { glyph: 2231, arity: 1, flags: { hat: true, xfl: true } },  
 $\overline{\phantom{x}}$ : { glyph: 2231, arity: 1, flags: { hat: true, xfl: true } },  
 $\widehat{\phantom{x}}$ : {  
     glyph: 2247,  
     arity: 1,  
     flags: { hat: true, xfl: true, yfl: true }  
 },  
 $\hat{\phantom{x}}$ : { glyph: 2247, arity: 1, flags: { hat: true } },  
 $\acute{\phantom{x}}$ : { glyph: 2248, arity: 1, flags: { hat: true } },  
 $\grave{\phantom{x}}$ : { glyph: 2249, arity: 1, flags: { hat: true } },  
 $\breve{\phantom{x}}$ : { glyph: 2250, arity: 1, flags: { hat: true } },  
 $\tilde{\phantom{x}}$ : { glyph: 2246, arity: 1, flags: { hat: true } },  
 $\underline{\phantom{x}}$ : { glyph: 2231, arity: 1, flags: { mat: true, xfl: true } },

'\not': { glyph: 2220, arity: 1, flags: {} },  
 '\neq': { glyph: 2239, arity: 1, flags: {} },  
 '\ne': { glyph: 2239, arity: 1, flags: {} },  
 '\exists': { glyph: 2279, arity: 0, flags: {} },  
 '\in': { glyph: 2260, arity: 0, flags: {} },  
 '\subset': { glyph: 2256, arity: 0, flags: {} },  
 '\supset': { glyph: 2258, arity: 0, flags: {} },  
 '\cup': { glyph: 2257, arity: 0, flags: {} },  
 '\cap': { glyph: 2259, arity: 0, flags: {} },  
 '\infty': { glyph: 2270, arity: 0, flags: {} },  
 '\partial': { glyph: 2265, arity: 0, flags: {} },  
 '\nabla': { glyph: 2266, arity: 0, flags: {} },  
 '\aleph': { glyph: 2077, arity: 0, flags: {} },  
 '\wp': { glyph: 2190, arity: 0, flags: {} },  
 '\therefore': { glyph: 740, arity: 0, flags: {} },  
 '\mid': { glyph: 2229, arity: 0, flags: {} },

'\sum': { glyph: 2402, arity: 0, flags: { big: true } },  
 '\prod': { glyph: 2401, arity: 0, flags: { big: true } },  
 '\bigoplus': { glyph: 2284, arity: 0, flags: { big: true } },  
 '\bigodot': { glyph: 2281, arity: 0, flags: { big: true } },  
 '\int': { glyph: 2412, arity: 0, flags: { yfl: true } },  
 '\oint': { glyph: 2269, arity: 0, flags: { yfl: true } },  
 '\oplus': { glyph: 1284, arity: 0, flags: {} },  
 '\odot': { glyph: 1281, arity: 0, flags: {} },  
 '\perp': { glyph: 738, arity: 0, flags: {} },  
 '\angle': { glyph: 739, arity: 0, flags: {} },  
 '\triangle': { glyph: 842, arity: 0, flags: {} },  
 '\Box': { glyph: 841, arity: 0, flags: {} },

'\rightarrow': { glyph: 2261, arity: 0, flags: {} },  
 '\to': { glyph: 2261, arity: 0, flags: {} },  
 '\leftarrow': { glyph: 2263, arity: 0, flags: {} },  
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 '\bigcirc': { glyph: 904, arity: 0, flags: {} },  
 '\bullet': { glyph: 828, arity: 0, flags: {} },  
 '\star': { glyph: 856, arity: 0, flags: {} },  
 '\diamond': { glyph: 743, arity: 0, flags: {} },  
 '\ast': { glyph: 728, arity: 0, flags: {} },

/\*verbatim symbols\*/  
 '\log': { glyph: 0, arity: 0, flags: { txt: true } },  
 '\ln': { glyph: 0, arity: 0, flags: { txt: true } },  
 '\exp': { glyph: 0, arity: 0, flags: { txt: true } },

'\mod': { glyph: 0, arity: 0, flags: { txt: true } },  
'\lim': { glyph: 0, arity: 0, flags: { txt: true, big: true } },

␣

'\sin': { glyph: 0, arity: 0, flags: { txt: true } },  
'\cos': { glyph: 0, arity: 0, flags: { txt: true } },  
'\tan': { glyph: 0, arity: 0, flags: { txt: true } },  
'\csc': { glyph: 0, arity: 0, flags: { txt: true } },  
'\sec': { glyph: 0, arity: 0, flags: { txt: true } },  
'\cot': { glyph: 0, arity: 0, flags: { txt: true } },  
'\sinh': { glyph: 0, arity: 0, flags: { txt: true } },  
'\cosh': { glyph: 0, arity: 0, flags: { txt: true } },  
'\tanh': { glyph: 0, arity: 0, flags: { txt: true } },  
'\csch': { glyph: 0, arity: 0, flags: { txt: true } },  
'\sech': { glyph: 0, arity: 0, flags: { txt: true } },  
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'\arcsin': { glyph: 0, arity: 0, flags: { txt: true } },  
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'\arccsc': { glyph: 0, arity: 0, flags: { txt: true } },  
'\arcsec': { glyph: 0, arity: 0, flags: { txt: true } },  
'\arccot': { glyph: 0, arity: 0, flags: { txt: true } },

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/\*font modes\*/

'\text': { glyph: 0, arity: 1, flags: {} },  
'\mathnormal': { glyph: 0, arity: 1, flags: {} },  
'\mathrm': { glyph: 0, arity: 1, flags: {} },  
'\mathit': { glyph: 0, arity: 1, flags: {} },  
'\mathbf': { glyph: 0, arity: 1, flags: {} },  
'\mathsf': { glyph: 0, arity: 1, flags: {} },  
'\mathtt': { glyph: 0, arity: 1, flags: {} },  
'\mathfrak': { glyph: 0, arity: 1, flags: {} },  
'\mathcal': { glyph: 0, arity: 1, flags: {} },  
'\mathbb': { glyph: 0, arity: 1, flags: {} },  
'\mathscr': { glyph: 0, arity: 1, flags: {} },  
'\rm': { glyph: 0, arity: 1, flags: {} },  
'\it': { glyph: 0, arity: 1, flags: {} },  
'\bf': { glyph: 0, arity: 1, flags: {} },  
'\sf': { glyph: 0, arity: 1, flags: {} },  
'\tt': { glyph: 0, arity: 1, flags: {} },  
'\frak': { glyph: 0, arity: 1, flags: {} },  
'\cal': { glyph: 0, arity: 1, flags: {} },  
'\bb': { glyph: 0, arity: 1, flags: {} },  
'\scr': { glyph: 0, arity: 1, flags: {} },

␣

'\quad': { glyph: 0, arity: 0, flags: {} },  
'\,': { glyph: 0, arity: 0, flags: {} },

'\.': { glyph: 0, arity: 0, flags: {} },  
'\;': { glyph: 0, arity: 0, flags: {} },  
'\!': { glyph: 0, arity: 0, flags: {} },

Ð

/\*greek letters\*/

'\alpha': { glyph: 2127, flags: {} },  
'\beta': { glyph: 2128, flags: {} },  
'\gamma': { glyph: 2129, flags: {} },  
'\delta': { glyph: 2130, flags: {} },  
'\varepsilon': { glyph: 2131, flags: {} },  
'\zeta': { glyph: 2132, flags: {} },  
'\eta': { glyph: 2133, flags: {} },  
'\vartheta': { glyph: 2134, flags: {} },  
'\iota': { glyph: 2135, flags: {} },  
'\kappa': { glyph: 2136, flags: {} },  
'\lambda': { glyph: 2137, flags: {} },  
'\mu': { glyph: 2138, flags: {} },  
'\nu': { glyph: 2139, flags: {} },  
'\xi': { glyph: 2140, flags: {} },  
'\omicron': { glyph: 2141, flags: {} },  
'\pi': { glyph: 2142, flags: {} },  
'\rho': { glyph: 2143, flags: {} },  
'\sigma': { glyph: 2144, flags: {} },  
'\tau': { glyph: 2145, flags: {} },  
'\upsilon': { glyph: 2146, flags: {} },  
'\varphi': { glyph: 2147, flags: {} },  
'\chi': { glyph: 2148, flags: {} },  
'\psi': { glyph: 2149, flags: {} },  
'\omega': { glyph: 2150, flags: {} },

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'\epsilon': { glyph: 2184, flags: {} },  
'\theta': { glyph: 2185, flags: {} },  
'\phi': { glyph: 2186, flags: {} },  
'\varsigma': { glyph: 2187, flags: {} },

Ð

'\Alpha': { glyph: 2027, flags: {} },  
'\Beta': { glyph: 2028, flags: {} },  
'\Gamma': { glyph: 2029, flags: {} },  
'\Delta': { glyph: 2030, flags: {} },  
'\Epsilon': { glyph: 2031, flags: {} },  
'\Zeta': { glyph: 2032, flags: {} },  
'\Eta': { glyph: 2033, flags: {} },  
'\Theta': { glyph: 2034, flags: {} },  
'\Iota': { glyph: 2035, flags: {} },  
'\Kappa': { glyph: 2036, flags: {} },  
'\Lambda': { glyph: 2037, flags: {} },

```

'\Mu': { glyph: 2038, flags: {} },Đ
'\Nu': { glyph: 2039, flags: {} },Đ
'\Xi': { glyph: 2040, flags: {} },Đ
'\Omicron': { glyph: 2041, flags: {} },Đ
'\Pi': { glyph: 2042, flags: {} },Đ
'\Rho': { glyph: 2043, flags: {} },Đ
'\Sigma': { glyph: 2044, flags: {} },Đ
'\Tau': { glyph: 2045, flags: {} },Đ
'\Upsilon': { glyph: 2046, flags: {} },Đ
'\Phi': { glyph: 2047, flags: {} },Đ
'\Chi': { glyph: 2048, flags: {} },Đ
'\Psi': { glyph: 2049, flags: {} },Đ
'\Omega': { glyph: 2050, flags: {} }Đ
}Đ
Đ
export { SYMB }Đ
Đ
export function asciiMap(x: string, mode = 'math'): number {Đ
  const c = x.charCodeAt(0)Đ
  if (65 <= c && c <= 90) {Đ
    const d = c - 65Đ
    if (mode == 'text' || mode == 'rm') {Đ
      return d + 2001Đ
    } else if (mode == 'tt') {Đ
      return d + 501Đ
    } else if (mode == 'bf' || mode == 'bb') {Đ
      return d + 3001Đ
    } else if (mode == 'sf') {Đ
      return d + 2501Đ
    } else if (mode == 'frak') {Đ
      return d + 3301Đ
    } else if (mode == 'scr' || mode == 'cal') {Đ
      return d + 2551Đ
    } else {Đ
      return d + 2051Đ
    }Đ
  }Đ
  if (97 <= c && c <= 122) {Đ
    const d = c - 97Đ
    if (mode == 'text' || mode == 'rm') {Đ
      return d + 2101Đ
    } else if (mode == 'tt') {Đ
      return d + 601Đ
    } else if (mode == 'bf' || mode == 'bb') {Đ
      return d + 3101Đ
    } else if (mode == 'sf') {Đ

```

```

    return d + 2601Đ
} else if (mode == 'frak') {Đ
    return d + 3401Đ
} else if (mode == 'scr' || mode == 'cal') {Đ
    return d + 2651Đ
} else {Đ
    return d + 2151Đ
}Đ
}Đ
if (48 <= c && c <= 57) {Đ
    const d = c - 48Đ
    if (mode == 'it') {Đ
        return d + 2750Đ
    } else if (mode == 'bf') {Đ
        return d + 3200Đ
    } else if (mode == 'tt') {Đ
        return d + 700Đ
    } else {Đ
        return d + 2200Đ
    }Đ
}Đ
Đ
return <number>{Đ
    '·': 2210,Đ
    ',': 2211,Đ
    '·': 2212,Đ
    '·': 2213,Đ
    '!': 2214,Đ
    '?': 2215,Đ
    '\": 2216,Đ
    '"': 2217,Đ
    '*': 2219,Đ
    '/': 2220,Đ
    '-': 2231,Đ
    '+': 2232,Đ
    '=': 2238,Đ
    '<': 2241,Đ
    '>': 2242,Đ
    '~': 2246,Đ
    '@': 2273,Đ
    '\\': 804Đ
}[x]Đ
}Đ

```

File Path: canvas-editor/src/editor/core/draw/particle/previewer/Previewer.ts

```
import { EDITOR_PREFIX } from '../../../dataset/constant/Editor'
import { IEditorOption } from '../../../interface/Editor'
import { IElement, IElementPosition } from '../../../interface/Element'
import {
  IPreviewerCreateResult,
  IPreviewerDrawOption
} from '../../../interface/Previewer'
import { downloadFile } from '../../../utils'
import { Draw } from '../Draw'

export class Previewer {
  private container: HTMLDivElement
  private canvas: HTMLCanvasElement
  private draw: Draw
  private options: Required<IEditorOption>
  private curElement: IElement | null
  private curElementSrc: string
  private previewerDrawOption: IPreviewerDrawOption
  private curPosition: IElementPosition | null
  // bÖbye9SØ:[ø
  private resizerSelection: HTMLDivElement
  private resizerHandleList: HTMLDivElement[]
  private resizerImageContainer: HTMLDivElement
  private resizerImage: HTMLImageElement
  private width: number
  private height: number
  private mousedownX: number
  private mousedownY: number
  private curHandleIndex: number
  // ~,‰• S:
  private previewerContainer: HTMLDivElement | null
  private previewerImage: HTMLImageElement | null
}

constructor(draw: Draw) {
  this.container = draw.getContainer()
  this.canvas = draw.getPage()
  this.draw = draw
  this.options = draw.getOptions()
  this.curElement = null
  this.curElementSrc = ''
  this.previewerDrawOption = {}
  this.curPosition = null
  // VprG:[ø•)e>
  const {
    resizerSelection,

```

```

    resizerHandleList,Đ
    resizerImageContainer,Đ
    resizerImageĐ
} = this._createResizerDom()Đ
this.resizerSelection = resizerSelectionĐ
this.resizerHandleList = resizerHandleListĐ
this.resizerImageContainer = resizerImageContainerĐ
this.resizerImage = resizerImageĐ
this.width = 0Đ
this.height = 0Đ
this.mousedownX = 0Đ
this.mousedownY = 0Đ
this.curHandleIndex = 0 // žØ«SóN %oÒĐ
// VprG~,%oÈĐ
resizerSelection.ondbclick = this._dbclick.bind(this)Đ
this.previewContainer = nullĐ
this.previewImage = nullĐ
}Đ
Đ
private _createResizerDom(): IPreviewerCreateResult {Đ
    // bÖby•1hFĐ
    const resizerSelection = document.createElement('div')Đ
    resizerSelection.classList.add(`${EDITOR_PREFIX}-resizer-selection`)Đ
    resizerSelection.style.display = 'none'Đ
    resizerSelection.style.borderColor = this.options.resizerColorĐ
    const resizerHandleList: HTMLDivElement[] = []Đ
    for (let i = 0; i < 8; i++) {Đ
        const handleDom = document.createElement('div')Đ
        handleDom.style.background = this.options.resizerColorĐ
        handleDom.classList.add(`handle-${i}`)Đ
        handleDom.setAttribute('data-index', String(i))Đ
        handleDom.onmousedown = this._mousedown.bind(this)Đ
        resizerSelection.append(handleDom)Đ
        resizerHandleList.push(handleDom)Đ
    }Đ
    this.container.append(resizerSelection)Đ
    // bÖby•\PİĐ
    const resizerImageContainer = document.createElement('div')Đ
    resizerImageContainer.classList.add(`${EDITOR_PREFIX}-resizer-image`)Đ
    resizerImageContainer.style.display = 'none'Đ
    const resizerImage = document.createElement('img')Đ
    resizerImageContainer.append(resizerImage)Đ
    this.container.append(resizerImageContainer)Đ
    return {Đ
        resizerSelection,Đ
        resizerHandleList,Đ

```



```

        resizerImageContainer,Ð
        resizerImageÐ
    }Ð
}Ð
Ð
private _keydown = () => {Ð
    // g •.vØNˆNö%œSÑeöy N;Rˆ• kÁbÖby• S:Ð
    if (this.resizerSelection.style.display === 'block') {Ð
        this.clearResizer()Ð
        document.removeEventListener('keydown', this._keydown)Ð
    }Ð
}Ð
Ð
private _mousedown(evt: MouseEvent) {Ð
    this.canvas = this.draw.getPage()Ð
    if (!this.curPosition || !this.curElement) returnÐ
    const { scale } = this.optionsÐ
    const height = this.draw.getHeight()Ð
    const pageGap = this.draw.getPageGap()Ð
    this.mousedownX = evt.xÐ
    this.mousedownY = evt.yÐ
    const target = evt.target as HTMLDivElementÐ
    this.curHandleIndex = Number(target.dataset.index)Ð
    // e9SØQlh Ð
    const cursor = window.getComputedStyle(target).cursorÐ
    document.body.style.cursor = cursorÐ
    this.canvas.style.cursor = cursorÐ
    // bÖbyVprG•\PİÐ
    this.resizerImage.src = this.curElementSrcÐ
    this.resizerImageContainer.style.display = 'block'Ð
    const {Ð
        coordinate: {Ð
            leftTop: [left, top]Ð
        }Ð
    } = this.curPositionÐ
    const prePageHeight = this.draw.getPageNo() * (height + pageGap)Ð
    this.resizerImageContainer.style.left = `${left}px`Ð
    this.resizerImageContainer.style.top = `${top + prePageHeight}px`Ð
    this.resizerImage.style.width = `${this.curElement.width! * scale}px`Ð
    this.resizerImage.style.height = `${this.curElement.height! * scale}px`Ð
    // •ýR Qh\@NˆNöÐ
    const mousemoveFn = this._mousemove.bind(this)Ð
    document.addEventListener('mousemove', mousemoveFn)Ð
    document.addEventListener(Ð
        'mouseup',Ð
        () => {Ð

```

```

// e9SØ\:[øÐ
if (this.curElement && this.curPosition) {Ð
  this.curElement.width = this.widthÐ
  this.curElement.height = this.heightÐ
  this.draw.render({ isSetCursor: false })Ð
  this.drawResizer(Ð
    this.curElement,Ð
    this.curPosition,Ð
    this.previewerDrawOptionÐ
  )Ð
}Ð
// •ØSŸRoO\u(Ð
this.resizerImageContainer.style.display = 'none'Ð
document.removeEventListener('mousemove', mousemoveFn)Ð
document.body.style.cursor = ''Ð
this.canvas.style.cursor = 'text'Ð
},Ð
{Ð
  once: trueÐ
}Ð
)Ð
evt.preventDefault()Ð
}Ð
Ð
private _mousemove(evt: MouseEvent) {Ð
  if (!this.curElement) returnÐ
  const { scale } = this.optionsÐ
  let dx = 0Ð
  let dy = 0Ð
  switch (this.curHandleIndex) {Ð
    case 0:Ð
      dx = this.mousedownX - evt.xÐ
      dy = this.mousedownY - evt.yÐ
      breakÐ
    case 1:Ð
      dy = this.mousedownY - evt.yÐ
      breakÐ
    case 2:Ð
      dx = evt.x - this.mousedownXÐ
      dy = this.mousedownY - evt.yÐ
      breakÐ
    case 3:Ð
      dx = evt.x - this.mousedownXÐ
      breakÐ
    case 5:Ð
      dy = evt.y - this.mousedownYÐ

```

```

        break
    case 6:
        dx = this.mousedownX - evt.x
        dy = evt.y - this.mousedownY
        break
    case 7:
        dx = this.mousedownX - evt.x
        break
    default:
        dx = evt.x - this.mousedownX
        dy = evt.y - this.mousedownY
        break
    }
    this.width = this.curElement.width! + dx
    this.height = this.curElement.height! + dy
    this.resizerImage.style.width = `${this.width * scale}px`
    this.resizerImage.style.height = `${this.height * scale}px`
    evt.preventDefault()
}
}
private _dblclick() {
    this._drawPreviewer()
    document.body.style.overflow = 'hidden'
}
private _drawPreviewer() {
    const previewerContainer = document.createElement('div')
    previewerContainer.classList.add(`${EDITOR_PREFIX}-image-preview`)
    // Qs•íc "®
    const closeBtn = document.createElement('i')
    closeBtn.classList.add('image-close')
    closeBtn.onclick = () => {
        this._clearPreviewer()
    }
    previewerContainer.append(closeBtn)
    // VprG
    const imgContainer = document.createElement('div')
    imgContainer.classList.add(`${EDITOR_PREFIX}-image-container`)
    const img = document.createElement('img')
    img.src = this.curElementSrc
    img.draggable = false
    imgContainer.append(img)
    this.previewerImage = img
    previewerContainer.append(imgContainer)
    // dÍO\h
    let x = 0

```

```

let y = 0
let scaleSize = 1
let rotateSize = 0
const menuContainer = document.createElement('div')
menuContainer.classList.add(`${EDITOR_PREFIX}-image-menu`)
const zoomIn = document.createElement('i')
zoomIn.classList.add('zoom-in')
zoomIn.onclick = () => {
  scaleSize += 0.1
  this._setPreviewerTransform(scaleSize, rotateSize, x, y)
}
menuContainer.append(zoomIn)
const zoomOut = document.createElement('i')
zoomOut.onclick = () => {
  if (scaleSize - 0.1 <= 0.1) return
  scaleSize -= 0.1
  this._setPreviewerTransform(scaleSize, rotateSize, x, y)
}
zoomOut.classList.add('zoom-out')
menuContainer.append(zoomOut)
const rotate = document.createElement('i')
rotate.classList.add('rotate')
rotate.onclick = () => {
  rotateSize += 1
  this._setPreviewerTransform(scaleSize, rotateSize, x, y)
}
menuContainer.append(rotate)
const originalSize = document.createElement('i')
originalSize.classList.add('original-size')
originalSize.onclick = () => {
  x = 0
  y = 0
  scaleSize = 1
  rotateSize = 0
  this._setPreviewerTransform(scaleSize, rotateSize, x, y)
}
menuContainer.append(originalSize)
const imageDownload = document.createElement('i')
imageDownload.classList.add('image-download')
imageDownload.onclick = () => {
  const { mime } = this.previewerDrawOption
  downloadFile(img.src, `${this.curElement?.id}.${mime || 'png'}`)
}
menuContainer.append(imageDownload)
previewerContainer.append(menuContainer)
this.previewerContainer = previewerContainer

```

```

document.body.append(previewerContainer)
// bÖbyœ etOM•n
let startX = 0
let startY = 0
let isAllowDrag = false
img.onmousedown = evt => {
  isAllowDrag = true
  startX = evt.x
  startY = evt.y
  previewerContainer.style.cursor = 'move'
}
previewerContainer.onmousemove = (evt: MouseEvent) => {
  if (!isAllowDrag) return
  x += evt.x - startX
  y += evt.y - startY
  startX = evt.x
  startY = evt.y
  this._setPreviewerTransform(scaleSize, rotateSize, x, y)
}
previewerContainer.onmouseup = () => {
  isAllowDrag = false
  previewerContainer.style.cursor = 'auto'
}
previewerContainer.onwheel = evt => {
  evt.preventDefault()
  if (evt.deltaY < 0) {
    // e>Y
    scaleSize += 0.1
  } else {
    // •\
    if (scaleSize - 0.1 <= 0.1) return
    scaleSize -= 0.1
  }
  this._setPreviewerTransform(scaleSize, rotateSize, x, y)
}
}
}

public _setPreviewerTransform(
  scale: number,
  rotate: number,
  x: number,
  y: number
) {
  if (!this.previewerImage) return
  this.previewerImage.style.left = `${x}px`
  this.previewerImage.style.top = `${y}px`

```

```

    this.previewImage.style.transform = `scale(${scale}) rotate(${Ð
    rotate * 90Ð
    }deg)`Ð
  }Ð
Ð
  private _clearPreviewer() {Ð
    this.previewContainer?.remove()Ð
    this.previewContainer = nullÐ
    document.body.style.overflow = 'auto'Ð
  }Ð
Ð
  public drawResizer(Ð
    element: IElement,Ð
    position: IElementPosition,Ð
    options: IPreviewerDrawOption = {}Ð
  ) {Ð
    this.previewDrawOption = optionsÐ
    const { scale } = this.optionsÐ
    const {Ð
      coordinate: {Ð
        leftTop: [left, top]Ð
      },Ð
      ascentÐ
    } = positionÐ
    const elementWidth = element.width! * scaleÐ
    const elementHeight = element.height! * scaleÐ
    const height = this.draw.getHeight()Ð
    const pageGap = this.draw.getPageGap()Ð
    const handleSize = this.options.resizerSizeÐ
    const preY = this.draw.getPageNo() * (height + pageGap)Ð
    // •hFÐ
    this.resizerSelection.style.left = `${left}px`Ð
    this.resizerSelection.style.top = `${top + preY + ascent}px`Ð
    this.resizerSelection.style.width = `${elementWidth}px`Ð
    this.resizerSelection.style.height = `${elementHeight}px`Ð
    // handleÐ
    for (let i = 0; i < 8; i++) {Ð
      const left =Ð
        i === 0 || i === 6 || i === 7Ð
        ? -handleSizeÐ
        : i === 1 || i === 5Ð
        ? elementWidth / 2Ð
        : elementWidth - handleSizeÐ
      const top =Ð
        i === 0 || i === 1 || i === 2Ð
        ? -handleSizeÐ

```

```

        : i === 3 || i === 7
        ? elementHeight / 2 - handleSize
        : elementHeight - handleSize
    this.resizerHandleList[i].style.left = `${left}px`
    this.resizerHandleList[i].style.top = `${top}px`
  }
  this.resizerSelection.style.display = 'block'
  this.curElement = element
  this.curElementSrc = element[options.srcKey || 'value'] || ''
  this.curPosition = position
  this.width = this.curElement.width! * scale
  this.height = this.curElement.height! * scale
  document.addEventListener('keydown', this._keydown)
}
}
public clearResizer() {
  this.resizerSelection.style.display = 'none'
  document.removeEventListener('keydown', this._keydown)
}
}

```

File Path: canvas-editor/src/editor/core/draw/particle/table/TableParticle.ts

```
import { ElementType, IElement, TableBorder } from '../..'
import { IEditorOption } from '../interface/Editor'
import { ITd } from '../interface/table/Td'
import { ITr } from '../interface/table/Tr'
import { deepClone } from '../utils'
import { RangeManager } from '../range/RangeManager'
import { Draw } from '../Draw'

interface IDrawTableBorderOption {
  ctx: CanvasRenderingContext2D
  startX: number
  startY: number
  width: number
  height: number
  isDrawFullBorder?: boolean
}

export class TableParticle {
  private draw: Draw
  private range: RangeManager
  private options: Required<IEditorOption>

  constructor(draw: Draw) {
    this.draw = draw
    this.range = draw.getRange()
    this.options = draw.getOptions()
  }

  public getTrListGroupByCol(payload: ITr[]): ITr[] {
    const trList = deepClone(payload)
    for (let t = 0; t < payload.length; t++) {
      const tr = trList[t]
      for (let d = tr.tdList.length - 1; d >= 0; d--) {
        const td = tr.tdList[d]
        const { rowspan, rowIndex, colIndex } = td
        const curRowIndex = rowIndex! + rowspan - 1
        if (curRowIndex !== d) {
          const changeTd = tr.tdList.splice(d, 1)[0]
          trList[curRowIndex].tdList.splice(colIndex!, 0, changeTd)
        }
      }
    }
    return trList
  }
}
```



```

public getRangeRowCol(): ITd[][] | null {
  const { isTable, index, trIndex, tdIndex } = this.draw
    .getPosition()
    .getPositionContext()
  if (!isTable) return null
  const {
    isCrossRowCol,
    startTdIndex,
    endTdIndex,
    startTrIndex,
    endTrIndex
  } = this.range.getRange()
  const originalElementList = this.draw.getOriginalElementList()
  const element = originalElementList[index]
  const curTrList = element.trList
  // —•èR vôc•ÔVÞQIh b@W(SUQCh<Ð
  if (!isCrossRowCol) {
    return [[curTrList[trIndex].tdList[tdIndex]]]
  }
  let startTd = curTrList[startTrIndex].tdList[startTdIndex]
  let endTd = curTrList[endTrIndex].tdList[endTdIndex]
  // N▯cb•wYËOM•n
  if (startTd.x! > endTd.x! || startTd.y! > endTd.y!) {
    // prettier-ignore
    [startTd, endTd] = [endTd, startTd]
  }
  const startColIndex = startTd.colIndex
  const endColIndex = endTd.colIndex! + (endTd.colspan - 1)
  const startRowIndex = startTd.rowIndex
  const endRowIndex = endTd.rowIndex! + (endTd.rowspan - 1)
  // • S:ˆLR Ð
  const rowCol: ITd[][] = []
  for (let t = 0; t < curTrList.length; t++) {
    const tr = curTrList[t]
    const tdList: ITd[] = []
    for (let d = 0; d < tr.tdList.length; d++) {
      const td = tr.tdList[d]
      const tdColIndex = td.colIndex
      const tdRowIndex = td.rowIndex
      if (
        tdColIndex >= startColIndex &&
        tdColIndex <= endColIndex &&
        tdRowIndex >= startRowIndex &&
        tdRowIndex <= endRowIndex
      ) {
        tdList.push(td)
      }
    }
  }
}

```

```

    }
  }
  if (tdList.length) {
    rowCol.push(tdList)
  }
}
return rowCol.length ? rowCol : null
}
}
private _drawOuterBorder(payload: IDrawTableBorderOption) {
  const { ctx, startX, startY, width, height, isDrawFullBorder } = payload
  ctx.beginPath()
  const x = Math.round(startX)
  const y = Math.round(startY)
  ctx.translate(0.5, 0.5)
  if (isDrawFullBorder) {
    ctx.rect(x, y, width, height)
  } else {
    ctx.moveTo(x, y + height)
    ctx.lineTo(x, y)
    ctx.lineTo(x + width, y)
  }
  ctx.stroke()
  ctx.translate(-0.5, -0.5)
}
}
private _drawBorder(
  ctx: CanvasRenderingContext2D,
  element: IElement,
  startX: number,
  startY: number
) {
  const { colgroup, trList, borderType } = element
  if (!colgroup || !trList || borderType === TableBorder.EMPTY) return
  const { scale } = this.options
  const tableWidth = element.width! * scale
  const tableHeight = element.height! * scale
  const isExternalBorderType = borderType === TableBorder.EXTERNAL
  ctx.save()
  // n2gO•1hF
  this._drawOuterBorder({
    ctx,
    startX,
    startY,
    width: tableWidth,
    height: tableHeight,
  })
}

```

```

    isDrawFullBorder: isExternalBorderType)
  })
  if (!isExternalBorderType) {
    // n2gÓ^hh<
    for (let t = 0; t < trList.length; t++) {
      const tr = trList[t]
      for (let d = 0; d < tr.tdList.length; d++) {
        const td = tr.tdList[d]
        const width = td.width! * scale
        const height = td.height! * scale
        const x = Math.round(td.x! * scale + startX + width)
        const y = Math.round(td.y! * scale + startY)
        ctx.translate(0.5, 0.5)
        // ~ØR6~¿ga
        ctx.beginPath()
        ctx.moveTo(x, y)
        ctx.lineTo(x, y + height)
        ctx.lineTo(x - width, y + height)
        ctx.stroke()
        ctx.translate(-0.5, -0.5)
      }
    }
    ctx.restore()
  }
  private _drawBackgroundColor(
    ctx: CanvasRenderingContext2D,
    element: IElement,
    startX: number,
    startY: number
  ) {
    const { trList } = element
    if (!trList) return
    const { scale } = this.options
    for (let t = 0; t < trList.length; t++) {
      const tr = trList[t]
      for (let d = 0; d < tr.tdList.length; d++) {
        const td = tr.tdList[d]
        if (!td.backgroundColor) continue
        ctx.save()
        const width = td.width! * scale
        const height = td.height! * scale
        const x = Math.round(td.x! * scale + startX)
        const y = Math.round(td.y! * scale + startY)
        ctx.fillStyle = td.backgroundColor

```

```

        ctx.fillRect(x, y, width, height)Đ
        ctx.restore()Đ
    }Đ
}Đ
}Đ
Đ
public computeRowCollInfo(element: IElement) {Đ
    const { colgroup, trList } = elementĐ
    if (!colgroup || !trList) returnĐ
    let x = 0Đ
    let y = 0Đ
    for (let t = 0; t < trList.length; t++) {Đ
        const tr = trList[t]Đ
        // ^hh<g T N ^LĐ
        const isLastTr = trList.length - 1 === tĐ
        // _SRM^Lg \ šØ^!Đ
        let rowMinHeight = 0Đ
        for (let d = 0; d < tr.tdList.length; d++) {Đ
            const td = tr.tdList[d]Đ
            // ċ{—NKRM^Lx•tPOyû'İĐ
            let offsetXIndex = 0Đ
            if (trList.length > 1 && t !== 0) {Đ
                for (let pT = 0; pT < t; pT++) {Đ
                    const pTr = trList[pT]Đ
                    // vøT x•tf/T&[XW(•è^LĐ
                    for (let pD = 0; pD < pTr.tdList.length; pD++) {Đ
                        const pTd = pTr.tdList[pD]Đ
                        const pTdX = pTd.x!Đ
                        const pTdY = pTd.y!Đ
                        const pTdWidth = pTd.width!Đ
                        const pTdHeight = pTd.height!Đ
                        // \ NžĐ
                        if (pTdX < x) continueĐ
                        if (pTdX > x) breakĐ
                        if (pTd.x === x && pTdY + pTdHeight > y) {Đ
                            x += pTdWidthĐ
                            offsetXIndex += pTd.colspanĐ
                        }Đ
                    }Đ
                }Đ
            }Đ
        }Đ
        // ċ{—h<R epĐ
        let collIndex = 0Đ
        const preTd = tr.tdList[d - 1]Đ
        if (preTd) {Đ
            collIndex = preTd.collIndex! + offsetXIndex + 1Đ
        }
    }
}

```

```

    if (preTd.colspan > 1) {
        collIndex += preTd.colspan - 1
    }
    } else {
        collIndex += offsetXIndex
    }
    // {—h<[½š
    let width = 0
    for (let col = 0; col < td.colspan; col++) {
        width += colgroup[col + collIndex].width
    }
    let height = 0
    for (let row = 0; row < td.rowspan; row++) {
        height += trList[row + t].height
    }
    // yPOyü'İ
    if (rowMinHeight === 0 || rowMinHeight > height) {
        rowMinHeight = height
    }
    // _SRM^Lg T N N*td
    const isLastRowTd = tr.tdList.length - 1 === d
    // _SRMR g T N N*td
    let isLastColTd = isLastTr
    if (!isLastColTd) {
        if (td.rowspan > 1) {
            const nextTrLength = trList.length - 1 - t
            isLastColTd = td.rowspan - 1 === nextTrLength
        }
    }
    // _SRM^hh<g T N N*td
    const isLastTd = isLastTr && isLastRowTd
    td.isLastRowTd = isLastRowTd
    td.isLastColTd = isLastColTd
    td.isLastTd = isLastTd
    // Oîe9_SRMh<clientBox
    td.x = x
    td.y = y
    td.width = width
    td.height = height
    td.rowIndex = t
    td.collIndex = collIndex
    // _SRMR x•t}/R
    x += width
    // N ^LN-v,,g T td
    if (isLastRowTd && !isLastTd) {
        x = 0
    }

```

```

        y += rowMinHeight
    }
}
}
}
}
}
}

public drawRange(
    ctx: CanvasRenderingContext2D,
    element: IElement,
    startX: number,
    startY: number
) {
    const { scale, rangeAlpha, rangeColor } = this.options
    const { type, trList } = element
    if (!trList || type !== ElementType.TABLE) return
    const {
        isCrossRowCol,
        startTdIndex,
        endTdIndex,
        startTrIndex,
        endTrIndex
    } = this.range.getRange()
    // [XW(•è~L/R
    if (!isCrossRowCol) return
    let startTd = trList[startTrIndex!].tdList[startTdIndex!]
    let endTd = trList[endTrIndex!].tdList[endTdIndex!]
    // Næcb•wYËOM•n
    if (startTd.x! > endTd.x! || startTd.y! > endTd.y!) {
        [startTd, endTd] = [endTd, startTd]
    }
    const startColIndex = startTd.colIndex!
    const endColIndex = endTd.colIndex! + (endTd.colspan - 1)
    const startRowIndex = startTd.rowIndex!
    const endRowIndex = endTd.rowIndex! + (endTd.rowspan - 1)
    ctx.save()
    for (let t = 0; t < trList.length; t++) {
        const tr = trList[t]
        for (let d = 0; d < tr.tdList.length; d++) {
            const td = tr.tdList[d]
            const tdColIndex = td.colIndex!
            const tdRowIndex = td.rowIndex!
            if (
                tdColIndex >= startColIndex &&
                tdColIndex <= endColIndex &&
                tdRowIndex >= startRowIndex &&
                tdRowIndex <= endRowIndex
            ) {
                // Draw the cell
            }
        }
    }
    ctx.restore()
}

```

```

    ) {
        const x = td.x! * scale
        const y = td.y! * scale
        const width = td.width! * scale
        const height = td.height! * scale
        ctx.globalAlpha = rangeAlpha
        ctx.fillStyle = rangeColor
        ctx.fillRect(x + startX, y + startY, width, height)
    }
}
}
ctx.restore()
}
}
public render(
    ctx: CanvasRenderingContext2D,
    element: IElement,
    startX: number,
    startY: number
) {
    this._drawBackgroundColor(ctx, element, startX, startY)
    this._drawBorder(ctx, element, startX, startY)
}
}

```

File Path: canvas-editor/src/editor/core/draw/particle/table/TableTool.ts

```
import { IElement } from '../..'
import { EDITOR_PREFIX } from '../../dataset/constant/Editor'
import { TableOrder } from '../../dataset/enum/table/TableTool'
import { IEditorOption } from '../../interface/Editor'
import { Position } from '../position/Position'
import { Draw } from '../Draw'

interface IAnchorMouseDown {
  evt: MouseEvent
  order: TableOrder
  index: number
  element: IElement
}

export class TableTool {
  // SUQCh<g \ [½^
  private readonly MIN_TD_WIDTH = 20
  // ^LR ]âQwvø[ù^hh<POyûP<
  private readonly ROW_COL_OFFSET = 18
  // •hF]âQw[½/šØ^
  private readonly BORDER_VALUE = 4

  private draw: Draw
  private canvas: HTMLCanvasElement
  private options: Required<IEditorOption>
  private position: Position
  private container: HTMLDivElement
  private toolRowContainer: HTMLDivElement | null
  private toolColContainer: HTMLDivElement | null
  private toolBorderContainer: HTMLDivElement | null
  private anchorLine: HTMLDivElement | null
  private mousedownX: number
  private mousedownY: number

  constructor(draw: Draw) {
    this.draw = draw
    this.canvas = draw.getPage()
    this.options = draw.getOptions()
    this.position = draw.getPosition()
    this.container = draw.getContainer()
    // x0 y•t
    this.toolRowContainer = null
    this.toolColContainer = null
    this.toolBorderContainer = null
    this.anchorLine = null
  }
}
```



```

    this.mousedownX = 0
    this.mousedownY = 0
  }
}
public dispose() {
  this.toolRowContainer?.remove()
  this.toolColContainer?.remove()
  this.toolBorderContainer?.remove()
  this.toolRowContainer = null
  this.toolColContainer = null
  this.toolBorderContainer = null
}
}
public render() {
  const { isTable, index, trIndex, tdIndex } =
    this.position.getPositionContext()
  if (!isTable) return
  // • kANKRM]åQw
  this.dispose()
  // n2gÓb@— epcn
  const { scale } = this.options
  const elementList = this.draw.getOriginalElementList()
  const positionList = this.position.getOriginalPositionList()
  const element = elementList[index!]
  const position = positionList[index!]
  const { colgroup, trList } = element
  const {
    coordinate: { leftTop }
  } = position
  const height = this.draw.getHeight()
  const pageGap = this.draw.getPageGap()
  const prePageHeight = this.draw.getPageNo() * (height + pageGap)
  const tableX = leftTop[0]
  const tableY = leftTop[1] + prePageHeight
  const td = element.trList![trIndex!].tdList[tdIndex!]
  const rowIndex = td.rowIndex
  const collIndex = td.collIndex
  // n2gÓ^L]åQw
  const rowHeightList = trList!.map(tr => tr.height)
  const rowContainer = document.createElement('div')
  rowContainer.classList.add(`${EDITOR_PREFIX}-table-tool__row`)
  rowContainer.style.transform = `translateX(-${
    this.ROW_COL_OFFSET * scale
  }px)`
  for (let r = 0; r < rowHeightList.length; r++) {
    const rowHeight = rowHeightList[r] * scale

```

```

const rowItem = document.createElement('div')Đ
rowItem.classList.add(`${EDITOR_PREFIX}-table-tool__row__item`)Đ
if (r === rowIndex) {Đ
  rowItem.classList.add('active')Đ
}Đ
const rowItemAnchor = document.createElement('div')Đ
rowItemAnchor.classList.add(`${EDITOR_PREFIX}-table-tool__anchor`)Đ
rowItemAnchor.onmousedown = evt => {Đ
  this._mousedown({Đ
    evt,Đ
    element,Đ
    index: r,Đ
    order: TableOrder.ROWĐ
  })Đ
}Đ
rowItem.append(rowItemAnchor)Đ
rowItem.style.height = `${rowHeight}px`Đ
rowContainer.append(rowItem)Đ
}Đ
rowContainer.style.left = `${tableX}px`Đ
rowContainer.style.top = `${tableY}px`Đ
this.container.append(rowContainer)Đ
this.toolRowContainer = rowContainerĐ
Đ
// n2gÓR ]âQwĐ
const colWidthList = colgroup!.map(col => col.width)Đ
const colContainer = document.createElement('div')Đ
colContainer.classList.add(`${EDITOR_PREFIX}-table-tool__col`)Đ
colContainer.style.transform = `translateY(-${Đ
  this.ROW_COL_OFFSET * scaleĐ
}px)`Đ
for (let c = 0; c < colWidthList.length; c++) {Đ
  const colWidth = colWidthList[c] * scaleĐ
  const collItem = document.createElement('div')Đ
  collItem.classList.add(`${EDITOR_PREFIX}-table-tool__col__item`)Đ
  if (c === colIndex) {Đ
    collItem.classList.add('active')Đ
  }Đ
  const collItemAnchor = document.createElement('div')Đ
  collItemAnchor.classList.add(`${EDITOR_PREFIX}-table-tool__anchor`)Đ
  collItemAnchor.onmousedown = evt => {Đ
    this._mousedown({Đ
      evt,Đ
      element,Đ
      index: c,Đ
      order: TableOrder.COLĐ
    })Đ
  }Đ
  collItem.append(collItemAnchor)Đ
  colContainer.append(collItem)Đ
}Đ

```

```

    })
  }
  collItem.append(collItemAnchor)
  collItem.style.width = `${colWidth}px`
  colContainer.append(collItem)
}
colContainer.style.left = `${tableX}px`
colContainer.style.top = `${tableY}px`
this.container.append(colContainer)
this.toolColContainer = colContainer
}

// n2gÓSUQCh<•1hFbÖbý]åQw
const tableHeight = element.height! * scale
const tableWidth = element.width! * scale
const borderContainer = document.createElement('div')
borderContainer.classList.add(`${EDITOR_PREFIX}-table-tool__border`)
borderContainer.style.height = `${tableHeight}px`
borderContainer.style.width = `${tableWidth}px`
borderContainer.style.left = `${tableX}px`
borderContainer.style.top = `${tableY}px`
for (let r = 0; r < trList!.length; r++) {
  const tr = trList![r]
  for (let d = 0; d < tr.tdList.length; d++) {
    const td = tr.tdList[d]
    const rowBorder = document.createElement('div')
    rowBorder.classList.add(`${EDITOR_PREFIX}-table-tool__border__row`)
    rowBorder.style.width = `${td.width! * scale}px`
    rowBorder.style.height = `${this.BORDER_VALUE}px`
    rowBorder.style.top = `
      (td.y! + td.height!) * scale - this.BORDER_VALUE / 2
    `
    rowBorder.style.left = `${td.x! * scale}px`
    rowBorder.onmousedown = evt => {
      this._mousedown({
        evt,
        element,
        index: td.rowIndex! + td.rowspan - 1,
        order: TableOrder.ROW
      })
    }
  }
  borderContainer.appendChild(rowBorder)
  const colBorder = document.createElement('div')
  colBorder.classList.add(`${EDITOR_PREFIX}-table-tool__border__col`)
  colBorder.style.width = `${this.BORDER_VALUE}px`
  colBorder.style.height = `${td.height! * scale}px`
  colBorder.style.top = `${td.y! * scale}px`

```

```

colBorder.style.left = `${
  (td.x! + td.width!) * scale - this.BORDER_VALUE / 2
}px`
colBorder.onmousedown = evt => {
  this._mousedown({
    evt,
    element,
    index: td.colIndex! + td.colspan - 1,
    order: TableOrder.COL
  })
}
borderContainer.appendChild(colBorder)
}
this.container.append(borderContainer)
this.toolBorderContainer = borderContainer
}
}
private _mousedown(payload: IAnchorMouseDown) {
  const { evt, index, order, element } = payload
  this.canvas = this.draw.getPage()
  const { scale } = this.options
  const width = this.draw.getWidth()
  const height = this.draw.getHeight()
  const pageGap = this.draw.getPageGap()
  const prePageHeight = this.draw.getPageNo() * (height + pageGap)
  this.mousedownX = evt.x
  this.mousedownY = evt.y
  const target = evt.target as HTMLDivElement
  const canvasRect = this.canvas.getBoundingClientRect()
  // e9SØQlh
  const cursor = window.getComputedStyle(target).cursor
  document.body.style.cursor = cursor
  this.canvas.style.cursor = cursor
  // bÖbý~¿
  let startX = 0
  let startY = 0
  const anchorLine = document.createElement('div')
  anchorLine.classList.add(`${EDITOR_PREFIX}-table-anchor__line`)
  if (order === TableOrder.ROW) {
    anchorLine.classList.add(`${EDITOR_PREFIX}-table-anchor__line__row`)
    anchorLine.style.width = `${width}px`
    startX = 0
    startY = prePageHeight + this.mousedownY - canvasRect.top
  } else {
    anchorLine.classList.add(`${EDITOR_PREFIX}-table-anchor__line__col`)

```

```

    anchorLine.style.height = `${height}px`
    startX = this.mousedownX - canvasRect.left
    startY = prePageHeight
  }
  anchorLine.style.left = `${startX}px`
  anchorLine.style.top = `${startY}px`
  this.container.append(anchorLine)
  this.anchorLine = anchorLine
  // •ýR Qh\@N«Nö
  let dx = 0
  let dy = 0
  const mousemoveFn = (evt: MouseEvent) => {
    const movePosition = this._mousemove(evt, order, startX, startY)
    if (movePosition) {
      dx = movePosition.dx
      dy = movePosition.dy
    }
  }
  document.addEventListener('mousemove', mousemoveFn)
  document.addEventListener(
    'mouseup',
    () => {
      let isChangeSize = false
      // e9SØ\:[
      if (order === TableOrder.ROW) {
        const tr = element.trList![index]
        // g Y'yûR"šØ^i-T N yûR"•...Qúg \ šØ^i-P[šÿ R Ql\ yûR"i
        const { defaultTrMinHeight } = this.options
        if (dy < 0 && tr.height + dy < defaultTrMinHeight) {
          dy = defaultTrMinHeight - tr.height
        }
        if (dy) {
          tr.height += dy
          tr.minHeight = tr.height
          isChangeSize = true
        }
      } else {
        const { colgroup } = element
        if (colgroup && dx) {
          // [½^iR 'M
          const innerWidth = this.draw.getInnerWidth()
          const curColWidth = colgroup[index].width
          // g \ yûR"•Ýy»çj{—Y,gœT ]æyûR"ÿ O•SUQCh<\ NŹg \ [½^iÿ R Ql\ yûR"i
          if (dx < 0 && curColWidth + dx < this.MIN_TD_WIDTH) {
            dx = this.MIN_TD_WIDTH - curColWidth
          }
        }
      }
    }
  )

```

```

// g Y'yûR"•Ýy»«{—Y,gœT SóyûR"ÿ O•T —bN N*SUQCh<\ NŽg \ [½^!ÿ R Qİ\ yûR"İĐ
const nextColWidth = colgroup[index + 1]?.widthĐ
if (Đ
  dx > 0 &&Đ
  nextColWidth &&Đ
  nextColWidth - dx < this.MIN_TD_WIDTHĐ
) {Đ
  dx = nextColWidth - this.MIN_TD_WIDTHĐ
}Đ
const moveColWidth = curColWidth + dxĐ
// _ YËyûR"Đ
let moveTableWidth = 0Đ
for (let c = 0; c < colgroup.length; c++) {Đ
  const group = colgroup[c]Đ
  // N N R QİS»POyûİĐ
  if (c === index + 1) {Đ
    moveTableWidth -= dxĐ
  }Đ
  // _SRMR R N POyûİĐ
  if (c === index) {Đ
    moveTableWidth += moveColWidthĐ
  }Đ
  if (c !== index) {Đ
    moveTableWidth += group.widthĐ
  }Đ
}Đ
if (moveTableWidth > innerWidth) {Đ
  const tableWidth = element.width!Đ
  dx = innerWidth - tableWidthĐ
}Đ
if (dx) {Đ
  // _SRMR XžR Ÿ T R Qİ\ Đ
  if (colgroup.length - 1 !== index) {Đ
    colgroup[index + 1].width -= dx / scaleĐ
  }Đ
  colgroup[index].width += dx / scaleĐ
  isChangeSize = trueĐ
}Đ
}Đ
}Đ
if (isChangeSize) {Đ
  this.draw.render({ isSetCursor: false })Đ
}Đ
// •ØSŸRoO\u(Đ
anchorLine.remove()Đ
document.removeEventListener('mousemove', mousemoveFn)Đ

```

```

        document.body.style.cursor = "Đ
        this.canvas.style.cursor = 'text'Đ
    },Đ
    {Đ
        once: trueĐ
    }Đ
)Đ
evt.preventDefault()Đ
}Đ
Đ
private _mousemove(Đ
    evt: MouseEvent,Đ
    tableOrder: TableOrder,Đ
    startX: number,Đ
    startY: numberĐ
): { dx: number; dy: number } | null {Đ
    if (!this.anchorLine) return nullĐ
    const dx = evt.x - this.mousedownXĐ
    const dy = evt.y - this.mousedownYĐ
    if (tableOrder === TableOrder.ROW) {Đ
        this.anchorLine.style.top = `${startY + dy}px`Đ
    } else {Đ
        this.anchorLine.style.left = `${startX + dx}px`Đ
    }Đ
    evt.preventDefault()Đ
    return { dx, dy }Đ
}Đ
}Đ

```

File Path: canvas-editor/src/editor/core/draw/richtext/AbstractRichText.ts

```
import { IElementFillRect } from '../..../interface/Element'
export abstract class AbstractRichText {
  public fillRect: IElementFillRect
  public fillColor?: string
  constructor() {
    this.fillRect = this.clearFillInfo()
  }
  public clearFillInfo() {
    this.fillColor = undefined
    this.fillRect = {
      x: 0,
      y: 0,
      width: 0,
      height: 0
    }
    return this.fillRect
  }
  public recordFillInfo(
    ctx: CanvasRenderingContext2D,
    x: number,
    y: number,
    width: number,
    height?: number,
    color?: string
  ) {
    const isFirstRecord = !this.fillRect.width
    if (!isFirstRecord && this.fillColor && this.fillColor !== color) {
      this.render(ctx)
      this.clearFillInfo()
      return
    }
    if (isFirstRecord) {
      this.fillRect.x = x
      this.fillRect.y = y
    }
    if (height && this.fillRect.height < height) {
      this.fillRect.height = height
    }
    this.fillRect.width += width
    this.fillColor = color
  }
}
```



```
⊖  
  public abstract render(ctx: CanvasRenderingContext2D): void⊖  
}⊖
```

File Path: canvas-editor/src/editor/core/draw/richtext/Highlight.ts

```
import { AbstractRichText } from './AbstractRichText'Đ
```

```
import { IEditorOption } from '../../../interface/Editor'Đ
```

```
import { Draw } from './Draw'Đ
```

```
Đ
```

```
export class Highlight extends AbstractRichText {Đ
```

```
  private options: Required<IEditorOption>Đ
```

```
Đ
```

```
  constructor(draw: Draw) {Đ
```

```
    super()Đ
```

```
    this.options = draw.getOptions()Đ
```

```
  }Đ
```

```
Đ
```

```
  public render(ctx: CanvasRenderingContext2D) {Đ
```

```
    if (!this.fillRect.width) returnĐ
```

```
    const { highlightAlpha } = this.optionsĐ
```

```
    const { x, y, width, height } = this.fillRectĐ
```

```
    ctx.save()Đ
```

```
    ctx.globalAlpha = highlightAlphaĐ
```

```
    ctx.fillStyle = this.fillColor!Đ
```

```
    ctx.fillRect(x, y, width, height)Đ
```

```
    ctx.restore()Đ
```

```
    this.clearFillInfo()Đ
```

```
  }Đ
```

```
}Đ
```

File Path: canvas-editor/src/editor/core/draw/richtext/Strikeout.ts

```
import { AbstractRichText } from './AbstractRichText'
import { IEditorOption } from '../../../interface/Editor'
import { Draw } from './Draw'

export class Strikeout extends AbstractRichText {
  private options: Required<IEditorOption>

  constructor(draw: Draw) {
    super()
    this.options = draw.getOptions()
  }

  public render(ctx: CanvasRenderingContext2D) {
    if (!this.fillRect.width) return
    const { strikeoutColor } = this.options
    const { x, y, width } = this.fillRect
    ctx.save()
    ctx.strokeStyle = strikeoutColor
    const adjustY = y + 0.5 // Nî1Y n2gÓÿ ••QM~¿[½^i{INŽ3
    ctx.beginPath()
    ctx.moveTo(x, adjustY)
    ctx.lineTo(x + width, adjustY)
    ctx.stroke()
    ctx.restore()
    this.clearFillInfo()
  }
}
```

File Path: canvas-editor/src/editor/core/draw/richtext/Underline.ts

```
import { AbstractRichText } from './AbstractRichText'Đ
import { IEditorOption } from '../../../interface/Editor'Đ
import { Draw } from './Draw'Đ
Đ
export class Underline extends AbstractRichText {Đ
  private options: Required<IEditorOption>Đ
Đ
  constructor(draw: Draw) {Đ
    super()Đ
    this.options = draw.getOptions()Đ
  }Đ
Đ
  public render(ctx: CanvasRenderingContext2D) {Đ
    if (!this.fillRect.width) returnĐ
    const { underlineColor } = this.optionsĐ
    const { x, y, width } = this.fillRectĐ
    ctx.save()Đ
    ctx.strokeStyle = this.fillColor || underlineColorĐ
    const adjustY = y + 0.5 // NÎ1Y n2gÓÿ ••QM~¿[½^!{INŽ3Đ
    ctx.beginPath()Đ
    ctx.moveTo(x, adjustY)Đ
    ctx.lineTo(x + width, adjustY)Đ
    ctx.stroke()Đ
    ctx.restore()Đ
    this.clearFillInfo()Đ
  }Đ
}Đ
```

```

File Path: canvas-editor/src/editor/core/event/CanvasEvent.ts
import { ElementStyleKey } from '../../dataset/enum/ElementStyle'
import { IElement, IElementPosition } from '../../interface/Element'
import { ICurrentPosition } from '../../interface/Position'
import { Draw } from '../draw/Draw'
import { Position } from '../position/Position'
import { RangeManager } from '../range/RangeManager'
import { threeClick } from '../utils'
import { IRange } from '../../interface/Range'
import { mousedown } from './handlers/mousedown'
import { mouseup } from './handlers/mouseup'
import { mouseleave } from './handlers/mouseleave'
import { mousemove } from './handlers/mousemove'
import { keydown } from './handlers/keydown'
import { input } from './handlers/input'
import { cut } from './handlers/cut'
import { copy } from './handlers/copy'
import { drop } from './handlers/drop'
import click from './handlers/click'
import composition from './handlers/composition'
import drag from './handlers/drag'
import {
  export interface ICompositionInfo {
    elementList: IElement[]
    startIndex: number
    endIndex: number
    value: string
  }
}

export class CanvasEvent {
  public isAllowSelection: boolean
  public isComposing: boolean
  public compositionInfo: ICompositionInfo | null

  public isAllowDrag: boolean
  public isAllowDrop: boolean
  public cacheRange: IRange | null
  public cacheElementList: IElement[] | null
  public cachePositionList: IElementPosition[] | null
  public mouseDownStartPosition: ICurrentPosition | null

  private draw: Draw
  private pageContainer: HTMLDivElement
  private pageList: HTMLCanvasElement[]
  private range: RangeManager
  private position: Position

```

```

Ð
constructor(draw: Draw) {Ð
    this.draw = drawÐ
    this.pageContainer = draw.getPageContainer()Ð
    this.pageList = draw.getPageList()Ð
    this.range = this.draw.getRange()Ð
    this.position = this.draw.getPosition()Ð
Ð
    this.isAllowSelection = falseÐ
    this.isComposing = falseÐ
    this.compositionInfo = nullÐ
    this.isAllowDrag = falseÐ
    this.isAllowDrop = falseÐ
    this.cacheRange = nullÐ
    this.cacheElementList = nullÐ
    this.cachePositionList = nullÐ
    this.mouseDownStartPosition = nullÐ
}Ð
Ð
public getDraw(): Draw {Ð
    return this.drawÐ
}Ð
Ð
public register() {Ð
    this.pageContainer.addEventListener('mousedown', this.mousedown.bind(this))Ð
    this.pageContainer.addEventListener('mouseup', this.mouseup.bind(this))Ð
    this.pageContainer.addEventListener(Ð
        'mouseleave',Ð
        this.mouseleave.bind(this)Ð
    )Ð
    this.pageContainer.addEventListener('mousemove', this.mousemove.bind(this))Ð
    this.pageContainer.addEventListener('dblclick', this.dblclick.bind(this))Ð
    this.pageContainer.addEventListener('dragover', this.dragover.bind(this))Ð
    this.pageContainer.addEventListener('drop', this.drop.bind(this))Ð
    threeClick(this.pageContainer, this.threeClick.bind(this))Ð
}Ð
Ð
public setIsAllowSelection(payload: boolean) {Ð
    this.isAllowSelection = payloadÐ
    if (!payload) {Ð
        this.applyPainterStyle()Ð
    }Ð
}Ð
Ð
public setIsAllowDrag(payload: boolean) {Ð
    this.isAllowDrag = payloadÐ

```

```

    this.isAllowDrop = payloadĐ
}Đ
Đ
public clearPainterStyle() {Đ
    this.pageList.forEach(p => {Đ
        p.style.cursor = 'text'Đ
    })Đ
    this.draw.setPainterStyle(null)Đ
}Đ
Đ
public applyPainterStyle() {Đ
    const painterStyle = this.draw.getPainterStyle()Đ
    if (!painterStyle) returnĐ
    const selection = this.range.getSelection()Đ
    if (!selection) returnĐ
    const painterStyleKeys = Object.keys(painterStyle)Đ
    selection.forEach(s => {Đ
        painterStyleKeys.forEach(pKey => {Đ
            const key = pKey as keyof typeof ElementStyleKeyĐ
            s[key] = painterStyle[key] as anyĐ
        })Đ
    })Đ
    this.draw.render({ isSetCursor: false })Đ
    // n - dh <_ R7Đ
    const painterOptions = this.draw.getPainterOptions()Đ
    if (!painterOptions || !painterOptions.isDbclick) {Đ
        this.clearPainterStyle()Đ
    }Đ
}Đ
Đ
public selectAll() {Đ
    const position = this.position.getPositionList()Đ
    this.range.setRange(0, position.length - 1)Đ
    this.draw.render({Đ
        isSubmitHistory: false,Đ
        isSetCursor: false,Đ
        isCompute: falseĐ
    })Đ
}Đ
Đ
public mousemove(evt: MouseEvent) {Đ
    mousemove(evt, this)Đ
}Đ
Đ
public mousedown(evt: MouseEvent) {Đ
    mousedown(evt, this)Đ
}

```

```

    }Ð
Ð
    public mouseup(evt: MouseEvent) {Ð
        mouseup(evt, this)Ð
    }Ð
Ð
    public mouseleave(evt: MouseEvent) {Ð
        mouseleave(evt, this)Ð
    }Ð
Ð
    public keydown(evt: KeyboardEvent) {Ð
        keydown(evt, this)Ð
    }Ð
Ð
    public dblclick(evt: MouseEvent) {Ð
        click.dblclick(this, evt)Ð
    }Ð
Ð
    public threeClick() {Ð
        click.threeClick(this)Ð
    }Ð
Ð
    public input(data: string) {Ð
        input(data, this)Ð
    }Ð
Ð
    public cut() {Ð
        cut(this)Ð
    }Ð
Ð
    public copy() {Ð
        copy(this)Ð
    }Ð
Ð
    public compositionstart() {Ð
        composition.compositionstart(this)Ð
    }Ð
Ð
    public compositionend(evt: CompositionEvent) {Ð
        composition.compositionend(this, evt)Ð
    }Ð
Ð
    public drop(evt: DragEvent) {Ð
        drop(evt, this)Ð
    }Ð
Ð

```



```
public dragover(evt: DragEvent | MouseEvent) {  
    drag.dragover(evt, this)  
}  
}
```

```

File Path: canvas-editor/src/editor/core/event/GlobalEvent.ts
import { EDITOR_COMPONENT } from '../../dataset/constant/Editor'
import { IEditorOption } from '../../interface/Editor'
import { findParent } from '../../utils'
import { Cursor } from '../cursor/Cursor'
import { Control } from '../draw/control/Control'
import { Draw } from '../draw/Draw'
import { HyperlinkParticle } from '../draw/particle/HyperlinkParticle'
import { DateParticle } from '../draw/particle/date/DateParticle'
import { Previewer } from '../draw/particle/previewer/Previewer'
import { TableTool } from '../draw/particle/table/TableTool'
import { RangeManager } from '../range/RangeManager'
import { CanvasEvent } from './CanvasEvent'

export class GlobalEvent {
  private draw: Draw
  private canvas: HTMLCanvasElement
  private options: Required<IEditorOption>
  private cursor: Cursor | null
  private canvasEvent: CanvasEvent
  private range: RangeManager
  private previewer: Previewer
  private tableTool: TableTool
  private hyperlinkParticle: HyperlinkParticle
  private control: Control
  private dateParticle: DateParticle
  private dprMediaQueryList: MediaQueryList

  constructor(draw: Draw, canvasEvent: CanvasEvent) {
    this.draw = draw
    this.canvas = draw.getPage()
    this.options = draw.getOptions()
    this.canvasEvent = canvasEvent
    this.cursor = null
    this.range = draw.getRange()
    this.previewer = draw.getPreviewer()
    this.tableTool = draw.getTableTool()
    this.hyperlinkParticle = draw.getHyperlinkParticle()
    this.dateParticle = draw.getDateParticle()
    this.control = draw.getControl()
    this.dprMediaQueryList = window.matchMedia(
      `(resolution: ${window.devicePixelRatio}dppx)`
    )
  }

  public register() {

```

```

    this.cursor = this.draw.getCursor()Ð
    this.addEvent()Ð
}Ð
Ð
private addEvent() {Ð
    window.addEventListener('blur', this.recoverEffect)Ð
    document.addEventListener('keyup', this.setRangeStyle)Ð
    document.addEventListener('click', this.recoverEffect)Ð
    document.addEventListener('mouseup', this.setCanvasEventAbility)Ð
    document.addEventListener('wheel', this.setPageScale, { passive: false })Ð
    document.addEventListener('visibilitychange', this._handleVisibilityChange)Ð
    this.dprMediaQueryList.addEventListener('change', this._handleDprChange)Ð
}Ð
Ð
public removeEvent() {Ð
    window.removeEventListener('blur', this.recoverEffect)Ð
    document.removeEventListener('keyup', this.setRangeStyle)Ð
    document.removeEventListener('click', this.recoverEffect)Ð
    document.removeEventListener('mouseup', this.setCanvasEventAbility)Ð
    document.removeEventListener('wheel', this.setPageScale)Ð
    document.removeEventListener(Ð
        'visibilitychange',Ð
        this._handleVisibilityChangeÐ
    )Ð
    this.dprMediaQueryList.removeEventListener('change', this._handleDprChange)Ð
}Ð
Ð
public recoverEffect = (evt: Event) => {Ð
    if (!this.cursor) returnÐ
    const cursorDom = this.cursor.getCursorDom()Ð
    const agentDom = this.cursor.getAgentDom()Ð
    const innerDoms = [this.canvas, cursorDom, agentDom, document.body]Ð
    if (innerDoms.includes(evt.target as any)) {Ð
        this.setRangeStyle()Ð
        returnÐ
    }Ð
    // ••‘VhY •èdomÐ
    const outerEditorDom = findParent(Ð
        evt.target as Element,Ð
        (node: Node & Element) =>Ð
            !!node && node.nodeType === 1 && !!node.getAttribute(EDITOR_COMPONENT),Ð
        trueÐ
    )Ð
    if (outerEditorDom) {Ð
        this.setRangeStyle()Ð
        this.watchCursorActive()Ð
    }
}

```

```

        return
    }
    this.cursor.recoveryCursor()
    this.range.recoveryRangeStyle()
    this.previewer.clearResizer()
    this.tableTool.dispose()
    this.hyperlinkParticle.clearHyperlinkPopup()
    this.control.destroyControl()
    this.dateParticle.clearDatePicker()
}
}
public setCanvasEventAbility = () => {
    this.canvasEvent.setIsAllowDrag(false)
    this.canvasEvent.setIsAllowSelection(false)
}
}
public setRangeStyle = () => {
    this.range.setRangeStyle()
}
}
public watchCursorActive() {
    // • S:•iT &[ž–EQlh yûQúQlh Nāt
    if (!this.range.getIsCollapsed()) return
    setTimeout(() => {
        // \ j!bßQlh SØb Y1m;f>y:r¶
        if (!this.cursor?.getAgentIsActive()) {
            this.cursor?.drawCursor({
                isFocus: false,
                isBlink: false
            })
        }
    })
}
}
}
}
}
public setPageScale = (evt: WheelEvent) => {
    if (!evt.ctrlKey) return
    evt.preventDefault()
    const { scale } = this.options
    if (evt.deltaY < 0) {
        // e>Y
        const nextScale = scale * 10 + 1
        if (nextScale <= 30) {
            this.draw.setPageScale(nextScale / 10)
        }
    } else {
        // •)\
    }
}

```

```

    const nextScale = scale * 10 - 1
    if (nextScale >= 5) {
      this.draw.setPageScale(nextScale / 10)
    }
  }
}
}

private _handleVisibilityChange = () => {
  if (document.visibilityState) {
    const isCollapsed = this.range.getIsCollapsed()
    this.cursor?.drawCursor({
      isShow: isCollapsed
    })
  }
}

private _handleDprChange = () => {
  this.draw.setPageDevicePixel()
}
}

```

File Path: canvas-editor/src/editor/core/event/handlers/click.ts

```
import { ZERO } from '../../../../dataset/constant/Common'
import { LETTER_REG, NUMBER_LIKE_REG } from '../../../../dataset/constant/Regular'
import { CanvasEvent } from '../CanvasEvent'

function dblclick(host: CanvasEvent, evt: MouseEvent) {
  const draw = host.getDraw()
  const position = draw.getPosition()
  // R cbS:Wß
  if (draw.getIsPagingMode()) {
    const positionContext = position.getPositionByXY({
      x: evt.offsetX,
      y: evt.offsetY
    })
    if (!~positionContext.index && positionContext.zone) {
      draw.getZone().setZone(positionContext.zone)
      return
    }
  }
  // •R"bi• e±[W
  const cursorPosition = position.getCursorPosition()
  if (!cursorPosition) return
  const { value, index } = cursorPosition
  // R$e-f/T&f/ep[Wb ,ñe±
  let upCount = 0
  let downCount = 0
  const isNumber = NUMBER_LIKE_REG.test(value)
  if (isNumber || LETTER_REG.test(value)) {
    const elementList = draw.getElementList()
    // T N gâˆâ
    let upStartIndex = index - 1
    while (upStartIndex > 0) {
      const value = elementList[upStartIndex].value
      if (
        (isNumber && NUMBER_LIKE_REG.test(value)) ||
        (!isNumber && LETTER_REG.test(value))
      ) {
        upCount++
        upStartIndex--
      } else {
        break
      }
    }
    // T N gâˆâ
    let downStartIndex = index + 1
    while (downStartIndex < elementList.length) {
```

```

    const value = elementList[downStartIndex].value
    if (
      (isNumber && NUMBER_LIKE_REG.test(value)) ||
      (!isNumber && LETTER_REG.test(value))
    ) {
      downCount++
      downStartIndex++
    } else {
      break
    }
  }
}
// ¼• N-S:W
const rangeManager = draw.getRange()
rangeManager.setRange(index - upCount - 1, index + downCount)
// R7e°e‡hc
draw.render({
  isSubmitHistory: false,
  isSetCursor: false,
  isCompute: false
})
}
}
function threeClick(host: CanvasEvent) {
  const draw = host.getDraw()
  const position = draw.getPosition()
  const cursorPosition = position.getCursorPosition()
  if (!cursorPosition) return
  const { index } = cursorPosition
  const elementList = draw.getElementList()
  // R$e-f/T&f/-ö½[W{&
  let upCount = 0
  let downCount = 0
  // T N gâ
  let upStartIndex = index - 1
  while (upStartIndex > 0) {
    const value = elementList[upStartIndex].value
    if (value !== ZERO) {
      upCount++
      upStartIndex--
    } else {
      break
    }
  }
  // T N gâ
  let downStartIndex = index + 1

```

```

while (downStartIndex < elementList.length) {
  const value = elementList[downStartIndex].value
  if (value !== ZERO) {
    downCount++
    downStartIndex++
  } else {
    break
  }
}
// ¼• N-S:W
const rangeManager = draw.getRange()
rangeManager.setRange(index - upCount - 1, index + downCount)
// R7e°e†hc
draw.render({
  isSubmitHistory: false,
  isSetCursor: false,
  isCompute: false
})
}
}
export default {
  dblclick,
  threeClick
}

```



File Path: canvas-editor/src/editor/core/event/handlers/composition.ts

```
import { CanvasEvent } from '../CanvasEvent'
import { input, removeComposingInput } from './input'

function compositionstart(host: CanvasEvent) {
  host.isComposing = true
}

function compositionend(host: CanvasEvent, evt: CompositionEvent) {
  host.isComposing = false
  // Y t •“QehFQs•i
  const draw = host.getDraw()
  // N [XW(P<ÿ R -dT b •“Qe
  if (!evt.data) {
    removeComposingInput(host)
    const rangeManager = draw.getRange()
    const { endIndex: curIndex } = rangeManager.getRange()
    draw.render({
      curIndex,
      isSubmitHistory: false
    })
  } else {
    // [XW(P<ÿ eàlÕ%œSÑinputNˆNö— bKR”hÀmK^v%œSÑn2gÓ
    setTimeout(() => {
      if (host.compositionInfo) {
        input(evt.data, host)
      }
    })
  }
  // yû-dNât •“QehFepcn
  const cursor = draw.getCursor()
  cursor.clearAgentDomValue()
}

export default {
  compositionstart,
  compositionend
}
```

File Path: canvas-editor/src/editor/core/event/handlers/copy.ts

```
import { writeElementList } from '../../utils/clipboard'Ð
```

```
import { CanvasEvent } from '../CanvasEvent'Ð
```

```
Ð
```

```
export function copy(host: CanvasEvent) {Ð
```

```
  const draw = host.getDraw()Ð
```

```
  const rangeManager = draw.getRange()Ð
```

```
  const { startIndex, endIndex } = rangeManager.getRange()Ð
```

```
  if (startIndex !== endIndex) {Ð
```

```
    const options = draw.getOptions()Ð
```

```
    const elementList = draw.getElementList()Ð
```

```
    writeElementList(elementList.slice(startIndex + 1, endIndex + 1), options)Ð
```

```
  }Ð
```

```
}Ð
```

File Path: canvas-editor/src/editor/core/event/handlers/cut.ts

```
import { writeElementList } from '../utils/clipboard'Ð
```

```
import { CanvasEvent } from '../CanvasEvent'Ð
```

```
Ð
```

```
export function cut(host: CanvasEvent) {Ð
```

```
  const draw = host.getDraw()Ð
```

```
  const rangeManager = draw.getRange()Ð
```

```
  const { startIndex, endIndex } = rangeManager.getRange()Ð
```

```
  if (!~startIndex && !~endIndex) returnÐ
```

```
  const isReadonly = draw.isReadonly()Ð
```

```
  if (isReadonly) returnÐ
```

```
  const control = draw.getControl()Ð
```

```
  const isPartRangeInControlOutside = control.isPartRangeInControlOutside()Ð
```

```
  if (isPartRangeInControlOutside) returnÐ
```

```
  const activeControl = control.getActiveControl()Ð
```

```
  const elementList = draw.getElementList()Ð
```

```
  let start = startIndexÐ
```

```
  let end = endIndexÐ
```

```
  // eà• S:R RjR N ^LÐ
```

```
  if (startIndex === endIndex) {Ð
```

```
    const position = draw.getPosition()Ð
```

```
    const positionList = position.getPositionList()Ð
```

```
    const startPosition = positionList[startIndex]Ð
```

```
    const curRowNo = startPosition.rowNoÐ
```

```
    const curPageNo = startPosition.pageNoÐ
```

```
    const cutElementIndexList: number[] = []Ð
```

```
    for (let p = 0; p < positionList.length; p++) {Ð
```

```
      const position = positionList[p]Ð
```

```
      if (position.pageNo > curPageNo) breakÐ
```

```
      if (position.pageNo === curPageNo && position.rowNo === curRowNo) {Ð
```

```
        cutElementIndexList.push(p)Ð
```

```
      }Ð
```

```
    }Ð
```

```
    const firstElementIndex = cutElementIndexList[0] - 1Ð
```

```
    start = firstElementIndex < 0 ? 0 : firstElementIndexÐ
```

```
    end = cutElementIndexList[cutElementIndexList.length - 1]Ð
```

```
  }Ð
```

```
  const options = draw.getOptions()Ð
```

```
  // Q™Qe|~•4g•Ð
```

```
  writeElementList(elementList.slice(start + 1, end + 1), options)Ð
```

```
  let curIndex: numberÐ
```

```
  if (activeControl) {Ð
```

```
    curIndex = control.cut()Ð
```

```
  } else {Ð
```

```
    draw.spliceElementList(elementList, start + 1, end - start)Ð
```

```
    curIndex = startÐ
```

```
}  
rangeManager.setRange(curlIndex, curlIndex)  
draw.render({ curlIndex })  
}
```

File Path: canvas-editor/src/editor/core/event/handlers/drag.ts

```
import { findParent } from '../utils'
import { CanvasEvent } from '../CanvasEvent'
import {
  DragEvent,
  MouseEvent,
  CanvasEvent,
} from '@types'

function dragover(
  evt: DragEvent | MouseEvent,
  host: CanvasEvent
): void {
  const draw = host.getDraw()
  const isReadOnly = draw.isReadOnly()
  if (isReadOnly) return
  evt.preventDefault()
  // ---^••VhS:y•kbbÖe>
  const pageContainer = draw.getPageContainer()
  const editorRegion = findParent(
    evt.target as Element,
    (node: Element) => node === pageContainer,
    true
  )
  if (!editorRegion) return
  const target = evt.target as HTMLDivElement
  const pageIndex = target.dataset.index
  // ¼•npageNo
  if (pageIndex) {
    draw.setPageNo(Number(pageIndex))
  }
  const position = draw.getPosition()
  const positionContext = position.adjustPositionContext({
    x: evt.offsetX,
    y: evt.offsetY,
  })
  if (!positionContext) return
  const { isTable, tdValueIndex, index } = positionContext
  // ¼•n S:SÊQlh OM•n
  const positionList = position.getPositionList()
  const curlIndex = isTable ? tdValueIndex! : index
  if (~index) {
    const rangeManager = draw.getRange()
    rangeManager.setRange(curlIndex, curlIndex)
    position.setCursorPosition(positionList[curlIndex])
  }
  const cursor = draw.getCursor()
  const {
    cursor: { dragColor, dragWidth },
  } = draw.getOptions()
  cursor.drawCursor({
    width: dragWidth,
    color: dragColor,
    isBlink: false,
  })
}
```

```
    })  
  }  
    
  export default {  
    dragover  
  }  
}
```

File Path: canvas-editor/src/editor/core/event/handlers/drop.ts

```
import { CanvasEvent } from '../CanvasEvent'
```

```
␣
```

```
export function drop(evt: DragEvent, host: CanvasEvent) {␣
```

```
  evt.preventDefault()␣
```

```
  const data = evt.dataTransfer?.getData('text')␣
```

```
  if (data) {␣
```

```
    host.input(data)␣
```

```
  }␣
```

```
}␣
```

File Path: canvas-editor/src/editor/core/event/handlers/input.ts

```
import { ZERO } from '../../../dataset/constant/Common'
import { EDITOR_ELEMENT_COPY_ATTR } from '../../../dataset/constant/Element'
import { ElementType } from '../../../dataset/enum/Element'
import { IElement } from '../../../interface/Element'
import { splitText } from '../../../utils'
import { formatElementContext, getAnchorElement } from '../../../utils/element'
import { CanvasEvent } from '../../CanvasEvent'

export function input(data: string, host: CanvasEvent) {
  const draw = host.getDraw()
  const isReadonly = draw.isReadonly()
  if (isReadonly) return
  const position = draw.getPosition()
  const cursorPosition = position.getCursorPosition()
  if (!data || !cursorPosition) return
  const isComposing = host.isComposing
  // kcW(T b e†g,•Û^L—^•“QedíO
  if (isComposing && host.compositionInfo?.value === data) return
  const control = draw.getControl()
  if (control.isPartRangeInControlOutside()) {
    // _ýue• S:•èR W(c§Növ,,•“Qe
    return
  }
  // yû–dT b •“Qe
  removeComposingInput(host)
  if (!isComposing) {
    const cursor = draw.getCursor()
    cursor.clearAgentDomValue()
  }
  const activeControl = control.getActiveControl()
  const { TEXT, HYPERLINK, SUBSCRIPT, SUPERScript, DATE } = ElementType
  const text = data.replaceAll(`\n`, ZERO)
  const rangeManager = draw.getRange()
  const { startIndex, endIndex } = rangeManager.getRange()
  // h<_ S QC}
  const elementList = draw.getElementList()
  const copyElement = getAnchorElement(elementList, endIndex)
  if (!copyElement) return
  const inputData: IElement[] = splitText(text).map(value => {
    const newElement: IElement = {
      value
    }
  })
  const nextElement = elementList[endIndex + 1]
  if (
    copyElement.type === TEXT ||

```



```

(!copyElement.type && copyElement.value !== ZERO) ||Đ
(copyElement.type === HYPERLINK && nextElement?.type === HYPERLINK) ||Đ
(copyElement.type === DATE && nextElement?.type === DATE) ||Đ
(copyElement.type === SUBSCRIPT && nextElement?.type === SUBSCRIPT) ||Đ
(copyElement.type === SUPERScript && nextElement?.type ===
SUPERScript)Đ
) {Đ
  EDITOR_ELEMENT_COPY_ATTR.forEach(attr => {Đ
    const value = copyElement[attr] as neverĐ
    if (value !== undefined) {Đ
      newElement[attr] = valueĐ
    }Đ
  })Đ
}Đ
if (isComposing) {Đ
  newElement.underline = trueĐ
}Đ
return newElementĐ
})Đ
// c$Nö-yû-dplaceholderĐ
let curlIndex: numberĐ
if (activeControl && !control.isRangInPostfix()) {Đ
  curlIndex = control.setValue(inputData)Đ
} else {Đ
  const start = startIndex + 1Đ
  if (startIndex !== endIndex) {Đ
    draw.spliceElementList(elementList, start, endIndex - startIndex)Đ
  }Đ
  formatElementContext(elementList, inputData, startIndex)Đ
  draw.spliceElementList(elementList, start, 0, ...inputData)Đ
  curlIndex = startIndex + inputData.lengthĐ
}Đ
if (~curlIndex) {Đ
  rangeManager.setRange(curlIndex, curlIndex)Đ
  draw.render({Đ
    curlIndex,Đ
    isSubmitHistory: !isComposingĐ
  })Đ
}Đ
if (isComposing) {Đ
  host.compositionInfo = {Đ
    elementList,Đ
    value: text,Đ
    startIndex: curlIndex - inputData.length,Đ
    endIndex: curlIndexĐ
  }Đ
}Đ

```

```
    }  
  }  
}  
  
export function removeComposingInput(host: CanvasEvent) {  
  if (!host.compositionInfo) return  
  const { elementList, startIndex, endIndex } = host.compositionInfo  
  elementList.splice(startIndex + 1, endIndex - startIndex)  
  const rangeManager = host.getDraw().getRange()  
  rangeManager.setRange(startIndex, startIndex)  
  host.compositionInfo = null  
}
```

File Path: canvas-editor/src/editor/core/event/handlers/keydown.ts

```
import { EditorZone } from '../..'
import { ZERO } from '../dataset/constant/Common'
import { ElementType } from '../dataset/enum/Element'
import { KeyMap } from '../dataset/enum/KeyMap'
import { IElement, IElementPosition } from '../interface/Element'
import { formatElementContext } from '../utils/element'
import { isMod } from '../utils/hotkey'
import { CanvasEvent } from '../CanvasEvent'

export function keydown(evt: KeyboardEvent, host: CanvasEvent) {
  if (host.isComposing) return
  const draw = host.getDraw()
  const position = draw.getPosition()
  const cursorPosition = position.getCursorPosition()
  if (!cursorPosition) return
  const isReadonly = draw.isReadonly()
  const historyManager = draw.getHistoryManager()
  const elementList = draw.getElementList()
  const positionList = position.getPositionList()
  const { index } = cursorPosition
  const rangeManager = draw.getRange()
  const { startIndex, endIndex } = rangeManager.getRange()
  const isCollapsed = startIndex === endIndex
  // _SRMöAm;c$Nö
  const control = draw.getControl()
  const isPartRangeInControlOutside = control.isPartRangeInControlOutside()
  const activeControl = control.getActiveControl()
  if (evt.key === KeyMap.Backspace) {
    if (isReadonly || isPartRangeInControlOutside) return
    let curIndex: number
    if (activeControl) {
      curIndex = control.keydown(evt)
    } else {
      // R$e-f/T&QAç,R -d
      if (isCollapsed && elementList[index].value === ZERO && index === 0) {
        evt.preventDefault()
        return
      }
      // n zz_SRM^L[üŸPe¹_
      const startElement = elementList[startIndex]
      if (isCollapsed && startElement.rowFlex && startElement.value === ZERO) {
        const rowList = draw.getRowList()
        const rowNo = positionList[startIndex].rowNo
        const rowFlexElementList = rowList[rowNo].elementList
        rowFlexElementList.forEach(element => {
```

```

        delete element.rowFlex
    })
}
if (!isCollapsed) {
    draw.spliceElementList(
        elementList,
        startIndex + 1,
        endIndex - startIndex
    )
} else {
    draw.spliceElementList(elementList, index, 1)
}
curlIndex = isCollapsed ? index - 1 : startIndex
}
rangeManager.setRange(curlIndex, curlIndex)
draw.render({ curlIndex })
} else if (evt.key === KeyMap.Delete) {
    if (isReadOnly || isPartRangeInControlOutside) return
    let curlIndex: number
    if (activeControl) {
        curlIndex = control.keydown(evt)
    } else if (elementList[endIndex + 1]?.type === ElementType.CONTROL) {
        curlIndex = control.removeControl(endIndex + 1)
    } else {
        if (!isCollapsed) {
            draw.spliceElementList(
                elementList,
                startIndex + 1,
                endIndex - startIndex
            )
        } else {
            draw.spliceElementList(elementList, index + 1, 1)
        }
    }
    curlIndex = isCollapsed ? index : startIndex
}
rangeManager.setRange(curlIndex, curlIndex)
draw.render({ curlIndex })
} else if (evt.key === KeyMap.Enter) {
    if (isReadOnly || isPartRangeInControlOutside) return
    const enterText: IElement = {
        value: ZERO
    }
    const startElement = elementList[startIndex]
    const endElement = elementList[endIndex]
    // R ^hWWQ...cb^L
    if (evt.shiftKey && startElement.listId) {

```

```

    enterText.listWrap = true
  }
  // h ~ ~ Ó \ > Y V P • fe à — h < _ S
  if (
    !(
      endElement.titleId &&
      endElement.titleId !== elementList[endIndex + 1]?.titleId
    )
  ) {
    formatElementContext(elementList, [enterText], startIndex)
  }
  let curIndex: number
  if (activeControl && !control.isRangeInPostfix()) {
    curIndex = control.setValue([enterText])
  } else {
    if (isCollapsed) {
      draw.spliceElementList(elementList, index + 1, 0, enterText)
    } else {
      draw.spliceElementList(
        elementList,
        startIndex + 1,
        endIndex - startIndex,
        enterText
      )
    }
    curIndex = index + 1
  }
  if (~curIndex) {
    rangeManager.setRange(curIndex, curIndex)
    draw.render({ curIndex })
  }
  evt.preventDefault()
} else if (evt.key === KeyMap.Left) {
  if (isReadOnly) return
  if (index > 0) {
    const curIndex = startIndex - 1
    // shift R • e > • S
    let anchorStartIndex = curIndex
    let anchorEndIndex = curIndex
    const cursorPosition = position.getCursorPosition()
    if (evt.shiftKey && cursorPosition) {
      if (startIndex !== endIndex) {
        if (startIndex === cursorPosition.index) {
          // Q Ĩ • S
          anchorStartIndex = startIndex
          anchorEndIndex = endIndex - 1
        }
      }
    }
  }
}

```

```

    } else {
        anchorStartIndex = curIndex
        anchorEndIndex = endIndex
    }
    } else {
        anchorEndIndex = endIndex
    }
}
if (!~anchorStartIndex || !~anchorEndIndex) return
rangeManager.setRange(anchorStartIndex, anchorEndIndex)
const isCollapsed = anchorStartIndex === anchorEndIndex
draw.render({
    curlIndex: isCollapsed ? anchorStartIndex : undefined,
    isSetCursor: isCollapsed,
    isSubmitHistory: false,
    isCompute: false
})
evt.preventDefault()
}
} else if (evt.key === KeyMap.Right) {
    if (isReadOnly) return
    if (index < positionList.length) {
        const curIndex = endIndex + 1
        // shiftR •e>• S:
        let anchorStartIndex = curIndex
        let anchorEndIndex = curIndex
        const cursorPosition = position.getCursorPosition()
        if (evt.shiftKey && cursorPosition) {
            if (startIndex !== endIndex) {
                if (startIndex === cursorPosition.index) {
                    // XžY'• S:
                    anchorStartIndex = startIndex
                    anchorEndIndex = curIndex
                } else {
                    anchorStartIndex = startIndex + 1
                    anchorEndIndex = endIndex
                }
            }
        } else {
            anchorStartIndex = startIndex
        }
    }
    const maxElementListIndex = elementList.length - 1
    if (
        anchorStartIndex > maxElementListIndex ||
        anchorEndIndex > maxElementListIndex
    ) {

```

```

    returnĐ
}Đ
rangeManager.setRange(anchorStartIndex, anchorEndIndex)Đ
const isCollapsed = anchorStartIndex === anchorEndIndexĐ
draw.render({Đ
  curlIndex: isCollapsed ? anchorStartIndex : undefined,Đ
  isSetCursor: isCollapsed,Đ
  isSubmitHistory: false,Đ
  isCompute: falseĐ
})Đ
evt.preventDefault()Đ
}Đ
} else if (evt.key === KeyMap.Up || evt.key === KeyMap.Down) {Đ
  if (isReadOnly) returnĐ
  let anchorPosition: IElementPosition = cursorPositionĐ
  const isUp = evt.key === KeyMap.UpĐ
  if (evt.shiftKey) {Đ
    if (startIndex === cursorPosition.index) {Đ
      anchorPosition = positionList[endIndex]Đ
    } else {Đ
      anchorPosition = positionList[startIndex]Đ
    }Đ
  }Đ
  const {Đ
    rowNo,Đ
    index,Đ
    pageNo,Đ
    coordinate: { leftTop, rightTop }Đ
  } = anchorPositionĐ
  if ((isUp && rowNo !== 0) || (!isUp && rowNo !== draw.getRowCount())) {Đ
    // N N N*Qlh p¹b@W(^LOM•n–ÆT Đ
    const probablePosition = isUpĐ
      ? positionListĐ
        .slice(0, index)Đ
        .filter(p => p.rowNo === rowNo - 1 && pageNo === p.pageNo)Đ
      : positionListĐ
        .slice(index, positionList.length - 1)Đ
        .filter(p => p.rowNo === rowNo + 1 && pageNo === p.pageNo)Đ
    // gáb~N _SRMOM•nQC} p¹N±SÉg Y v,,OM•nĐ
    let maxIndex = 0Đ
    let maxDistance = 0Đ
    for (let p = 0; p < probablePosition.length; p++) {Đ
      const position = probablePosition[p]Đ
      // _SRMQlh W(RMĐ
      if (Đ
        position.coordinate.leftTop[0] >= leftTop[0] &&Đ

```

```

    position.coordinate.leftTop[0] <= rightTop[0]Đ
  ) {Đ
    const curDistance = rightTop[0] - position.coordinate.leftTop[0]Đ
    if (curDistance > maxDistance) {Đ
      maxIndex = position.indexĐ
      maxDistance = curDistanceĐ
      breakĐ
    }Đ
  }Đ
  // _SRMQlh W(T Đ
  else if (Đ
    position.coordinate.leftTop[0] <= leftTop[0] &&Đ
    position.coordinate.rightTop[0] >= leftTop[0]Đ
  ) {Đ
    const curDistance = position.coordinate.rightTop[0] - leftTop[0]Đ
    if (curDistance > maxDistance) {Đ
      maxIndex = position.indexĐ
      maxDistance = curDistanceĐ
      breakĐ
    }Đ
  }Đ
  // S9'MN R0Đ
  if (p === probablePosition.length - 1 && maxIndex === 0) {Đ
    maxIndex = position.indexĐ
  }Đ
}Đ
const curIndex = maxIndexĐ
// shiftR •)e>• S:Đ
let anchorStartIndex = curIndexĐ
let anchorEndIndex = curIndexĐ
if (evt.shiftKey) {Đ
  if (startIndex !== endIndex) {Đ
    if (startIndex === cursorPosition.index) {Đ
      anchorStartIndex = startIndexĐ
    } else {Đ
      anchorEndIndex = endIndexĐ
    }Đ
  } else {Đ
    if (isUp) {Đ
      anchorEndIndex = endIndexĐ
    } else {Đ
      anchorStartIndex = startIndexĐ
    }Đ
  }Đ
}Đ
if (anchorStartIndex > anchorEndIndex) {Đ

```



```

    // prettier-ignore
    [anchorStartIndex, anchorEndIndex] = [anchorEndIndex, anchorStartIndex]
  }
  rangeManager.setRange(anchorStartIndex, anchorEndIndex)
  const isCollapsed = anchorStartIndex === anchorEndIndex
  draw.render({
    curlIndex: isCollapsed ? anchorStartIndex : undefined,
    isSetCursor: isCollapsed,
    isSubmitHistory: false,
    isCompute: false
  })
}
} else if (isMod(evt) && evt.key === KeyMap.Z) {
  if (isReadOnly) return
  historyManager.undo()
  evt.preventDefault()
} else if (isMod(evt) && evt.key === KeyMap.Y) {
  if (isReadOnly) return
  historyManager.redo()
  evt.preventDefault()
} else if (isMod(evt) && evt.key === KeyMap.C) {
  host.copy()
  evt.preventDefault()
} else if (isMod(evt) && evt.key === KeyMap.X) {
  host.cut()
  evt.preventDefault()
} else if (isMod(evt) && evt.key === KeyMap.A) {
  host.selectAll()
  evt.preventDefault()
} else if (isMod(evt) && evt.key === KeyMap.S) {
  if (isReadOnly) return
  const listener = draw.getListener()
  if (listener.saved) {
    listener.saved(draw.getValue())
  }
  evt.preventDefault()
} else if (evt.key === KeyMap.ESC) {
  // • Qúh<_ R7
  host.clearPainterStyle()
  // • Qú~uw ~u•••
  const zoneManager = draw.getZone()
  if (!zoneManager.isMainActive()) {
    zoneManager.setZone(EditorZone.MAIN)
  }
  evt.preventDefault()
} else if (evt.key === KeyMap.TAB) {

```

```
draw.insertElementList([  
  {  
    type: ElementType.TAB,  
    value: "  
  }  
])  
evt.preventDefault()  
}  
}
```

File Path: canvas-editor/src/editor/core/event/handlers/mousedown.ts

```
import { ElementType } from '../../../../dataset/enum/Element'
import { MouseEventButton } from '../../../../dataset/enum/Event'
import { deepClone } from '../../../../utils'
import { isMod } from '../../../../utils/hotkey'
import { CheckboxControl } from '../../draw/control/checkbox/CheckboxControl'
import { CanvasEvent } from '../CanvasEvent'

export function mousedown(evt: MouseEvent, host: CanvasEvent) {
  if (evt.button === MouseEventButton.RIGHT) return
  const draw = host.getDraw()
  const isReadonly = draw.isReadonly()
  const rangeManager = draw.getRange()
  const position = draw.getPosition()
  // f/T&f/• S:bÖby
  if (!host.isAllowDrag) {
    const range = rangeManager.getRange()
    if (!isReadonly && range.startIndex !== range.endIndex) {
      const isPointInRange = rangeManager.getIsPointInRange(
        evt.offsetX,
        evt.offsetY
      )
      if (isPointInRange) {
        host.isAllowDrag = true
        host.cacheRange = deepClone(range)
        host.cacheElementList = draw.getElementList()
        host.cachePositionList = position.getPositionList()
        return
      }
    }
  }
  const target = evt.target as HTMLDivElement
  const pageIndex = target.dataset.index
  // ¼•npageNo
  if (pageIndex) {
    draw.setPageNo(Number(pageIndex))
  }
  host.isAllowSelection = true
  const positionResult = position.adjustPositionContext({
    x: evt.offsetX,
    y: evt.offsetY
  })
  if (!positionResult) return
  const {
    index,
    isDirectHit,
  }
```

```

isCheckbox,Đ
isImage,Đ
isTable,Đ
tdValueIndex,Đ
hitLineStartIndexĐ
} = positionResultĐ
// °_U•S:_YĖOM•nĐ
host.mouseDownStartPosition = {Đ
  ...positionResult,Đ
  index: isTable ? tdValueIndex! : indexĐ
}Đ
const elementList = draw.getElementList()Đ
const positionList = position.getPositionList()Đ
const curIndex = isTable ? tdValueIndex! : indexĐ
const curElement = elementList[curIndex]Đ
// ~ØR6Đ
const isDirectHitImage = !(isDirectHit && isImage)Đ
const isDirectHitCheckbox = !(isDirectHit && isCheckbox)Đ
if (~index) {Đ
  rangeManager.setRange(curIndex, curIndex)Đ
  position.setCursorPosition(positionList[curIndex])Đ
  // Y • hFĐ
  const isSetCheckbox = isDirectHitCheckbox && !isReadOnlyĐ
  if (isSetCheckbox) {Đ
    const { checkbox } = curElementĐ
    if (checkbox) {Đ
      checkbox.value = !checkbox.valueĐ
    } else {Đ
      curElement.checkbox = {Đ
        value: trueĐ
      }Đ
    }Đ
  }Đ
  const control = draw.getControl()Đ
  const activeControl = control.getActiveControl()Đ
  if (activeControl instanceof CheckboxControl) {Đ
    activeControl.setSelect()Đ
  }Đ
}Đ
draw.render({Đ
  curIndex,Đ
  isSubmitHistory: isSetCheckbox,Đ
  isSetCursor: !isDirectHitImage && !isDirectHitCheckbox,Đ
  isCompute: falseĐ
})Đ
// ™-[W— [šOMR0^L™-ÿ —^N N ^Lg T N N*[WT Đ
if (hitLineStartIndex) {Đ

```

```

    host.getDraw().getCursor().drawCursor({
        hitLineStartIndex
    })
}
}
// ~,%,ë]âQw~ÄNö
const previewer = draw.getPreviewer()
previewer.clearResizer()
if (isDirectHitImage && !isReadonly) {
    previewer.drawResizer(
        curElement,
        positionList[curIndex],
        curElement.type === ElementType.LATEX
        ? {
            mime: 'svg',
            srcKey: 'laTexSVG'
        }
        : {}
    )
    // Qlh NöNät N"Y1ÿ 'íe°[šOM
    draw.getCursor().drawCursor({
        isShow: false
    })
}
// ^hh<]âQw~ÄNö
const tableTool = draw.getTableTool()
tableTool.dispose()
if (isTable && !isReadonly) {
    tableTool.render()
}
// •..."pc¥
const hyperlinkParticle = draw.getHyperlinkParticle()
hyperlinkParticle.clearHyperlinkPopup()
if (curElement.type === ElementType.HYPERLINK) {
    if (isMod(evt)) {
        hyperlinkParticle.openHyperlink(curElement)
    } else {
        hyperlinkParticle.drawHyperlinkPopup(curElement, positionList[curIndex])
    }
}
// eåg c$Nö
const dateParticle = draw.getDateParticle()
dateParticle.clearDatePicker()
if (curElement.type === ElementType.DATE && !isReadonly) {
    dateParticle.renderDatePicker(curElement, positionList[curIndex])
}

```

}D

File Path: canvas-editor/src/editor/core/event/handlers/mouseleave.ts

```
import { CanvasEvent } from '../CanvasEvent'
```

```
␣
```

```
export function mouseleave(evt: MouseEvent, host: CanvasEvent) {␣
```

```
  // f/T&•ØW(canvasQ...•è␣
```

```
  const draw = host.getDraw()␣
```

```
  const pageContainer = draw.getPageContainer()␣
```

```
  const { x, y, width, height } = pageContainer.getBoundingClientRect()␣
```

```
  if (evt.x >= x && evt.x <= x + width && evt.y >= y && evt.y <= y + height) {␣
```

```
    return␣
```

```
  }␣
```

```
  host.setIsAllowSelection(false)␣
```

```
}␣
```

File Path: canvas-editor/src/editor/core/event/handlers/mousemove.ts

```
import { CanvasEvent } from '../CanvasEvent'
export function mousemove(evt: MouseEvent, host: CanvasEvent) {
  const draw = host.getDraw()
  // f/T&f/bÖbye±[W
  if (host.isAllowDrag) {
    // f/T&QAç,bÖbyR0• S:
    const x = evt.offsetX
    const y = evt.offsetY
    const { startIndex, endIndex } = host.cacheRange!
    const positionList = host.cachePositionList!
    for (let p = startIndex + 1; p <= endIndex; p++) {
      const {
        coordinate: { leftTop, rightBottom }
      } = positionList[p]
      if (
        x >= leftTop[0] &&
        x <= rightBottom[0] &&
        y >= leftTop[1] &&
        y <= rightBottom[1]
      ) {
        return
      }
    }
    host.dragover(evt)
    host.isAllowDrop = true
    return
  }
  if (!host.isAllowSelection || !host.mouseDownStartPosition) return
  const target = evt.target as HTMLDivElement
  const pageIndex = target.dataset.index
  // ç¼•npageNo
  if (pageIndex) {
    draw.setPageNo(Number(pageIndex))
  }
  // ~Óg_OM•n
  const position = draw.getPosition()
  const positionResult = position.getPositionByXY({
    x: evt.offsetX,
    y: evt.offsetY
  })
  if (!~positionResult.index) return
  const { index, isTable, tdValueIndex, tdIndex, trIndex, tableId } = positionResult
  const {
```



```

    index: startIndex,Đ
    isTable: startIsTable,Đ
    tdIndex: startTdIndex,Đ
    trIndex: startTrIndexĐ
  } = host.mouseDownStartPositionĐ
  const endIndex = isTable ? tdValueIndex! : indexĐ
  // R$e-f/T&f^hh<•è^L/R Đ
  const rangeManager = draw.getRange()Đ
  if (Đ
    isTable &&Đ
    startIsTable &&Đ
    (tdIndex !== startTdIndex || trIndex !== startTrIndex)Đ
  ) {Đ
    rangeManager.setRange(Đ
      endIndex,Đ
      endIndex,Đ
      tableId,Đ
      startTdIndex,Đ
      tdIndex,Đ
      startTrIndex,Đ
      trIndexĐ
    )Đ
  } else {Đ
    let end = ~endIndex ? endIndex : 0Đ
    // _ YËOM•nĐ
    let start = startIndexĐ
    if (start > end) {Đ
      // prettier-ignoreĐ
      [start, end] = [end, start]Đ
    }Đ
    if (start === end) returnĐ
    rangeManager.setRange(start, end)Đ
  }Đ
  // ~ØR6Đ
  draw.render({Đ
    isSubmitHistory: false,Đ
    isSetCursor: false,Đ
    isCompute: falseĐ
  })Đ
}Đ

```

```

File Path: canvas-editor/src/editor/core/event/handlers/mouseup.ts
import { EDITOR_ELEMENT_STYLE_ATTR } from '../../../../dataset/constant/Element'
import { ControlComponent, ControlType } from '../../../../dataset/enum/Control'
import { ElementType } from '../../../../dataset/enum/Element'
import { IElement } from '../../../../interface/Element'
import { deepClone, getUUID } from '../../../../utils'
import { formatElementContext, formatElementList } from '../../../../utils/element'
import { CanvasEvent } from '../CanvasEvent'
import {
  type IDragElement = IElement & { dragId: string }
}
function createDragId(element: IElement): string {
  const dragId = getUUID()
  Reflect.set(element, 'dragId', dragId)
  return dragId
}
function getElementIndexByDragId(dragId: string, elementList: IElement[]) {
  return (<IDragElement[]>elementList).findIndex(el => el.dragId === dragId)
}
export function mouseup(evt: MouseEvent, host: CanvasEvent) {
  // R$e-f/T&QAç,bÖe>
  if (host.isAllowDrop) {
    const draw = host.getDraw()
    const position = draw.getPosition()
    const positionList = position.getPositionList()
    const rangeManager = draw.getRange()
    const cacheRange = host.cacheRange!
    const cacheElementList = host.cacheElementList!
    const cachePositionList = host.cachePositionList!
    const range = rangeManager.getRange()
    // f/T&— %œ•bÖby-OM•nSÑu e9SØ
    if (
      range.startIndex >= cacheRange.startIndex &&
      range.endIndex <= cacheRange.endIndex
    ) {
      rangeManager.replaceRange({
        ...cacheRange
      })
      draw.render({
        isSetCursor: false,
        isCompute: false,
        isSubmitHistory: false
      })
      return
    }
  }
}

```

```

}Đ
// f/T&f/N SİbÖbýv,,c$Nö~Óg,,QC} Đ
const dragElementList = cacheElementList.slice(Đ
  cacheRange.startIndex + 1,Đ
  cacheRange.endIndex + 1Đ
)Đ
const isContainControl = dragElementList.find(Đ
  element => element.type === ElementType.CONTROLĐ
)Đ
if (isContainControl) {Đ
  // NÅQA{, (g RM/T QC} N f/c$Nö || W(c$NöRMT || e‡g,c$NöN f/P<) bÖbýĐ
  const cacheStartElement = cacheElementList[cacheRange.startIndex + 1]Đ
  const cacheEndElement = cacheElementList[cacheRange.endIndex]Đ
  const isAllowDragControl =Đ
    ((cacheStartElement.type !== ElementType.CONTROL ||Đ
      cacheStartElement.controlComponent === ControlComponent.PREFIX) &&Đ
      (cacheEndElement.type !== ElementType.CONTROL ||Đ
        cacheEndElement.controlComponent === ControlComponent.POSTFIX)) ||Đ
    (cacheStartElement.controlId === cacheEndElement.controlId &&Đ
      cacheStartElement.controlComponent === ControlComponent.PREFIX &&Đ
      cacheEndElement.controlComponent === ControlComponent.POSTFIX) ||Đ
    (cacheStartElement.control?.type === ControlType.TEXT &&Đ
      cacheStartElement.controlComponent === ControlComponent.VALUE &&Đ
      cacheEndElement.control?.type === ControlType.TEXT &&Đ
      cacheEndElement.controlComponent === ControlComponent.VALUE)Đ
  if (!isAllowDragControl) {Đ
    draw.render({Đ
      curlIndex: range.startIndex,Đ
      isCompute: false,Đ
      isSubmitHistory: falseĐ
    })Đ
    returnĐ
  }Đ
}Đ
}Đ
// h<_ S QC} Đ
const editorOptions = draw.getOptions()Đ
const elementList = draw.getElementList()Đ
const replaceElementList = dragElementList.map(el => {Đ
  if (Đ
    !el.type ||Đ
    el.type === ElementType.TEXT ||Đ
    el.control?.type === ControlType.TEXTĐ
  ) {Đ
    const newElement: IElement = {Đ
      value: el.valueĐ
    }Đ
  }

```

```

EDITOR_ELEMENT_STYLE_ATTR.forEach(attr => {
  const value = el[attr] as never
  if (value !== undefined) {
    newElement[attr] = value
  }
})
return newElement
} else {
  const newElement = deepClone(el)
  formatElementList([newElement], {
    isHandleFirstElement: false,
    editorOptions
  })
  return newElement
}
})
formatElementContext(elementList, replaceElementList, range.startIndex)
// • [XbÖby• S:_ YË~Ög_id
const cacheRangeStartId = createDragId(
  cacheElementList[cacheRange.startIndex]
)
const cacheRangeEndId = createDragId(cacheElementList[cacheRange.endIndex])
// ¼•nbÖbyP<
const replaceLength = replaceElementList.length
let rangeStart = range.startIndex
let rangeEnd = rangeStart + replaceLength
const control = draw.getControl()
const activeControl = control.getActiveControl()
if (
  activeControl &&
  cacheElementList[rangeStart].controlComponent !== ControlComponent.POSTFIX
) {
  rangeEnd = activeControl.setValue(replaceElementList)
  rangeStart = rangeEnd - replaceLength
} else {
  draw.spliceElementList(
    elementList,
    rangeStart + 1,
    0,
    ...replaceElementList
  )
}
if (!~rangeEnd) {
  draw.render({
    isSetCursor: false
  })
}

```

```

    returnĐ
}Đ
// • [X_SRM_ YĚ~Óg_idĐ
const rangeStartId = createDragId(elementList[rangeStart])Đ
const rangeEndId = createDragId(elementList[rangeEnd])Đ
// R -dSŸg bÖbýQC} Đ
const cacheRangeStartIndex = getElementIndexByDragId(Đ
    cacheRangeStartId,Đ
    cacheElementListĐ
)Đ
const cacheRangeEndIndex = getElementIndexByDragId(Đ
    cacheRangeEndId,Đ
    cacheElementListĐ
)Đ
const cacheEndElement = cacheElementList[cacheRangeEndIndex]Đ
if (Đ
    cacheEndElement.type === ElementType.CONTROL &&Đ
    cacheEndElement.controlComponent !== ControlComponent.POSTFIXĐ
) {Đ
    rangeManager.replaceRange({Đ
        ...cacheRange,Đ
        startIndex: cacheRangeStartIndex,Đ
        endIndex: cacheRangeEndIndexĐ
    })Đ
    control.getActiveControl()?.cut()Đ
} else {Đ
    draw.spliceElementList(Đ
        cacheElementList,Đ
        cacheRangeStartIndex + 1,Đ
        cacheRangeEndIndex - cacheRangeStartIndexĐ
    )Đ
}Đ
// 'İ¼N N e‡Đ
const startElement = elementList[range.startIndex]Đ
const cacheStartElement = cacheElementList[cacheRange.startIndex]Đ
const startPosition = positionList[range.startIndex]Đ
const cacheStartPosition = cachePositionList[cacheRange.startIndex]Đ
const positionContext = position.getPositionContext()Đ
let positionContextIndex = positionContext.indexĐ
if (positionContextIndex) {Đ
    if (startElement.tableId && !cacheStartElement.tableId) {Đ
        // ^hh<Y yŮR~R0^hh<Q...&&^hh<NKRMD
        if (cacheStartPosition.index < positionContextIndex) {Đ
            positionContextIndex -= replaceLengthĐ
        }Đ
    } else if (!startElement.tableId && cacheStartElement.tableId) {Đ

```

```

// ^hh<Q...yûR0^hh<Y &&^hh<NKRMĐ
if (startPosition.index < positionContextIndex) {Đ
  positionContextIndex += replaceLengthĐ
}Đ
}Đ
position.setPositionContext({Đ
  ...positionContext,Đ
  index: positionContextIndexĐ
})Đ
}Đ
// 'İ¼• S:Đ
const rangeStartIndex = getElementIndexByDragId(rangeStartId, elementList)Đ
const rangeEndIndex = getElementIndexByDragId(rangeEndId, elementList)Đ
rangeManager.setRange(Đ
  rangeStartIndex,Đ
  rangeEndIndex,Đ
  range.tableId,Đ
  range.startTdIndex,Đ
  range.endTdIndex,Đ
  range.startTrIndex,Đ
  range.endTrIndexĐ
)Đ
// 'İ°n2gÓĐ
draw.render({Đ
  isSetCursor: falseĐ
})Đ
} else if (host.isAllowDrag) {Đ
  // Y,gœf/QAĳ,bÖbyN QAĳ,bÖe>R Qlh 'İ•nĐ
  host.mousedown(evt)Đ
}Đ
}Đ

```

File Path: canvas-editor/src/editor/core/history/HistoryManager.ts

```
import { Draw } from '../draw/Draw'
export class HistoryManager {
  private undoStack: Array<Function> = []
  private redoStack: Array<Function> = []
  private maxRecordCount: number
  constructor(draw: Draw) {
    // _yue{,N k!S†Sò¢°_U
    this.maxRecordCount = draw.getOptions().historyMaxRecordCount + 1
  }
  public undo() {
    if (this.undoStack.length > 1) {
      const pop = this.undoStack.pop()!
      this.redoStack.push(pop)
      if (this.undoStack.length) {
        this.undoStack[this.undoStack.length - 1]()
      }
    }
  }
  public redo() {
    if (this.redoStack.length) {
      const pop = this.redoStack.pop()!
      this.undoStack.push(pop)
      pop()
    }
  }
  public execute(fn: Function) {
    this.undoStack.push(fn)
    if (this.redoStack.length) {
      this.redoStack = []
    }
    while (this.undoStack.length > this.maxRecordCount) {
      this.undoStack.shift()
    }
  }
  public isCanUndo(): boolean {
    return this.undoStack.length > 1
  }
  public isCanRedo(): boolean {
    return this.redoStack.length > 0
  }
}
```

```
    return !!this.redoStack.length
  }
}
public recovery() {
  this.undoStack = []
  this.redoStack = []
}
}
```



File Path: canvas-editor/src/editor/core/i18n/I18n.ts

```
import { ILang } from '../interface/i18n/I18n'
import zhCN from './lang/zh-CN.json'
import en from './lang/en.json'
import { mergeObject } from '../utils'
import { DeepPartial } from '../interface/Common'

export class I18n {
  private langMap: Map<string, ILang> = new Map([
    ['zhCN', zhCN],
    ['en', en]
  ])

  private currentLocale = 'zhCN'

  public registerLangMap(locale: string, lang: DeepPartial<ILang>) {
    const sourceLang = this.langMap.get(locale)
    this.langMap.set(locale, <ILang>mergeObject(sourceLang || zhCN, lang))
  }

  public setLocale(locale: string) {
    this.currentLocale = locale
  }

  public getLang(): ILang {
    return this.langMap.get(this.currentLocale) || zhCN
  }

  public t(path: string): string {
    const keyList = path.split('.')
    let value = ''
    let item = this.getLang()
    for (let k = 0; k < keyList.length; k++) {
      const key = keyList[k]
      const currentValue = Reflect.get(item, key)
      if (currentValue) {
        value = item = currentValue
      } else {
        return ''
      }
    }
    return value
  }
}
```

File Path: canvas-editor/src/editor/core/listener/Listener.ts

```
import {
  IContentChange,
  IControlChange,
  IIntersectionPageNoChange,
  IPageModeChange,
  IPageScaleChange,
  IPageSizeChange,
  IRangeStyleChange,
  ISaved,
  IVisiblePageNoListChange,
  IZoneChange
} from '../../interface/Listener'

export class Listener {
  public rangeStyleChange: IRangeStyleChange | null
  public visiblePageNoListChange: IVisiblePageNoListChange | null
  public intersectionPageNoChange: IIntersectionPageNoChange | null
  public pageSizeChange: IPageSizeChange | null
  public pageScaleChange: IPageScaleChange | null
  public saved: ISaved | null
  public contentChange: IContentChange | null
  public controlChange: IControlChange | null
  public pageModeChange: IPageModeChange | null
  public zoneChange: IZoneChange | null

  constructor() {
    this.rangeStyleChange = null
    this.visiblePageNoListChange = null
    this.intersectionPageNoChange = null
    this.pageSizeChange = null
    this.pageScaleChange = null
    this.saved = null
    this.contentChange = null
    this.controlChange = null
    this.pageModeChange = null
    this.zoneChange = null
  }
}
```

File Path: canvas-editor/src/editor/core/observer/ImageObserver.ts

```
export class ImageObserver {  
  private promiseList: Promise<unknown>[]  
    
  constructor() {  
    this.promiseList = []  
  }  
    
  public add(payload: Promise<unknown>) {  
    this.promiseList.push(payload)  
  }  
    
  public clearAll() {  
    this.promiseList = []  
  }  
    
  public allSettled() {  
    return Promise.allSettled(this.promiseList)  
  }  
}
```

File Path: canvas-editor/src/editor/core/observer/ScrollObserver.ts

```
import { debounce } from '../utils'
import { Draw } from '../draw/Draw'
import {
  export interface IElementVisibleInfo {
    intersectionHeight: number
  }
  export interface IPageVisibleInfo {
    intersectionPageNo: number
    visiblePageNoList: number[]
  }
  export class ScrollObserver {
    private draw: Draw
    constructor(draw: Draw) {
      this.draw = draw
      // vNT,nÚ•n
      setTimeout(() => {
        if (!window.scrollY) {
          this._observer()
        }
      })
      this._addEvent()
    }
    private _addEvent() {
      document.addEventListener('scroll', this._observer)
    }
    public removeEvent() {
      document.removeEventListener('scroll', this._observer)
    }
    public getElementVisibleInfo(element: Element): IElementVisibleInfo {
      const rect = element.getBoundingClientRect()
      const viewHeight = Math.max(
        document.documentElement.clientHeight,
        window.innerHeight
      )
      const visibleHeight =
        Math.min(rect.bottom, viewHeight) - Math.max(rect.top, 0)
      return {
        intersectionHeight: visibleHeight > 0 ? visibleHeight : 0
      }
    }
  }
}
```

```

    }
}
public getPageVisibleInfo(): IPageVisibleInfo {
    const pageList = this.draw.getPageList()
    const visiblePageNoList: number[] = []
    let intersectionPageNo = 0
    let intersectionMaxHeight = 0
    for (let i = 0; i < pageList.length; i++) {
        const curPage = pageList[i]
        const { intersectionHeight } = this.getElementVisibleInfo(curPage)
        // NKRM~u[XW(N~SÉ && _SRM~uN N~SÉR T ~iWGN N~SÉÿ ~Ög__~s~
        if (intersectionMaxHeight && !intersectionHeight) break
        if (intersectionHeight) {
            visiblePageNoList.push(i)
        }
        if (intersectionHeight > intersectionMaxHeight) {
            intersectionMaxHeight = intersectionHeight
            intersectionPageNo = i
        }
    }
    return {
        intersectionPageNo,
        visiblePageNoList
    }
}
private _observer = debounce(() => {
    const { intersectionPageNo, visiblePageNoList } = this.getPageVisibleInfo()
    this.draw.setIntersectionPageNo(intersectionPageNo)
    this.draw.setVisiblePageNoList(visiblePageNoList)
}, 150)
}

```

File Path: canvas-editor/src/editor/core/observer/SelectionObserver.ts

```
import { MoveDirection } from '../dataset/enum/Observer'
import { Draw } from '../draw/Draw'
import { RangeManager } from '../range/RangeManager'

export class SelectionObserver {
  // k!k!nÚR"••^!
  private readonly step: number = 5
  // %œSÑnÚR"– P<
  private readonly thresholdPoints: [
    top: number,
    down: number,
    left: number,
    right: number
  ] = [70, 40, 10, 20]

  private rangeManager: RangeManager
  private requestAnimationFrameId: number | null
  private isMouseDown: boolean
  private isMoving: boolean

  constructor(draw: Draw) {
    this.requestAnimationFrameId = null
    this.isMouseDown = false
    this.isMoving = false
    this.rangeManager = draw.getRange()

    this._addEvent()
  }

  private _addEvent() {
    document.addEventListener('mousedown', this._mousedown)
    document.addEventListener('mousemove', this._mousemove)
    document.addEventListener('mouseup', this._mouseup)
  }

  public removeEvent() {
    document.removeEventListener('mousedown', this._mousedown)
    document.removeEventListener('mousemove', this._mousemove)
    document.removeEventListener('mouseup', this._mouseup)
  }

  private _mousedown = () => {
    this.isMouseDown = true
  }
}
```

```

private _mouseup = () => {
  this.isMouseDown = false
  this._stopMove()
}
}

private _mousemove = (evt: MouseEvent) => {
  if (!this.isMouseDown || this.rangeManager.getIsCollapsed()) return
  const { x, y } = evt
  const clientWidth = document.documentElement.clientWidth
  const clientHeight = document.documentElement.clientHeight
  if (y < this.thresholdPoints[0]) {
    this._startMove(MoveDirection.UP)
  } else if (clientHeight - y <= this.thresholdPoints[1]) {
    this._startMove(MoveDirection.DOWN)
  } else if (x < this.thresholdPoints[2]) {
    this._startMove(MoveDirection.LEFT)
  } else if (clientWidth - x < this.thresholdPoints[3]) {
    this._startMove(MoveDirection.RIGHT)
  } else {
    this._stopMove()
  }
}

private _move(direction: MoveDirection) {
  const x = window.scrollX
  const y = window.scrollY
  if (direction === MoveDirection.DOWN) {
    window.scrollTo(x, y + this.step)
  } else if (direction === MoveDirection.UP) {
    window.scrollTo(x, y - this.step)
  } else if (direction === MoveDirection.LEFT) {
    window.scrollTo(x - this.step, y)
  } else {
    window.scrollTo(x + this.step, y)
  }
  this.requestAnimationFrameId = window.requestAnimationFrame(
    this._move.bind(this, direction)
  )
}

private _startMove(direction: MoveDirection) {
  if (this.isMoving) return
  this.isMoving = true
  this._move(direction)
}

```

```
private _stopMove() {  
  if (this.requestAnimationFrameId) {  
    window.cancelAnimationFrame(this.requestAnimationFrameId)  
    this.requestAnimationFrameId = null  
    this.isMoving = false  
  }  
}  
}
```



File Path: canvas-editor/src/editor/core/plugin/Plugin.ts

```
import Editor from '../..'
import { PluginFunction } from '../interface/Plugin'
export class Plugin {
  private editor: Editor
  constructor(editor: Editor) {
    this.editor = editor
  }
  public use<Options>({
    pluginFunction: PluginFunction<Options>,
    options?: Options
  }) {
    pluginFunction(this.editor, options)
  }
}
```

```

File Path: canvas-editor/src/editor/core/position/Position.ts
import { ElementType, RowFlex, VerticalAlign } from '../..'
import { ZERO } from '../dataset/constant/Common'
import { ControlComponent, ImageDisplay } from '../dataset/enum/Control'
import {
  IComputePageRowPositionPayload,
  IComputePageRowPositionResult
} from '../interface/Position'
import { IEditorOption } from '../interface/Editor'
import { IElement, IElementPosition } from '../interface/Element'
import {
  ICurrentPosition,
  IGetPositionByXYPayload,
  IPositionContext
} from '../interface/Position'
import { Draw } from '../draw/Draw'
import { EditorZone } from '../dataset/enum/Editor'

export class Position {
  private cursorPosition: IElementPosition | null
  private positionContext: IPositionContext
  private positionList: IElementPosition[]

  private draw: Draw
  private options: Required<IEditorOption>

  constructor(draw: Draw) {
    this.positionList = []
    this.cursorPosition = null
    this.positionContext = {
      isTable: false,
      isControl: false
    }
    this.draw = draw
    this.options = draw.getOptions()
  }

  public getTablePositionList(
    sourceElementList: IElement[]
  ): IElementPosition[] {
    const { index, trIndex, tdIndex } = this.positionContext
    return (
      sourceElementList[index!].trList[trIndex!].tdList[tdIndex!]
        .positionList || []
    )
  }
}

```

```

    }
}

public getPositionList(): IElementPosition[] {
    return this.positionContext.isTable
        ? this.getTablePositionList(this.draw.getOriginalElementList())
        : this.getOriginalPositionList()
}

public getMainPositionList(): IElementPosition[] {
    return this.positionContext.isTable
        ? this.getTablePositionList(this.draw.getOriginalMainElementList())
        : this.positionList
}

public getOriginalPositionList(): IElementPosition[] {
    const zoneManager = this.draw.getZone()
    if (zoneManager.isHeaderActive()) {
        const header = this.draw.getHeader()
        return header.getPositionList()
    }
    if (zoneManager.isFooterActive()) {
        const footer = this.draw.getFooter()
        return footer.getPositionList()
    }
    return this.positionList
}

public getOriginalMainPositionList(): IElementPosition[] {
    return this.positionList
}

public setPositionList(payload: IElementPosition[]) {
    this.positionList = payload
}

public computePageRowPosition(
    payload: IComputePageRowPositionPayload
): IComputePageRowPositionResult {
    const {
        positionList,
        rowList,
        pageNo,
        startX,
        startY,
        startRowIndex,
        startIndex
    } = payload
    const result: IComputePageRowPositionResult = {
        positionList,
        rowList,
        pageNo,
        startX,
        startY,
        startRowIndex,
        startIndex
    }
    return result
}

```

```

    innerWidthÐ
  } = payloadÐ
  const { scale, tdPadding } = this.optionsÐ
  let x = startXÐ
  let y = startYÐ
  let index = startIndexÐ
  for (let i = 0; i < rowList.length; i++) {Ð
    const curRow = rowList[i]Ð
    // ¸{—ˆLPOyûˆÿ ˆL\EN-0 \ESóÿ Ð
    if (curRow.rowFlex === RowFlex.CENTER) {Ð
      x += (innerWidth - curRow.width) / 2Ð
    } else if (curRow.rowFlex === RowFlex.RIGHT) {Ð
      x += innerWidth - curRow.widthÐ
    }Ð
    // R ˆhT SóyûRˆ-uYQúR ˆhh7_ OM•nÐ
    if (curRow.isList) {Ð
      x += curRow.offsetX || 0Ð
    }Ð
    // _SRMtdb@W(OM•nÐ
    const tablePreX = xÐ
    const tablePreY = yÐ
    for (let j = 0; j < curRow.elementList.length; j++) {Ð
      const element = curRow.elementList[j]Ð
      const metrics = element.metricsÐ
      const offsetY =Ð
        (element.imgDisplay !== ImageDisplay.INLINE &&Ð
          element.type === ElementType.IMAGE) ||Ð
        element.type === ElementType.LATEXÐ
        ? curRow.ascent - metrics.heightÐ
        : curRow.ascentÐ
      const positionItem: IElementPosition = {Ð
        pageNo,Ð
        index,Ð
        value: element.value,Ð
        rowIndex: startRowIndex + i,Ð
        rowNo: i,Ð
        metrics,Ð
        ascent: offsetY,Ð
        lineHeight: curRow.height,Ð
        isFirstLetter: j === 0,Ð
        isLastLetter: j === curRow.elementList.length - 1,Ð
        coordinate: {Ð
          leftTop: [x, y],Ð
          leftBottom: [x, y + curRow.height],Ð
          rightTop: [x + metrics.width, y],Ð
          rightBottom: [x + metrics.width, y + curRow.height]Ð
        }
      }
    }
  }
}

```

```

    }
  }
  positionList.push(positionItem)
  index++
  x += metrics.width
  // {—^hh<Q...QC} OM•n
  if (element.type === ElementType.TABLE) {
    const tdGap = tdPadding * 2
    for (let t = 0; t < element.trList!.length; t++) {
      const tr = element.trList![t]
      for (let d = 0; d < tr.tdList!.length; d++) {
        const td = tr.tdList![d]
        td.positionList = []
        const rowList = td.rowList!
        const drawRowResult = this.computePageRowPosition({
          positionList: td.positionList,
          rowList,
          pageNo,
          startRowIndex: 0,
          startIndex: 0,
          startX: (td.x! + tdPadding) * scale + tablePreX,
          startY: td.y! * scale + tablePreY,
          innerWidth: (td.width! - tdGap) * scale
        })
        // W,vô[ùÿPe¹_
        if (
          td.verticalAlign === VerticalAlign.MIDDLE ||
          td.verticalAlign === VerticalAlign.BOTTOM
        ) {
          const rowsHeight = rowList.reduce(
            (pre, cur) => pre + cur.height,
            0
          )
          const blankHeight = (td.height! - tdGap) * scale - rowsHeight
          const offsetHeight =
            td.verticalAlign === VerticalAlign.MIDDLE
              ? blankHeight / 2
              : blankHeight
          if (Math.floor(offsetHeight) > 0) {
            td.positionList.forEach(tdPosition => {
              const {
                coordinate: { leftTop, leftBottom, rightBottom, rightTop }
              } = tdPosition
              leftTop[1] += offsetHeight
              leftBottom[1] += offsetHeight
              rightBottom[1] += offsetHeight
            })
          }
        }
      }
    }
  }

```

```

        rightTop[1] += offsetHeight
    })
}
}
x = drawRowResult.x
y = drawRowResult.y
}
}
// `bY R YEx0 y
x = tablePreX
y = tablePreY
}
}
x = startX
y += curRow.height
}
return { x, y, index }
}
}
public computePositionList() {
    // •nzzSYOM•nOá`o
    this.positionList = []
    // c kĭ~u^L'j{—
    const innerWidth = this.draw.getInnerWidth()
    const pageRowList = this.draw.getPageRowList()
    const margins = this.draw.getMargins()
    const startX = margins[3]
    // •wYĖOM•nSx~uw _qTÍ
    const header = this.draw.getHeader()
    const extraHeight = header.getExtraHeight()
    const startY = margins[0] + extraHeight
    let startRowIndex = 0
    for (let i = 0; i < pageRowList.length; i++) {
        const rowList = pageRowList[i]
        const startIndex = rowList[0].startIndex
        this.computePageRowPosition({
            positionList: this.positionList,
            rowList,
            pageNo: i,
            startRowIndex,
            startIndex,
            startX,
            startY,
            innerWidth
        })
        startRowIndex += rowList.length
    }
}

```

```

    }
}
}
public setCursorPosition(position: IElementPosition | null) {
    this.cursorPosition = position
}
public getCursorPosition(): IElementPosition | null {
    return this.cursorPosition
}
public getPositionContext(): IPositionContext {
    return this.positionContext
}
public setPositionContext(payload: IPositionContext) {
    this.positionContext = payload
}
public getPositionByXY(payload: IGetPositionByXYPayload): ICurrentPosition {
    const { x, y, isTable } = payload
    let { elementList, positionList } = payload
    if (!elementList) {
        elementList = this.draw.getOriginalElementList()
    }
    if (!positionList) {
        positionList = this.getOriginalPositionList()
    }
    const zoneManager = this.draw.getZone()
    const curPageNo = this.draw.getPageNo()
    const isMainActive = zoneManager.isMainActive()
    const positionNo = isMainActive ? curPageNo : 0
    for (let j = 0; j < positionList.length; j++) {
        const {
            index,
            pageNo,
            isFirstLetter,
            coordinate: { leftTop, rightTop, leftBottom }
        } = positionList[j]
        if (positionNo !== pageNo) continue
        // T}N-QC}
        if (
            leftTop[0] <= x &&
            rightTop[0] >= x &&
            leftTop[1] <= y &&
            leftBottom[1] >= y
        )
    }
}

```

```

) {
  let currentPositionIndex = j
  const element = elementList[j]
  // ^hh<^«T}N-
  if (element.type === ElementType.TABLE) {
    for (let t = 0; t < element.trList!.length; t++) {
      const tr = element.trList![t]
      for (let d = 0; d < tr.tdList.length; d++) {
        const td = tr.tdList[d]
        const tablePosition = this.getPositionByXY({
          x,
          y,
          td,
          tablePosition: positionList[j],
          isTable: true,
          elementList: td.value,
          positionList: td.positionList
        })
        if (~tablePosition.index) {
          const { index: tdValueIndex, hitLineStartIndex } = tablePosition
          const tdValueElement = td.value[tdValueIndex]
          return {
            index,
            isChecked:
              tdValueElement.type === ElementType.CHECKBOX ||
              tdValueElement.controlComponent ===
                ControlComponent.CHECKBOX,
            isControl: tdValueElement.type === ElementType.CONTROL,
            isImage: tablePosition.isImage,
            isDirectHit: tablePosition.isDirectHit,
            isTable: true,
            tdIndex: d,
            trIndex: t,
            tdValueIndex,
            tdId: td.id,
            trId: tr.id,
            tableId: element.id,
            hitLineStartIndex
          }
        }
      }
    }
  }
  // VprGS:WßWGN:T}N-
  if (
    element.type === ElementType.IMAGE ||

```



```

    element.type === ElementType.LATEX
  ) {
    return {
      index: currentPositionIndex,
      isDirectHit: true,
      isImage: true
    }
  }
  if (
    element.type === ElementType.CHECKBOX ||
    element.controlComponent === ControlComponent.CHECKBOX
  ) {
    return {
      index: currentPositionIndex,
      isDirectHit: true,
      isCheckbox: true
    }
  }
  let hitLineStartIndex: number | undefined
  // R$e-f/T&W(e±[WN-•ôRMT
  if (elementList[index].value !== ZERO) {
    const valueWidth = rightTop[0] - leftTop[0]
    if (x < leftTop[0] + valueWidth / 2) {
      currentPositionIndex = j - 1
      if (isFirstLetter) {
        hitLineStartIndex = j
      }
    }
  }
  return {
    hitLineStartIndex,
    index: currentPositionIndex,
    isControl: element.type === ElementType.CONTROL
  }
}
// —^T}N-S:W
let isLastArea = false
let currentPositionIndex = -1
let hitLineStartIndex: number | undefined
// R$e-f/T&W(^hh<Q...
if (isTable) {
  const { scale } = this.options
  const { td, tablePosition } = payload
  if (td && tablePosition) {
    const { leftTop } = tablePosition.coordinate

```

```

const tdX = td.x! * scale + leftTop[0]Đ
const tdY = td.y! * scale + leftTop[1]Đ
const tdWidth = td.width! * scaleĐ
const tdHeight = td.height! * scaleĐ
if (!(tdX < x && x < tdX + tdWidth && tdY < y && y < tdY + tdHeight)) {Đ
    return {Đ
        index: currentPositionIndexĐ
    }Đ
}Đ
}Đ
}Đ
}Đ
// R$e-b@\^Lf/T&[XW(QC} Đ
const lastLetterList = positionList.filter(Đ
    p => p.isLastLetter && p.pageNo === positionNoĐ
)Đ
for (let j = 0; j < lastLetterList.length; j++) {Đ
    const {Đ
        index,Đ
        pageNo,Đ
        coordinate: { leftTop, leftBottom }Đ
    } = lastLetterList[j]Đ
    if (positionNo !== pageNo) continueĐ
    if (y > leftTop[1] && y <= leftBottom[1]) {Đ
        const isHead = x < this.options.margins[3]Đ
        // f/T&W(Y4•èĐ
        if (isHead) {Đ
            const headIndex = positionList.findIndex(Đ
                p => p.pageNo === positionNo && p.rowNo === lastLetterList[j].rowNoĐ
            )Đ
            // Y4•èQC} N:zzQC} eöeà— • N-Đ
            if (~headIndex) {Đ
                if (positionList[headIndex].value === ZERO) {Đ
                    currentPositionIndex = headIndexĐ
                } else {Đ
                    currentPositionIndex = headIndex - 1Đ
                    hitLineStartIndex = headIndexĐ
                }Đ
            } else {Đ
                currentPositionIndex = indexĐ
            }Đ
        } else {Đ
            currentPositionIndex = indexĐ
        }Đ
    }Đ
    isLastArea = trueĐ
    breakĐ
}Đ

```

```

}Ð
if (!isLastArea) {Ð
    // ~uw ^••è•Ýy»~u—b~v•è•Ýy»Ð
    const header = this.draw.getHeader()Ð
    const headerBottomY = header.getHeaderTop() + header.getHeight()Ð
    // ~u• N •è•Ýy»~u—b~v•è•Ýy»Ð
    const footer = this.draw.getFooter()Ð
    const pageHeight = this.draw.getHeight()Ð
    const footerTopY =Ð
        pageHeight - (footer.getFooterBottom() + footer.getHeight())Ð
    // R$e-b@\^OM•nf/T&\^NŽ~uw ~u• S:WßÐ
    if (isMainActive) {Ð
        // ~uw Ÿ _SRMOM•n\ NŽ~uw ^••èOM•nÐ
        if (y < headerBottomY) {Ð
            return {Ð
                index: -1,Ð
                zone: EditorZone.HEADERÐ
            }Ð
        }Ð
        // ~u• Ÿ _SRMOM•nY'NŽ~u• ~v•èOM•nÐ
        if (y > footerTopY) {Ð
            return {Ð
                index: -1,Ð
                zone: EditorZone.FOOTERÐ
            }Ð
        }Ð
    } else {Ð
        // mainS:WßŸ _SRMOM•n\ NŽ~uw ^••èOM•n && Y'NŽ~u• ~v•èOM•nÐ
        if (y <= footerTopY && y >= headerBottomY) {Ð
            return {Ð
                index: -1,Ð
                zone: EditorZone.MAINÐ
            }Ð
        }Ð
    }Ð
    // _SRM~ug T N ^LÐ
    return {Ð
        index:Ð
            lastLetterList[lastLetterList.length - 1]?.index ||Ð
            positionList.length - 1Ð
    }Ð
}Ð
return {Ð
    hitLineStartIndex,Ð
    index: currentPositionIndex,Ð
    isControl: elementList[currentPositionIndex]?.type === ElementType.CONTROLÐ
}

```

```

    }
    }
}

public adjustPositionContext(
    payload: IGetPositionByXYPayload
): ICurrentPosition | null {
    const isReadOnly = this.draw.isReadOnly()
    const positionResult = this.getPositionByXY(payload)
    if (!~positionResult.index) return null
    // yûR"ç$NöQ...Qlh
    if (positionResult.isControl && !isReadOnly) {
        const { index, isTable, trIndex, tdIndex, tdValueIndex } = positionResult
        const control = this.draw.getControl()
        const { newIndex } = control.moveCursor({
            index,
            isTable,
            trIndex,
            tdIndex,
            tdValueIndex
        })
        if (isTable) {
            positionResult.tdValueIndex = newIndex
        } else {
            positionResult.index = newIndex
        }
    }
    const {
        index,
        isCheckbox,
        isControl,
        isTable,
        trIndex,
        tdIndex,
        tdId,
        trId,
        tableId
    } = positionResult
    // ¼•nOM•nN N e±
    this.setPositionContext({
        isTable: isTable || false,
        isCheckbox: isCheckbox || false,
        isControl: isControl || false,
        index,
        trIndex,
        tdIndex,
        tdId,
    })
}

```

```
    trId,␣  
    tableId␣  
  })␣  
  return positionResult␣  
}␣  
}
```

File Path: canvas-editor/src/editor/core/range/RangeManager.ts

```
import { ElementType } from '../..'
import { ZERO } from '../../dataset/constant/Common'
import { TEXTLIKE_ELEMENT_TYPE } from '../../dataset/constant/Element'
import { ControlComponent } from '../../dataset/enum/Control'
import { IEditorOption } from '../../interface/Editor'
import { IElement } from '../../interface/Element'
import { IRange, RangeRowArray, RangeRowMap } from '../../interface/Range'
import { getAnchorElement } from '../../utils/element'
import { Draw } from '../draw/Draw'
import { HistoryManager } from '../history/HistoryManager'
import { Listener } from '../listener/Listener'
import { Position } from '../position/Position'

export class RangeManager {
  private draw: Draw
  private options: Required<IEditorOption>
  private range: IRange
  private listener: Listener
  private position: Position
  private historyManager: HistoryManager

  constructor(draw: Draw) {
    this.draw = draw
    this.options = draw.getOptions()
    this.listener = draw.getListener()
    this.position = draw.getPosition()
    this.historyManager = draw.getHistoryManager()
    this.range = {
      startIndex: -1,
      endIndex: -1
    }
  }

  public getRange(): IRange {
    return this.range
  }

  public clearRange() {
    this.setRange(-1, -1)
  }

  public getIsCollapsed(): boolean {
    const { startIndex, endIndex } = this.range
    return startIndex === endIndex
  }
}
```

```

Ð
public getSelection(): IElement[] | null {Ð
    const { startIndex, endIndex } = this.rangeÐ
    if (startIndex === endIndex) return nullÐ
    const elementList = this.draw.getElementList()Ð
    return elementList.slice(startIndex + 1, endIndex + 1)Ð
}Ð
Ð
public getTextLikeSelection(): IElement[] | null {Ð
    const selection = this.getSelection()Ð
    if (!selection) return nullÐ
    return selection.filter(Ð
        s => !s.type || TEXTLIKE_ELEMENT_TYPE.includes(s.type)Ð
    )Ð
}Ð
Ð
// f·SÖQlh b@• OM•n^LOá`oÐ
public getRangeRow(): RangeRowMap | null {Ð
    const { startIndex, endIndex } = this.rangeÐ
    if (!~startIndex && !~endIndex) return nullÐ
    const positionList = this.position.getPositionList()Ð
    const rangeRow: RangeRowMap = new Map()Ð
    for (let p = startIndex; p < endIndex + 1; p++) {Ð
        const { pageNo, rowNo } = positionList[p]Ð
        const rowSet = rangeRow.get(pageNo)Ð
        if (!rowSet) {Ð
            rangeRow.set(pageNo, new Set([rowNo]))Ð
        } else {Ð
            if (!rowSet.has(rowNo)) {Ð
                rowSet.add(rowNo)Ð
            }Ð
        }Ð
    }Ð
    return rangeRowÐ
}Ð
Ð
// f·SÖ• SÖkμ,,=Oá`oÐ
public getRangeParagraph(): RangeRowArray | null {Ð
    const { startIndex, endIndex } = this.rangeÐ
    if (!~startIndex && !~endIndex) return nullÐ
    const positionList = this.position.getPositionList()Ð
    const elementList = this.draw.getElementList()Ð
    const rangeRow: RangeRowArray = new Map()Ð
    // T N gâb~Ð
    let start = startIndexÐ
    while (start >= 0) {Ð

```

```

const { pageNo, rowNo } = positionList[start]Đ
let rowArray = rangeRow.get(pageNo)Đ
if (!rowArray) {Đ
  rowArray = []Đ
  rangeRow.set(pageNo, rowArray)Đ
}Đ
if (!rowArray.includes(rowNo)) {Đ
  rowArray.unshift(rowNo)Đ
}Đ
if (Đ
  positionList[start]?.value === ZERO ||Đ
  elementList[start].titleId !== elementList[start - 1]?.titleIdĐ
) {Đ
  breakĐ
}Đ
start--Đ
}Đ
// N-•ô• béĐ
if (startIndex !== endIndex) {Đ
  let middle = startIndex + 1Đ
  while (middle < endIndex) {Đ
    const { pageNo, rowNo } = positionList[middle]Đ
    let rowArray = rangeRow.get(pageNo)Đ
    if (!rowArray) {Đ
      rowArray = []Đ
      rangeRow.set(pageNo, rowArray)Đ
    }Đ
    if (!rowArray.includes(rowNo)) {Đ
      rowArray.push(rowNo)Đ
    }Đ
    middle++Đ
  }Đ
}Đ
// T N gâb~Đ
let end = endIndexĐ
while (end < positionList.length) {Đ
  if (Đ
    positionList[end].value === ZERO ||Đ
    elementList[end].titleId !== elementList[end + 1]?.titleIdĐ
  ) {Đ
    breakĐ
  }Đ
  const { pageNo, rowNo } = positionList[end]Đ
  let rowArray = rangeRow.get(pageNo)Đ
  if (!rowArray) {Đ
    rowArray = []Đ

```



```

        rangeRow.set(pageNo, rowArray)Đ
    }Đ
    if (!rowArray.includes(rowNo)) {Đ
        rowArray.push(rowNo)Đ
    }Đ
    end++Đ
}Đ
return rangeRowĐ
}Đ
Đ
// f·SÖ• S:QC} R ^hĐ
public getRangeElementList(): IElement[] | null {Đ
    const { startIndex, endIndex } = this.rangeĐ
    if (!~startIndex && !~endIndex) return nullĐ
    // — %•e9SØv,,QC} R ^hĐ
    const rangeElementList: IElement[] = []Đ
    // • S:~LOá`oĐ
    const rangeRow = this.getRangeParagraph()Đ
    if (!rangeRow) return nullĐ
    const elementList = this.draw.getElementList()Đ
    const positionList = this.position.getPositionList()Đ
    for (let p = 0; p < positionList.length; p++) {Đ
        const position = positionList[p]Đ
        const rowArray = rangeRow.get(position.pageNo)Đ
        if (!rowArray) continueĐ
        if (rowArray.includes(position.rowNo)) {Đ
            rangeElementList.push(elementList[p])Đ
        }Đ
    }Đ
    return rangeElementListĐ
}Đ
Đ
public getIsSelectAll() {Đ
    const elementList = this.draw.getElementList()Đ
    const { startIndex, endIndex } = this.rangeĐ
    return startIndex === 0 && elementList.length - 1 === endIndexĐ
}Đ
Đ
public getIsPointInRange(x: number, y: number): boolean {Đ
    const { startIndex, endIndex } = this.rangeĐ
    const positionList = this.position.getPositionList()Đ
    for (let p = startIndex + 1; p <= endIndex; p++) {Đ
        const {Đ
            coordinate: { leftTop, rightBottom }Đ
        } = positionList[p]Đ
        if (Đ

```

```

        x >= leftTop[0] &&Đ
        x <= rightBottom[0] &&Đ
        y >= leftTop[1] &&Đ
        y <= rightBottom[1]Đ
    ) {Đ
        return trueĐ
    }Đ
}Đ
return falseĐ
}Đ
Đ
public setRange(Đ
    startIndex: number,Đ
    endIndex: number,Đ
    tableId?: string,Đ
    startTdIndex?: number,Đ
    endTdIndex?: number,Đ
    startTrIndex?: number,Đ
    endTrIndex?: numberĐ
) {Đ
    this.range.startIndex = startIndexĐ
    this.range.endIndex = endIndexĐ
    this.range.tableId = tableIdĐ
    this.range.startTdIndex = startTdIndexĐ
    this.range.endTdIndex = endTdIndexĐ
    this.range.startTrIndex = startTrIndexĐ
    this.range.endTrIndex = endTrIndexĐ
    this.range.isCrossRowCol = !(Đ
        startTdIndex ||Đ
        endTdIndex ||Đ
        startTrIndex ||Đ
        endTrIndexĐ
    )Đ
    this.range.zone = this.draw.getZone().getZone()Đ
    // oÀm;c$NöĐ
    const control = this.draw.getControl()Đ
    if (~startIndex && ~endIndex) {Đ
        const elementList = this.draw.getElementList()Đ
        const element = elementList[startIndex]Đ
        if (element?.type === ElementType.CONTROL) {Đ
            control.initControl()Đ
            returnĐ
        }Đ
    }Đ
    control.destroyControl()Đ
}Đ

```

Đ

```
public replaceRange(range: IRange) {Đ
  this.setRange(Đ
    range.startIndex,Đ
    range.endIndex,Đ
    range.tableId,Đ
    range.startTdIndex,Đ
    range.endTdIndex,Đ
    range.startTrIndex,Đ
    range.endTrIndexĐ
  )Đ
}
```

Đ

Đ

Đ

```
public setRangeStyle() {Đ
  if (!this.listener.rangeStyleChange) returnĐ
  // ~Óg_Qlh OM•nĐ
  const { startIndex, endIndex, isCrossRowCol } = this.rangeĐ
  if (!~startIndex && !~endIndex) returnĐ
  let curElement: IElement | nullĐ
  if (isCrossRowCol) {Đ
    // SUQCh<• béNå_SRM^hh<[šOMĐ
    const originalElementList = this.draw.getOriginalElementList()Đ
    const positionContext = this.position.getPositionContext()Đ
    curElement = originalElementList[positionContext.index!]Đ
  } else {Đ
    const index = ~endIndex ? endIndex : 0Đ
    // ^L™—Nå{,N N*—^cb^L{&QC} [šOMĐ
    const elementList = this.draw.getElementList()Đ
    curElement = getAnchorElement(elementList, index)Đ
  }Đ
  if (!curElement) returnĐ
  // • SÖQC} R ^hĐ
  const curElementList = this.getSelection() || [curElement]Đ
  // |{W†Đ
  const type = curElement.type || ElementType.TEXTĐ
  // [le‡g,Đ
  const font = curElement.font || this.options.defaultFontĐ
  const size = curElement.size || this.options.defaultSizeĐ
  const bold = !~curElementList.findIndex(el => !el.bold)Đ
  const italic = !~curElementList.findIndex(el => !el.italic)Đ
  const underline = !~curElementList.findIndex(el => !el.underline)Đ
  const strikeout = !~curElementList.findIndex(el => !el.strikeout)Đ
  const color = curElement.color || nullĐ
  const highlight = curElement.highlight || nullĐ
  const rowFlex = curElement.rowFlex || nullĐ
  const rowMargin = curElement.rowMargin || this.options.defaultRowMarginĐ
}
```

```

const dashArray = curElement.dashArray || []
const level = curElement.level || null
const listType = curElement.listType || null
const listStyle = curElement.listStyle || null
// fÜSU
const painter = !!this.draw.getPainterStyle()
const undo = this.historyManager.isCanUndo()
const redo = this.historyManager.isCanRedo()
this.listener.rangeStyleChange({
  type,
  undo,
  redo,
  painter,
  font,
  size,
  bold,
  italic,
  underline,
  strikeout,
  color,
  highlight,
  rowFlex,
  rowMargin,
  dashArray,
  level,
  listType,
  listStyle
})
}
}
}

public recoveryRangeStyle() {
  if (!this.listener.rangeStyleChange) return
  const font = this.options.defaultFont
  const size = this.options.defaultSize
  const rowMargin = this.options.defaultRowMargin
  const painter = !!this.draw.getPainterStyle()
  const undo = this.historyManager.isCanUndo()
  const redo = this.historyManager.isCanRedo()
  this.listener.rangeStyleChange({
    type: null,
    undo,
    redo,
    painter,
    font,
    size,
    bold: false,

```

```

        italic: false,Ð
        underline: false,Ð
        strikethrough: false,Ð
        color: null,Ð
        highlight: null,Ð
        rowFlex: null,Ð
        rowMargin: Ð
        dashArray: [],Ð
        level: null,Ð
        listType: null,Ð
        listStyle: nullÐ
    })Ð
}Ð
Ð
public shrinkBoundary() {Ð
    const elementList = this.draw.getElementList()Ð
    const range = this.getRange()Ð
    const { startIndex, endIndex } = rangeÐ
    const startElement = elementList[startIndex]Ð
    const endElement = elementList[endIndex]Ð
    if (startIndex === endIndex) {Ð
        if (startElement.controlComponent === ControlComponent.PLACEHOLDER) {Ð
            // b~R0{,N N*placeholder[W{&Ð
            let index = startIndex - 1Ð
            while (index > 0) {Ð
                const preElement = elementList[index]Ð
                if (Ð
                    preElement.controlId !== startElement.controlId ||Ð
                    preElement.controlComponent === ControlComponent.PREFIXÐ
                ) {Ð
                    range.startIndex = indexÐ
                    range.endIndex = indexÐ
                    breakÐ
                }Ð
                index--Ð
            }Ð
        }Ð
    } else {Ð
        // ™—0 \>N:S`OM{&eöy e6•)R0g T N N*RM• [W{&T Ð
        if (Ð
            startElement.controlComponent === ControlComponent.PLACEHOLDER ||Ð
            endElement.controlComponent === ControlComponent.PLACEHOLDERÐ
        ) {Ð
            let index = endIndex - 1Ð
            while (index > 0) {Ð
                const preElement = elementList[index]Ð

```

```

    if (Ð
        preElement.controlId !== endElement.controlId ||Ð
        preElement.controlComponent === ControlComponent.PREFIXÐ
    ) {Ð
        range.startIndex = indexÐ
        range.endIndex = indexÐ
        returnÐ
    }Ð
    index--Ð
}Ð
}Ð
// T Sógåb~R0{,N N*ValueÐ
if (startElement.controlComponent === ControlComponent.PREFIX) {Ð
    let index = startIndex + 1Ð
    while (index < elementList.length) {Ð
        const nextElement = elementList[index]Ð
        if (Ð
            nextElement.controlId !== startElement.controlId ||Ð
            nextElement.controlComponent === ControlComponent.VALUEÐ
        ) {Ð
            range.startIndex = index - 1Ð
            breakÐ
        } else if (Ð
            nextElement.controlComponent === ControlComponent.PLACEHOLDERÐ
        ) {Ð
            range.startIndex = index - 1Ð
            range.endIndex = index - 1Ð
            returnÐ
        }Ð
        index++Ð
    }Ð
}Ð
// T Jægåb~R0{,N N*ValueÐ
if (endElement.controlComponent !== ControlComponent.VALUE) {Ð
    let index = startIndex - 1Ð
    while (index > 0) {Ð
        const preElement = elementList[index]Ð
        if (Ð
            preElement.controlId !== startElement.controlId ||Ð
            preElement.controlComponent === ControlComponent.VALUEÐ
        ) {Ð
            range.startIndex = indexÐ
            breakÐ
        } else if (Ð
            preElement.controlComponent === ControlComponent.PLACEHOLDERÐ
        ) {Ð

```

```
        range.startIndex = index  
        range.endIndex = index  
        return  
    }  
    index--  
}  
  
}  
  
}  
  
}  
  
}  
  
public render(  
    ctx: CanvasRenderingContext2D,  
    x: number,  
    y: number,  
    width: number,  
    height: number  
) {  
    ctx.save()  
    ctx.globalAlpha = this.options.rangeAlpha  
    ctx.fillStyle = this.options.rangeColor  
    ctx.fillRect(x, y, width, height)  
    ctx.restore()  
}  
  
public toString(): string {  
    const selection = this.getSelection()  
    if (!selection) return ""  
    return selection  
        .map(s => s.value)  
        .join("")  
        .replace(new RegExp(ZERO, 'g'), "")  
}  
}
```

```

File Path: canvas-editor/src/editor/core/register/Register.ts
import { IRegisterContextMenu } from '../..interface/contextmenu/ContextMenu'Đ
import { IRegisterShortcut } from '../..interface/shortcut/Shortcut'Đ
import { ContextMenu } from '../contextmenu/ContextMenu'Đ
import { Shortcut } from '../shortcut/Shortcut'Đ
import { I18n } from '../i18n/I18n'Đ
import { ILang } from '../..interface/i18n/I18n'Đ
import { DeepPartial } from '../..interface/Common'Đ
Đ
interface IRegisterPayload {Đ
  contextMenu: ContextMenuĐ
  shortcut: ShortcutĐ
  i18n: I18nĐ
}Đ
Đ
export class Register {Đ
  public contextMenuList: (payload: IRegisterContextMenu[]) => voidĐ
  public shortcutList: (payload: IRegisterShortcut[]) => voidĐ
  public langMap: (locale: string, lang: DeepPartial<ILang>) => voidĐ
  Đ
  constructor(payload: IRegisterPayload) {Đ
    const { contextMenu, shortcut, i18n } = payloadĐ
    this.contextMenuList = contextMenu.registerContextMenuList.bind(contextMenu)Đ
    this.shortcutList = shortcut.registerShortcutList.bind(shortcut)Đ
    this.langMap = i18n.registerLangMap.bind(i18n)Đ
  }Đ
}Đ

```



```

File Path: canvas-editor/src/editor/core/shortcut/Shortcut.ts
import { IRegisterShortcut } from '../interface/shortcut/Shortcut'
import { richtextKeys } from '../keys/richtextKeys'
import { Command } from '../command/Command'
import { Draw } from '../draw/Draw'
import { isMod } from '../utils/hotkey'
import { titleKeys } from '../keys/titleKeys'
import { listKeys } from '../keys/listKeys'
import {
  export class Shortcut {
    private command: Command
    private globalShortcutList: IRegisterShortcut[]
    private agentShortcutList: IRegisterShortcut[]

    constructor(draw: Draw, command: Command) {
      this.command = command
      this.globalShortcutList = []
      this.agentShortcutList = []
      // Q...è_ëcw•
      this._addShortcutList([...richtextKeys, ...titleKeys, ...listKeys])
      // Qh\@_ëcw•
      this._addEvent()
      // ••Vh_ëcw•
      const agentDom = draw.getCursor().getAgentDom()
      agentDom.addEventListener('keydown', this._agentKeydown.bind(this))
    }

    private _addEvent() {
      document.addEventListener('keydown', this._globalKeydown)
    }

    public removeEvent() {
      document.removeEventListener('keydown', this._globalKeydown)
    }

    private _addShortcutList(payload: IRegisterShortcut[]) {
      for (let s = 0; s < payload.length; s++) {
        const shortCut = payload[s]
        if (shortCut.isGlobal) {
          this.globalShortcutList.push(shortCut)
        } else {
          this.agentShortcutList.push(shortCut)
        }
      }
    }
  }
}

```

```

public registerShortcutList(payload: IRegisterShortcut[]) {
  this._addShortcutList(payload)
}
private _globalKeydown = (evt: KeyboardEvent) => {
  if (!this.globalShortcutList.length) return
  this._execute(evt, this.globalShortcutList)
}
private _agentKeydown(evt: KeyboardEvent) {
  if (!this.agentShortcutList.length) return
  this._execute(evt, this.agentShortcutList)
}
private _execute(evt: KeyboardEvent, shortCutList: IRegisterShortcut[]) {
  for (let s = 0; s < shortCutList.length; s++) {
    const shortCut = shortCutList[s]
    if (
      (shortCut.mod
        ? isMod(evt) === !!shortCut.mod
        : evt.ctrlKey === !!shortCut.ctrl &&
          evt.metaKey === !!shortCut.meta) &&
      evt.shiftKey === !!shortCut.shift &&
      evt.altKey === !!shortCut.alt &&
      evt.key === shortCut.key
    ) {
      shortCut.callback(this.command)
      evt.preventDefault()
      break
    }
  }
}

```

File Path: canvas-editor/src/editor/core/shortcut/keys/listKeys.ts

```
import { Command, ListStyle, ListType } from '../..'
import { KeyMap } from '../../dataset/enum/KeyMap'
import { IRegisterShortcut } from '../../interface/shortcut/Shortcut'

export const listKeys: IRegisterShortcut[] = [
  {
    key: KeyMap.I,
    shift: true,
    mod: true,
    callback: (command: Command) => {
      command.executeList(ListType.UL, ListStyle.DISC)
    },
  },
  {
    key: KeyMap.U,
    shift: true,
    mod: true,
    callback: (command: Command) => {
      command.executeList(ListType.OL)
    },
  },
]
```

File Path: canvas-editor/src/editor/core/shortcut/keys/richtextKeys.ts

```
import { Command, RowFlex } from '../..'
import { KeyMap } from '../../dataset/enum/KeyMap'
import { IRegisterShortcut } from '../../interface/shortcut/Shortcut'
import { isApple } from '../utils/ua'

export const richtextKeys: IRegisterShortcut[] = [
  {
    key: KeyMap.X_UPPERCASE,
    ctrl: true,
    shift: true,
    callback: (command: Command) => {
      command.executeStrikeout()
    }
  },
  {
    key: KeyMap.LEFT_BRACKET,
    mod: true,
    callback: (command: Command) => {
      command.executeSizeAdd()
    }
  },
  {
    key: KeyMap.RIGHT_BRACKET,
    mod: true,
    callback: (command: Command) => {
      command.executeSizeMinus()
    }
  },
  {
    key: KeyMap.B,
    mod: true,
    callback: (command: Command) => {
      command.executeBold()
    }
  },
  {
    key: KeyMap.I,
    mod: true,
    callback: (command: Command) => {
      command.executeItalic()
    }
  },
  {
    key: KeyMap.U,
    mod: true,
```

```

    callback: (command: Command) => {
      command.executeUnderline()
    }
  },
  {
    key: isApple ? KeyMap.COMMA : KeyMap.RIGHT_ANGLE_BRACKET,
    mod: true,
    shift: true,
    callback: (command: Command) => {
      command.executeSuperscript()
    }
  },
  {
    key: isApple ? KeyMap.PERIOD : KeyMap.LEFT_ANGLE_BRACKET,
    mod: true,
    shift: true,
    callback: (command: Command) => {
      command.executeSubscript()
    }
  },
  {
    key: KeyMap.L,
    mod: true,
    callback: (command: Command) => {
      command.executeRowFlex(RowFlex.LEFT)
    }
  },
  {
    key: KeyMap.E,
    mod: true,
    callback: (command: Command) => {
      command.executeRowFlex(RowFlex.CENTER)
    }
  },
  {
    key: KeyMap.R,
    mod: true,
    callback: (command: Command) => {
      command.executeRowFlex(RowFlex.RIGHT)
    }
  },
  {
    key: KeyMap.J,
    mod: true,
    callback: (command: Command) => {
      command.executeRowFlex(RowFlex.ALIGNMENT)
    }
  }
}

```

}D  
}D  
]D

File Path: canvas-editor/src/editor/core/shortcut/keys/titleKeys.ts

```
import { Command, TitleLevel } from '../..'
import { KeyMap } from '../../dataset/enum/KeyMap'
import { IRegisterShortcut } from '../../interface/shortcut/Shortcut'

export const titleKeys: IRegisterShortcut[] = [
  {
    key: KeyMap.ZERO,
    alt: true,
    ctrl: true,
    callback: (command: Command) => {
      command.executeTitle(null)
    }
  },
  {
    key: KeyMap.ONE,
    alt: true,
    ctrl: true,
    callback: (command: Command) => {
      command.executeTitle(TitleLevel.FIRST)
    }
  },
  {
    key: KeyMap.TWO,
    alt: true,
    ctrl: true,
    callback: (command: Command) => {
      command.executeTitle(TitleLevel.SECOND)
    }
  },
  {
    key: KeyMap.THREE,
    alt: true,
    ctrl: true,
    callback: (command: Command) => {
      command.executeTitle(TitleLevel.THIRD)
    }
  },
  {
    key: KeyMap.FOUR,
    alt: true,
    ctrl: true,
    callback: (command: Command) => {
      command.executeTitle(TitleLevel.FOURTH)
    }
  }
]
```

```
{␣  
  key: KeyMap.FIVE,␣  
  alt: true,␣  
  ctrl: true,␣  
  callback: (command: Command) => {␣  
    command.executeTitle(TitleLevel.FIFTH)␣  
  }␣  
},␣  
{␣  
  key: KeyMap.SIX,␣  
  alt: true,␣  
  ctrl: true,␣  
  callback: (command: Command) => {␣  
    command.executeTitle(TitleLevel.SIXTH)␣  
  }␣  
}␣  
}␣  
]
```



```

File Path: canvas-editor/src/editor/core/worker/WorkerManager.ts
import { Draw } from '../draw/Draw'
import WordCountWorker from '../works/wordCount?worker&inline'
import CatalogWorker from '../works/catalog?worker&inline'
import { ICatalog } from '../../interface/Catalog'

export class WorkerManager {
  private draw: Draw
  private wordCountWorker: Worker
  private catalogWorker: Worker

  constructor(draw: Draw) {
    this.draw = draw
    this.wordCountWorker = new WordCountWorker()
    this.catalogWorker = new CatalogWorker()
  }

  public getWordCount(): Promise<number> {
    return new Promise((resolve, reject) => {
      this.wordCountWorker.onmessage = evt => {
        resolve(evt.data)
      }
      this.wordCountWorker.onerror = evt => {
        reject(evt)
      }
      const elementList = this.draw.getOriginalMainElementList()
      this.wordCountWorker.postMessage(elementList)
    })
  }

  public getCatalog(): Promise<ICatalog | null> {
    return new Promise((resolve, reject) => {
      this.catalogWorker.onmessage = evt => {
        resolve(evt.data)
      }
      this.catalogWorker.onerror = evt => {
        reject(evt)
      }
      const elementList = this.draw.getOriginalMainElementList()
      this.catalogWorker.postMessage(elementList)
    })
  }
}

```

}D

```

File Path: canvas-editor/src/editor/core/worker/works/catalog.ts
import { ICatalog, ICatalogItem } from '../../../interface/Catalog'
import { IElement } from '../../../interface/Element'

enum ElementType {
  TITLE = 'title'
}

enum TitleLevel {
  FIRST = 'first',
  SECOND = 'second',
  THIRD = 'third',
  FOURTH = 'fourth',
  FIFTH = 'fifth',
  SIXTH = 'sixth'
}

const titleOrderNumberMapping: Record<TitleLevel, number> = {
  [TitleLevel.FIRST]: 1,
  [TitleLevel.SECOND]: 2,
  [TitleLevel.THIRD]: 3,
  [TitleLevel.FOURTH]: 4,
  [TitleLevel.FIFTH]: 5,
  [TitleLevel.SIXTH]: 6
}

const ZERO = '\u200B'

function getCatalog(elementList: IElement[]): ICatalog | null {
  // {}
  const titleElementList: IElement[] = []
  let t = 0
  while (t < elementList.length) {
    const element = elementList[t]
    if (element.titleId) {
      const titleId = element.titleId
      const level = element.level
      const titleElement: IElement = {
        type: ElementType.TITLE,
        value: "",
        level,
        titleId
      }
      const valueList: IElement[] = []
      while (t < elementList.length) {
        const titleE = elementList[t]

```

```

    if (titleId !== titleE.titleId) {
        t--
        break
    }
    valueList.push(titleE)
    t++
}
titleElement.value = valueList
    .map(s => s.value)
    .join("")
    .replace(new RegExp(ZERO, 'g'), '')
titleElementList.push(titleElement)
}
t++
}
if (!titleElementList.length) return null
// gâb~R0kÔg e°QC} Y'v,,h ~eö~Èkb
const recursiveInsert = (title: IElement, catalogItem: ICatalogItem) => {
    const subCatalogItem =
        catalogItem.subCatalog[catalogItem.subCatalog.length - 1]
    const catalogItemLevel = titleOrderNumberMapping[subCatalogItem?.level]
    const titleLevel = titleOrderNumberMapping[title.level!]
    if (subCatalogItem && titleLevel > catalogItemLevel) {
        recursiveInsert(title, subCatalogItem)
    } else {
        catalogItem.subCatalog.push({
            id: title.titleId!,
            name: title.value,
            level: title.level!,
            subCatalog: []
        })
    }
}
// _as~h ~~Ä
// Y,gœ_SRM R ^h~$R+\\ NŽh ~~Äg e°h ~~$R+ÿ R • _Rgâb~g \\ ~$R+^v•ýR
// Y,gœY'NŽÿ R vôc•ýR •ó_SRMh ~~Ä
const catalog: ICatalog = []
for (let e = 0; e < titleElementList.length; e++) {
    const title = titleElementList[e]
    const catalogItem = catalog[catalog.length - 1]
    const catalogItemLevel = titleOrderNumberMapping[catalogItem?.level]
    const titleLevel = titleOrderNumberMapping[title.level!]
    if (catalogItem && titleLevel > catalogItemLevel) {
        recursiveInsert(title, catalogItem)
    } else {
        catalog.push({

```

```
    id: title.titleId!,  
    name: title.value,  
    level: title.level!,  
    subCatalog: []  
  })  
}  
}  
return catalog  
}  
  
onmessage = evt => {  
  const elementList = <IElement[]>evt.data  
  const catalog = getCatalog(elementList)  
  postMessage(catalog)  
}
```

File Path: canvas-editor/src/editor/core/worker/works/wordCount.ts

```
import { IElement } from '../../interface/Element'
enum ElementType {
  TEXT = 'text',
  TABLE = 'table',
  HYPERLINK = 'hyperlink',
  CONTROL = 'control'
}
enum ControlComponent {
  VALUE = 'value'
}
const ZERO = '\u200B'
const WRAP = '\n'
function pickText(elementList: IElement[]): string {
  let text = ''
  let e = 0
  while (e < elementList.length) {
    const element = elementList[e]
    // ^hh<0 •...”pc¥• _RY t
    if (element.type === ElementType.TABLE) {
      if (element.trList) {
        for (let t = 0; t < element.trList.length; t++) {
          const tr = element.trList[t]
          for (let d = 0; d < tr.tdList.length; d++) {
            const td = tr.tdList[d]
            text += pickText(td.value)
          }
        }
      }
    } else if (element.type === ElementType.HYPERLINK) {
      const hyperlinkId = element.hyperlinkId
      const valueList: IElement[] = []
      while (e < elementList.length) {
        const hyperlinkE = elementList[e]
        if (hyperlinkId !== hyperlinkE.hyperlinkId) {
          e--
          break
        }
        delete hyperlinkE.type
        valueList.push(hyperlinkE)
        e++
      }
    }
  }
}
```

```

    text += pickText(valueList)
  } else if (element.type === ElementType.CONTROL) {
    const controlId = element.controlId
    const valueList: IElement[] = []
    while (e < elementList.length) {
      const controlE = elementList[e]
      if (controlId !== controlE.controlId) {
        e--
        break
      }
      if (controlE.controlComponent === ControlComponent.VALUE) {
        delete controlE.type
        valueList.push(controlE)
      }
      e++
    }
    text += pickText(valueList)
  }
  // e.g., "R"
  if (!element.type || element.type === ElementType.TEXT) {
    text += element.value
  }
  e++
}
return text
}
}

function groupText(text: string): string[] {
  const characterList: string[] = []
  // ,ñeþ ep[WetOSR –"N:N N*[Wep
  const numberReg = /[0-9]/
  const letterReg = /[A-Za-z]/
  const blankReg = /\s/
  // for of _as[W{&
  let isPreLetter = false
  let isPreNumber = false
  let compositionText = ""
  // Y t ~ÄT eþg,
  function pushCompositionText() {
    if (compositionText) {
      characterList.push(compositionText)
      compositionText = ""
    }
  }
  for (const t of text) {
    if (letterReg.test(t)) {

```

```

    if (!isPreLetter) {
        pushCompositionText()
    }
    compositionText += t
    isPreLetter = true
    isPreNumber = false
} else if (numberReg.test(t)) {
    if (!isPreNumber) {
        pushCompositionText()
    }
    compositionText += t
    isPreLetter = false
    isPreNumber = true
} else {
    pushCompositionText()
    isPreLetter = false
    isPreNumber = false
    if (!blankReg.test(t)) {
        characterList.push(t)
    }
}
}
pushCompositionText()
return characterList
}
}

onmessage = evt => {
    const elementList = <IElement[]>evt.data
    // cDSÖe†g,
    const originText = pickText(elementList)
    // •Çnäe†g,
    const filterText = originText
        .replace(new RegExp(`^${ZERO}`), "")
        .replace(new RegExp(ZERO, 'g'), WRAP)
    // e†g,R ~Ä
    const textGroup = groupText(filterText)
    postMessage(textGroup.length)
}
}

```



```

File Path: canvas-editor/src/editor/core/zone/Zone.ts
import { EDITOR_PREFIX } from '../dataset/constant/Editor'
import { EditorZone } from '../dataset/enum/Editor'
import { IEditorOption } from '../interface/Editor'
import { nextTick } from '../utils'
import { Draw } from '../draw/Draw'
import { I18n } from '../i18n/I18n'

export class Zone {
  private readonly INDICATOR_PADDING = 2
  private readonly INDICATOR_TITLE_TRANSLATE = [20, 5]

  private draw: Draw
  private options: Required<IEditorOption>
  private i18n: I18n
  private container: HTMLDivElement

  private currentZone: EditorZone
  private indicatorContainer: HTMLDivElement | null

  constructor(draw: Draw) {
    this.draw = draw
    this.i18n = draw.getI18n()
    this.options = draw.getOptions()
    this.container = draw.getContainer()
    this.currentZone = EditorZone.MAIN
    this.indicatorContainer = null
  }

  public isHeaderActive(): boolean {
    return this.getZone() === EditorZone.HEADER
  }

  public isMainActive(): boolean {
    return this.getZone() === EditorZone.MAIN
  }

  public isFooterActive(): boolean {
    return this.getZone() === EditorZone.FOOTER
  }

  public getZone(): EditorZone {
    return this.currentZone
  }

  public setZone(payload: EditorZone) {

```

```

    if (this.currentZone === payload) return
    this.currentZone = payload
    this.draw.getRange().clearRange()
    this.draw.render({
      isSubmitHistory: false,
      isSetCursor: false,
      isCompute: false
    })
    // c y:Vh
    this.drawZoneIndicator()
    // VpOE
    nextTick(() => {
      const listener = this.draw.getListener()
      if (listener.zoneChange) {
        listener.zoneChange(payload)
      }
    })
  }
}
}

public drawZoneIndicator() {
  this._clearZoneIndicator()
  if (!this.isHeaderActive() && !this.isFooterActive()) return
  const { scale } = this.options
  const isHeaderActive = this.isHeaderActive()
  const [offsetX, offsetY] = this.INDICATOR_TITLE_TRANSLATED
  const pageList = this.draw.getPageList()
  const margins = this.draw.getMargins()
  const innerWidth = this.draw.getInnerWidth()
  const pageHeight = this.draw.getHeight()
  const pageGap = this.draw.getPageGap()
  const preY = pageHeight + pageGap
  // R ^ú c y:Vh[Vh
  this.indicatorContainer = document.createElement('div')
  this.indicatorContainer.classList.add(`${EDITOR_PREFIX}-zone-indicator`)
  // c y:VhOM•n
  const header = this.draw.getHeader()
  const footer = this.draw.getFooter()
  const indicatorHeight = isHeaderActive
    ? header.getHeight()
    : footer.getHeight()
  const indicatorTop = isHeaderActive
    ? header.getHeaderTop()
    : pageHeight - footer.getFooterBottom() - indicatorHeight
  for (let p = 0; p < pageList.length; p++) {
    const startY = preY * p + indicatorTop
    const indicatorLeftX = margins[3] - this.INDICATOR_PADDING
  }
}

```

```

const indicatorRightX = margins[3] + innerWidth + this.INDICATOR_PADDING
const indicatorTopY = isHeaderActive
  ? startY - this.INDICATOR_PADDING
  : startY + indicatorHeight + this.INDICATOR_PADDING
const indicatorBottomY = isHeaderActive
  ? startY + indicatorHeight + this.INDICATOR_PADDING
  : startY - this.INDICATOR_PADDING
// h
const indicatorTitle = document.createElement('div')
indicatorTitle.innerText = this.i18n.t(
  `frame.${isHeaderActive ? 'header' : 'footer'}`
)
indicatorTitle.style.top = `${indicatorBottomY}px`
indicatorTitle.style.transform = `translate(${offsetX * scale}px, ${
  offsetY * scale
})px) scale(${scale})`
this.indicatorContainer.append(indicatorTitle)

// N
const lineTop = document.createElement('span')
lineTop.classList.add(`${EDITOR_PREFIX}-zone-indicator-border__top`)
lineTop.style.top = `${indicatorTopY}px`
lineTop.style.width = `${innerWidth}px`
lineTop.style.marginLeft = `${margins[3]}px`
this.indicatorContainer.append(lineTop)

// ]æ
const lineLeft = document.createElement('span')
lineLeft.classList.add(`${EDITOR_PREFIX}-zone-indicator-border__left`)
lineLeft.style.top = `${startY}px`
lineLeft.style.height = `${indicatorHeight}px`
lineLeft.style.left = `${indicatorLeftX}px`
this.indicatorContainer.append(lineLeft)

// N
const lineBottom = document.createElement('span')
lineBottom.classList.add(`${EDITOR_PREFIX}-zone-indicator-border__bottom`)
lineBottom.style.top = `${indicatorBottomY}px`
this.indicatorContainer.append(lineBottom)

// S
const lineRight = document.createElement('span')
lineRight.classList.add(`${EDITOR_PREFIX}-zone-indicator-border__right`)
lineRight.style.top = `${startY}px`
lineRight.style.height = `${indicatorHeight}px`
lineRight.style.left = `${indicatorRightX}px`

```

```
        this.indicatorContainer.append(lineRight)Ð
    }Ð
    this.container.append(this.indicatorContainer)Ð
}Ð
Ð
private _clearZoneIndicator() {Ð
    this.indicatorContainer?.remove()Ð
    this.indicatorContainer = nullÐ
}Ð
}Ð
```

File Path: canvas-editor/src/editor/dataset/constant/Checkbox.ts

```
import { ICheckboxOption } from '../interface/Checkbox'
```

```
export const defaultCheckboxOption: Readonly<Required<ICheckboxOption>> = {
```

```
  width: 14,
```

```
  height: 14,
```

```
  gap: 5,
```

```
  lineWidth: 1,
```

```
  fillStyle: '#5175f4',
```

```
  fontStyle: '#ffffff'
```

```
}
```

File Path: canvas-editor/src/editor/dataset/constant/Common.ts

```
import { MaxHeightRatio } from '../enum/Common'
export const ZERO = '\u200B'
export const WRAP = '\n'
export const HORIZON_TAB = '\t'
export const NBSP = '\u0020'
export const PUNCTUATION_LIST = [
  ',',
  '0',
  ':',
  'ÿ',
  ';',
  'ÿ',
  ':',
  '0',
  ';',
  'ÿ',
  '?',
  'ÿ',
  '!',
  'ÿ'
]
export const maxHeightRadioMapping: Record<MaxHeightRatio, number> = {
  [MaxHeightRatio.HALF]: 1 / 2,
  [MaxHeightRatio.ONE_THIRD]: 1 / 3,
  [MaxHeightRatio.QUARTER]: 1 / 4
}
```

File Path: canvas-editor/src/editor/dataset/constant/ContextMenu.ts  
export const NAME\_PLACEHOLDER = {  
 SELECTED\_TEXT: '%s'  
}

File Path: canvas-editor/src/editor/dataset/constant/Control.ts

```
import { IControlOption } from '../..../interface/Control'
```

```
␣
```

```
export const defaultControlOption: Readonly<Required<IControlOption>> = {␣
```

```
  placeholderColor: '#9c9b9b',␣
```

```
  bracketColor: '#000000',␣
```

```
  prefix: '{',␣
```

```
  postfix: '}'␣
```

```
}␣
```



File Path: canvas-editor/src/editor/dataset/constant/Cursor.ts

```
import { ICursorOption } from '../interface/Cursor'
```

```
export const CURSOR_AGENT_HEIGHT = 12
```

```
export const defaultCursorOption: Readonly<Required<ICursorOption>> = {
```

```
  width: 1,
```

```
  color: '#000000',
```

```
  dragWidth: 2,
```

```
  dragColor: '#0000FF'
```

```
}
```

```
File Path: canvas-editor/src/editor/dataset/constant/Editor.ts
export const EDITOR_COMPONENT = 'editor-component'
export const EDITOR_PREFIX = 'ce'
```

File Path: canvas-editor/src/editor/dataset/constant/Element.ts

```
import { ElementType } from '../enum/Element'
import { IElement } from '../interface/Element'

export const EDITOR_ELEMENT_STYLE_ATTR: Array<keyof IElement> = [
  'bold',
  'color',
  'highlight',
  'font',
  'size',
  'italic',
  'underline',
  'strikeout'
]

export const EDITOR_ELEMENT_COPY_ATTR: Array<keyof IElement> = [
  'type',
  'font',
  'size',
  'bold',
  'color',
  'italic',
  'highlight',
  'underline',
  'strikeout',
  'rowFlex',
  'url',
  'hyperlinkId',
  'dateId',
  'dateFormat'
]

export const EDITOR_ELEMENT_ZIP_ATTR: Array<keyof IElement> = [
  'type',
  'font',
  'size',
  'bold',
  'color',
  'italic',
  'highlight',
  'underline',
  'strikeout',
  'rowFlex',
  'rowMargin',
  'dashArray',
  'trList',
]
```

```

'borderType', ⌀
'width', ⌀
'height', ⌀
'url', ⌀
'colgroup', ⌀
'valueList', ⌀
'control', ⌀
'checkbox', ⌀
'dateFormat', ⌀
'block', ⌀
'level', ⌀
'listType', ⌀
'listStyle', ⌀
'listWrap' ⌀
} ⌀
⌀
export const TABLE_CONTEXT_ATTR: Array<keyof IElement> = [⌀
  'tdId', ⌀
  'trId', ⌀
  'tableId' ⌀
] ⌀
⌀
export const TITLE_CONTEXT_ATTR: Array<keyof IElement> = ['level', 'titleId'] ⌀
⌀
export const LIST_CONTEXT_ATTR: Array<keyof IElement> = [⌀
  'listId', ⌀
  'listType', ⌀
  'listStyle' ⌀
] ⌀
⌀
export const EDITOR_ELEMENT_CONTEXT_ATTR: Array<keyof IElement> = [⌀
  ...TABLE_CONTEXT_ATTR, ⌀
  ...TITLE_CONTEXT_ATTR, ⌀
  ...LIST_CONTEXT_ATTR ⌀
] ⌀
⌀
export const TEXTLIKE_ELEMENT_TYPE: ElementType[] = [⌀
  ElementType.TEXT, ⌀
  ElementType.HYPERLINK, ⌀
  ElementType.SUBSCRIPT, ⌀
  ElementType.SUPERSCRIPT, ⌀
  ElementType.CONTROL, ⌀
  ElementType.DATE ⌀
] ⌀
⌀
export const INLINE_ELEMENT_TYPE: ElementType[] = [⌀

```

```
ElementType.BLOCK,␣
ElementType.PAGE_BREAK,␣
ElementType.SEPARATOR,␣
ElementType.TABLE␣
}␣
␣
export const INLINE_NODE_NAME: string[] = ['HR', 'TABLE', 'UL', 'OL']␣
␣
export const VIRTUAL_ELEMENT_TYPE: ElementType[] = [␣
  ElementType.TITLE,␣
  ElementType.LIST␣
]␣
```

```
File Path: canvas-editor/src/editor/dataset/constant/Footer.ts
import { IFooter } from '../..interface/Footer'
import { MaxHeightRatio } from '../enum/Common'
export const defaultFooterOption: Readonly<Required<IFooter>> = {
  bottom: 30,
  maxHeightRadio: MaxHeightRatio.HALF,
  disabled: false
}
```

```
File Path: canvas-editor/src/editor/dataset/constant/Header.ts
import { IHeader } from '../interface/Header'
import { MaxHeightRatio } from '../enum/Common'
export const defaultHeaderOption: Readonly<Required<IHeader>> = {
  top: 30,
  maxHeightRadio: MaxHeightRatio.HALF,
  disabled: false
}
```

```
File Path: canvas-editor/src/editor/dataset/constant/List.ts
import { ListStyle, ListType, UIStyle } from '../enum/List'
export const ulStyleMapping: Record<UIStyle, string> = {
  [UIStyle.DISC]: '•',
  [UIStyle.CIRCLE]: '◉',
  [UIStyle.SQUARE]: '◻'
}
export const listTypeElementMapping: Record<ListType, string> = {
  [ListType.OL]: 'ol',
  [ListType.UL]: 'ul'
}
export const listStyleCSSMapping: Record<ListStyle, string> = {
  [ListStyle.DISC]: 'disc',
  [ListStyle.CIRCLE]: 'circle',
  [ListStyle.SQUARE]: 'square',
  [ListStyle.DECIMAL]: 'decimal'
}
```



File Path: canvas-editor/src/editor/dataset/constant/PageNumber.ts

```
import { IPageNumber } from '../..interface/PageNumber'
import { NumberType } from '../enum/Common'
import { RowFlex } from '../enum/Row'

export const FORMAT_PLACEHOLDER = {
  PAGE_NO: '{pageNo}',
  PAGE_COUNT: '{pageCount}'
}

export const defaultPageNumberOption: Readonly<Required<IPageNumber>> = {
  bottom: 60,
  size: 12,
  font: 'Yahei',
  color: '#000000',
  rowFlex: RowFlex.CENTER,
  format: FORMAT_PLACEHOLDER.PAGE_NO,
  numberType: NumberType.ARABIC,
  disabled: false,
  startPageNo: 1,
  fromPageNo: 0
}
```

File Path: canvas-editor/src/editor/dataset/constant/Placeholder.ts

```
import { IPlaceholder } from '../interface/Placeholder'
```

```
␣
```

```
export const defaultPlaceholderOption: Readonly<Required<IPlaceholder>> = {␣
```

```
  data: '',␣
```

```
  color: '#DCDFE6',␣
```

```
  opacity: 1,␣
```

```
  size: 16,␣
```

```
  font: 'Yahei'␣
```

```
}␣
```

File Path: canvas-editor/src/editor/dataset/constant/Regular.ts

```
export const NUMBER_REG = /[0-9]/
```

```
export const LETTER_REG = /[a-zA-Z]/
```

```
export const NUMBER_LIKE_REG = /[0-9.]/
```

```
export const CHINESE_REG = /[\u4e00-\u9fa5]/
```

```
export const WORD_LIKE_REG = /^[a-zA-Z][a-zA-Z]/
```

File Path: canvas-editor/src/editor/dataset/constant/Title.ts

```
import { ITitleOption, ITitleSizeOption } from '../..interface/Title'ð
```

```
import { TitleLevel } from '../enum/Title'ð
```

```
ð
```

```
export const defaultTitleOption: Readonly<Required<ITitleOption>> = {ð
```

```
  defaultFirstSize: 26,ð
```

```
  defaultSecondSize: 24,ð
```

```
  defaultThirdSize: 22,ð
```

```
  defaultFourthSize: 20,ð
```

```
  defaultFifthSize: 18,ð
```

```
  defaultSixthSize: 16ð
```

```
}ð
```

```
ð
```

```
export const titleSizeMapping: Record<TitleLevel, keyof ITitleSizeOption> = {ð
```

```
  [TitleLevel.FIRST]: 'defaultFirstSize',ð
```

```
  [TitleLevel.SECOND]: 'defaultSecondSize',ð
```

```
  [TitleLevel.THIRD]: 'defaultThirdSize',ð
```

```
  [TitleLevel.FOURTH]: 'defaultFourthSize',ð
```

```
  [TitleLevel.FIFTH]: 'defaultFifthSize',ð
```

```
  [TitleLevel.SIXTH]: 'defaultSixthSize'ð
```

```
}ð
```

```
ð
```

```
export const titleOrderNumberMapping: Record<TitleLevel, number> = {ð
```

```
  [TitleLevel.FIRST]: 1,ð
```

```
  [TitleLevel.SECOND]: 2,ð
```

```
  [TitleLevel.THIRD]: 3,ð
```

```
  [TitleLevel.FOURTH]: 4,ð
```

```
  [TitleLevel.FIFTH]: 5,ð
```

```
  [TitleLevel.SIXTH]: 6ð
```

```
}ð
```

```
ð
```

```
export const titleNodeNameMapping: Record<string, TitleLevel> = {ð
```

```
  H1: TitleLevel.FIRST,ð
```

```
  H2: TitleLevel.SECOND,ð
```

```
  H3: TitleLevel.THIRD,ð
```

```
  H4: TitleLevel.FOURTH,ð
```

```
  H5: TitleLevel.FIFTH,ð
```

```
  H6: TitleLevel.SIXTHð
```

```
}ð
```

File Path: canvas-editor/src/editor/dataset/constant/Watermark.ts

```
import { IWatermark } from '../..interface/Watermark'
```

```
export const defaultWatermarkOption: Readonly<Required<IWatermark>> = {
```

```
  data: '',
```

```
  color: '#AEB5C0',
```

```
  opacity: 0.3,
```

```
  size: 200,
```

```
  font: 'Yahei'
```

```
};
```

File Path: canvas-editor/src/editor/dataset/enum/Block.ts

```
export enum BlockType {
```

```
  IFRAME = 'iframe',
```

```
  VIDEO = 'video'
```

```
};
```

File Path: canvas-editor/src/editor/dataset/enum/Common.ts

```
export enum MaxHeightRatio {
```

```
  HALF = 'half',
```

```
  ONE_THIRD = 'one-third',
```

```
  QUARTER = 'quarter'
```

```
} 
```

```
export enum NumberType {
```

```
  ARABIC = 'arabic',
```

```
  CHINESE = 'chinese'
```

```
} 
```

File Path: canvas-editor/src/editor/dataset/enum/Control.ts

```
export enum ControlType {  
  TEXT = 'text',  
  SELECT = 'select',  
  CHECKBOX = 'checkbox'  
}  
  
export enum ControlComponent {  
  PREFIX = 'prefix',  
  POSTFIX = 'postfix',  
  PLACEHOLDER = 'placeholder',  
  VALUE = 'value',  
  CHECKBOX = 'checkbox'  
}  
  
export enum ImageDisplay {  
  INLINE = 'inline',  
  BLOCK = 'block'  
}
```



File Path: canvas-editor/src/editor/dataset/enum/Editor.ts

```
export enum EditorComponent {  
  COMPONENT = 'component',  
  MENU = 'menu',  
  MAIN = 'main',  
  FOOTER = 'footer',  
  CONTEXTMENU = 'contextmenu',  
  POPUP = 'popup',  
  CATALOG = 'catalog'  
}  
  
export enum EditorContext {  
  PAGE = 'page',  
  TABLE = 'table'  
}  
  
export enum EditorMode {  
  EDIT = 'edit',  
  CLEAN = 'clean',  
  READONLY = 'readonly'  
}  
  
export enum EditorZone {  
  HEADER = 'header',  
  MAIN = 'main',  
  FOOTER = 'footer'  
}  
  
export enum PageMode {  
  PAGING = 'paging',  
  CONTINUITY = 'continuity'  
}  
  
export enum PaperDirection {  
  VERTICAL = 'vertical',  
  HORIZONTAL = 'horizontal'  
}  
  
export enum WordBreak {  
  BREAK_ALL = 'break-all',  
  BREAK_WORD = 'break-word'  
}
```

File Path: canvas-editor/src/editor/dataset/enum/Element.ts

```
export enum ElementType {  
  TEXT = 'text',  
  IMAGE = 'image',  
  TABLE = 'table',  
  HYPERLINK = 'hyperlink',  
  SUPERScript = 'superscript',  
  SUBSCRIPT = 'subscript',  
  SEPARATOR = 'separator',  
  PAGE_BREAK = 'pageBreak',  
  CONTROL = 'control',  
  CHECKBOX = 'checkbox',  
  LATEX = 'latex',  
  TAB = 'tab',  
  DATE = 'date',  
  BLOCK = 'block',  
  TITLE = 'title',  
  LIST = 'list',  
}
```

File Path: canvas-editor/src/editor/dataset/enum/ElementStyle.ts

```
export enum ElementStyleKey {
```

```
  font = 'font',
```

```
  size = 'size',
```

```
  width = 'width',
```

```
  height = 'height',
```

```
  bold = 'bold',
```

```
  color = 'color',
```

```
  highlight = 'highlight',
```

```
  italic = 'italic',
```

```
  underline = 'underline',
```

```
  strikeout = 'strikeout'
```

```
};
```

File Path: canvas-editor/src/editor/dataset/enum/Event.ts

```
export enum MouseEventButton {
```

```
  LEFT = 0,
```

```
  CENTER = 1,
```

```
  RIGHT = 2
```

```
};
```

File Path: canvas-editor/src/editor/dataset/enum/KeyMap.ts

```
export enum KeyMap {  
  Delete = 'Delete',  
  Backspace = 'Backspace',  
  Enter = 'Enter',  
  Left = 'ArrowLeft',  
  Right = 'ArrowRight',  
  Up = 'ArrowUp',  
  Down = 'ArrowDown',  
  ESC = 'Escape',  
  TAB = 'Tab',  
  META = 'Meta',  
  LEFT_BRACKET = '[',  
  RIGHT_BRACKET = ']',  
  COMMA = ',',  
  PERIOD = '.',  
  LEFT_ANGLE_BRACKET = '<',  
  RIGHT_ANGLE_BRACKET = '>',  
  EQUAL = '=',  
  MINUS = '-',  
  PLUS = '+',  
  A = 'a',  
  B = 'b',  
  C = 'c',  
  D = 'd',  
  E = 'e',  
  F = 'f',  
  G = 'g',  
  H = 'h',  
  I = 'i',  
  J = 'j',  
  K = 'k',  
  L = 'l',  
  M = 'm',  
  N = 'n',  
  O = 'o',  
  P = 'p',  
  Q = 'q',  
  R = 'r',  
  S = 's',  
  T = 't',  
  U = 'u',  
  V = 'v',  
  W = 'w',  
  X = 'x',  
  Y = 'y',  
}
```

```
Z = 'z',Ð
A_UPPERCASE = 'A',Ð
B_UPPERCASE = 'B',Ð
C_UPPERCASE = 'C',Ð
D_UPPERCASE = 'D',Ð
E_UPPERCASE = 'E',Ð
F_UPPERCASE = 'F',Ð
G_UPPERCASE = 'G',Ð
H_UPPERCASE = 'H',Ð
I_UPPERCASE = 'I',Ð
J_UPPERCASE = 'J',Ð
K_UPPERCASE = 'K',Ð
L_UPPERCASE = 'L',Ð
M_UPPERCASE = 'M',Ð
N_UPPERCASE = 'N',Ð
O_UPPERCASE = 'O',Ð
P_UPPERCASE = 'P',Ð
Q_UPPERCASE = 'Q',Ð
R_UPPERCASE = 'R',Ð
S_UPPERCASE = 'S',Ð
T_UPPERCASE = 'T',Ð
U_UPPERCASE = 'U',Ð
V_UPPERCASE = 'V',Ð
W_UPPERCASE = 'W',Ð
X_UPPERCASE = 'X',Ð
Y_UPPERCASE = 'Y',Ð
Z_UPPERCASE = 'Z',Ð
ZERO = '0',Ð
ONE = '1',Ð
TWO = '2',Ð
THREE = '3',Ð
FOUR = '4',Ð
FIVE = '5',Ð
SIX = '6',Ð
SEVEN = '7',Ð
EIGHT = '8',Ð
NINE = '9'Ð
}Ð
```

File Path: canvas-editor/src/editor/dataset/enum/List.ts

```
export enum ListType {  
  UL = 'ul',  
  OL = 'ol'  
}  
  
export enum UIStyle {  
  DISC = 'disc', // [ž_ÁW p¹  
  CIRCLE = 'circle', // zz_ÁW p¹  
  SQUARE = 'square' // [ž_Áe¹WW  
}  
  
export enum OIStyle {  
  DECIMAL = 'decimal' // -?bÉO/ep[W  
}  
  
export enum ListStyle {  
  DISC = UIStyle.DISC,  
  CIRCLE = UIStyle.CIRCLE,  
  SQUARE = UIStyle.SQUARE,  
  DECIMAL = OIStyle.DECIMAL  
}
```

File Path: canvas-editor/src/editor/dataset/enum/Observer.ts

```
export enum MoveDirection {
```

```
  UP = 'top',
```

```
  DOWN = 'down',
```

```
  LEFT = 'left',
```

```
  RIGHT = 'right'
```

```
};
```



File Path: canvas-editor/src/editor/dataset/enum/Row.ts

```
export enum RowFlex {  
  LEFT = 'left',  
  CENTER = 'center',  
  RIGHT = 'right',  
  ALIGNMENT = 'alignment'  
}
```

File Path: canvas-editor/src/editor/dataset/enum/Title.ts

```
export enum TitleLevel {
```

```
  FIRST = 'first',
```

```
  SECOND = 'second',
```

```
  THIRD = 'third',
```

```
  FOURTH = 'fourth',
```

```
  FIFTH = 'fifth',
```

```
  SIXTH = 'sixth'
```

```
};
```

File Path: canvas-editor/src/editor/dataset/enum/VerticalAlign.ts

```
export enum VerticalAlign {
```

```
  TOP = 'top',
```

```
  MIDDLE = 'middle',
```

```
  BOTTOM = 'bottom'
```

```
};
```

File Path: canvas-editor/src/editor/dataset/enum/table/Table.ts

```
export enum TableBorder {
```

```
  ALL = 'all',
```

```
  EMPTY = 'empty',
```

```
  EXTERNAL = 'external'
```

```
};
```

File Path: canvas-editor/src/editor/dataset/enum/table/TableTool.ts

```
export enum TableOrder {
```

```
  ROW = 'row',
```

```
  COL = 'col'
```

```
}
```

File Path: canvas-editor/src/editor/index.ts

```
import './assets/css/index.css'
import { IEditorData, IEditorOption, IEditorResult } from './interface/Editor'
import { IElement } from './interface/Element'
import { Draw } from './core/draw/Draw'
import { Command } from './core/command/Command'
import { CommandAdapt } from './core/command/CommandAdapt'
import { Listener } from './core/listener/Listener'
import { RowFlex } from './dataset/enum/Row'
import { ElementType } from './dataset/enum/Element'
import { formatElementList } from './utils/element'
import { Register } from './core/register/Register'
import { ContextMenu } from './core/contextmenu/ContextMenu'
import {
  IContextMenuContext,
  IRegisterContextMenu
} from './interface/contextmenu/ContextMenu'
import {
  EditorComponent,
  EditorZone,
  EditorMode,
  PageMode,
  PaperDirection,
  WordBreak
} from './dataset/enum/Editor'
import { EDITOR_COMPONENT } from './dataset/constant/Editor'
import { IHeader } from './interface/Header'
import { IWatermark } from './interface/Watermark'
import { defaultHeaderOption } from './dataset/constant/Header'
import { defaultWatermarkOption } from './dataset/constant/Watermark'
import { ControlType, ImageDisplay } from './dataset/enum/Control'
import { defaultControlOption } from './dataset/constant/Control'
import { IControlOption } from './interface/Control'
import { ICheckboxOption } from './interface/Checkbox'
import { defaultCheckboxOption } from './dataset/constant/Checkbox'
import { DeepRequired } from './interface/Common'
import { INavigateInfo } from './core/draw/interactive/Search'
import { Shortcut } from './core/shortcut/Shortcut'
import { KeyMap } from './dataset/enum/KeyMap'
import { BlockType } from './dataset/enum/Block'
import { IBlock } from './interface/Block'
import { ILang } from './interface/i18n/i18n'
import { ICursorOption } from './interface/Cursor'
import { defaultCursorOption } from './dataset/constant/Cursor'
import { IPageNumber } from './interface/PageNumber'
import { defaultPageNumberOption } from './dataset/constant/PageNumber'
```

```

import { VerticalAlign } from './dataset/enum/VerticalAlign'Đ
import { TableBorder } from './dataset/enum/table/Table'Đ
import { IFooter } from './interface/Footer'Đ
import { defaultFooterOption } from './dataset/constant/Footer'Đ
import { MaxHeightRatio, NumberType } from './dataset/enum/Common'Đ
import { ITitleOption } from './interface/Title'Đ
import { defaultTitleOption } from './dataset/constant/Title'Đ
import { TitleLevel } from './dataset/enum/Title'Đ
import { ListStyle, ListType } from './dataset/enum/List'Đ
import { ICatalog, ICatalogItem } from './interface/Catalog'Đ
import { IPlaceholder } from './interface/Placeholder'Đ
import { defaultPlaceholderOption } from './dataset/constant/Placeholder'Đ
import { Plugin } from './core/plugin/Plugin'Đ
import { UsePlugin } from './interface/Plugin'Đ
Đ
export default class Editor {Đ
  public command: CommandĐ
  public listener: ListenerĐ
  public register: RegisterĐ
  public destroy: () => voidĐ
  public use: UsePluginĐ
Đ
  constructor(Đ
    container: HTMLDivElement,Đ
    data: IEditorData | IElement[],Đ
    options: IEditorOption = {}Đ
  ) {Đ
    const headerOptions: Required<IHeader> = {Đ
      ...defaultHeaderOption,Đ
      ...options.headerĐ
    }Đ
    const footerOptions: Required<IFooter> = {Đ
      ...defaultFooterOption,Đ
      ...options.footerĐ
    }Đ
    const pageNumberOptions: Required<IPageNumber> = {Đ
      ...defaultPageNumberOption,Đ
      ...options.pageNumberĐ
    }Đ
    const waterMarkOptions: Required<IWatermark> = {Đ
      ...defaultWatermarkOption,Đ
      ...options.watermarkĐ
    }Đ
    const controlOptions: Required<IControlOption> = {Đ
      ...defaultControlOption,Đ
      ...options.controlĐ
    }
  }
}

```

```

    }
    const checkboxOptions: Required<ICheckboxOption> = {
      ...defaultCheckboxOption,
      ...options.checkbox
    }
    const cursorOptions: Required<ICursorOption> = {
      ...defaultCursorOption,
      ...options.cursor
    }
    const titleOptions: Required<ITitleOption> = {
      ...defaultTitleOption,
      ...options.title
    }
    const placeholderOptions: Required<IPlaceholder> = {
      ...defaultPlaceholderOption,
      ...options.placeholder
    }
    const editorOptions: DeepRequired<IEditorOption> = {
      mode: EditorMode.EDIT,
      defaultType: 'TEXT',
      defaultFont: 'Yahei',
      defaultSize: 16,
      minSize: 5,
      maxSize: 72,
      defaultRowMargin: 1,
      defaultBasicRowMarginHeight: 8,
      defaultTabWidth: 32,
      width: 794,
      height: 1123,
      scale: 1,
      pageGap: 20,
      underlineColor: '#000000',
      strikeoutColor: '#FF0000',
      rangeAlpha: 0.6,
      rangeColor: '#AECBFA',
      rangeMinWidth: 5,
      searchMatchAlpha: 0.6,
      searchMatchColor: '#FFFF00',
      searchNavigateMatchColor: '#AAD280',
      highlightAlpha: 0.6,
      resizerColor: '#4182D9',
      resizerSize: 5,
      marginIndicatorSize: 35,
      marginIndicatorColor: '#BABABA',
      margins: [100, 120, 100, 120],
    }

```



```

pageMode: PageMode.PAGING,Đ
tdPadding: 5,Đ
defaultTrMinHeight: 40,Đ
defaultColMinWidth: 40,Đ
defaultHyperlinkColor: '#0000FF',Đ
paperDirection: PaperDirection.VERTICAL,Đ
inactiveAlpha: 0.6,Đ
historyMaxRecordCount: 100,Đ
wordBreak: WordBreak.BREAK_WORD,Đ
printPixelRatio: 3,Đ
...options,Đ
header: headerOptions,Đ
footer: footerOptions,Đ
pageNumber: pageNumberOptions,Đ
watermark: waterMarkOptions,Đ
control: controlOptions,Đ
checkbox: checkboxOptions,Đ
cursor: cursorOptions,Đ
title: titleOptions,Đ
placeholder: placeholderOptionsĐ
}Đ
// epcnY t Đ
let headerElementList: IElement[] = []Đ
let mainElementList: IElement[] = []Đ
let footerElementList: IElement[] = []Đ
if (Array.isArray(data)) {Đ
  mainElementList = dataĐ
} else {Đ
  headerElementList = data.header || []Đ
  mainElementList = data.mainĐ
  footerElementList = data.footer || []Đ
}Đ
const pageComponentData = [Đ
  headerElementList,Đ
  mainElementList,Đ
  footerElementListĐ
]Đ
pageComponentData.forEach(elementList => {Đ
  formatElementList(elementList, {Đ
    editorOptionsĐ
  })Đ
})Đ
// vÑT,Đ
this.listener = new Listener()Đ
// T/R"Đ
const draw = new Draw(Đ

```

```

    container,Ð
    editorOptions,Ð
    {Ð
        header: headerElementList,Ð
        main: mainElementList,Ð
        footer: footerElementListÐ
    },Ð
    this.listenerÐ
)Ð
// T}NäÐ
this.command = new Command(new CommandAdapt(draw))Ð
// fÜSUÐ
const contextMenu = new ContextMenu(draw, this.command)Ð
// _ëcw•.Ð
const shortcut = new Shortcut(draw, this.command)Ð
// lèQCEÐ
this.register = new Register({Ð
    contextMenu,Ð
    shortcut,Ð
    i18n: draw.getI18n()Ð
})Ð
// lèQCE• kÁe'lÖÐ
this.destroy = () => {Ð
    draw.destroy()Ð
    shortcut.removeEvent()Ð
    contextMenu.removeEvent()Ð
}Ð
// cÖNöÐ
const plugin = new Plugin(this)Ð
this.use = plugin.use.bind(plugin)Ð
}Ð
}Ð
Ð
// [ùY [ùCEaÐ
export {Ð
    Editor,Ð
    RowFlex,Ð
    VerticalAlign,Ð
    EditorZone,Ð
    EditorMode,Ð
    ElementType,Ð
    ControlType,Ð
    EditorComponent,Ð
    EDITOR_COMPONENT,Ð
    PageMode,Ð
    ImageDisplay,Ð

```

```
Command,Ð
KeyMap,Ð
BlockType,Ð
PaperDirection,Ð
TableBorder,Ð
MaxHeightRatio,Ð
NumberType,Ð
TitleLevel,Ð
ListType,Ð
ListStyle,Ð
WordBreakÐ
}Ð
Ð
// [ùY |{W«Ð
export type {Ð
    IElement,Ð
    IEditorData,Ð
    IEditorOption,Ð
    IEditorResult,Ð
    IContextMenuContext,Ð
    IRegisterContextMenu,Ð
    IWatermark,Ð
    INavigateInfo,Ð
    IBlock,Ð
    ILang,Ð
    ICatalog,Ð
    ICatalogItemÐ
}Ð
```

File Path: canvas-editor/src/editor/interface/Block.ts

```
import { BlockType } from '../dataset/enum/Block'
```

```
{
```

```
  export interface IFrameBlock {
```

```
    src: string
```

```
  }
```

```
}
```

```
export interface IVideoBlock {
```

```
  src: string
```

```
}
```

```
}
```

```
export interface IBlock {
```

```
  type: BlockType
```

```
  iframeBlock?: IFrameBlock
```

```
  videoBlock?: IVideoBlock
```

```
}
```

File Path: canvas-editor/src/editor/interface/Catalog.ts

```
import { TitleLevel } from '../dataset/enum/Title'
```

```
{
```

```
  export interface ICatalogItem {
```

```
    id: string
```

```
    name: string
```

```
    level: TitleLevel
```

```
    subCatalog: ICatalogItem[]
```

```
  }
```

```
}
```

```
export type ICatalog = ICatalogItem[]
```

File Path: canvas-editor/src/editor/interface/Checkbox.ts

```
export interface ICheckbox {
```

```
  value: boolean | null
```

```
  code?: string
```

```
  disabled?: boolean
```

```
}
```

```
export interface ICheckboxOption {
```

```
  width?: number
```

```
  height?: number
```

```
  gap?: number
```

```
  lineWidth?: number
```

```
  fillStyle?: string
```

```
  fontStyle?: string
```

```
}
```

File Path: canvas-editor/src/editor/interface/Common.ts

export type Primitive =

- | string
- | number
- | boolean
- | bigint
- | symbol
- | undefined
- | null

export type Builtin = Primitive | Function | Date | Error | RegExp

export type DeepRequired<T> = T extends Error

  ? Required<T>

  : T extends Builtin

  ? T

  : T extends Map<infer K, infer V>

  ? Map<DeepRequired<K>, DeepRequired<V>>

  : T extends ReadonlyMap<infer K, infer V>

  ? ReadonlyMap<DeepRequired<K>, DeepRequired<V>>

  : T extends WeakMap<infer K, infer V>

  ? WeakMap<DeepRequired<K>, DeepRequired<V>>

  : T extends Set<infer U>

  ? Set<DeepRequired<U>>

  : T extends ReadonlySet<infer U>

  ? ReadonlySet<DeepRequired<U>>

  : T extends WeakSet<infer U>

  ? WeakSet<DeepRequired<U>>

  : T extends Promise<infer U>

  ? Promise<DeepRequired<U>>

  : T extends {}

  ? { [K in keyof T]-?: DeepRequired<T[K]> }

  : Required<T>

export type DeepPartial<T> = {

  [P in keyof T]?: DeepPartial<T[P]>

}

File Path: canvas-editor/src/editor/interface/Control.ts

```
import { ControlType } from '../dataset/enum/Control'
```

```
import { ICheckbox } from './Checkbox'
```

```
import { IElement } from './Element'
```

```
{
```

```
  export interface IValueSet {
```

```
    value: string
```

```
    code: string
```

```
  }
```

```
}
```

```
  export interface IControlSelect {
```

```
    code: string | null
```

```
    valueSets: IValueSet[]
```

```
  }
```

```
}
```

```
  export interface IControlCheckbox {
```

```
    code: string | null
```

```
    min?: number
```

```
    max?: number
```

```
    valueSets: IValueSet[]
```

```
    checkbox?: ICheckbox
```

```
  }
```

```
}
```

```
  export interface IControlBasic {
```

```
    type: ControlType
```

```
    value: IElement[] | null
```

```
    placeholder?: string
```

```
    conceptId?: string
```

```
    prefix?: string
```

```
    postfix?: string
```

```
  }
```

```
}
```

```
  export type IControl = IControlBasic &
```

```
    Partial<IControlSelect> &
```

```
    Partial<IControlCheckbox>
```

```
  }
```

```
  export interface IControlOption {
```

```
    placeholderColor?: string
```

```
    bracketColor?: string
```

```
    prefix?: string
```

```
    postfix?: string
```

```
  }
```

```
}
```

```
  export interface IControlInitOption {
```

```
    index: number
```

```
    isTable?: boolean
```



```
    trIndex?: number;
    tdIndex?: number;
    tdValueIndex?: number;
  };
  export interface IControlInitResult {
    newIndex: number;
  };
  export interface IControlInstance {
    getElement(): IElement;
    getValue(): IElement[];
    setValue(data: IElement[]): number;
    keydown(evt: KeyboardEvent): number;
    cut(): number;
  };
}
```

File Path: canvas-editor/src/editor/interface/Cursor.ts

```
export interface ICursorOption {
```

```
  width?: number
```

```
  color?: string
```

```
  dragWidth?: number
```

```
  dragColor?: string
```

```
}
```

```
File Path: canvas-editor/src/editor/interface/Draw.ts
import { EditorZone } from '../dataset/enum/Editor'
import { IElement, IElementPosition } from './Element'
import { IRow } from './Row'

export interface IDrawOption {
  curlIndex?: number
  isSetCursor?: boolean
  isSubmitHistory?: boolean
  isCompute?: boolean
  isLazy?: boolean
}

export interface IDrawImagePayload {
  width: number
  height: number
  value: string
}

export interface IDrawRowPayload {
  elementList: IElement[]
  positionList: IElementPosition[]
  rowList: IRow[]
  pageNo: number
  startIndex: number
  innerWidth: number
  zone?: EditorZone
}

export interface IDrawPagePayload {
  elementList: IElement[]
  positionList: IElementPosition[]
  rowList: IRow[]
  pageNo: number
}

export interface IPainterOption {
  isDbclick: boolean
}

export interface IGetValueOption {
  pageNo?: number
}

export interface IAppendElementListOption {
  isPrepend?: boolean
}
```

}D

File Path: canvas-editor/src/editor/interface/Editor.ts

```
import { IElement } from '..'
import {
  EditorMode,
  PageMode,
  PaperDirection,
  WordBreak
} from '../dataset/enum/Editor'
import { ICheckboxOption } from './Checkbox'
import { IControlOption } from './Control'
import { ICursorOption } from './Cursor'
import { IFooter } from './Footer'
import { IHeader } from './Header'
import { IMargin } from './Margin'
import { IPageNumber } from './PageNumber'
import { IPlaceholder } from './Placeholder'
import { ITitleOption } from './Title'
import { IWatermark } from './Watermark'

export interface IEditorData {
  header?: IElement[]
  main: IElement[]
  footer?: IElement[]
}

export interface IEditorOption {
  mode?: EditorMode
  defaultType?: string
  defaultFont?: string
  defaultSize?: number
  minSize?: number
  maxSize?: number
  defaultBasicRowMarginHeight?: number
  defaultRowMargin?: number
  defaultTabWidth?: number
  width?: number
  height?: number
  scale?: number
  pageGap?: number
  underlineColor?: string
  strikeoutColor?: string
  rangeColor?: string
  rangeAlpha?: number
  rangeMinWidth?: number
  searchMatchColor?: string
  searchNavigateMatchColor?: string
}
```

```
searchMatchAlpha?: numberĐ
highlightAlpha?: numberĐ
resizerColor?: stringĐ
resizerSize?: numberĐ
marginIndicatorSize?: numberĐ
marginIndicatorColor?: stringĐ
margins?: IMarginĐ
pageMode?: PageModeĐ
tdPadding?: numberĐ
defaultTrMinHeight?: numberĐ
defaultColMinWidth?: numberĐ
defaultHyperlinkColor?: stringĐ
paperDirection?: PaperDirectionĐ
inactiveAlpha?: numberĐ
historyMaxRecordCount?: numberĐ
printPixelRatio?: numberĐ
wordBreak?: WordBreakĐ
header?: IHeaderĐ
footer?: IFooterĐ
pageNumber?: IPageNumberĐ
watermark?: IWatermarkĐ
control?: IControlOptionĐ
checkbox?: ICheckboxOptionĐ
cursor?: ICursorOptionĐ
title?: ITitleOptionĐ
placeholder?: IPlaceholderĐ
}Đ
Đ
export interface IEditorResult {Đ
  version: stringĐ
  width: numberĐ
  height: numberĐ
  margins: IMarginĐ
  watermark?: IWatermarkĐ
  data: IEditorDataĐ
}Đ
```

```
File Path: canvas-editor/src/editor/interface/Element.ts
import { ControlComponent, ImageDisplay } from '../dataset/enum/Control'Đ
import { ElementType } from '../dataset/enum/Element'Đ
import { ListStyle, ListType } from '../dataset/enum/List'Đ
import { RowFlex } from '../dataset/enum/Row'Đ
import { TitleLevel } from '../dataset/enum/Title'Đ
import { TableBorder } from '../dataset/enum/table/Table'Đ
import { IBlock } from './Block'Đ
import { ICheckbox } from './Checkbox'Đ
import { IControl } from './Control'Đ
import { IColgroup } from './table/Colgroup'Đ
import { ITr } from './table/Tr'Đ
Đ
export interface IElementBasic {Đ
  id?: stringĐ
  type?: ElementTypeĐ
  value: stringĐ
}Đ
Đ
export interface IElementStyle {Đ
  font?: stringĐ
  size?: numberĐ
  width?: numberĐ
  height?: numberĐ
  bold?: booleanĐ
  color?: stringĐ
  highlight?: stringĐ
  italic?: booleanĐ
  underline?: booleanĐ
  strikeout?: booleanĐ
  rowFlex?: RowFlexĐ
  rowMargin?: numberĐ
  letterSpacing?: numberĐ
}Đ
Đ
export interface ITitleElement {Đ
  valueList?: IElement[]Đ
  level?: TitleLevelĐ
  titleId?: stringĐ
}Đ
Đ
export interface IListElement {Đ
  valueList?: IElement[]Đ
  listType?: ListTypeĐ
  listStyle?: ListStyleĐ
  listId?: stringĐ
```

```

    listWrap?: boolean
  }
}
export interface ITableAttr {
  colgroup?: IColgroup[]
  trList?: ITr[]
  borderType?: TableBorder
}
export interface ITableElement {
  tdId?: string
  trId?: string
  tableId?: string
}
export type ITable = ITableAttr & ITableElement
export interface IHyperlinkElement {
  valueList?: IElement[]
  url?: string
  hyperlinkId?: string
}
export interface ISuperscriptSubscript {
  actualSize?: number
}
export interface ISeparator {
  dashArray?: number[]
}
export interface IControlElement {
  control?: IControl
  controlId?: string
  controlComponent?: ControlComponent
}
export interface ICheckboxElement {
  checkbox?: ICheckbox
}
export interface ILaTeXElement {
  laTexSVG?: string
}
export interface IDateElement {

```



```

    dateFormat?: stringĐ
    dateId?: stringĐ
}Đ
Đ
export interface IImageElement {Đ
    imgDisplay?: ImageDisplayĐ
}Đ
Đ
export interface IBlockElement {Đ
    block?: IBlockĐ
}Đ
Đ
export type IElement = IElementBasic &Đ
    IElementStyle &Đ
    ITable &Đ
    IHyperlinkElement &Đ
    ISuperscriptSubscript &Đ
    ISeparator &Đ
    IControlElement &Đ
    ICheckboxElement &Đ
    ILaTexElement &Đ
    IDateElement &Đ
    IImageElement &Đ
    IBlockElement &Đ
    ITitleElement &Đ
    IListElementĐ
Đ
export interface IElementMetrics {Đ
    width: numberĐ
    height: numberĐ
    boundingBoxAscent: numberĐ
    boundingBoxDescent: numberĐ
}Đ
Đ
export interface IElementPosition {Đ
    pageNo: numberĐ
    index: numberĐ
    value: stringĐ
    rowIndex: numberĐ
    rowNo: numberĐ
    ascent: numberĐ
    lineHeight: numberĐ
    metrics: IElementMetricsĐ
    isFirstLetter: booleanĐ
    isLastLetter: booleanĐ
    coordinate: {Đ

```

```
    leftTop: number[]  
    leftBottom: number[]  
    rightTop: number[]  
    rightBottom: number[]  
  }  
}  
  
export interface IElementFillRect {  
  x: number  
  y: number  
  width: number  
  height: number  
}
```

```
File Path: canvas-editor/src/editor/interface/Footer.ts
import { MaxHeightRatio } from '../dataset/enum/Common'
export interface IFooter {
  bottom?: number
  maxHeightRadio?: MaxHeightRatio
  disabled?: boolean
}
```

```
File Path: canvas-editor/src/editor/interface/Header.ts
import { MaxHeightRatio } from '../dataset/enum/Common'
export interface IHeader {
  top?: number
  maxHeightRadio?: MaxHeightRatio
  disabled?: boolean
}
```

File Path: canvas-editor/src/editor/interface/Listener.ts

```
import {  
  EditorZone,  
  ElementType,  
  ListStyle,  
  ListType,  
  PageMode,  
  TitleLevel  
} from '..'  
import { RowFlex } from '../dataset/enum/Row'  
import { IControl } from './Control'  
import { IEditorResult } from './Editor'  
  
export interface IRangeStyle {  
  type: ElementType | null  
  undo: boolean  
  redo: boolean  
  painter: boolean  
  font: string  
  size: number  
  bold: boolean  
  italic: boolean  
  underline: boolean  
  strikeout: boolean  
  color: string | null  
  highlight: string | null  
  rowFlex: RowFlex | null  
  rowMargin: number  
  dashArray: number[]  
  level: TitleLevel | null  
  listType: ListType | null  
  listStyle: ListStyle | null  
}  
  
export type IRangeStyleChange = (payload: IRangeStyle) => void  
  
export type IVisiblePageNoListChange = (payload: number[]) => void  
  
export type IIntersectionPageNoChange = (payload: number) => void  
  
export type IPageSizeChange = (payload: number) => void  
  
export type IPageScaleChange = (payload: number) => void  
  
export type ISaved = (payload: IEditorResult) => void
```

export type IContentChange = () => void

Ⓜ

export type IControlChange = (payload: IControl | null) => void

Ⓜ

export type IPageModeChange = (payload: PageMode) => void

Ⓜ

export type IZoneChange = (payload: EditorZone) => void

File Path: canvas-editor/src/editor/interface/Margin.ts

```
export type IMargin = [top: number, right: number, bottom: number, left: number]␣
```

File Path: canvas-editor/src/editor/interface/PageNumber.ts

```
import { NumberType } from '../dataset/enum/Common'
```

```
import { RowFlex } from '../dataset/enum/Row'
```

```
{
```

```
export interface IPageNumber {
```

```
  bottom?: number
```

```
  size?: number
```

```
  font?: string
```

```
  color?: string
```

```
  rowFlex?: RowFlex
```

```
  format?: string
```

```
  numberType?: NumberType
```

```
  disabled?: boolean
```

```
  startPageNo?: number
```

```
  fromPageNo?: number
```

```
}
```



File Path: canvas-editor/src/editor/interface/Placeholder.ts

```
export interface IPlaceholder {
```

```
  data: string
```

```
  color?: string
```

```
  opacity?: number
```

```
  size?: number
```

```
  font?: string
```

```
}
```

File Path: canvas-editor/src/editor/interface/Plugin.ts

```
import Editor from '..'␣
```

```
␣
```

```
export type PluginFunction<Options> = (editor: Editor, options?: Options) => any␣
```

```
␣
```

```
export type UsePlugin = <Options>(␣
```

```
  pluginFunction: PluginFunction<Options>,␣
```

```
  options?: Options␣
```

```
) => void␣
```

File Path: canvas-editor/src/editor/interface/Position.ts

```
import { IElement } from '..'Ð
import { EditorZone } from '../dataset/enum/Editor'Ð
import { IElementPosition } from './Element'Ð
import { IRow } from './Row'Ð
import { ITd } from './table/Td'Ð
Ð
export interface ICurrentPosition {Ð
  index: numberÐ
  isChecked?: booleanÐ
  isControl?: booleanÐ
  isImage?: booleanÐ
  isTable?: booleanÐ
  isDirectHit?: booleanÐ
  trIndex?: numberÐ
  tdIndex?: numberÐ
  tdValueIndex?: numberÐ
  tdId?: stringÐ
  trId?: stringÐ
  tableId?: stringÐ
  zone?: EditorZoneÐ
  hitLineStartIndex?: numberÐ
}Ð
Ð
export interface IGetPositionByXYPayload {Ð
  x: numberÐ
  y: numberÐ
  isTable?: booleanÐ
  td?: ITdÐ
  tablePosition?: IElementPositionÐ
  elementList?: IElement[]Ð
  positionList?: IElementPosition[]Ð
}Ð
Ð
export interface IPositionContext {Ð
  isTable: booleanÐ
  isChecked?: booleanÐ
  isControl?: booleanÐ
  index?: numberÐ
  trIndex?: numberÐ
  tdIndex?: numberÐ
  tdId?: stringÐ
  trId?: stringÐ
  tableId?: stringÐ
}Ð
Ð
```

```
export interface IComputePageRowPositionPayload {  
  positionList: IElementPosition[]  
  rowList: IRow[]  
  pageNo: number  
  startRowIndex: number  
  startIndex: number  
  startX: number  
  startY: number  
  innerWidth: number  
}  
  
export interface IComputePageRowPositionResult {  
  x: number  
  y: number  
  index: number  
}
```

File Path: canvas-editor/src/editor/interface/Previewer.ts

```
import { IElement } from './Element'
export interface IPreviewerCreateResult {
  resizerSelection: HTMLDivElement
  resizerHandleList: HTMLDivElement[]
  resizerImageContainer: HTMLDivElement
  resizerImage: HTMLImageElement
}
export interface IPreviewerDrawOption {
  mime?: 'png' | 'jpg' | 'jpeg' | 'svg'
  srcKey?: keyof Pick<IElement, 'value' | 'laTexSVG'>
}
```

File Path: canvas-editor/src/editor/interface/Range.ts

```
import { EditorZone } from '../dataset/enum/Editor'
```

```
import { IElement } from './Element'
```

```
{
```

```
  export interface IRange {
```

```
    startIndex: number
```

```
    endIndex: number
```

```
    isCrossRowCol?: boolean
```

```
    tableId?: string
```

```
    startTdIndex?: number
```

```
    endTdIndex?: number
```

```
    startTrIndex?: number
```

```
    endTrIndex?: number
```

```
    zone?: EditorZone
```

```
  }
```

```
}
```

```
export type RangeRowArray = Map<number, number[]>
```

```
{
```

```
  export type RangeRowMap = Map<number, Set<number>>
```

```
}
```

```
export type RangeContext = {
```

```
  isCollapsed: boolean
```

```
  startElement: IElement
```

```
  endElement: IElement
```

```
  startPageNo: number
```

```
  endPageNo: number
```

```
}
```

```
File Path: canvas-editor/src/editor/interface/Row.ts
import { RowFlex } from '../dataset/enum/Row'
import { IElement, IElementMetrics } from './Element'
export type IRowElement = IElement & {
  metrics: IElementMetrics
  style: string
}
export interface IRow {
  width: number
  height: number
  ascent: number
  rowFlex?: RowFlex
  startIndex: number
  isPageBreak?: boolean
  isList?: boolean
  listIndex?: number
  offsetX?: number
  elementList: IRowElement[]
}
```

```
File Path: canvas-editor/src/editor/interface/Search.ts
import { EditorContext } from '../dataset/enum/Editor'
export interface ISearchResultBasic {
  type: EditorContext
  index: number
  groupId: string
}
export interface ISearchResultRestArgs {
  tableIndex?: number
  trIndex?: number
  tdIndex?: number
  tdId?: string
  startIndex?: number
}
export type ISearchResult = ISearchResultBasic & ISearchResultRestArgs
```



File Path: canvas-editor/src/editor/interface/Title.ts

```
export interface ITitleSizeOption {  
  defaultFirstSize?: number  
  defaultSecondSize?: number  
  defaultThirdSize?: number  
  defaultFourthSize?: number  
  defaultFifthSize?: number  
  defaultSixthSize?: number  
}  
  
export type ITitleOption = ITitleSizeOption & {}
```

File Path: canvas-editor/src/editor/interface/Watermark.ts

```
export interface IWatermark {
```

```
  data: string
```

```
  color?: string
```

```
  opacity?: number
```

```
  size?: number
```

```
  font?: string
```

```
}
```

File Path: canvas-editor/src/editor/interface/contextmenu/ContextMenu.ts

```
import { Command } from '../../core/command/Command'
```

```
import { IElement } from '../../Element'
```

```
␣
```

```
export interface IContextMenuContext {␣
```

```
  startElement: IElement | null␣
```

```
  endElement: IElement | null␣
```

```
  isReadonly: boolean␣
```

```
  editorHasSelection: boolean␣
```

```
  editorTextFocus: boolean␣
```

```
  isInTable: boolean␣
```

```
  isCrossRowCol: boolean␣
```

```
}␣
```

```
␣
```

```
export interface IRegisterContextMenu {␣
```

```
  id?: string␣
```

```
  isDivider?: boolean␣
```

```
  icon?: string␣
```

```
  name?: string␣
```

```
  shortCut?: string␣
```

```
  when?: (payload: IContextMenuContext) => boolean␣
```

```
  callback?: (command: Command, context: IContextMenuContext) => any␣
```

```
  childMenus?: IRegisterContextMenu[]␣
```

```
}␣
```

```
␣
```

```
export interface IContextmenuLang {␣
```

```
  global: {␣
```

```
    cut: string␣
```

```
    copy: string␣
```

```
    paste: string␣
```

```
    selectAll: string␣
```

```
    print: string␣
```

```
  }␣
```

```
  control: {␣
```

```
    delete: string␣
```

```
  }␣
```

```
  hyperlink: {␣
```

```
    delete: string␣
```

```
    cancel: string␣
```

```
    edit: string␣
```

```
  }␣
```

```
  image: {␣
```

```
    change: string␣
```

```
    saveAs: string␣
```

```
    textWrap: string␣
```

```
    textWrapType: {␣
```

```
    embed: stringÐ
    upDown: stringÐ
  }Ð
}Ð
table: {Ð
  insertRowCol: stringÐ
  insertTopRow: stringÐ
  insertBottomRow: stringÐ
  insertLeftCol: stringÐ
  insertRightCol: stringÐ
  deleteRowCol: stringÐ
  deleteRow: stringÐ
  deleteCol: stringÐ
  deleteTable: stringÐ
  mergeCell: stringÐ
  mergeCancelCell: stringÐ
}Ð
}Ð
```

```
File Path: canvas-editor/src/editor/interface/i18n/l18n.ts
import { IDatePickerLang } from '../../core/draw/particle/date/DatePicker'
import { IContextmenuLang } from '../../contextmenu/ContextMenu'
export interface ILang {
  contextmenu: IContextmenuLang
  datePicker: IDatePickerLang
}
```

```
File Path: canvas-editor/src/editor/interface/shortcut/Shortcut.ts
import { Command } from '../../core/command/Command'
import { KeyMap } from '../../dataset/enum/KeyMap'

export interface IRegisterShortcut {
  key: KeyMap
  ctrl?: boolean
  meta?: boolean
  mod?: boolean // windows:ctrl || mac:command
  shift?: boolean
  alt?: boolean // windows:alt || mac:option
  isGlobal?: boolean
  callback: (command: Command) => any
}
```

File Path: canvas-editor/src/editor/interface/table/Colgroup.ts

```
export interface IColgroup {
```

```
  id?: string
```

```
  width: number
```

```
}
```

```

File Path: canvas-editor/src/editor/interface/table/Td.ts
import { VerticalAlign } from '../dataset/enum/VerticalAlign'
import { IElement, IElementPosition } from '../Element'
import { IRow } from '../Row'

export interface ITd {
  id?: string
  x?: number
  y?: number
  width?: number
  height?: number
  colspan: number
  rowspan: number
  value: IElement[]
  isLastRowTd?: boolean
  isLastColTd?: boolean
  isLastTd?: boolean
  rowIndex?: number
  collIndex?: number
  rowList?: IRow[]
  positionList?: IElementPosition[]
  verticalAlign?: VerticalAlign
  backgroundColor?: string
  mainHeight?: number // Q...[1 + Q...•1•ÝšØ^İ
  realHeight?: number // w [žšØ^İ S T+•èR Ÿ Đ
  realMinHeight?: number // w [žg \ šØ^İ S T+•èR Ÿ Đ
}

```



File Path: canvas-editor/src/editor/interface/table/Tr.ts

```
import { ITd } from './Td'
```

```
export interface ITr {
```

```
  id?: string
```

```
  height: number
```

```
  tdList: ITd[]
```

```
  minHeight?: number
```

```
}
```

```
File Path: canvas-editor/src/editor/types/index.d.ts
// •èR mO%oÈVhcanvasN N e±e/c ¢¾•nNåN \^`Đ
interface CanvasRenderingContext2D {Đ
  letterSpacing: stringĐ
  wordSpacing: stringĐ
}Đ
```

```

File Path: canvas-editor/src/editor/utils/clipboard.ts
import { IEditorOption, IElement, ListStyle, ListType, RowFlex } from '..'
import { ZERO } from '../dataset/constant/Common'
import {
  INLINE_NODE_NAME,
  TEXTLIKE_ELEMENT_TYPE
} from '../dataset/constant/Element'
import {
  listStyleCSSMapping,
  listTypeElementMapping
} from '../dataset/constant/List'
import {
  titleNodeNameMapping,
  titleOrderNumberMapping
} from '../dataset/constant/Title'
import { ControlComponent } from '../dataset/enum/Control'
import { ElementType } from '../dataset/enum/Element'
import { DeepRequired } from '../interface/Common'
import { ITd } from '../interface/table/Td'
import { ITr } from '../interface/table/Tr'
import { getElementRowFlex, zipElementList } from './element'

export function writeClipboardItem(text: string, html: string) {
  if (!text || !html) return
  const plainText = new Blob([text], { type: 'text/plain' })
  const htmlText = new Blob([html], { type: 'text/html' })
  if (window.ClipboardItem) {
    // @ts-ignore
    const item = new ClipboardItem({
      [plainText.type]: plainText,
      [htmlText.type]: htmlText
    })
    window.navigator.clipboard.write([item])
  } else {
    const fakeElement = document.createElement('div')
    fakeElement.setAttribute('contenteditable', 'true')
    fakeElement.innerHTML = html
    document.body.append(fakeElement)
    // add new range
    const selection = window.getSelection()
    const range = document.createRange()
    range.selectNodeContents(fakeElement)
    selection?.removeAllRanges()
    selection?.addRange(range)
    document.execCommand('copy')
    fakeElement.remove()
  }
}

```

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    }ð
  }ð
  ð
  export function convertElementToDom(ð
    element: IElement,ð
    options: DeepRequired<IEditorOption>ð
  ): HTMLElement {ð
    let tagName: keyof HTMLElementTagNameMap = 'span'ð
    if (element.type === ElementType.SUPERSCRIPT) {ð
      tagName = 'sup'ð
    } else if (element.type === ElementType.SUBSCRIPT) {ð
      tagName = 'sub'ð
    } else if (ð
      element.rowFlex === RowFlex.CENTER ||ð
      element.rowFlex === RowFlex.RIGHTð
    ) {ð
      tagName = 'p'ð
    }ð
    const dom = document.createElement(tagName)ð
    dom.style.fontFamily = element.font || options.defaultFontð
    if (element.rowFlex) {ð
      const isAlignment = element.rowFlex === RowFlex.ALIGNMENTð
      dom.style.textAlign = isAlignment ? 'justify' : element.rowFlexð
    }ð
    if (element.color) {ð
      dom.style.color = element.colorð
    }ð
    if (element.bold) {ð
      dom.style.fontWeight = '600'ð
    }ð
    if (element.italic) {ð
      dom.style.fontStyle = 'italic'ð
    }ð
    dom.style.fontSize = `${element.size || options.defaultSize}px`ð
    if (element.highlight) {ð
      dom.style.backgroundColor = element.highlightð
    }ð
    dom.innerText = element.value.replace(new RegExp(`${ZERO}`, 'g'), '\n')ð
    return domð
  }ð
  ð
  export function writeElementList(ð
    elementList: IElement[],ð
    options: DeepRequired<IEditorOption>ð
  ) {ð
    function buildDomFromElementList(payload: IElement[]): HTMLDivElement {ð

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const clipboardDom = document.createElement('div')
for (let e = 0; e < payload.length; e++) {
  const element = payload[e]
  // g,• ^hh<
  if (element.type === ElementType.TABLE) {
    const tableDom: HTMLTableElement = document.createElement('table')
    const trList = element.trList
    for (let t = 0; t < trList.length; t++) {
      const trDom = document.createElement('tr')
      const tr = trList[t]
      for (let d = 0; d < tr.tdList.length; d++) {
        const tdDom = document.createElement('td')
        tdDom.style.border = '1px solid'
        const td = tr.tdList[d]
        tdDom.colSpan = td.colspan
        tdDom.rowSpan = td.rowspan
        const childDom = buildDomFromElementList(zipElementList(td.value!))
        tdDom.innerHTML = childDom.innerHTML
        if (td.backgroundColor) {
          tdDom.style.backgroundColor = td.backgroundColor
        }
        trDom.append(tdDom)
      }
      tableDom.append(trDom)
    }
    clipboardDom.append(tableDom)
  } else if (element.type === ElementType.HYPERLINK) {
    const a = document.createElement('a')
    a.innerText = element.valueList!.map(v => v.value).join("")
    if (element.url) {
      a.href = element.url
    }
    clipboardDom.append(a)
  } else if (element.type === ElementType.TITLE) {
    const h = document.createElement(
      `h${titleOrderNumberMapping[element.level!]}`
    )
    const childDom = buildDomFromElementList(
      zipElementList(element.valueList!)
    )
    h.innerHTML = childDom.innerHTML
    clipboardDom.append(h)
  } else if (element.type === ElementType.LIST) {
    const list = document.createElement(
      listTypeElementMapping[element.listType!]
    )
  }
}

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if (element.listStyle) {
  list.style.listStyleType = listStyleCSSMapping[element.listStyle]
}
// c qgcb^L{&bÆR
let curListIndex = 0
const listElementListMap: Map<number, IElement[]> = new Map()
const zipList = zipElementList(element.valueList!)
for (let z = 0; z < zipList.length; z++) {
  const zipElement = zipList[z]
  if (zipElement.listWrap) {
    const listElementList = listElementListMap.get(curListIndex) || []
    listElementList.push(zipElement)
    listElementListMap.set(curListIndex, listElementList)
  } else {
    const zipValueList = zipElement.value.split('\n')
    for (let c = 0; c < zipValueList.length; c++) {
      if (c > 0) {
        curListIndex += 1
      }
      const value = zipValueList[c]
      const listElementList = listElementListMap.get(curListIndex) || []
      listElementList.push({
        ...zipElement,
        value
      })
      listElementListMap.set(curListIndex, listElementList)
    }
  }
}
listElementListMap.forEach(listElementList => {
  const li = document.createElement('li')
  const childDom = buildDomFromElementList(listElementList)
  li.innerHTML = childDom.innerHTML
  list.append(li)
})
clipboardDom.append(list)
} else if (element.type === ElementType.IMAGE) {
  const img = document.createElement('img')
  if (element.value) {
    img.src = element.value
    img.width = element.width!
    img.height = element.height!
  }
  clipboardDom.append(img)
} else if (element.type === ElementType.SEPARATOR) {
  const hr = document.createElement('hr')

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    clipboardDom.append(hr)
  } else if (element.type === ElementType.CHECKBOX) {
    const checkbox = document.createElement('input')
    checkbox.type = 'checkbox'
    if (element.checkbox?.value) {
      checkbox.setAttribute('checked', 'true')
    }
    clipboardDom.append(checkbox)
  } else if (
    !element.type ||
    element.type === ElementType.LATEX ||
    TEXTLIKE_ELEMENT_TYPE.includes(element.type)
  ) {
    let text = ""
    if (element.type === ElementType.CONTROL) {
      text = element.control?.value?.[0]?.value || ""
    } else if (element.type === ElementType.DATE) {
      text = element.valueList?.map(v => v.value).join("") || ""
    } else {
      text = element.value
    }
    if (!text) continue
    // RMN N*QC} f/h ~ÿ yû-d™-^Lcb^L{&
    if (payload[e - 1]?.type === ElementType.TITLE) {
      text = text.replace(/^\n/, "")
    }
    const dom = convertElementToDom(element, options)
    dom.innerText = text.replace(new RegExp(`${ZERO}`, 'g'), '\n')
    clipboardDom.append(dom)
  }
}
return clipboardDom
}
const clipboardDom = buildDomFromElementList(zipElementList(elementList))
// Q™QeRj•4g•
document.body.append(clipboardDom)
const text = clipboardDom.innerText
// QH•ýR T yû-dÿ T&R innerTexteàlÕ%ãg•cb^L{&
clipboardDom.remove()
const html = clipboardDom.innerHTML
if (!text || !html) return
writeClipboardItem(text, html)
}
}
export function convertTextNodeToElement(
  textNode: Element | Node
)

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): IElement | null {
  if (!textNode || textNode.nodeType !== 3) return null
  const parentNode = <HTMLElement>textNode.parentNode
  const anchorNode =
    parentNode.nodeName === 'FONT'
      ? <HTMLElement>parentNode.parentNode
      : parentNode
  const rowFlex = getElementRowFlex(anchorNode)
  const value = textNode.textContent
  const style = window.getComputedStyle(anchorNode)
  if (!value || anchorNode.nodeName === 'STYLE') return null
  const element: IElement = {
    value,
    color: style.color,
    bold: Number(style.fontWeight) > 500,
    italic: style.fontStyle.includes('italic'),
    size: Math.floor(parseFloat(style.fontSize))
  }
  // QC {W<-žØ«æ†g,
  if (anchorNode.nodeName === 'SUB' || style.verticalAlign === 'sub') {
    element.type = ElementType.SUBSCRIPT
  } else if (anchorNode.nodeName === 'SUP' || style.verticalAlign === 'super') {
    element.type = ElementType.SUPERSCRIPT
  }
  // ^L[ùŸP
  if (rowFlex !== RowFlex.LEFT) {
    element.rowFlex = rowFlex
  }
  // šØN®,r
  if (style.backgroundColor !== 'rgba(0, 0, 0, 0)') {
    element.highlight = style.backgroundColor
  }
  return element
}
}
interface IGetElementListByHTMLOption {
  innerWidth: number
}
export function getElementListByHTML(
  htmlText: string,
  options: IGetElementListByHTMLOption
): IElement[] {
  const elementList: IElement[] = []
  function findTextNode(dom: Element | Node) {
    if (dom.nodeType === 3) {

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const element = convertTextNodeToElement(dom)Ð
if (element) {Ð
  elementList.push(element)Ð
}Ð
} else if (dom.nodeType === 1) {Ð
  const childNodes = dom.childNodesÐ
  for (let n = 0; n < childNodes.length; n++) {Ð
    const node = childNodes[n]Ð
    // brQC} N display:blockQC} — cb^LÐ
    if (node.nodeName === 'BR') {Ð
      elementList.push({Ð
        value: '\n'Ð
      })Ð
    } else if (node.nodeName === 'A') {Ð
      const aElement = node as HTMLLinkElementÐ
      const value = aElement.innerTextÐ
      if (value) {Ð
        elementList.push({Ð
          type: ElementType.HYPERLINK,Ð
          value: "",Ð
          valueList: [Ð
            {Ð
              valueÐ
            }Ð
          ],Ð
          url: aElement.hrefÐ
        })Ð
      }Ð
    } else if (/H[1-6]/.test(node.nodeName)) {Ð
      const hElement = node as HTMLTitleElementÐ
      const valueList = getElementListByHTML(hElement.innerHTML, options)Ð
      elementList.push({Ð
        value: "",Ð
        type: ElementType.TITLE,Ð
        level: titleNodeNameMapping[node.nodeName],Ð
        valueListÐ
      })Ð
    } if (Ð
      node.nextSibling &&Ð
      !INLINE_NODE_NAME.includes(node.nextSibling.nodeName)Ð
    ) {Ð
      elementList.push({Ð
        value: '\n'Ð
      })Ð
    }Ð
  } else if (node.nodeName === 'UL' || node.nodeName === 'OL') {Ð

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const listNode = node as HTMLListElement | HTMLUListElement
const listElement: IElement = {
  value: "",
  type: ElementType.LIST,
  valueList: []
}
if (node.nodeName === 'OL') {
  listElement.listType = ListType.OL
} else {
  listElement.listType = ListType.UL
  listElement.listStyle = <ListStyle>(
    <unknown>listNode.style.listStyleType
  )
}
listNode.querySelectorAll('li').forEach(li => {
  const liValueList = getElementListByHTML(li.innerHTML, options)
  liValueList.forEach(list => {
    if (list.value === '\n') {
      list.listWrap = true
    }
  })
  liValueList.unshift({
    value: '\n'
  })
  listElement.valueList!.push(...liValueList)
})
elementList.push(listElement)
} else if (node.nodeName === 'HR') {
  elementList.push({
    value: '\n',
    type: ElementType.SEPARATOR
  })
} else if (node.nodeName === 'IMG') {
  const { src, width, height } = node as HTMLImageElement
  if (src && width && height) {
    elementList.push({
      width,
      height,
      value: src,
      type: ElementType.IMAGE
    })
  }
} else if (node.nodeName === 'TABLE') {
  const tableElement = node as HTMLTableElement
  const element: IElement = {
    type: ElementType.TABLE,

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    value: '\n',
    colgroup: [],
    trList: []
  }
  // Wúx@epcn
  tableElement.querySelectorAll('tr').forEach(trElement => {
    const trHeightStr = window
      .getComputedStyle(trElement)
      .height.replace('px', '')
    const tr: ITr = {
      height: Number(trHeightStr),
      tdList: []
    }
    trElement.querySelectorAll('th,td').forEach(tdElement => {
      const tableCell = <HTMLTableCellElement>tdElement
      const valueList = getElementListByHTML(
        tableCell.innerHTML,
        options
      )
      const td: ITd = {
        colspan: tableCell.colSpan,
        rowspan: tableCell.rowSpan,
        value: valueList
      }
      if (tableCell.style.backgroundColor) {
        td.backgroundColor = tableCell.style.backgroundColor
      }
      tr.tdList.push(td)
    })
    if (tr.tdList.length) {
      element.trList!.push(tr)
    }
  })
  if (element.trList!.length) {
    // R • ~yepcn
    const tdCount = element.trList![0].tdList.reduce(
      (pre, cur) => pre + cur.colspan,
      0
    )
    const width = Math.ceil(options.innerWidth / tdCount)
    for (let i = 0; i < tdCount; i++) {
      element.colgroup!.push({
        width
      })
    }
  }
  elementList.push(element)

```

```

    }
    } else if (
      node.nodeName === 'INPUT' &&
      (<HTMLInputElement>node).type === ControlComponent.CHECKBOX
    ) {
      elementList.push({
        type: ElementType.CHECKBOX,
        value: '',
        checkbox: {
          value: (<HTMLInputElement>node).checked
        }
      })
    } else {
      findTextNode(node)
      if (node.nodeType === 1 && n !== childNodes.length - 1) {
        const display = window.getComputedStyle(node as Element).display
        if (display === 'block') {
          elementList.push({
            value: '\n'
          })
        }
      }
    }
  }
}
// •ýR dom
const clipboardDom = document.createElement('div')
clipboardDom.innerHTML = htmlText
document.body.appendChild(clipboardDom)
const deleteNodes: ChildNode[] = []
clipboardDom.childNodes.forEach(child => {
  if (child.nodeType !== 1 && !child.textContent?.trim()) {
    deleteNodes.push(child)
  }
})
deleteNodes.forEach(node => node.remove())
// d }"e±g,,,p¹
findTextNode(clipboardDom)
// yû–ddom
clipboardDom.remove()
return elementList
}

```

File Path: canvas-editor/src/editor/utils/element.ts

```
import { cloneProperty, deepClone, getUUID, splitText } from '.'
import { ElementType, IEditorOption, IElement, RowFlex } from '..'
import { LaTeXParticle } from '../core/draw/particle/latex/LaTeXParticle'
import { defaultCheckboxOption } from '../dataset/constant/Checkbox'
import { ZERO } from '../dataset/constant/Common'
import { defaultControlOption } from '../dataset/constant/Control'
import {
  EDITOR_ELEMENT_CONTEXT_ATTR,
  EDITOR_ELEMENT_ZIP_ATTR,
  TABLE_CONTEXT_ATTR,
  TEXTLIKE_ELEMENT_TYPE
} from '../dataset/constant/Element'
import { titleSizeMapping } from '../dataset/constant/Title'
import { ControlComponent, ControlType } from '../dataset/enum/Control'
import { ITd } from '../interface/table/Td'

export function unzipElementList(elementList: IElement[]): IElement[] {
  const result: IElement[] = []
  for (let v = 0; v < elementList.length; v++) {
    const valueItem = elementList[v]
    const textList = splitText(valueItem.value)
    for (let d = 0; d < textList.length; d++) {
      result.push({ ...valueItem, value: textList[d] })
    }
  }
  return result
}

interface IFormatElementListOption {
  isHandleFirstElement?: boolean
  editorOptions: Required<IEditorOption>
}

export function formatElementList(
  elementList: IElement[],
  options: IFormatElementListOption
) {
  const { isHandleFirstElement, editorOptions } = <IFormatElementListOption>{
    isHandleFirstElement: true,
    ...options
  }
  const startElement = elementList[0]
  if (
    isHandleFirstElement &&
    startElement?.value !== ZERO &&
  ) {
  }
```

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    startElement?.value !== '\n'
  ) {
    elementList.unshift({
      value: ZERO
    })
  }
  let i = 0
  while (i < elementList.length) {
    let el = elementList[i]
    // O QHY t †ZbßQC}
    if (el.type === ElementType.TITLE) {
      // yû-dr6,,p¹
      elementList.splice(i, 1)
      // h<_ S QC}
      const valueList = el.valueList || []
      formatElementList(valueList, {
        ...options,
        isHandleFirstElement: false
      })
      // •ýR ,,p¹
      if (valueList.length) {
        const titleId = getUUID()
        const titleOptions = editorOptions.title
        for (let v = 0; v < valueList.length; v++) {
          const value = valueList[v]
          if (el.level) {
            value.titleId = titleId
            value.level = el.level
          }
          // e‡g,WŸQC} ‹¾•n[WOSSÊR |—
          if (isTextLikeElement(value)) {
            if (!value.size) {
              value.size = titleOptions[titleSizeMapping[value.level!]]
            }
            if (value.bold === undefined) {
              value.bold = true
            }
          }
        }
        elementList.splice(i, 0, value)
        i++
      }
    }
    i--
  } else if (el.type === ElementType.LIST) {
    // yû-dr6,,p¹
    elementList.splice(i, 1)
  }

```

```

// h<_ S QC} Ð
const valueList = el.valueList || []Ð
formatElementList(valueList, {Ð
  ...optionsÐ
})Ð
// •ýR „p¹Ð
if (valueList.length) {Ð
  const listId = getUUID()Ð
  for (let v = 0; v < valueList.length; v++) {Ð
    const value = valueList[v]Ð
    value.listId = listIdÐ
    value.listType = el.listTypeÐ
    value.listStyle = el.listStyleÐ
    elementList.splice(i, 0, value)Ð
    i++Ð
  }Ð
}Ð
i--Ð
} else if (el.type === ElementType.TABLE) {Ð
  const tableId = getUUID()Ð
  el.id = tableIdÐ
  if (el.trList) {Ð
    for (let t = 0; t < el.trList.length; t++) {Ð
      const tr = el.trList[t]Ð
      const trId = getUUID()Ð
      tr.id = trIdÐ
      if (Ð
        !tr.minHeight ||Ð
        tr.minHeight < editorOptions.defaultTrMinHeightÐ
      ) {Ð
        tr.minHeight = editorOptions.defaultTrMinHeightÐ
      }Ð
      if (tr.height < tr.minHeight) {Ð
        tr.height = tr.minHeightÐ
      }Ð
      for (let d = 0; d < tr.tdList.length; d++) {Ð
        const td = tr.tdList[d]Ð
        const tdId = getUUID()Ð
        td.id = tdIdÐ
        formatElementList(td.value, {Ð
          ...options,Ð
          isHandleFirstElement: trueÐ
        })Ð
        for (let v = 0; v < td.value.length; v++) {Ð
          const value = td.value[v]Ð
          value.tdId = tdIdÐ

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        value.trId = trIdĐ
        value.tableId = tableIdĐ
    }Đ
}Đ
}Đ
}Đ
} else if (el.type === ElementType.HYPERLINK) {Đ
    // yŭ-dr6,,p¹Đ
    elementList.splice(i, 1)Đ
    // QC} \U_ Đ
    const valueList = unzipElementList(el.valueList || [])Đ
    // •ýR ,,p¹Đ
    if (valueList.length) {Đ
        const hyperlinkId = getUUID()Đ
        for (let v = 0; v < valueList.length; v++) {Đ
            const value = valueList[v]Đ
            value.type = el.typeĐ
            value.url = el.urlĐ
            value.hyperlinkId = hyperlinkIdĐ
            elementList.splice(i, 0, value)Đ
            i++Đ
        }Đ
    }Đ
    i--Đ
} else if (el.type === ElementType.DATE) {Đ
    // yŭ-dr6,,p¹Đ
    elementList.splice(i, 1)Đ
    // QC} \U_ Đ
    const valueList = unzipElementList(el.valueList || [])Đ
    // •ýR ,,p¹Đ
    if (valueList.length) {Đ
        const dateId = getUUID()Đ
        for (let v = 0; v < valueList.length; v++) {Đ
            const value = valueList[v]Đ
            value.type = el.typeĐ
            value.dateFormat = el.dateFormatĐ
            value.dateId = dateIdĐ
            elementList.splice(i, 0, value)Đ
            i++Đ
        }Đ
    }Đ
    i--Đ
} else if (el.type === ElementType.CONTROL) {Đ
    const { prefix, postfix, value, placeholder, code, type, valueSets } =Đ
    el.control!Đ
    const controlId = getUUID()Đ

```



```

// yû—dr6,,p¹Ð
elementList.splice(i, 1)Ð
// RMT • N*`'S ‹¾•nÐ
const thePrePostfixArgs: Pick<IElement, 'color'> = {}Ð
if (editorOptions && editorOptions.control) {Ð
  thePrePostfixArgs.color = editorOptions.control.bracketColorÐ
}Ð
// RM• Ð
const prefixStrList = splitText(prefix || defaultControlOption.prefix)Ð
for (let p = 0; p < prefixStrList.length; p++) {Ð
  const value = prefixStrList[p]Ð
  elementList.splice(i, 0, {Ð
    controlId,Ð
    value,Ð
    type: el.type,Ð
    control: el.control,Ð
    controlComponent: ControlComponent.PREFIX,Ð
    ...thePrePostfixArgsÐ
  })Ð
  i++Ð
}Ð
// P<Ð
if (Ð
  (value && value.length) ||Ð
  type === ControlType.CHECKBOX ||Ð
  (type === ControlType.SELECT && code && (!value || !value.length))Ð
) {Ð
  let valueList: IElement[] = value || []Ð
  if (type === ControlType.CHECKBOX) {Ð
    const codeList = code ? code.split(',') : []Ð
    if (Array.isArray(valueSets) && valueSets.length) {Ð
      // bÆR valueListO QHO•u(Qv\^`Ð
      const valueStyleList = valueList.reduce(Ð
        (pre, cur) =>Ð
          pre.concat(Ð
            cur.value.split("").map(v => ({ ...cur, value: v })),Ð
          ),Ð
        [] as IElement[]Ð
      )Ð
      let valueStyleIndex = 0Ð
      for (let v = 0; v < valueSets.length; v++) {Ð
        const valueSet = valueSets[v]Ð
        // checkbox~ÄNöÐ
        elementList.splice(i, 0, {Ð
          controlId,Ð
          value: "",Ð

```

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    type: el.type,␣
    control: el.control,␣
    controlComponent: ControlComponent.CHECKBOX,␣
    checkbox: {␣
      code: valueSet.code,␣
      value: codeList.includes(valueSet.code)␣
    }␣
  })␣
  i++␣
  // e≠g,␣
  const valueStrList = splitText(valueSet.value)␣
  for (let e = 0; e < valueStrList.length; e++) {␣
    const value = valueStrList[e]␣
    const isLastLetter = e === valueStrList.length - 1␣
    elementList.splice(i, 0, {␣
      ...valueStyleList[valueStyleIndex],␣
      controlId,␣
      value,␣
      type: el.type,␣
      letterSpacing: isLastLetter ? defaultCheckboxOption.gap : 0,␣
      control: el.control,␣
      controlComponent: ControlComponent.VALUE␣
    })␣
    valueStyleIndex++␣
    i++␣
  }␣
}␣
}␣
}␣
} else {␣
  if (!value || !value.length) {␣
    if (Array.isArray(valueSets) && valueSets.length) {␣
      const valueSet = valueSets.find(v => v.code === code)␣
      if (valueSet) {␣
        valueList = [␣
          {␣
            value: valueSet.value␣
          }␣
        ]␣
      }␣
    }␣
  }␣
}␣
}␣
for (let v = 0; v < valueList.length; v++) {␣
  const element = valueList[v]␣
  const valueStrList = splitText(element.value)␣
  for (let e = 0; e < valueStrList.length; e++) {␣
    const value = valueStrList[e]␣

```

```

        elementList.splice(i, 0, {
            ...element,
            controlId,
            value,
            type: el.type,
            control: el.control,
            controlComponent: ControlComponent.VALUE
        })
        i++
    }
}
} else if (placeholder) {
    // placeholder
    const thePlaceholderArgs: Pick<IElement, 'color'> = {}
    if (editorOptions && editorOptions.control) {
        thePlaceholderArgs.color = editorOptions.control.placeholderColor
    }
    const placeholderStrList = splitText(placeholder)
    for (let p = 0; p < placeholderStrList.length; p++) {
        const value = placeholderStrList[p]
        elementList.splice(i, 0, {
            controlId,
            value,
            type: el.type,
            control: el.control,
            controlComponent: ControlComponent.PLACEHOLDER,
            ...thePlaceholderArgs
        })
        i++
    }
}
// T •
const postfixStrList = splitText(postfix || defaultControlOption.postfix)
for (let p = 0; p < postfixStrList.length; p++) {
    const value = postfixStrList[p]
    elementList.splice(i, 0, {
        controlId,
        value,
        type: el.type,
        control: el.control,
        controlComponent: ControlComponent.POSTFIX,
        ...thePrePostfixArgs
    })
    i++
}

```

```

    i--Ð
  } else if (Ð
    (!el.type || el.type === ElementType.TEXT) &&Ð
    el.value.length > 1Ð
  ) {Ð
    elementList.splice(i, 1)Ð
    const valueList = splitText(el.value)Ð
    for (let v = 0; v < valueList.length; v++) {Ð
      elementList.splice(i + v, 0, { ...el, value: valueList[v] })Ð
    }Ð
    el = elementList[i]Ð
  }Ð
  if (el.value === '\n') {Ð
    el.value = ZEROÐ
  }Ð
  if (el.type === ElementType.IMAGE || el.type === ElementType.BLOCK) {Ð
    el.id = getUUID()Ð
  }Ð
  if (el.type === ElementType.LATEX) {Ð
    const { svg, width, height } = LaTeXParticle.convertLaTextToSVG(el.value)Ð
    el.width = el.width || widthÐ
    el.height = el.height || heightÐ
    el.latexSVG = svgÐ
    el.id = getUUID()Ð
  }Ð
  i++Ð
}Ð
}Ð
Ð
export function isSameElementExceptValue(Ð
  source: IElement,Ð
  target: IElementÐ
): boolean {Ð
  const sourceKeys = Object.keys(source)Ð
  const targetKeys = Object.keys(target)Ð
  if (sourceKeys.length !== targetKeys.length) return falseÐ
  for (let s = 0; s < sourceKeys.length; s++) {Ð
    const key = sourceKeys[s] as neverÐ
    if (key === 'value') continueÐ
    if (source[key] !== target[key]) {Ð
      return falseÐ
    }Ð
  }Ð
  return trueÐ
}Ð
Ð

```

```

export function pickElementAttr(payload: IElement): IElement {
  const element: IElement = {
    value: payload.value === ZERO ? `` : payload.value
  }
  EDITOR_ELEMENT_ZIP_ATTR.forEach(attr => {
    const value = payload[attr] as never
    if (value !== undefined) {
      element[attr] = value
    }
  })
  return element
}

export function zipElementList(payload: IElement[]): IElement[] {
  const elementList = deepClone(payload)
  const zipElementListData: IElement[] = []
  let e = 0
  while (e < elementList.length) {
    let element = elementList[e]
    // N N e±™-[W{&ÿ S`OM{&ÿ
    if (
      e === 0 &&
      element.value === ZERO &&
      (!element.type || element.type === ElementType.TEXT)
    ) {
      e++
      continue
    }
    // O QHY t †ZbßQC} ÿ T ^hh<0 •..."pc¥0 eåg 0 c$NörykŠY t
    if (element.titleId && element.level) {
      // h ~Y t
      const titleId = element.titleId
      const level = element.level
      const titleElement: IElement = {
        type: ElementType.TITLE,
        value: "",
        level
      }
      const valueList: IElement[] = []
      while (e < elementList.length) {
        const titleE = elementList[e]
        if (titleId !== titleE.titleId) {
          e--
          break
        }
        delete titleE.level
      }
    }
  }
}

```

```

    valueList.push(titleE)
    e++
  }
  titleElement.valueList = zipElementList(valueList)
  element = titleElement
} else if (element.listId && element.listType) {
  // R ^hY t
  const listId = element.listId
  const listType = element.listType
  const listStyle = element.listStyle
  const listElement: IElement = {
    type: ElementType.LIST,
    value: "",
    listId,
    listType,
    listStyle
  }
  const valueList: IElement[] = []
  while (e < elementList.length) {
    const listE = elementList[e]
    if (listId !== listE.listId) {
      e--
      break
    }
    delete listE.listType
    delete listE.listStyle
    valueList.push(listE)
    e++
  }
  listElement.valueList = zipElementList(valueList)
  element = listElement
} else if (element.type === ElementType.TABLE) {
  if (element.trList) {
    for (let t = 0; t < element.trList.length; t++) {
      const tr = element.trList[t]
      delete tr.id
      for (let d = 0; d < tr.tdList.length; d++) {
        const td = tr.tdList[d]
        const zipTd: ITd = {
          colspan: td.colspan,
          rowspan: td.rowspan,
          value: zipElementList(td.value)
        }
        if (td.verticalAlign) {
          zipTd.verticalAlign = td.verticalAlign
        }
      }
    }
  }

```

```

        if (td.backgroundColor) {
            zipTd.backgroundColor = td.backgroundColor
        }
        tr.tdList[d] = zipTd
    }
}
} else if (element.type === ElementType.HYPERLINK) {
    // •..."pc¥Y t
    const hyperlinkId = element.hyperlinkId
    const hyperlinkElement: IElement = {
        type: ElementType.HYPERLINK,
        value: "",
        url: element.url
    }
    const valueList: IElement[] = []
    while (e < elementList.length) {
        const hyperlinkE = elementList[e]
        if (hyperlinkId !== hyperlinkE.hyperlinkId) {
            e--
            break
        }
        delete hyperlinkE.type
        delete hyperlinkE.url
        valueList.push(hyperlinkE)
        e++
    }
    hyperlinkElement.valueList = zipElementList(valueList)
    element = hyperlinkElement
} else if (element.type === ElementType.DATE) {
    const dateId = element.dateId
    const dateElement: IElement = {
        type: ElementType.DATE,
        value: "",
        dateFormat: element.dateFormat
    }
    const valueList: IElement[] = []
    while (e < elementList.length) {
        const dateE = elementList[e]
        if (dateId !== dateE.dateId) {
            e--
            break
        }
        delete dateE.type
        delete dateE.dateFormat
        valueList.push(dateE)
    }
}

```

```

    e++Ð
}Ð
dateElement.valueList = zipElementList(valueList)Ð
element = dateElementÐ
} else if (element.type === ElementType.CONTROL) {Ð
    // c$NöY t Ð
    const controlId = element.controlIdÐ
    const control = element.control!Ð
    const controlElement: IElement = {Ð
        type: ElementType.CONTROL,Ð
        value: "",Ð
        controlÐ
    }Ð
    const valueList: IElement[] = []Ð
    while (e < elementList.length) {Ð
        const controlE = elementList[e]Ð
        if (controlId !== controlE.controlId) {Ð
            e--Ð
            breakÐ
        }Ð
        if (controlE.controlComponent === ControlComponent.VALUE) {Ð
            delete controlE.typeÐ
            delete controlE.controlÐ
            valueList.push(controlE)Ð
        }Ð
        e++Ð
    }Ð
    controlElement.control!.value = zipElementList(valueList)Ð
    element = controlElementÐ
}Ð
// ~ÄT QC} Ð
const pickElement = pickElementAttr(element)Ð
if (Ð
    !element.type ||Ð
    element.type === ElementType.TEXT ||Ð
    element.type === ElementType.SUBSCRIPT ||Ð
    element.type === ElementType.SUPERSCRIPTÐ
) {Ð
    while (e < elementList.length) {Ð
        const nextElement = elementList[e + 1]Ð
        e++Ð
        if (Ð
            nextElement &&Ð
            isSameElementExceptValue(pickElement, pickElementAttr(nextElement))Ð
        ) {Ð
            const nextValue =Ð

```



```

        nextElement.value === ZERO ? '\n' : nextElement.value
        pickElement.value += nextValue
    } else {
        break
    }
}
} else {
    e++
}
zipElementListData.push(pickElement)
}
return zipElementListData
}
}

export function getElementRowFlex(node: HTMLElement) {
    const textAlign = window.getComputedStyle(node).textAlign
    switch (textAlign) {
        case 'left':
        case 'start':
            return RowFlex.LEFT
        case 'center':
            return RowFlex.CENTER
        case 'right':
        case 'end':
            return RowFlex.RIGHT
        case 'justify':
            return RowFlex.ALIGNMENT
        default:
            return RowFlex.LEFT
    }
}

export function isTextLikeElement(element: IElement): boolean {
    return !element.type || TEXTLIKE_ELEMENT_TYPE.includes(element.type)
}

export function getAnchorElement(
    elementList: IElement[],
    anchorIndex: number
): IElement | null {
    const anchorElement = elementList[anchorIndex]
    if (!anchorElement) return null
    const anchorNextElement = elementList[anchorIndex + 1]
    // —^R ^hQC} && _SRMQC} f/cb^L{& && N N N*QC} N f/cb^L{& R NâN N N*QC} OW:SÂ€ QC}
    return !anchorElement.listId &&
        anchorElement.value === ZERO &&

```

```

    anchorNextElement &&Đ
    anchorNextElement.value !== ZEROĐ
    ? anchorNextElementĐ
    : anchorElementĐ
}Đ
Đ
export interface IFormatElementContextOption {Đ
    isBreakWhenWrap: booleanĐ
}Đ
Đ
export function formatElementContext(Đ
    sourceElementList: IElement[],Đ
    formatElementList: IElement[],Đ
    anchorIndex: number,Đ
    options?: IFormatElementContextOptionĐ
) {Đ
    const copyElement = getAnchorElement(sourceElementList, anchorIndex)Đ
    if (!copyElement) returnĐ
    const { isBreakWhenWrap = false } = options || {}Đ
    for (let e = 0; e < formatElementList.length; e++) {Đ
        const targetElement = formatElementList[e]Đ
        if (Đ
            isBreakWhenWrap &&Đ
            !copyElement.listId &&Đ
            /\n/.test(targetElement.value)Đ
        ) {Đ
            breakĐ
        }Đ
        // [šOMQC} —^R ^hÿ eà— Y t |~•4R ^hv„N N e‡Đ
        if (!copyElement.listId && targetElement.type === ElementType.LIST) {Đ
            targetElement.valueList?.forEach(valueItem => {Đ
                cloneProperty<IElement>(TABLE_CONTEXT_ATTR, copyElement, valueItem)Đ
            })Đ
            continueĐ
        }Đ
        if (targetElement.valueList?.length) {Đ
            formatElementContext(Đ
                sourceElementList,Đ
                targetElement.valueList,Đ
                anchorIndexĐ
            )Đ
        }Đ
        cloneProperty<IElement>(Đ
            EDITOR_ELEMENT_CONTEXT_ATTR,Đ
            copyElement,Đ
            targetElementĐ
        )
    }
}

```

)D  
}D  
}D

File Path: canvas-editor/src/editor/utils/hotkey.ts

```
import { isApple } from './ua'
```

```
{
```

```
  export function isMod(evt: KeyboardEvent | MouseEvent) {
```

```
    return isApple ? evt.metaKey : evt.ctrlKey
```

```
  }
```

File Path: canvas-editor/src/editor/utils/index.ts

```
export function debounce(func: Function, delay: number) {  
  let timer: number  
  return function (this: any, ...args: any[]) {  
    if (timer) {  
      window.clearTimeout(timer)  
    }  
    timer = window.setTimeout(() => {  
      func.apply(this, args)  
    }, delay)  
  }  
}  
  
export function deepClone<T>(obj: T): T {  
  if (!obj || typeof obj !== 'object') {  
    return obj  
  }  
  let newObj: any = {}  
  if (Array.isArray(obj)) {  
    newObj = obj.map(item => deepClone(item))  
  } else {  
    Object.keys(obj as any).forEach(key => {  
      // @ts-ignore  
      return (newObj[key] = deepClone(obj[key]))  
    })  
  }  
  return newObj  
}  
  
export function isBody(node: Element): boolean {  
  return node && node.nodeType === 1 && node.tagName.toLowerCase() === 'body'  
}  
  
export function findParent(  
  node: Element,  
  filterFn: Function,  
  includeSelf: boolean  
) {  
  if (node && !isBody(node)) {  
    node = includeSelf ? node : (node.parentNode as Element)  
    while (node) {  
      if (!filterFn || filterFn(node) || isBody(node)) {  
        return filterFn && !filterFn(node) && isBody(node) ? null : node  
      }  
      node = node.parentNode as Element  
    }  
  }  
}
```

```

    }Ð
    return nullÐ
}Ð
Ð
export function getUUID(): string {Ð
    function S4(): string {Ð
        return (((1 + Math.random()) * 0x10000) | 0).toString(16).substring(1)Ð
    }Ð
    return (Ð
        S4() +Ð
        S4() +Ð
        '-' +Ð
        S4() +Ð
        '-' +Ð
        S4() +Ð
        '-' +Ð
        S4() +Ð
        '-' +Ð
        S4() +Ð
        S4() +Ð
        S4()Ð
    )Ð
}Ð
Ð
export function splitText(text: string): string[] {Ð
    const data: string[] = []Ð
    for (const t of text) {Ð
        data.push(t)Ð
    }Ð
    return dataÐ
}Ð
Ð
export function downloadFile(href: string, fileName: string) {Ð
    const a = document.createElement('a')Ð
    a.href = hrefÐ
    a.download = fileNameÐ
    a.click()Ð
}Ð
Ð
export function threeClick(dom: HTMLElement, fn: (evt: MouseEvent) => any) {Ð
    nClickEvent(3, dom, fn)Ð
}Ð
Ð
function nClickEvent(Ð
    n: number,Ð
    dom: HTMLElement,Ð

```

```

    fn: (evt: MouseEvent) => any
  ) {
    let count = 0
    let lastTime = 0
  }
  const handler = function (evt: MouseEvent) {
    const currentTime = new Date().getTime()
    count = currentTime - lastTime < 300 ? count + 1 : 0
    lastTime = new Date().getTime()
    if (count >= n - 1) {
      fn(evt)
      count = 0
    }
  }
  dom.addEventListener('click', handler)
}
export function isObject(type: unknown): type is Record<string, unknown> {
  return Object.prototype.toString.call(type) === '[object Object]'
}
export function isArray(type: unknown): type is Array<unknown> {
  return Array.isArray(type)
}
export function mergeObject<T>(source: T, target: T): T {
  if (isObject(source) && isObject(target)) {
    const objectTarget = <Record<string, unknown>>target
    for (const [key, val] of Object.entries(source)) {
      if (!objectTarget[key]) {
        objectTarget[key] = val
      } else {
        objectTarget[key] = mergeObject(val, objectTarget[key])
      }
    }
  } else if (isArray(source) && isArray(target)) {
    target.push(...source)
  }
  return target
}
export function nextTick(fn: Function) {
  setTimeout(() => {
    fn()
  }, 0)
}

```

```

}Ð
Ð
export function convertNumberToChinese(num: number) {Ð
  const chineseNum = [Ð
    '–ö',Ð
    'N ',Ð
    'Nœ',Ð
    'N ',Ð
    'VÛ',Ð
    'N"',Ð
    'Qm',Ð
    'N ',Ð
    'Qk',Ð
    'N']Ð
  ]Ð
  const chineseUnit = [Ð
    '',Ð
    'SA',Ð
    'v~',Ð
    'SC',Ð
    'N ',Ð
    'SA',Ð
    'v~',Ð
    'SC',Ð
    'N¿',Ð
    'SA',Ð
    'v~',Ð
    'SC',Ð
    'N ',Ð
    'SA',Ð
    'v~',Ð
    'SC',Ð
    'N¿',Ð
  ]Ð
  if (!num || isNaN(num)) return '–ö'Ð
  const numStr = num.toString().split("")Ð
  let result = ""Ð
  for (let i = 0; i < numStr.length; i++) {Ð
    const desIndex = numStr.length - 1 - iÐ
    result = `${chineseUnit[i]}${result}`Ð
    result = `${chineseNum[Number(numStr[desIndex])]}${result}`Ð
  }Ð
  result = result.replace(/–ö(SC|v~|SA)/g, '–ö').replace(/SA–ö/g, 'SA')Ð
  result = result.replace(/–ö+/g, '–ö')Ð
  result = result.replace(/–öN¿/g, 'N¿').replace(/–öN /g, 'N ')Ð
  result = result.replace(/N¿N /g, 'N¿')Ð

```



```

    result = result.replace(/-ö+$/, "")
    result = result.replace(/^N SA/g, 'SA')
    return result
}
}
export function cloneProperty<T>(<
  properties: (keyof T)[],
  sourceElement: T,
  targetElement: T
) {
  for (let i = 0; i < properties.length; i++) {
    const property = properties[i]
    const value = sourceElement[property]
    if (value !== undefined) {
      targetElement[property] = value
    } else {
      delete targetElement[property]
    }
  }
}
}
export function convertStringToBase64(input: string) {
  const encoder = new TextEncoder()
  const data = encoder.encode(input)
  const charArray = Array.from(data, byte => String.fromCharCode(byte))
  const base64 = window.btoa(charArray.join(""))
  return base64
}

```

```

File Path: canvas-editor/src/editor/utils/print.ts
export function printImageBase64(
  base64List: string[],
  width: number,
  height: number
) {
  const iframe = document.createElement('iframe')
  // y»\On2gÓ
  iframe.style.visibility = 'hidden'
  iframe.style.position = 'absolute'
  iframe.style.left = '0'
  iframe.style.top = '0'
  iframe.style.width = '0'
  iframe.style.height = '0'
  iframe.style.border = 'none'
  document.body.append(iframe)
  const contentWindow = iframe.contentWindow!
  const doc = contentWindow.document
  doc.open()
  const container = document.createElement('div')
  base64List.forEach(base64 => {
    const image = document.createElement('img')
    image.style.width = `${width}px`
    image.style.height = `${height}px`
    image.src = base64
    container.append(image)
  })
  const style = document.createElement('style')
  const stylesheet = `*{margin:0;padding:0;}`
  style.append(document.createTextNode(stylesheet))
  setTimeout(() => {
    doc.write(`${style.outerHTML}${container.innerHTML}`)
    contentWindow.print()
    doc.close()
    // yû–diframe
    window.addEventListener(
      'mouseover',
      () => {
        iframe?.remove()
      },
      {
        once: true
      }
    )
  })
}

```

File Path: canvas-editor/src/editor/utils/ua.ts

```
export const isApple =
```

```
  typeof navigator !== 'undefined' && /Mac OS X/.test(navigator.userAgent)
```

```

File Path: canvas-editor/src/main.ts
import { data, options } from './mock'
import './style.css'
import prism from 'prismjs'
import Editor, {
  BlockType,
  Command,
  ControlType,
  EditorMode,
  ElementType,
  IBlock,
  ICatalogItem,
  IElement,
  KeyMap,
  ListStyle,
  ListType,
  PageMode,
  PaperDirection,
  RowFlex,
  TitleLevel
} from './editor'
import { Dialog } from './components/dialog/Dialog'
import { formatPrismToken } from './utils/prism'
import { Signature } from './components/signature/Signature'
import { debounce } from './utils'
import {
  window.onload = function () {
    const isApple =
      typeof navigator !== 'undefined' && /Mac OS X/.test(navigator.userAgent)
    // 1. R YES ••Vh
    const container = document.querySelector<HTMLDivElement>('.editor')!
    const instance = new Editor(
      container,
      {
        header: [
          {
            value: '{,N N°I S;-b',
            size: 32,
            rowFlex: RowFlex.CENTER
          },
          {
            value: '\n•èÊuÅ†',
            size: 18,
            rowFlex: RowFlex.CENTER
          }
        ]
      }
    )
  }
}

```

```

    {
      value: '\n',
      type: ElementType.SEPARATOR
    },
    main: <|Element[]>data,
    footer: [
      {
        value: 'canvas-editor',
        size: 12
      }
    ],
    options
  )
  console.log(['ŹO< ', instance])
  // cypressO•u(
  Reflect.set(window, 'editor', instance)
)
// fÜSU_9z—• kÁ
window.addEventListener(
  'click',
  evt => {
    const visibleDom = document.querySelector('.visible')
    if (!visibleDom || visibleDom.contains(<Node>evt.target)) return
    visibleDom.classList.remove('visible')
  },
  {
    capture: true
  }
)
// 2. | d• | 'ÍPZ | h<_ R7 | n -dh<_ |
const undoDom = document.querySelector<HTMLDivElement>('.menu-item__undo')!
undoDom.title = `d• (${isApple ? '# ' : 'Ctrl'}+Z)`
undoDom.onclick = function () {
  console.log('undo')
  instance.command.executeUndo()
}
const redoDom = document.querySelector<HTMLDivElement>('.menu-item__redo')!
redoDom.title = `ÍPZ(${isApple ? '# ' : 'Ctrl'}+Y)`
redoDom.onclick = function () {
  console.log('redo')
  instance.command.executeRedo()
}

```

Ð

```
const painterDom = document.querySelector<HTMLDivElement>('Ð  
' .menu-item__painter'Ð
```

```
)!Ð
```

```
painterDom.onclick = function () {Ð
```

```
  console.log('painter')Ð
```

```
  instance.command.executePainter({Ð
```

```
    isDbclick: falseÐ
```

```
  })Ð
```

```
}Ð
```

```
painterDom.ondbclick = function () {Ð
```

```
  console.log('painter')Ð
```

```
  instance.command.executePainter({Ð
```

```
    isDbclick: trueÐ
```

```
  })Ð
```

```
}Ð
```

Ð

```
document.querySelector<HTMLDivElement>(' .menu-item__format')!.onclick =Ð
```

```
function () {Ð
```

```
  console.log('format')Ð
```

```
  instance.command.executeFormat()Ð
```

```
}Ð
```

Ð

```
// 3. | [WOS | [WOSSØY' | [WOSSØ\ | R |— | eœOS | N R ~¿ | R -d~¿ | N h | N h | [WOS~œ,r | €lfo
```

```
const fontDom = document.querySelector<HTMLDivElement>(' .menu-item__font')!Ð
```

```
const fontSelectDom = fontDom.querySelector<HTMLDivElement>(' .select')!Ð
```

```
const fontOptionDom = fontDom.querySelector<HTMLDivElement>(' .options')!Ð
```

```
fontDom.onclick = function () {Ð
```

```
  console.log('font')Ð
```

```
  fontOptionDom.classList.toggle('visible')Ð
```

```
}Ð
```

```
fontOptionDom.onclick = function (evt) {Ð
```

```
  const li = evt.target as HTMLLIElementÐ
```

```
  instance.command.executeFont(li.dataset.family!)Ð
```

```
}Ð
```

Ð

```
const sizeSetDom = document.querySelector<HTMLDivElement>(' .menu-item__size')!Ð
```

```
const sizeSelectDom = sizeSetDom.querySelector<HTMLDivElement>(' .select')!Ð
```

```
const sizeOptionDom = sizeSetDom.querySelector<HTMLDivElement>(' .options')!Ð
```

```
sizeSetDom.title = `⌘³⁄₄•ñ[WS÷`Ð
```

```
sizeSetDom.onclick = function () {Ð
```

```
  console.log('size')Ð
```

```
  sizeOptionDom.classList.toggle('visible')Ð
```

```
}Ð
```

```
sizeOptionDom.onclick = function (evt) {Ð
```

```
  const li = evt.target as HTMLLIElementÐ
```

```

    instance.command.executeSize(Number(li.dataset.size!))Đ
  }Đ
Đ
  const sizeAddDom = document.querySelector<HTMLDivElement>(Đ
    '.menu-item__size-add'Đ
  )!Đ
  sizeAddDom.title = `XŽY'[WS÷(${'isApple ? '# ' : 'Ctrl'}+)]`Đ
  sizeAddDom.onclick = function () {Đ
    console.log('size-add')Đ
    instance.command.executeSizeAdd()Đ
  }Đ
Đ
  const sizeMinusDom = document.querySelector<HTMLDivElement>(Đ
    '.menu-item__size-minus'Đ
  )!Đ
  sizeMinusDom.title = `Qİ\ [WS÷(${'isApple ? '# ' : 'Ctrl'}+)]`Đ
  sizeMinusDom.onclick = function () {Đ
    console.log('size-minus')Đ
    instance.command.executeSizeMinus()Đ
  }Đ
Đ
  const boldDom = document.querySelector<HTMLDivElement>('.menu-item__bold')!Đ
  boldDom.title = `R |—(${'isApple ? '# ' : 'Ctrl'}+B)`Đ
  boldDom.onclick = function () {Đ
    console.log('bold')Đ
    instance.command.executeBold()Đ
  }Đ
Đ
  const italicDom =Đ
    document.querySelector<HTMLDivElement>('.menu-item__italic')!Đ
  italicDom.title = `eœOS(${'isApple ? '# ' : 'Ctrl'}+I)`Đ
  italicDom.onclick = function () {Đ
    console.log('italic')Đ
    instance.command.executeItalic()Đ
  }Đ
Đ
  const underlineDom = document.querySelector<HTMLDivElement>(Đ
    '.menu-item__underline'Đ
  )!Đ
  underlineDom.title = `N R ~¿(${'isApple ? '# ' : 'Ctrl'}+U)`Đ
  underlineDom.onclick = function () {Đ
    console.log('underline')Đ
    instance.command.executeUnderline()Đ
  }Đ
Đ
  const strikeoutsDom = document.querySelector<HTMLDivElement>(Đ

```

```

    '.menu-item__strikeout'!Đ
)!Đ
strikeoutDom.onclick = function () {Đ
    console.log('strikeout')Đ
    instance.command.executeStrikeout()Đ
}Đ
Đ
const superscriptDom = document.querySelector<HTMLDivElement>(Đ
    '.menu-item__superscript'Đ
)!Đ
superscriptDom.title = `N h (${isApple ? '# ' : 'Ctrl'}+Shift+,)`Đ
superscriptDom.onclick = function () {Đ
    console.log('superscript')Đ
    instance.command.executeSuperscript()Đ
}Đ
Đ
const subscriptDom = document.querySelector<HTMLDivElement>(Đ
    '.menu-item__subscript'Đ
)!Đ
subscriptDom.title = `N h (${isApple ? '# ' : 'Ctrl'}+Shift+,)`Đ
subscriptDom.onclick = function () {Đ
    console.log('subscript')Đ
    instance.command.executeSubscript()Đ
}Đ
Đ
const colorControlDom = document.querySelector<HTMLInputElement>('#color')!Đ
colorControlDom.oninput = function () {Đ
    instance.command.executeColor(colorControlDom.value)Đ
}Đ
const colorDom = document.querySelector<HTMLDivElement>('.menu-item__color')!Đ
const colorSpanDom = colorDom.querySelector('span')!Đ
colorDom.onclick = function () {Đ
    console.log('color')Đ
    colorControlDom.click()Đ
}Đ
Đ
const highlightControlDom =Đ
    document.querySelector<HTMLInputElement>('#highlight')!Đ
highlightControlDom.oninput = function () {Đ
    instance.command.executeHighlight(highlightControlDom.value)Đ
}Đ
const highlightDom = document.querySelector<HTMLDivElement>(Đ
    '.menu-item__highlight'Đ
)!Đ
const highlightSpanDom = highlightDom.querySelector('span')!Đ
highlightDom.onclick = function () {Đ

```



```

    console.log('highlight')Đ
    highlightControlDom?.click()Đ
  }Đ
Đ
  const titleDom = document.querySelector<HTMLDivElement>('.menu-item__title')!Đ
  const titleSelectDom = titleDom.querySelector<HTMLDivElement>('.select')!Đ
  const titleOptionDom = titleDom.querySelector<HTMLDivElement>('.options')!Đ
  titleOptionDom.querySelectorAll('li').forEach((li, index) => {Đ
    li.title = `Ctrl+${isApple ? 'Option' : 'Alt'}+${index}`Đ
  })Đ
Đ
  titleDom.onclick = function () {Đ
    console.log('title')Đ
    titleOptionDom.classList.toggle('visible')Đ
  }Đ
  titleOptionDom.onclick = function (evt) {Đ
    const li = evt.target as HTMLLIElementĐ
    const level = <TitleLevel>li.dataset.levelĐ
    instance.command.executeTitle(level || null)Đ
  }Đ
Đ
  const leftDom = document.querySelector<HTMLDivElement>('.menu-item__left')!Đ
  leftDom.title = `⌘[${isApple ? '#' : 'Ctrl'}+L]`Đ
  leftDom.onclick = function () {Đ
    console.log('left')Đ
    instance.command.executeRowFlex(RowFlex.LEFT)Đ
  }Đ
Đ
  const centerDom =Đ
    document.querySelector<HTMLDivElement>('.menu-item__center')!Đ
  centerDom.title = `⌘[${isApple ? '#' : 'Ctrl'}+E]`Đ
  centerDom.onclick = function () {Đ
    console.log('center')Đ
    instance.command.executeRowFlex(RowFlex.CENTER)Đ
  }Đ
Đ
  const rightDom = document.querySelector<HTMLDivElement>('.menu-item__right')!Đ
  rightDom.title = `⌘[${isApple ? '#' : 'Ctrl'}+R]`Đ
  rightDom.onclick = function () {Đ
    console.log('right')Đ
    instance.command.executeRowFlex(RowFlex.RIGHT)Đ
  }Đ
Đ
  const alignmentDom = document.querySelector<HTMLDivElement>(Đ
    '.menu-item__alignment'Đ
  )!Đ

```

```

alignmentDom.title = `N$zĩ[ùŸP($ {isApple ? '# ' : 'Ctrl'}+J)`Đ
alignmentDom.onclick = function () {Đ
  console.log('alignment')Đ
  instance.command.executeRowFlex(RowFlex.ALIGNMENT)Đ
}Đ
Đ
const rowMarginDom = document.querySelector<HTMLDivElement>(Đ
  '.menu-item__row-margin'Đ
)!Đ
const rowOptionDom = rowMarginDom.querySelector<HTMLDivElement>('.options')!Đ
rowMarginDom.onclick = function () {Đ
  console.log('row-margin')Đ
  rowOptionDom.classList.toggle('visible')Đ
}Đ
rowOptionDom.onclick = function (evt) {Đ
  const li = evt.target as HTMLLIElementĐ
  instance.command.executeRowMargin(Number(li.dataset.rowmargin!))Đ
}Đ
Đ
const listDom = document.querySelector<HTMLDivElement>('.menu-item__list')!Đ
listDom.title = `R ^h($ {isApple ? '# ' : 'Ctrl'}+Shift+U)`Đ
const listOptionDom = listDom.querySelector<HTMLDivElement>('.options')!Đ
listDom.onclick = function () {Đ
  console.log('list')Đ
  listOptionDom.classList.toggle('visible')Đ
}Đ
listOptionDom.onclick = function (evt) {Đ
  const li = evt.target as HTMLLIElementĐ
  const listType = <ListType>li.dataset.listType || nullĐ
  const listStyle = <ListStyle>( <unknown>li.dataset.listStyle)Đ
  instance.command.executeList(listType, listStyle)Đ
}Đ
Đ
// 4. | ^hh< | VprG | •..."pc¥ | R Rr~ğ | l4Sp | Năx WW | R –”{& | c$Nö | Y • hF | LaTeX | eăg • béVhĐ
const tableDom = document.querySelector<HTMLDivElement>('.menu-item__table')!Đ
const tablePanelContainer = document.querySelector<HTMLDivElement>(Đ
  '.menu-item__table__collapse'Đ
)!Đ
const tableClose = document.querySelector<HTMLDivElement>('.table-close')!Đ
const tableTitle = document.querySelector<HTMLDivElement>('.table-select')!Đ
const tablePanel = document.querySelector<HTMLDivElement>('.table-panel')!Đ
// ~ØR6^LR Đ
const tableCellList: HTMLDivElement[][] = []Đ
for (let i = 0; i < 10; i++) {Đ
  const tr = document.createElement('tr')Đ
  tr.classList.add('table-row')Đ

```

```

const trCellList: HTMLDivElement[] = []
for (let j = 0; j < 10; j++) {
  const td = document.createElement('td')
  td.classList.add('table-cel')
  tr.append(td)
  trCellList.push(td)
}
tablePanel.append(tr)
tableCellList.push(trCellList)
}
let colIndex = 0
let rowIndex = 0
// yû-db@g h<• bé
function removeAllTableCellSelect() {
  tableCellList.forEach(tr => {
    tr.forEach(td => td.classList.remove('active'))
  })
}
// ¼•nh ~Q...[1
function setTableTitle(payload: string) {
  tableTitle.innerText = payload
}
// `bY R YËr¶`
function recoveryTable() {
  // •ØSÿ• béh7_ 0 h ~0 • bé^LR
  removeAllTableCellSelect()
  setTableTitle('cÔQe')
  colIndex = 0
  rowIndex = 0
  // —•...ïpanel
  tablePanelContainer.style.display = 'none'
}
tableDom.onclick = function () {
  console.log('table')
  tablePanelContainer!.style.display = 'block'
}
tablePanel.onmousemove = function (evt) {
  const celSize = 16
  const rowMarginTop = 10
  const celMarginRight = 6
  const { offsetX, offsetY } = evt
  // yû-db@g • bé
  removeAllTableCellSelect()
  colIndex = Math.ceil(offsetX / (celSize + celMarginRight)) || 1
  rowIndex = Math.ceil(offsetY / (celSize + rowMarginTop)) || 1
  // e9SØ• béh7_

```

```

tableCellList.forEach((tr, trIndex) => {
  tr.forEach((td, tdIndex) => {
    if (tdIndex < colIndex && trIndex < rowIndex) {
      td.classList.add('active')
    }
  })
})
// e9S0^hh<h ~
setTableTitle(`${rowIndex}x${colIndex}`)
}
tableClose.onclick = function () {
  recoveryTable()
}
tablePanel.onclick = function () {
  // ^"u(• bé
  instance.command.executeInsertTable(rowIndex, colIndex)
  recoveryTable()
}
}
const imageDom = document.querySelector<HTMLDivElement>('.menu-
item__image')!
const imageFileDom = document.querySelector<HTMLInputElement>('#image')!
imageDom.onclick = function () {
  imageFileDom.click()
}
imageFileDom.onchange = function () {
  const file = imageFileDom.files![0]!
  const fileReader = new FileReader()
  fileReader.readAsDataURL(file)
  fileReader.onload = function () {
    // ⑆{—[½šØ
    const image = new Image()
    const value = fileReader.result as string
    image.src = value
    image.onload = function () {
      instance.command.executeImage({
        value,
        width: image.width,
        height: image.height
      })
      imageFileDom.value = ""
    }
  }
}
const hyperlinkDom = document.querySelector<HTMLDivElement>{

```

```

    '.menu-item__hyperlink'!
  )!
  hyperlinkDom.onclick = function () {
    console.log('hyperlink')
    new Dialog({
      title: '•...''pc¥',
      data: [
        {
          type: 'text',
          label: 'e‡g,',
          name: 'name',
          required: true,
          placeholder: '÷•“Qee‡g,'
        },
        {
          type: 'text',
          label: ''pc¥',
          name: 'url',
          required: true,
          placeholder: '÷•“Qe”pc¥'
        }
      ],
      onConfirm: payload => {
        const name = payload.find(p => p.name === 'name')?.value
        if (!name) return
        const url = payload.find(p => p.name === 'url')?.value
        if (!url) return
        instance.command.executeHyperlink({
          type: ElementType.HYPERLINK,
          value: "",
          url,
          valueList: name.split("").map(n => ({
            value: n,
            size: 16
          })))
      })
    })
  })
}
const separatorDom = document.querySelector<HTMLDivElement>(
  '.menu-item__separator'
)!
const separatorOptionDom =
  separatorDom.querySelector<HTMLDivElement>('.options')!
  separatorDom.onclick = function () {

```

```

    console.log('separator')
    separatorOptionDom.classList.toggle('visible')
  }
  separatorOptionDom.onmousedown = function (evt) {
    let payload: number[] = []
    const li = evt.target as HTMLLIElement
    const separatorDash = li.dataset.separator?.split(',').map(Number)
    if (separatorDash) {
      const isSingleLine = separatorDash.every(d => d === 0)
      if (!isSingleLine) {
        payload = separatorDash
      }
    }
    instance.command.executeSeparator(payload)
  }
}
const pageBreakDom = document.querySelector<HTMLDivElement>(
  '.menu-item__page-break'
)!
pageBreakDom.onclick = function () {
  console.log('pageBreak')
  instance.command.executePageBreak()
}
const watermarkDom = document.querySelector<HTMLDivElement>(
  '.menu-item__watermark'
)!
const watermarkOptionDom =
  watermarkDom.querySelector<HTMLDivElement>('.options')!
watermarkDom.onclick = function () {
  console.log('watermark')
  watermarkOptionDom.classList.toggle('visible')
}
watermarkOptionDom.onmousedown = function (evt) {
  const li = evt.target as HTMLLIElement
  const menu = li.dataset.menu!
  watermarkOptionDom.classList.toggle('visible')
  if (menu === 'add') {
    new Dialog({
      title: 'l4Sp',
      data: [
        {
          type: 'text',
          label: 'Q...[1]',
          name: 'data',
          required: true,

```

```

        placeholder: '÷•“QeQ...['
    },
    {
        type: 'color',
        label: 'œ,r',
        name: 'color',
        required: true,
        value: '#AEB5C0'
    },
    {
        type: 'number',
        label: '[WOSY\'',
        name: 'size',
        required: true,
        value: '120'
    }
],
onConfirm: payload => {
    const nullableIndex = payload.findIndex(p => !p.value)
    if (~nullableIndex) return
    const watermark = payload.reduce((pre, cur) => {
        pre[cur.name] = cur.value
        return pre
    }, <any>{})
    instance.command.executeAddWatermark({
        data: watermark.data,
        color: watermark.color,
        size: Number(watermark.size)
    })
}
})
} else {
    instance.command.executeDeleteWatermark()
}
}
}
const codeblockDom = document.querySelector<HTMLDivElement>(
    '.menu-item__codeblock'
)!
codeblockDom.onclick = function () {
    console.log('codeblock')
    new Dialog({
        title: 'Nâx WW',
        data: [
            {
                type: 'textarea',

```

```

    name: 'codeblock',Đ
    placeholder: '÷•“QeNãx ',Đ
    width: 500,Đ
    height: 300Đ
  }Đ
],Đ
onConfirm: payload => {Đ
  const codeblock = payload.find(p => p.name === 'codeblock')?.valueĐ
  if (!codeblock) returnĐ
  const tokenList = prism.tokenize(codeblock, prism.languages.javascript)Đ
  const formatTokenList = formatPrismToken(tokenList)Đ
  const elementList: IElement[] = []Đ
  for (let i = 0; i < formatTokenList.length; i++) {Đ
    const formatToken = formatTokenList[i]Đ
    const tokenStringList = formatToken.content.split("")Đ
    for (let j = 0; j < tokenStringList.length; j++) {Đ
      const value = tokenStringList[j]Đ
      const element: IElement = {Đ
        valueĐ
      }Đ
      if (formatToken.color) {Đ
        element.color = formatToken.colorĐ
      }Đ
      if (formatToken.bold) {Đ
        element.bold = trueĐ
      }Đ
      if (formatToken.italic) {Đ
        element.italic = trueĐ
      }Đ
      elementList.push(element)Đ
    }Đ
  }Đ
  elementList.unshift({Đ
    value: '\n'Đ
  })Đ
  instance.command.executeInsertElementList(elementList)Đ
}Đ
})Đ
}Đ
Đ
const controlDom = document.querySelector<HTMLDivElement>(Đ
  '.menu-item__control'Đ
)!Đ
const controlOptionDom = controlDom.querySelector<HTMLDivElement>('.options')!Đ
controlDom.onclick = function () {Đ
  console.log('control')Đ
}

```



```

    controlOptionDom.classList.toggle('visible')
  }
  controlOptionDom.onmousedown = function (evt) {
    controlOptionDom.classList.toggle('visible')
    const li = evt.target as HTMLLIElement
    const type = <ControlType>li.dataset.control
    switch (type) {
      case ControlType.TEXT:
        new Dialog({
          title: 'e†g,c$Nö',
          data: [
            {
              type: 'text',
              label: 'S`OM{&',
              name: 'placeholder',
              required: true,
              placeholder: '⌘÷•“QeS`OM{&'
            },
            {
              type: 'text',
              label: 'žØ⌘P<',
              name: 'value',
              placeholder: '⌘÷•“QežØ⌘P<'
            }
          ],
          onConfirm: payload => {
            const placeholder = payload.find(
              p => p.name === 'placeholder'
            ).value
            if (!placeholder) return
            const value = payload.find(p => p.name === 'value').value || ''
            instance.command.executeInsertElementList([
              {
                type: ElementType.CONTROL,
                value: "",
                control: {
                  type,
                  value: value
                },
                ? [
                  {
                    value
                  }
                ],
                : null,
                placeholder
              }
            ])
          }
        })
      }
    }
  }
}

```

```

    }
  })
}
})
break
case ControlType.SELECT:
  new Dialog({
    title: 'R N>c§Nö',
    data: [
      {
        type: 'text',
        label: 'S`OM{&',
        name: 'placeholder',
        required: true,
        placeholder: '÷•“QeS`OM{&'
      },
      {
        type: 'text',
        label: 'žØ«P<',
        name: 'code',
        placeholder: '÷•“QežØ«P<'
      },
      {
        type: 'textarea',
        label: 'P<–Æ',
        name: 'valueSets',
        required: true,
        height: 100,
        placeholder: `÷•“QeP<–ÆJSONÿ Oÿ òn[{"n"value":"g ",\n"code":"98175"\n}]`
      }
    ],
    onConfirm: payload => {
      const placeholder = payload.find(
        p => p.name === 'placeholder'
      ).value
      if (!placeholder) return
      const valueSets = payload.find(p => p.name === 'valueSets').value
      if (!valueSets) return
      const code = payload.find(p => p.name === 'code').value
      instance.command.executeInsertElementList([
        {
          type: ElementType.CONTROL,
          value: "",
          control: {
            type,
            code,

```

```

        value: null,Đ
        placeholder,Đ
        valueSets: JSON.parse(valueSets)Đ
    }Đ
}Đ
])Đ
}Đ
})Đ
breakĐ
case ControlType.CHECKBOX:Đ
    new Dialog({Đ
        title: 'Y • hFc§Nö',Đ
        data: [Đ
            {Đ
                type: 'text',Đ
                label: 'žØ«P<',Đ
                name: 'code',Đ
                placeholder: '÷•“QežØ«P<ÿ Y N*P<Nå,ñe‡• S÷R Rr'Đ
            },Đ
            {Đ
                type: 'textarea',Đ
                label: 'P<–Æ',Đ
                name: 'valueSets',Đ
                required: true,Đ
                height: 100,Đ
                placeholder: `÷•“QeP<–ÆJSONÿ Oÿ ñ[{\n"value": "g ",\n"code": "98175"\n}]`Đ
            },Đ
        ],Đ
        onConfirm: payload => {Đ
            const valueSets = payload.find(p => p.name === 'valueSets')?.valueĐ
            if (!valueSets) returnĐ
            const code = payload.find(p => p.name === 'code')?.valueĐ
            instance.command.executeInsertElementList([Đ
                {Đ
                    type: ElementType.CONTROL,Đ
                    value: "",Đ
                    control: {Đ
                        type,Đ
                        code,Đ
                        value: null,Đ
                        valueSets: JSON.parse(valueSets)Đ
                    },Đ
                },Đ
            ],Đ
        ),Đ
    })Đ
}Đ

```

```

        break
    default:
        break
    }
}
const checkboxDom = document.querySelector<HTMLDivElement>('.menu-item__checkbox')
)!
checkboxDom.onclick = function () {
    console.log('checkbox')
    instance.command.executeInsertElementList([
        {
            type: ElementType.CHECKBOX,
            value: ''
        }
    ])
}
const latexDom = document.querySelector<HTMLDivElement>('.menu-item__latex')!
latexDom.onclick = function () {
    console.log('LaTeX')
    new Dialog({
        title: 'LaTeX',
        data: [
            {
                type: 'textarea',
                height: 100,
                name: 'value',
                placeholder: '÷•“QeLaTeXe‡g,'
            }
        ],
        onConfirm: payload => {
            const value = payload.find(p => p.name === 'value')?.value
            if (!value) return
            instance.command.executeInsertElementList([
                {
                    type: ElementType.LATEX,
                    value
                }
            ])
        }
    })
}
const dateDom = document.querySelector<HTMLDivElement>('.menu-item__date')!

```

```

const dateDomOptionDom = dateDom.querySelector<HTMLDivElement>('.options')!
dateDom.onclick = function () {
  console.log('date')
  dateDomOptionDom.classList.toggle('visible')
  // [SOMME et
  const bodyRect = document.body.getBoundingClientRect()
  const dateDomOptionRect = dateDomOptionDom.getBoundingClientRect()
  if (dateDomOptionRect.left + dateDomOptionRect.width > bodyRect.width) {
    dateDomOptionDom.style.right = '0px'
    dateDomOptionDom.style.left = 'unset'
  } else {
    dateDomOptionDom.style.right = 'unset'
    dateDomOptionDom.style.left = '0px'
  }
  // _SRMeåg
  const date = new Date()
  const year = date.getFullYear().toString()
  const month = (date.getMonth() + 1).toString().padStart(2, '0')
  const day = date.getDate().toString().padStart(2, '0')
  const hour = date.getHours().toString().padStart(2, '0')
  const minute = date.getMinutes().toString().padStart(2, '0')
  const second = date.getSeconds().toString().padStart(2, '0')
  const dateString = `${year}-${month}-${day}`
  const dateTimeString = `${dateString} ${hour}:${minute}:${second}`
  dateDomOptionDom.querySelector<HTMLLIElement>('li:first-child')!.innerText =
    dateString
  dateDomOptionDom.querySelector<HTMLLIElement>('li:last-child')!.innerText =
    dateTimeString
}
dateDomOptionDom.onmousedown = function (evt) {
  const li = evt.target as HTMLLIElement
  const dateFormat = li.dataset.format!
  dateDomOptionDom.classList.toggle('visible')
  instance.command.executeInsertElementList([
    {
      type: ElementType.DATE,
      value: "",
      dateFormat,
      valueList: [
        {
          value: li.innerText.trim()
        }
      ]
    }
  ])
}

```

Đ

```
const blockDom = document.querySelector<HTMLDivElement>('.menu-item__block')!Đ
```

```
blockDom.onclick = function () {Đ
```

```
  console.log('block')Đ
```

```
  new Dialog({Đ
```

```
    title: 'Q...[1WW',Đ
```

```
    data: [Đ
```

```
      {Đ
```

```
        type: 'select',Đ
```

```
        label: '|{W<',Đ
```

```
        name: 'type',Đ
```

```
        value: 'iframe',Đ
```

```
        required: true,Đ
```

```
        options: [Đ
```

```
          {Đ
```

```
            label: '•QW@',Đ
```

```
            value: 'iframe'Đ
```

```
          },Đ
```

```
          {Đ
```

```
            label: '%o/Æ~",Đ
```

```
            value: 'video'Đ
```

```
        }Đ
```

```
      ],Đ
```

```
    },Đ
```

```
    {Đ
```

```
      type: 'number',Đ
```

```
      label: '[½^',Đ
```

```
      name: 'width',Đ
```

```
      placeholder: '÷•“Qe[½^!ÿ žØ«řu—bQ...[½^!ÿ 'Đ
```

```
    },Đ
```

```
    {Đ
```

```
      type: 'number',Đ
```

```
      label: 'šØ^',Đ
```

```
      name: 'height',Đ
```

```
      required: true,Đ
```

```
      placeholder: '÷•“QešØ^'Đ
```

```
    },Đ
```

```
    {Đ
```

```
      type: 'textarea',Đ
```

```
      label: 'W0W@',Đ
```

```
      height: 100,Đ
```

```
      name: 'value',Đ
```

```
      required: true,Đ
```

```
      placeholder: '÷•“QeW0W@'Đ
```

```
    }Đ
```

```
  ],Đ
```

```

onConfirm: payload => {
  const type = payload.find(p => p.name === 'type')?.value
  if (!type) return
  const value = payload.find(p => p.name === 'value')?.value
  if (!value) return
  const width = payload.find(p => p.name === 'width')?.value
  const height = payload.find(p => p.name === 'height')?.value
  if (!height) return
  const block: IBlock = {
    type: <BlockType>type
  }
  if (block.type === BlockType.IFRAME) {
    block.iframeBlock = {
      src: value
    }
  } else if (block.type === BlockType.VIDEO) {
    block.videoBlock = {
      src: value
    }
  }
  const blockElement: IElement = {
    type: ElementType.BLOCK,
    value: "",
    height: Number(height),
    block
  }
  if (width) {
    blockElement.width = Number(width)
  }
  instance.command.executeInsertElementList([blockElement])
}
})
}
}
// 5. | d }"&fÿcb | bSSp |
const searchCollapseDom = document.querySelector<HTMLDivElement>('
.menu-item__search__collapse')
)!
const searchInputDom = document.querySelector<HTMLInputElement>('
.menu-item__search__collapse__search input')
)!
const replaceInputDom = document.querySelector<HTMLInputElement>('
.menu-item__search__collapse__replace input')
)!
const searchDom =
  document.querySelector<HTMLDivElement>('.menu-item__search')!

```

```

searchDom.title = `d }"N fyꞑb(${isApple ? '# ' : 'Ctrl'}+F)`Đ
const searchResultDom =Đ
  searchCollapseDom.querySelector<HTMLLabelElement>('.search-result')!Đ
function setSearchResult() {Đ
  const result = instance.command.getSearchNavigateInfo()Đ
  if (result) {Đ
    const { index, count } = resultĐ
    searchResultDom.innerText = `${index}/${count}`Đ
  } else {Đ
    searchResultDom.innerText = "Đ
  }Đ
}Đ
searchDom.onclick = function () {Đ
  console.log('search')Đ
  searchCollapseDom.style.display = 'block'Đ
  const bodyRect = document.body.getBoundingClientRect()Đ
  const searchRect = searchDom.getBoundingClientRect()Đ
  const searchCollapseRect = searchCollapseDom.getBoundingClientRect()Đ
  if (searchRect.left + searchCollapseRect.width > bodyRect.width) {Đ
    searchCollapseDom.style.right = '0px'Đ
    searchCollapseDom.style.left = 'unset'Đ
  } else {Đ
    searchCollapseDom.style.right = 'unset'Đ
  }Đ
  searchInputDom.focus()Đ
}Đ
searchCollapseDom.querySelector<HTMLSpanElement>('span')!.onclick =Đ
  function () {Đ
    searchCollapseDom.style.display = 'none'Đ
    searchInputDom.value = "Đ
    replaceInputDom.value = "Đ
    instance.command.executeSearch(null)Đ
    setSearchResult()Đ
  }Đ
searchInputDom.oninput = function () {Đ
  instance.command.executeSearch(searchInputDom.value || null)Đ
  setSearchResult()Đ
}Đ
searchInputDom.onkeydown = function (evt) {Đ
  if (evt.key === 'Enter') {Đ
    instance.command.executeSearch(searchInputDom.value || null)Đ
    setSearchResult()Đ
  }Đ
}Đ
searchCollapseDom.querySelector<HTMLButtonElement>('button')!.onclick =Đ
  function () {Đ

```



```

    const searchValue = searchInputDom.value
    const replaceValue = replaceInputDom.value
    if (searchValue && replaceValue && searchValue !== replaceValue) {
        instance.command.executeReplace(replaceValue)
    }
}
searchCollapseDom.querySelector<HTMLDivElement>('.arrow-left')!.onclick =
function () {
    instance.command.executeSearchNavigatePre()
    setSearchResult()
}
searchCollapseDom.querySelector<HTMLDivElement>('.arrow-right')!.onclick =
function () {
    instance.command.executeSearchNavigateNext()
    setSearchResult()
}
const printDom = document.querySelector<HTMLDivElement>('.menu-item__print')
printDom.title = `bSSp(${isApple ? '#' : 'Ctrl'}+P)`
printDom.onclick = function () {
    console.log('print')
    instance.command.executePrint()
}
// 6. vî_Uf>→• | ~u—bj!_ | ~,~ •)e> | ~,~ Y\ | ~,~ e¹T | ~u•¹•Ý | Qh\O
async function updateCatalog() {
    const catalog = await instance.command.getCatalog()
    const catalogMainDom =
        document.querySelector<HTMLDivElement>('.catalog__main')
    catalogMainDom.innerHTML = ''
    if (catalog) {
        const appendCatalog = (
            parent: HTMLDivElement,
            catalogItems: ICatalogItem[]
        ) => {
            for (let c = 0; c < catalogItems.length; c++) {
                const catalogItem = catalogItems[c]
                const catalogItemDom = document.createElement('div')
                catalogItemDom.classList.add('catalog-item')
                // n2gO
                const catalogItemContentDom = document.createElement('div')
                catalogItemContentDom.classList.add('catalog-item__content')
                const catalogItemContentSpanDom = document.createElement('span')
                catalogItemContentSpanDom.innerText = catalogItem.name
                catalogItemContentDom.append(catalogItemContentSpanDom)
                // [šOM

```

```

        catalogItemContentDom.onclick = () => {Đ
            instance.command.executeLocationCatalog(catalogItem.id)Đ
        }Đ
        catalogItemDom.append(catalogItemContentDom)Đ
        if (catalogItem.subCatalog && catalogItem.subCatalog.length) {Đ
            appendCatalog(catalogItemDom, catalogItem.subCatalog)Đ
        }Đ
        // •ýR Đ
        parent.append(catalogItemDom)Đ
    }Đ
}Đ
appendCatalog(catalogMainDom, catalog)Đ
}Đ
}Đ
let isCatalogShow = trueĐ
const catalogDom = document.querySelector<HTMLElement>('.catalog')!Đ
const catalogModeDom =Đ
    document.querySelector<HTMLDivElement>('.catalog-mode')!Đ
const catalogHeaderCloseDom = document.querySelector<HTMLDivElement>(Đ
    '.catalog__header__close'Đ
)!Đ
const switchCatalog = () => {Đ
    isCatalogShow = !isCatalogShowĐ
    if (isCatalogShow) {Đ
        catalogDom.style.display = 'block'Đ
        updateCatalog()Đ
    } else {Đ
        catalogDom.style.display = 'none'Đ
    }Đ
}Đ
catalogModeDom.onclick = switchCatalogĐ
catalogHeaderCloseDom.onclick = switchCatalogĐ
Đ
const pageModeDom = document.querySelector<HTMLDivElement>('.page-mode')!Đ
const pageModeOptionsDom =Đ
    pageModeDom.querySelector<HTMLDivElement>('.options')!Đ
pageModeDom.onclick = function () {Đ
    pageModeOptionsDom.classList.toggle('visible')Đ
}Đ
pageModeOptionsDom.onclick = function (evt) {Đ
    const li = evt.target as HTMLLIElementĐ
    instance.command.executePageMode(<PageMode>li.dataset.pageMode!)Đ
}Đ
Đ
document.querySelector<HTMLDivElement>('.page-scale-percentage')!.onclick =Đ
    function () {Đ

```

```

        console.log('page-scale-recovery')!Đ
        instance.command.executePageScaleRecovery()!Đ
    }!Đ
Đ
    document.querySelector<HTMLDivElement>('.page-scale-minus')!.onclick =Đ
    function () {!Đ
        console.log('page-scale-minus')!Đ
        instance.command.executePageScaleMinus()!Đ
    }!Đ
Đ
    document.querySelector<HTMLDivElement>('.page-scale-add')!.onclick =Đ
    function () {!Đ
        console.log('page-scale-add')!Đ
        instance.command.executePageScaleAdd()!Đ
    }!Đ
Đ
    // ~, _ Y\ Đ
    const paperSizeDom = document.querySelector<HTMLDivElement>('.paper-size')!Đ
    const paperSizeDomOptionsDom =Đ
    paperSizeDom.querySelector<HTMLDivElement>('.options')!Đ
    paperSizeDom.onclick = function () {!Đ
        paperSizeDomOptionsDom.classList.toggle('visible')!Đ
    }!Đ
    paperSizeDomOptionsDom.onclick = function (evt) {!Đ
        const li = evt.target as HTMLLIElement!Đ
        const paperType = li.dataset.paperSize!Đ
        const [width, height] = paperType.split('*').map(Number)!Đ
        instance.command.executePaperSize(width, height)!Đ
        // ~, _ r¶\ V!pf>!Đ
        paperSizeDomOptionsDom!Đ
        .querySelectorAll('li')!Đ
        .forEach(child => child.classList.remove('active'))!Đ
        li.classList.add('active')!Đ
    }!Đ
Đ
    // ~, _ e¹T Đ
    const paperDirectionDom =Đ
    document.querySelector<HTMLDivElement>('.paper-direction')!Đ
    const paperDirectionDomOptionsDom =Đ
    paperDirectionDom.querySelector<HTMLDivElement>('.options')!Đ
    paperDirectionDom.onclick = function () {!Đ
        paperDirectionDomOptionsDom.classList.toggle('visible')!Đ
    }!Đ
    paperDirectionDomOptionsDom.onclick = function (evt) {!Đ
        const li = evt.target as HTMLLIElement!Đ
        const paperDirection = li.dataset.paperDirection!Đ

```

```

instance.command.executePaperDirection(<PaperDirection>paperDirection)Đ
// ~, _ e¹T r¶` Vpf>Đ
paperDirectionDomOptionsDomĐ
.querySelectorAll('li')Đ
.forEach(child => child.classList.remove('active'))Đ
li.classList.add('active')Đ
}Đ
Đ
// ~u—b•¹•ÝĐ
const paperMarginDom =Đ
document.querySelector<HTMLDivElement>('.paper-margin')!Đ
paperMarginDom.onclick = function () {Đ
const [topMargin, rightMargin, bottomMargin, leftMargin] =Đ
instance.command.getPaperMargin()Đ
new Dialog({Đ
title: '~u•¹•Ý',Đ
data: [Đ
{Đ
type: 'text',Đ
label: 'N •¹•Ý',Đ
name: 'top',Đ
required: true,Đ
value: `${topMargin}`,Đ
placeholder: '÷•“QeN •¹•Ý'Đ
},Đ
{Đ
type: 'text',Đ
label: 'N •¹•Ý',Đ
name: 'bottom',Đ
required: true,Đ
value: `${bottomMargin}`,Đ
placeholder: '÷•“QeN •¹•Ý'Đ
},Đ
{Đ
type: 'text',Đ
label: ']æ•¹•Ý',Đ
name: 'left',Đ
required: true,Đ
value: `${leftMargin}`,Đ
placeholder: '÷•“Qe]æ•¹•Ý'Đ
},Đ
{Đ
type: 'text',Đ
label: 'Só•¹•Ý',Đ
name: 'right',Đ
required: true,Đ

```

```

    value: `${rightMargin}`,
    placeholder: '↵•“QeSó•1•Ý'
  },
],
onConfirm: payload => {
  const top = payload.find(p => p.name === 'top')?.value
  if (!top) return
  const bottom = payload.find(p => p.name === 'bottom')?.value
  if (!bottom) return
  const left = payload.find(p => p.name === 'left')?.value
  if (!left) return
  const right = payload.find(p => p.name === 'right')?.value
  if (!right) return
  instance.command.executeSetPaperMargin([
    Number(top),
    Number(right),
    Number(bottom),
    Number(left)
  ])
}
})
}
}
}
}
// Qh\O
const fullscreenDom = document.querySelector<HTMLDivElement>('.fullscreen')!
fullscreenDom.onclick = toggleFullscreen
window.addEventListener('keydown', evt => {
  if (evt.key === 'F11') {
    toggleFullscreen()
    evt.preventDefault()
  }
})
document.addEventListener('fullscreenchange', () => {
  fullscreenDom.classList.toggle('exist')
})
function toggleFullscreen() {
  console.log('fullscreen')
  if (!document.fullscreenElement) {
    document.documentElement.requestFullscreen()
  } else {
    document.exitFullscreen()
  }
}
}
}
// 7. ••“VhO•u(j!_
let modelIndex = 0

```

```

const modeList = [
  {
    mode: EditorMode.EDIT,
    name: '••j!_ '
  },
  {
    mode: EditorMode.CLEAN,
    name: 'n m j!_ '
  },
  {
    mode: EditorMode.READONLY,
    name: 'Sêûj!_ '
  }
]
const modeElement = document.querySelector<HTMLDivElement>('.editor-mode')!
modeElement.onclick = function () {
  // j!_ • bé_ªs
  modelIndex === 2 ? (modelIndex = 0) : modelIndex++
  // ¼•nj!_
  const { name, mode } = modeList[modelIndex]
  modeElement.innerText = name
  instance.command.executeMode(mode)
  // ¼•nfÜSUh gC–P%Æ%ÉŠ™^
  const isReadOnly = mode === EditorMode.READONLY
  const enableMenuList = ['search', 'print']
  document.querySelectorAll<HTMLDivElement>('.menu-item>div').forEach(dom => {
    const menu = dom.dataset.menu
    isReadOnly && (!menu || !enableMenuList.includes(menu))
      ? dom.classList.add('disable')
      : dom.classList.remove('disable')
  })
}
}
}
// 8. Q...•èNövŃT,
instance.listener.rangeStyleChange = function (payload) {
  // c§Nö|{W
  payload.type === ElementType.SUBSCRIPT
    ? subscriptDom.classList.add('active')
    : subscriptDom.classList.remove('active')
  payload.type === ElementType.SUPERSCRIPT
    ? superscriptDom.classList.add('active')
    : superscriptDom.classList.remove('active')
  payload.type === ElementType.SEPARATOR
    ? separatorDom.classList.add('active')
    : separatorDom.classList.remove('active')
  separatorOptionDom

```

```

        .querySelectorAll('li')ð
        .forEach(li => li.classList.remove('active'))ð
    if (payload.type === ElementType.SEPARATOR) {ð
        const separator = payload.dashArray.join(',') || '0,0'ð
        const curSeparatorDom = separatorOptionDom.querySelector<HTMLLIElement>(ð
            `[data-separator='${separator}']`ð
        )!ð
        if (curSeparatorDom) {ð
            curSeparatorDom.classList.add('active')ð
        }ð
    }ð
ð
    // [!e±g,ð
    fontOptionDomð
        .querySelectorAll<HTMLLIElement>('li')ð
        .forEach(li => li.classList.remove('active'))ð
    const curFontDom = fontOptionDom.querySelector<HTMLLIElement>(ð
        `[data-family='${payload.font}']`ð
    )ð
    if (curFontDom) {ð
        fontSelectDom.innerText = curFontDom.innerTextð
        fontSelectDom.style.fontFamily = payload.fontð
        curFontDom.classList.add('active')ð
    }ð
    sizeOptionDomð
        .querySelectorAll<HTMLLIElement>('li')ð
        .forEach(li => li.classList.remove('active'))ð
    const curSizeDom = sizeOptionDom.querySelector<HTMLLIElement>(ð
        `[data-size='${payload.size}']`ð
    )ð
    if (curSizeDom) {ð
        sizeSelectDom.innerText = curSizeDom.innerTextð
        curSizeDom.classList.add('active')ð
    } else {ð
        sizeSelectDom.innerText = `${payload.size}`ð
    }ð
    payload.boldð
        ? boldDom.classList.add('active')ð
        : boldDom.classList.remove('active')ð
    payload.italicð
        ? italicDom.classList.add('active')ð
        : italicDom.classList.remove('active')ð
    payload.underlineð
        ? underlineDom.classList.add('active')ð
        : underlineDom.classList.remove('active')ð
    payload.strikeoutð

```

```

    ? strikeoutsDom.classList.add('active')Đ
    : strikeoutsDom.classList.remove('active')Đ
if (payload.color) {Đ
    colorDom.classList.add('active')Đ
    colorControlDom.value = payload.colorĐ
    colorSpanDom.style.backgroundColor = payload.colorĐ
} else {Đ
    colorDom.classList.remove('active')Đ
    colorControlDom.value = '#000000'Đ
    colorSpanDom.style.backgroundColor = '#000000'Đ
}Đ
if (payload.highlight) {Đ
    highlightDom.classList.add('active')Đ
    highlightControlDom.value = payload.highlightĐ
    highlightSpanDom.style.backgroundColor = payload.highlightĐ
} else {Đ
    highlightDom.classList.remove('active')Đ
    highlightControlDom.value = '#ffff00'Đ
    highlightSpanDom.style.backgroundColor = '#ffff00'Đ
}Đ
Đ
// ^L^\@Đ
leftDom.classList.remove('active')Đ
centerDom.classList.remove('active')Đ
rightDom.classList.remove('active')Đ
alignmentDom.classList.remove('active')Đ
if (payload.rowFlex && payload.rowFlex === 'right') {Đ
    rightDom.classList.add('active')Đ
} else if (payload.rowFlex && payload.rowFlex === 'center') {Đ
    centerDom.classList.add('active')Đ
} else if (payload.rowFlex && payload.rowFlex === 'alignment') {Đ
    alignmentDom.classList.add('active')Đ
} else {Đ
    leftDom.classList.add('active')Đ
}Đ
Đ
// ^L•ô•ÝĐ
rowOptionDomĐ
    .querySelectorAll<HTMLLIElement>('li')Đ
    .forEach(li => li.classList.remove('active'))Đ
const curRowMarginDom = rowOptionDom.querySelector<HTMLLIElement>(Đ
    `[data-rowmargin='${payload.rowMargin}']`Đ
)!Đ
curRowMarginDom.classList.add('active')Đ
Đ
// RŸ€ýĐ

```



```

payload.undoĐ
  ? undoDom.classList.remove('no-allow')Đ
  : undoDom.classList.add('no-allow')Đ
payload.redoĐ
  ? redoDom.classList.remove('no-allow')Đ
  : redoDom.classList.add('no-allow')Đ
payload.painterĐ
  ? painterDom.classList.add('active')Đ
  : painterDom.classList.remove('active')Đ
Đ
// h ~Đ
titleOptionDomĐ
  .querySelectorAll<HTMLLIElement>('li')Đ
  .forEach(li => li.classList.remove('active'))Đ
if (payload.level) {Đ
  const curTitleDom = titleOptionDom.querySelector<HTMLLIElement>(Đ
    `[data-level='${payload.level}']` Đ
  )!Đ
  titleSelectDom.innerText = curTitleDom.innerTextĐ
  curTitleDom.classList.add('active')Đ
} else {Đ
  titleSelectDom.innerText = 'kce†'Đ
  titleOptionDom.querySelector('li:first-child')!.classList.add('active')Đ
}Đ
Đ
// R ^hĐ
listOptionDomĐ
  .querySelectorAll<HTMLLIElement>('li')Đ
  .forEach(li => li.classList.remove('active'))Đ
if (payload.listType) {Đ
  listDom.classList.add('active')Đ
  const listType = payload.listTypeĐ
  const listStyle =Đ
    payload.listType === ListType.OL ? ListStyle.DECIMAL : payload.listTypeĐ
  const curListDom = listOptionDom.querySelector<HTMLLIElement>(Đ
    `[data-list-type='${listType}'][data-list-style='${listStyle}']` Đ
  )Đ
  if (curListDom) {Đ
    curListDom.classList.add('active')Đ
  }Đ
} else {Đ
  listDom.classList.remove('active')Đ
}Đ
}Đ
Đ
instance.listener.visiblePageNoListChange = function (payload) {Đ

```

```

    const text = payload.map(i => i + 1).join('0 ')
    document.querySelector<HTMLSpanElement>('.page-no-list')!.innerText = text
  }
}
instance.listener.pageSizeChange = function (payload) {
  document.querySelector<HTMLSpanElement>(
    '.page-size'
  )!.innerText = `${payload}`
}
}
instance.listener.intersectionPageNoChange = function (payload) {
  document.querySelector<HTMLSpanElement>('.page-no')!.innerText = `${
    payload + 1
  }`
}
}
instance.listener.pageScaleChange = function (payload) {
  document.querySelector<HTMLSpanElement>(
    '.page-scale-percentage'
  )!.innerText = `${Math.floor(payload * 10 * 10)}%`
}
}
instance.listener.controlChange = function (payload) {
  const disableMenusInControlContext = [
    'superscript',
    'subscript',
    'table',
    'image',
    'hyperlink',
    'separator',
    'codeblock',
    'page-break',
    'control',
    'checkbox'
  ]
  // fÜSUdÍO\gC-P
  disableMenusInControlContext.forEach(menu => {
    const menuDom = document.querySelector<HTMLDivElement>(
      ` .menu-item__${menu}`
    )!
    payload
      ? menuDom.classList.add('disable')
      : menuDom.classList.remove('disable')
  })
}
}

```

```

instance.listener.pageModeChange = function (payload) {
  const activeMode = pageModeOptionsDom.querySelector<HTMLLIElement>(
    `[data-page-mode='${payload}']`
  )!
  pageModeOptionsDom
    .querySelectorAll('li')
    .forEach(li => li.classList.remove('active'))
  activeMode.classList.add('active')
}
instance.listener.contentChange = debounce(async function () {
  // [Wep
  const wordCount = await instance.command.getWordCount()
  document.querySelector<HTMLSpanElement>('.word-count')!.innerText = `${
    wordCount || 0
  }`
  // vi_U
  if (isCatalogShow) {
    updateCatalog()
  }
}, 200)
instance.listener.saved = function (payload) {
  console.log('elementList: ', payload)
}
// 9. Só•.fÜSUIèQCE
instance.register.contextMenuList([
  {
    name: '{~T ',
    icon: 'signature',
    when: payload => {
      return !payload.isReadOnly && payload.editorTextFocus
    },
    callback: (command: Command) => {
      new Signature({
        onConfirm(payload) {
          if (!payload) return
          const { value, width, height } = payload
          if (!value || !width || !height) return
          command.executeInsertElementList([
            {
              value,
              width,
              height,
              type: ElementType.IMAGE
            }
          ])
        }
      })
    }
  }
])

```

```

    }
  })
}
})
}
},
{
  name: 'h<_ ett ',
  icon: 'word-tool',
  when: payload => {
    return !payload.isReadOnly
  },
  callback: (command: Command) => {
    command.executeWordTool()
  }
}
])
}
// 10. _ëcw•.lèQÇ
instance.register.shortcutList([
{
  key: KeyMap.P,
  mod: true,
  isGlobal: true,
  callback: (command: Command) => {
    command.executePrint()
  }
},
{
  key: KeyMap.F,
  mod: true,
  isGlobal: true,
  callback: (command: Command) => {
    const text = command.getRangeText()
    searchDom.click()
    if (text) {
      searchInputDom.value = text
      instance.command.executeSearch(text)
      setSearchResult()
    }
  }
},
{
  key: KeyMap.MINUS,
  ctrl: true,
  isGlobal: true,

```

```
    callback: (command: Command) => {  
        command.executePageScaleMinus()  
    }  
},  
{  
    key: KeyMap.EQUAL,  
    ctrl: true,  
    isGlobal: true,  
    callback: (command: Command) => {  
        command.executePageScaleAdd()  
    }  
},  
{  
    key: KeyMap.ZERO,  
    ctrl: true,  
    isGlobal: true,  
    callback: (command: Command) => {  
        command.executePageScaleRecovery()  
    }  
}  
])  
}
```

File Path: canvas-editor/src/mock.ts

```
import {
  ControlType,
  ElementType,
  IEditorOption,
  IElement,
  ListType,
  TitleLevel
} from './editor'

const text = `N;Éÿ \nSÑpíN Y)ÿ T³UýN"Y)0 \ns°uÅSòÿ \n`£€ NŽN Y)RMeáf f>ñVàÿ a Q'T SÑs°—b•èl
120/80mmHgÿ \n•...R©hÀgâÿ \n2020^t6g 10eâÿ fne>ÿ ^@~Æ€PkÔ[136.50%ÿ POONÿ 40ÿ^50ÿ SUh8
`

// j!bßh ~
const titleText = [
  'N;Éÿ ',
  's°uÅSòÿ ',
  'eâ_€Sòÿ ',
  'mA^LuÅSòÿ ',
  'OSh<hÀgâÿ ',
  '•...R©hÀgâÿ ',
  '•èÊÊe-ÿ ',
  'Y •nl»u—ÿ ',
  'u5[P{~T ÿ ',
  'QvNÖ°_Uÿ '
]

const titleMap: Map<number, string> = new Map()
for (let t = 0; t < titleText.length; t++) {
  const value = titleText[t]
  const i = text.indexOf(value)
  if (~i) {
    titleMap.set(i, value)
  }
}

const colorText = ['O gÓ`'u¾uÅ']
const colorIndex: number[] = colorText
  .map(b => {
    const i = text.indexOf(b)
    return ~i
      ? Array(b.length)
        .fill(i)
        .map((_, j) => i + j)
      : []
  })
```

```

    .flat()
  }
  // j!bßšŒN@[W
  const highlightText = ['^@~Æ€ƆkÔ[']
  const highlightIndex: number[] = highlightText
    .map(b => {
      const i = text.indexOf(b)
      return ~i
        ? Array(b.length)
          .fill(i)
          .map((_, j) => i + j)
        : []
    })
    .flat()
  }
  const elementList: IElement[] = []
  // ~ÄT ~e‡g,epcn
  const textList = text.split("")
  let index = 0
  while (index < textList.length) {
    const value = textList[index]
    const title = titleMap.get(index)
    if (title) {
      elementList.push({
        value: "",
        type: ElementType.TITLE,
        level: TitleLevel.FIRST,
        valueList: [
          {
            value: title,
            size: 18
          }
        ]
      })
      index += title.length - 1
    } else if (colorIndex.includes(index)) {
      elementList.push({
        value,
        color: '#FF0000',
        size: 16
      })
    } else if (highlightIndex.includes(index)) {
      elementList.push({
        value,
        highlight: '#F2F27F'
      })
    }
  }

```

```

    } else {
        elementList.push({
            value,
            size: 16
        })
    }
    index++
}
}
// j!bβe‡g,c$Nö
elementList.splice(12, 0, {
    type: ElementType.CONTROL,
    value: "",
    control: {
        type: ControlType.TEXT,
        value: null,
        placeholder: 'QvNÖ^eQE',
        prefix: '{',
        postfix: '}'
    }
})
}
// j!bβN bÉc$Nö
elementList.splice(94, 0, {
    type: ElementType.CONTROL,
    value: "",
    control: {
        type: ControlType.SELECT,
        value: null,
        code: null,
        placeholder: 'g eà',
        prefix: '{',
        postfix: '}',
        valueSets: [
            {
                value: 'g ',
                code: '98175'
            },
            {
                value: 'eà',
                code: '98176'
            },
            {
                value: 'N ‹æ',
                code: '98177'
            }
        ]
    }
})

```



```

    ]Đ
  }Đ
})Đ
Đ
// j!bß•..."pc¥Đ
elementList.splice(116, 0, {Đ
  type: ElementType.HYPERLINK,Đ
  value: "",Đ
  valueList: [Đ
    {Đ
      value: 'e°',Đ
      size: 16Đ
    },Đ
    {Đ
      value: 'Q ',Đ
      size: 16Đ
    },Đ
    {Đ
      value: '€°',Đ
      size: 16Đ
    },Đ
    {Đ
      value: 'pŽ',Đ
      size: 16Đ
    }Đ
  ],Đ
  url: 'https://hufe.club/canvas-editor'Đ
})Đ
Đ
// j!bßN h Đ
elementList.splice(345, 0, {Đ
  value: '"',Đ
  color: '#FF0000',Đ
  type: ElementType.SUBSCRIPTĐ
})Đ
Đ
// j!bßN h Đ
elementList.splice(429, 0, {Đ
  value: '9',Đ
  type: ElementType.SUPERSCRIPTĐ
})Đ
Đ
// j!bßR ^hĐ
elementList.splice(450, 0, {Đ
  value: "",Đ
  type: ElementType.LIST,Đ

```

```
listType: ListType.OL,Đ
valueList: [Đ
  {Đ
    value: 'šØ^@S\ŋ|Ö\?uÅ\ŋuÅkÒ`'a Q`ŋ•ÇeO`'Ÿ;pŽ\ŋ•ÇeO`'Ÿ;`o€‰o'Đ
  }Đ
]Đ
})Đ
Đ
elementList.splice(452, 0, {Đ
  value: "",Đ
  type: ElementType.LIST,Đ
  listType: ListType.OL,Đ
  valueList: [Đ
    {Đ
      value:Đ
        '•...Xđ_ [üN u2r¶•z~Æ"ˆz•R:g/ÿ \nNYW(€•pŽ^h—bb—OSmK[šÿ \n•œ_ uÅSØ~Æ€ƒ'Ç-Æeg/0 T ~ˆv
    }Đ
  ]Đ
})Đ
Đ
// j!bßVprGĐ
elementList.splice(455, 0, {Đ
  value: `data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAAALAAAAA+CAYAAA
CLDZH2AAAMPmIDQ1BJQ0MgUHJvZmlsZQAASImVVwdYU8kWnltSlbTQpYTeBJEaQ
EoLYD0ltgISYBQYgwEFTuyqODaxQl2dFVEsQNIR+wsir0viKgo62LBrrxJAV33le/N982d
//5z5j9nzp259w4A6ie5YnEuqgFAnqhAEhcayBiTksogPQUEYAr0ABloc3n5YIZMTCsAZb
D9e3l3EyCy9pqjTOuf/f+1aPIF+TwAkBil0/n5vDyIDwKAV/HEkgIAiDLeYkqBWIZhBdoSG
CDEC2Q4U4GrZDhdgffKbRLi2BC3AEBW5XIlmQCoXYE8o5CXCTXU+iB2FvGFIgDUG
RD75eVN4kOcBrEttBFDLNNnpv+gk/k3zfQhTS43cwgr5ilv5CBhvjiXO+3/TMf/Lnm50kEf
1rCqZknC4mRzhnm7nTMpQoZVle4VpUdFQ6wF8QchX24PMUrNkoYIKuxRI14+G+YM
6ELszOcGRUBsBHGIKDcqUsmnZwhDOBDDFYJOFRZWEiDWh3iBID84XmmzSTIpTuk
Lrc+QsFIK/jxXlvcr8/VQmpPIUuq/zhJwIPqYWIFWQjLEVlgtC4VJURCrQeyUnxMfobQZV
ZTFjhq0kUjjZPFbQhwnEIUGKvSxwgxJSJzSviwvf3C+2KYsISdKifcXZCWEKfKDtfC48vj
hXLArAhErcVBHkD8mcnAufEFQsGLu2DOBKDFeqNBXBAYpxiLU8W5MUp73FyQGyrj
zSF2yy+MV47FkwrgglTo4xnigpgERZx4UTY3PEYRD74URAI2CAIMIIU1HUwC2UDY1tv
QC+8UPSGACyQgEwiAo5IZHJEs7xHBazwoAn9CJAD5Q+MC5b0CUAaj5r0Os4uoIMuS
9hflROeAJxHkgAuTCe6l8IGjIWxJ4DBnhP7xzYeXBeHNhlfX/e36Q/
c6wIBOPZKSDHhnqg5bEYGIQMYwYQrTDDXE/3AePhNcAWF1wJu41OI/v9oQnhHbCl
8INQgfhzkRhseSnKEeDDqgfosxF+o+5wK2hpjseiPtCdaiM6+KGwBF3g35YuD/07A5ZtjJ
uWVYYYP2n/bQY/PA2IHcWZglL0KAEU259HqtmruQ+pyHL9Y34UsaYP5Zs91POzf/
YP2efDNuJnS2wBdgA7h53CLmBHsQbAwE5gjVgrdkyGh1bXY/nqGvQWJ48nB+ol/
+Fv8MnKMpnvXOvc4/
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xkAE2ABbOF8XIAH8AEBIBiEg2iQAFLABbH9FIznEjAFzABzQSkOB0vBKrAObARbwA6
wG+wHDeAoOAXOgkvgCrgB7sHV0w1egD7wDnxGEISE0BA6YoCYIIaIA+KCMBE/JBiJ
```

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+EZw95h2sN8hvGGIq3bP+yuEWpkbxRnNN1oi1GrUb+xiXGosdh4rfFp414TXZMAk2yT  
ISbHTXpM6aZ+pkLTlaYnTJ8zdBgSRi5jDaOF0WdmZBZmJjXbbNZm9tncxjzRvNh8j/  
kDC6oF0yLDYqVFs0WfpanlaMsZlrWWd60oVkyrLKvVVues3lwbWCdbz7dusH5mo2/Ds  
SmyqbW5b0uz9bedbFtte92OaMe0y7Fbb3fFhrV3t8+yr7S/7IA6eDglHdY7tA8nDPcaLhp  
ePfyWo6ojy7HQsdax00nXKdKp2KnB6eUlyxGpI5aNODfim7O7c67zVud7I7VGho8sHtk0  
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+w+2NPh0fHsc6gztZH8Y/udfG6XjzOf/  
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A6+0A0FIAoMPzGXWs4vwnL4jizCpH4D9hxRIRXjwAqIP/77G98O/  
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AAAAAAAKgAgAEAAAAAQAALCgAwAEAAAAAQAAD4AAAAA/UM7vwAAD01JRE  
FUEAHtXQXoFM8Xf3Z3N3Y3tlgYWKjYLYoioqilLQp2Y2KAiYig2N2J3YHd3d26//eZPzO/

ufvenff9fndv9+67D+52dnd25s2bd7Mv5+IZDOSCS4EwpUD8MMXbRdulgKBA2DKw++J  
wORgUCESgnjBhAsWPH5/69Onjzmlcp0DYMfD169dp1KhRYtrcVTiOcy8PP+wYeNy4c  
WrWunXrpsrehSNHjICjRo1o//793rfc8wiiQLxwskLcvn2bChYsKMhfrFgxunr1qs+pwMpcp  
EgRunnzJtWpU4f27dvns557MfwfEFYrsL6aBlp9z507J5gX05MhQwb69u0b/fz5M/xnyx1  
BFAokjHLFWrCohTqksIN48P79e7pz5w7dunVLfCAfX7lyhS5duqTqrV27li5evCgYesSIE  
QQF0IXIoUDYMPC7d+9oy5YtivJVqlShT58+qfNABYgSgM+fPweq5t4LQwo4loE/fPhAp0  
+fpqNHj9KuXbvoxIkTHuQNhnnz5ctH48ePp79//1KyZMmoXLlyHm24JxFAAShxToKZM2c  
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RelUzMuQ05HnVVAyoMzEmXp4PHTrUJ9os+6o6OXPMNFhx81nPjovfv39XuGECeYdOt  
AONiOvTcSLE+vXraefOnfT06VPKmjUrwVxWu3Ztevv2LeXNm5fnnvxaFGbMmCHu42v  
06NGUKFEidW534c+fPx4oQKHs2bMnZcyY0eO6exl9CjiOgUuXLk34eMOvX7/UJV/K2l  
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b3G8ntO34FhulDf70E3a4rr8GdKwGODzCovpu7tL+iDsIWfQHMDlhxsBL0VVd/a1jZZ6S  
37XgGxgQ0b95czQNigr0BO1NKwBarMvgHjAtRQyptOEcwjzcgNhamNQTBIIxfKtB/  
fOjThdhTwDYGHscMDofp06f/c+Vr2bKIGimCw3UAI/hiaogKsBFjZZV/+oL/  
mNNXY9kOzFqQk2EdGDZsmLxs+IFnYF2cML2juNSgOSEV0W/lwIEDUMPFJ5gt92VcK  
zOgiKVFfhz+jkDGCsu2cBw+fLjIYGZ3sQowRyYwm9P8lqoHoiNoyAoA7sAPRxfMoYBtA  
e1gJp358PcAgYBIWsXwLOcaY8eOVeeSeVIWFImysh2OJVYMgyi2QKBvoMlrcacqMb4  
n8USguAvmUMA2EQImJQ6J5Dn9PyDW19fO6/J+kyZNCPltHBjWbsjgHdzHJn68otPJky  
c9dneHDRkmN7ihEcUWCKSXDHWsUOZ07xtilF0wiQLm/A5i1gpWOuRY8VDEB6n0rKk  
H3RjL0VF26Qn6Ya+KDRs2VHhYke6D9Hg5TuwD4YI5FLBNhJDo86qpJhYTjl0wQp1SD  
nFGyqes/EnUTD1iAxCMD/2wMmdq23G5MdtECJ5MAcgZQ6ijBN5HQJjN8DeyoYKIS5e  
qQHj+AVnSberUqUW7kydP9mkJsaTTuNCoU369c+fO9ViJoeDxHg+Wo4dN93RIEn+aa  
BVERzyyCodla9d2EUInKP8xt3qV8+lhGBqWBbYVi1w4va4ZZXY5GzCvyb448N2MZt02  
QkgBRzEwxg2m0k1akrnMtp2yiCKSK2X7UCatMp+Fcd7jXFeO/ZstZE8gt4031CCUsb8  
BOy6Y32IP8N7Vq1ePeIM90RjcyLzhCeXOnTv2jbsthJQCjmVgK6mAvCBkcDz+ngB/jCiV  
LCv7dds2nwJxkoFBRhmWiQ1JXAhfCsRZBg7fKXMx1ylgux1YR8YtuxSILgVcBo4uxdz6j  
qKAY8COmg4XmehS4H9f7COrHME8MAAAAABJRU5ErkJggg==`,

width: 89,

height: 32,

id: 'signature',

type: ElementType.IMAGE

}}

// j!bß^hh<

elementList.push({

type: ElementType.TABLE,

value: "",

colgroup: [

{

width: 180

},

{

width: 80

},

{

width: 130

},

{

width: 130

}

],

trList: [

```

{
  height: 40,
  tdList: [
    {
      colspan: 1,
      rowspan: 2,
      value: [
        { value: `1`, size: 16 },
        { value: `!`, size: 16 }
      ]
    },
    {
      colspan: 1,
      rowspan: 1,
      value: [
        { value: `2`, size: 16 },
        { value: `!`, size: 16 }
      ]
    },
    {
      colspan: 2,
      rowspan: 1,
      value: [
        { value: `3`, size: 16 },
        { value: `!`, size: 16 }
      ]
    }
  ]
},
{
  height: 40,
  tdList: [
    {
      colspan: 1,
      rowspan: 1,
      value: [
        { value: `4`, size: 16 },
        { value: `!`, size: 16 }
      ]
    },
    {
      colspan: 1,
      rowspan: 1,
      value: [
        { value: `5`, size: 16 },
        { value: `!`, size: 16 }
      ]
    }
  ]
}

```

```

]Đ
},Đ
{Đ
  colspan: 1,Đ
  rowspan: 1,Đ
  value: [Đ
    { value: `6`, size: 16 },Đ
    { value: `!`, size: 16 }Đ
  ]Đ
}Đ
]Đ
},Đ
{Đ
  height: 40,Đ
  tdList: [Đ
    {Đ
      colspan: 1,Đ
      rowspan: 1,Đ
      value: [Đ
        { value: `7`, size: 16 },Đ
        { value: `!`, size: 16 }Đ
      ]Đ
    },Đ
    {Đ
      colspan: 1,Đ
      rowspan: 1,Đ
      value: [Đ
        { value: `8`, size: 16 },Đ
        { value: `!`, size: 16 }Đ
      ]Đ
    },Đ
    {Đ
      colspan: 1,Đ
      rowspan: 1,Đ
      value: [Đ
        { value: `9`, size: 16 },Đ
        { value: `!`, size: 16 }Đ
      ]Đ
    },Đ
    {Đ
      colspan: 1,Đ
      rowspan: 1,Đ
      value: [Đ
        { value: `1`, size: 16 },Đ
        { value: `0`, size: 16 },Đ
        { value: `!`, size: 16 }Đ
      ]Đ
    }
  ]Đ
}Đ
{Đ
  colspan: 1,Đ
  rowspan: 1,Đ
  value: [Đ
    { value: `1`, size: 16 },Đ
    { value: `0`, size: 16 },Đ
    { value: `!`, size: 16 }Đ
  ]Đ
}Đ

```

```

    ]Đ
  }Đ
]Đ
}Đ
]Đ
})Đ
Đ
// j!bßcheckboxĐ
elementList.push(Đ
...(<|Element[]>[Đ
{Đ
  value: 'f/T&T a Nån Q...[1ÿ 'Đ
},Đ
{Đ
  type: ElementType.CONTROL,Đ
  control: {Đ
    type: ControlType.CHECKBOX,Đ
    code: '98175',Đ
    value: '',Đ
    valueSets: [Đ
      {Đ
        value: 'T a ',Đ
        code: '98175'Đ
      },Đ
      {Đ
        value: 'T&[š',Đ
        code: '98176'Đ
      }Đ
    ],Đ
  },Đ
  value: ''Đ
},Đ
{Đ
  value: '\n'Đ
}Đ
])Đ
)Đ
Đ
// LaTeXQl_ Đ
elementList.push(Đ
...(<|Element[]>[Đ
{Đ
  value: 'S;[fQl_ ŷ 'Đ
},Đ
{Đ
  value: `{E_k} = hv - {W_0}`,Đ

```



```

    type: ElementType.LATEX
  },
  {
    value: '\n'
  }
])
)
// eåg • bé
elementList.push(
  ...(<|Element[]>[
    {
      value: '{~•reåg y '
    },
    {
      value: '"',
      valueList: [
        {
          value: `2022-08-10 17:30:01`
        }
      ],
      type: ElementType.DATE
    },
    {
      value: '\n'
    }
  ])
)
// j!bß~Ó\>e‡g,
elementList.push(
  ...[
    {
      value: '"',
      type: ElementType.TAB
    },
    {
      value: 'E',
      size: 16
    },
    {
      value: 'O',
      size: 16
    },
    {
      value: 'F',

```

```
    size: 16Đ
  }Đ
]Đ
)Đ
Đ
export const data: IElement[] = elementListĐ
Đ
export const options: IEditorOption = {Đ
  margins: [100, 120, 100, 120],Đ
  watermark: {Đ
    data: 'CANVAS-EDITOR',Đ
    size: 120Đ
  },Đ
  pageNumber: {Đ
    format: '{,{pageNo}~u/Qq{pageCount}~u'Đ
  },Đ
  placeholder: {Đ
    data: '÷•“Qekce‡'Đ
  }Đ
}Đ
```

```

File Path: canvas-editor/src/plugins/copy/index.ts
// Y R6Q...[!eö^&QerHgCOá`oÿ Nãx NÂN:SÂ€ Đ
import Editor from '../editor'Đ
Đ
export interface ICopyWithCopyrightOption {Đ
  copyrightText: stringĐ
}Đ
Đ
export function copyWithCopyrightPlugin(Đ
  editor: Editor,Đ
  options?: ICopyWithCopyrightOptionĐ
) {Đ
  const copy = editor.command.executeCopyĐ
  Đ
  editor.command.executeCopy = () => {Đ
    const { copyrightText } = options || {}Đ
    if (copyrightText) {Đ
      const rangeText = editor.command.getRangeText()Đ
      if (!rangeText) returnĐ
      const text = `${rangeText}${copyrightText}` Đ
      const plainText = new Blob([text], { type: 'text/plain' })Đ
      // @ts-ignoreĐ
      const item = new ClipboardItem({Đ
        [plainText.type]: plainTextĐ
      })Đ
      window.navigator.clipboard.write([item])Đ
    } else {Đ
      copy()Đ
    }Đ
  }Đ
}Đ
Đ
}Đ

```

```

File Path: canvas-editor/src/plugins/markdown/index.ts
// {€S rHmarkdown•IIElementcÖNöy:O◊ÿ Năx NĂN:SÂ€ Đ
import Editor, {Đ
  Command,Đ
  ElementType,Đ
  IElement,Đ
  ListType,Đ
  TitleLevelĐ
} from '../editor'Đ
Đ
export type CommandWithMarkdown = Command & {Đ
  executeInsertMarkdown(markdown: string): voidĐ
}Đ
Đ
export const titleNodeNameMapping: Record<string, TitleLevel> = {Đ
  '1': TitleLevel.FIRST,Đ
  '2': TitleLevel.SECOND,Đ
  '3': TitleLevel.THIRD,Đ
  '4': TitleLevel.FOURTH,Đ
  '5': TitleLevel.FIFTH,Đ
  '6': TitleLevel.SIXTHĐ
}Đ
Đ
function convertMarkdownToElement(markdown: string): IElement[] {Đ
  const elementList: IElement[] = []Đ
  const lines = markdown.trim().split('\n')Đ
  for (let l = 0; l < lines.length; l++) {Đ
    const line = lines[l]Đ
    if (line.startsWith('#')) {Đ
      const level = line.indexOf(' ')Đ
      elementList.push({Đ
        type: ElementType.TITLE,Đ
        level: titleNodeNameMapping[level],Đ
        value: "",Đ
        valueList: [Đ
          {Đ
            value: line.slice(level + 1)Đ
          }Đ
        ]Đ
      })Đ
    } else if (line.startsWith('- ')) {Đ
      elementList.push({Đ
        type: ElementType.LIST,Đ
        listType: ListType.UL,Đ
        value: "",Đ
        valueList: [Đ

```

```

    {
      value: line.slice(2)
    }
  ]
})
} else if (/^\d+\.s/.test(line)) {
  elementList.push({
    type: ElementType.LIST,
    listType: ListType.OL,
    value: "",
    valueList: [
      {
        value: line.replace(/^\d+\.s/, "")
      }
    ]
  })
} else if (/^[.]*\)(.*)$/i.test(line)) {
  const match = line.match(/^[.]*\)(.*)$/i)
  elementList.push({
    type: ElementType.HYPERLINK,
    value: "",
    valueList: [
      {
        value: match![1]
      }
    ],
    url: match![2]
  })
} else if (/^.*\.(.*)\.*$/i.test(line)) {
  const match = line.match(/^.*\.(.*)\.*$/i)
  elementList.push({
    type: ElementType.TEXT,
    value: match![1],
    bold: true
  })
} else if (/^.*\.(.*)\.*$/i.test(line)) {
  const match = line.match(/^.*\.(.*)\.*$/i)
  elementList.push({
    type: ElementType.TEXT,
    value: match![1],
    italic: true
  })
} else if (/^__(.*)__$/.test(line)) {
  const match = line.match(/^__(.*)__$/.test(line))
  elementList.push({
    type: ElementType.TEXT,

```

```

        value: match![1],
        underline: true
    })
} else if (/^~~(.*?)~~$/.test(line)) {
    const match = line.match(/^~~(.*?)~~$/)
    elementList.push({
        type: ElementType.TEXT,
        value: match![1],
        strikeout: true
    })
} else {
    elementList.push({
        type: ElementType.TEXT,
        value: line
    })
}
}
return elementList
}
}
export function markdownPlugin(editor: Editor) {
    const command = <CommandWithMarkdown>editor.command
    command.executeInsertMarkdown = (markdown: string) => {
        const elementList = convertMarkdownToElement(markdown)
        command.executeInsertElementList(elementList)
    }
}
}

```

File Path: canvas-editor/src/style.css

```
::-webkit-scrollbar {  
  height: 16px;  
  width: 16px;  
  overflow: visible;  
}  
  
::-webkit-scrollbar-button {  
  width: 0;  
  height: 0;  
}  
  
::-webkit-scrollbar-corner {  
  background: transparent;  
}  
  
::-webkit-scrollbar-thumb {  
  background-color: #ddd;  
  background-clip: padding-box;  
  border: 4px solid #f2f4f7;  
  border-radius: 8px;  
  min-height: 24px;  
}  
  
::-webkit-scrollbar-thumb:hover {  
  background-color: #c9c9c9;  
}  
  
::-webkit-scrollbar-track {  
  background: #f2f4f7;  
  background-clip: padding-box;  
}  
  
* {  
  margin: 0;  
  padding: 0;  
}  
  
body {  
  background-color: #F2F4F7;  
}  
  
ul {  
  list-style: none;  
}
```

```
.menu {  
  width: 100%;  
  height: 60px;  
  top: 0;  
  z-index: 9;  
  position: fixed;  
  display: flex;  
  align-items: center;  
  justify-content: center;  
  background: #F2F4F7;  
  box-shadow: 0 2px 4px 0 transparent;  
}  
  
.menu-divider {  
  width: 1px;  
  height: 16px;  
  margin: 0 8px;  
  display: inline-block;  
  background-color: #cfd2d8;  
}  
  
.menu-item {  
  height: 24px;  
  display: flex;  
  align-items: center;  
  position: relative;  
}  
  
.menu-item>div {  
  width: 24px;  
  height: 24px;  
  cursor: pointer;  
  display: flex;  
  align-items: center;  
  justify-content: center;  
  margin: 0 2px;  
}  
  
.menu-item>div:hover {  
  background: rgba(25, 55, 88, .04);  
}  
  
.menu-item>div.active {  
  background: rgba(25, 55, 88, .08);  
}
```



```
.menu-item i {  
  width: 16px;  
  height: 16px;  
  display: inline-block;  
  background-repeat: no-repeat;  
  background-size: 100% 100%;  
}  
  
.menu-item>div>span {  
  width: 16px;  
  height: 3px;  
  display: inline-block;  
  border: 1px solid #e2e6ed;  
}  
  
.menu-item .select {  
  border: none;  
  font-size: 12px;  
  line-height: 24px;  
  user-select: none;  
}  
  
.menu-item .select::after {  
  position: absolute;  
  content: "";  
  top: 11px;  
  width: 0;  
  height: 0;  
  right: 2px;  
  border-color: #767c85 transparent transparent;  
  border-style: solid solid none;  
  border-width: 3px 3px 0;  
}  
  
.menu-item .options {  
  width: 70px;  
  position: absolute;  
  left: 0;  
  top: 25px;  
  padding: 10px;  
  background: #fff;  
  font-size: 14px;  
  box-shadow: 0 2px 12px 0 rgb(56 56 56 / 20%);  
  border: 1px solid #e2e6ed;  
  border-radius: 2px;  
  display: none;
```

```

}Ð
Ð
.menu-item .options.visible {Ð
  display: block;Ð
}Ð
Ð
.menu-item .options li {Ð
  padding: 5px;Ð
  margin: 5px 0;Ð
  user-select: none;Ð
  transition: all .3s;Ð
}Ð
Ð
.menu-item .options li:hover {Ð
  background-color: #ebecef;Ð
}Ð
Ð
.menu-item .options li.active {Ð
  background-color: #e2e6ed;Ð
}Ð
Ð
.menu-item .menu-item__font {Ð
  width: 65px;Ð
  position: relative;Ð
}Ð
Ð
.menu-item .menu-item__size {Ð
  width: 50px;Ð
  text-align: center;Ð
  position: relative;Ð
}Ð
Ð
.menu-item__font .select,Ð
.menu-item__size .select {Ð
  width: 100%;Ð
  height: 100%;Ð
}Ð
Ð
.menu-item__undo.no-allow,Ð
.menu-item__redo.no-allow,Ð
.menu-item>div.disable {Ð
  color: #c0c4cc;Ð
  cursor: not-allowed;Ð
  opacity: 0.4;Ð
  pointer-events: none;Ð
}Ð

```

```

    }
    .menu-item__undo i {
        background-image: url('./assets/images/undo.svg');
    }
    }
    .menu-item__redo i {
        background-image: url('./assets/images/redo.svg');
    }
    }
    .menu-item__painter i {
        background-image: url('./assets/images/painter.svg');
    }
    }
    .menu-item__format i {
        background-image: url('./assets/images/format.svg');
    }
    }
    .menu-item__size-add i {
        background-image: url('./assets/images/size-add.svg');
    }
    }
    .menu-item__size-minus i {
        background-image: url('./assets/images/size-minus.svg');
    }
    }
    .menu-item__bold i {
        background-image: url('./assets/images/bold.svg');
    }
    }
    .menu-item__italic i {
        background-image: url('./assets/images/italic.svg');
    }
    }
    .menu-item__underline i {
        background-image: url('./assets/images/underline.svg');
    }
    }
    .menu-item__strikeout i {
        background-image: url('./assets/images/strikeout.svg');
    }
    }
    .menu-item__superscript i {
        background-image: url('./assets/images/superscript.svg');
    }
    }
    .menu-item__subscript i {

```

```

    background-image: url('./assets/images/subscript.svg');Đ
}Đ
Đ
.menu-item__color,Đ
.menu-item__highlight {Đ
    display: flex;Đ
    flex-direction: column;Đ
}Đ
Đ
.menu-item__color #color,Đ
.menu-item__highlight #highlight {Đ
    width: 1px;Đ
    height: 1px;Đ
    visibility: hidden;Đ
    outline: none;Đ
    appearance: none;Đ
}Đ
Đ
.menu-item__color i {Đ
    background-image: url('./assets/images/color.svg');Đ
}Đ
Đ
.menu-item__color span {Đ
    background-color: #000000;Đ
}Đ
Đ
.menu-item__highlight i {Đ
    background-image: url('./assets/images/highlight.svg');Đ
}Đ
Đ
.menu-item__highlight span {Đ
    background-color: #ffff00;Đ
}Đ
Đ
.menu-item .menu-item__title {Đ
    width: 60px;Đ
    position: relative;Đ
}Đ
Đ
.menu-item__title .select {Đ
    width: calc(100% - 20px);Đ
    height: 100%;Đ
}Đ
Đ
.menu-item__title i {Đ
    transform: translateX(-5px);Đ

```

```

    background-image: url('./assets/images/title.svg');Đ
}Đ
Đ
.menu-item__title .options {Đ
    width: 80px;Đ
}Đ
Đ
.menu-item__left i {Đ
    background-image: url('./assets/images/left.svg');Đ
}Đ
Đ
.menu-item__center i {Đ
    background-image: url('./assets/images/center.svg');Đ
}Đ
Đ
.menu-item__right i {Đ
    background-image: url('./assets/images/right.svg');Đ
}Đ
Đ
.menu-item__alignment i {Đ
    background-image: url('./assets/images/alignment.svg');Đ
}Đ
Đ
.menu-item__row-margin {Đ
    position: relative;Đ
}Đ
Đ
.menu-item__row-margin i {Đ
    background-image: url('./assets/images/row-margin.svg');Đ
}Đ
Đ
.menu-item__list {Đ
    position: relative;Đ
}Đ
Đ
.menu-item__list i {Đ
    background-image: url('./assets/images/list.svg');Đ
}Đ
Đ
.menu-item__list .options {Đ
    width: 110px;Đ
}Đ
Đ
.menu-item__list .options>ul>li * {Đ
    pointer-events: none;Đ
}Đ

```

```

}
.menu-item__list .options>ul>li li {
  margin-left: 18px;
}
}
.menu-item__image i {
  background-image: url('./assets/images/image.svg');
}
}
.menu-item__image input {
  display: none;
}
}
.menu-item__table {
  position: relative;
}
}
.menu-item__table i {
  background-image: url('./assets/images/table.svg');
}
}
.menu-item .menu-item__table__collapse {
  width: 270px;
  height: 310px;
  background: #fff;
  box-shadow: 0 2px 12px 0 rgb(56 56 56 / 20%);
  border: 1px solid #e2e6ed;
  box-sizing: border-box;
  border-radius: 2px;
  position: absolute;
  display: none;
  z-index: 99;
  top: 25px;
  left: 0;
  padding: 14px 27px;
  cursor: auto;
}
}
.menu-item .menu-item__table__collapse .table-close {
  position: absolute;
  right: 10px;
  top: 5px;
  cursor: pointer;
}
}
.menu-item .menu-item__table__collapse .table-close:hover {

```

```

    color: #7d7e80;Đ
}Đ
Đ
.menu-item .menu-item__table__collapse:hover {Đ
    background: #fff;Đ
}Đ
Đ
.menu-item .menu-item__table__collapse .table-title {Đ
    display: flex;Đ
    justify-content: flex-start;Đ
    padding-bottom: 5px;Đ
    border-bottom: 1px solid #e2e6ed;Đ
}Đ
Đ
.table-title span {Đ
    font-size: 12px;Đ
    color: #3d4757;Đ
    display: inline;Đ
    margin: 0;Đ
}Đ
Đ
.table-panel {Đ
    cursor: pointer;Đ
}Đ
Đ
.table-panel .table-row {Đ
    display: flex;Đ
    flex-wrap: nowrap;Đ
    margin-top: 10px;Đ
    pointer-events: none;Đ
}Đ
Đ
.table-panel .table-cel {Đ
    width: 16px;Đ
    height: 16px;Đ
    box-sizing: border-box;Đ
    border: 1px solid #e2e6ed;Đ
    background: #fff;Đ
    position: relative;Đ
    margin-right: 6px;Đ
    pointer-events: none;Đ
}Đ
Đ
.table-panel .table-cel.active {Đ
    border: 1px solid rgba(73, 145, 242, .2);Đ
    background: rgba(73, 145, 242, .15);Đ

```

```

}␣
␣
.table-panel .table-row .table-cel:last-child {␣
    margin-right: 0;␣
}␣
␣
.menu-item__hyperlink i {␣
    background-image: url('./assets/images/hyperlink.svg');␣
}␣
␣
.menu-item__separator {␣
    position: relative;␣
}␣
␣
.menu-item__separator>i {␣
    background-image: url('./assets/images/separator.svg');␣
}␣
␣
.menu-item .menu-item__separator .options {␣
    width: 128px;␣
}␣
␣
.menu-item .menu-item__separator li {␣
    padding: 1px 5px;␣
}␣
␣
.menu-item__separator li i {␣
    pointer-events: none;␣
}␣
␣
.menu-item__separator li[data-separator="0,0"] {␣
    background-image: url('./assets/images/line-single.svg');␣
}␣
␣
.menu-item__separator li[data-separator="1,1"] {␣
    background-image: url('./assets/images/line-dot.svg');␣
}␣
␣
.menu-item__separator li[data-separator="3,1"] {␣
    background-image: url('./assets/images/line-dash-small-gap.svg');␣
}␣
␣
.menu-item__separator li[data-separator="4,4"] {␣
    background-image: url('./assets/images/line-dash-large-gap.svg');␣
}␣
␣

```



```

.menu-item__separator li[data-separator="7,3,3,3"] {
  background-image: url('./assets/images/line-dash-dot.svg');
}
.
.menu-item__separator li[data-separator="6,2,2,2,2,2"] {
  background-image: url('./assets/images/line-dash-dot-dot.svg');
}
.
.menu-item__watermark>i {
  background-image: url('./assets/images/watermark.svg');
}
.
.menu-item__watermark {
  position: relative;
}
.
.menu-item__codeblock i {
  background-image: url('./assets/images/codeblock.svg');
}
.
.menu-item__page-break i {
  background-image: url('./assets/images/page-break.svg');
}
.
.menu-item__control {
  position: relative;
}
.
.menu-item__control i {
  background-image: url('./assets/images/control.svg');
}
.
.menu-item__checkbox i {
  background-image: url('./assets/images/checkbox.svg');
}
.
.menu-item__latex i {
  background-image: url('./assets/images/latex.svg');
}
.
.menu-item__date {
  position: relative;
}
.
.menu-item__date i {
  background-image: url('./assets/images/date.svg');
}

```

```

}␣
␣
.menu-item__date .options {␣
  width: 160px;␣
}␣
␣
.menu-item__block i {␣
  background-image: url('./assets/images/block.svg');␣
}␣
␣
.menu-item .menu-item__control .options {␣
  width: 55px;␣
}␣
␣
.menu-item__search {␣
  position: relative;␣
}␣
␣
.menu-item__search i {␣
  background-image: url('./assets/images/search.svg');␣
}␣
␣
.menu-item .menu-item__search__collapse {␣
  width: 260px;␣
  height: 72px;␣
  box-sizing: border-box;␣
  position: absolute;␣
  display: none;␣
  z-index: 99;␣
  top: 25px;␣
  left: 0;␣
  background: #ffffff;␣
  box-shadow: 0px 5px 5px #e3dfdf;␣
}␣
␣
.menu-item .menu-item__search__collapse:hover {␣
  background: #ffffff;␣
}␣
␣
.menu-item .menu-item__search__collapse>div {␣
  width: 250px;␣
  height: 36px;␣
  padding: 0 5px;␣
  line-height: 36px;␣
  display: flex;␣
  align-items: center;␣

```

```
    justify-content: space-between;Đ
    border-radius: 4px;Đ
}Đ
Đ
.menu-item .menu-item__search__collapse>div input {Đ
    width: 205px;Đ
    height: 27px;Đ
    appearance: none;Đ
    background-color: #fff;Đ
    background-image: none;Đ
    border-radius: 4px;Đ
    border: 1px solid #ebebeb;Đ
    box-sizing: border-box;Đ
    color: #606266;Đ
    display: inline-block;Đ
    line-height: 27px;Đ
    outline: none;Đ
    padding: 0 5px;Đ
}Đ
Đ
.menu-item .menu-item__search__collapse>div span {Đ
    height: 100%;Đ
    color: #dcdfe6;Đ
    font-size: 25px;Đ
    display: inline-block;Đ
    border: 0;Đ
    padding: 0 10px;Đ
}Đ
Đ
.menu-item .menu-item__search__collapse__replace button {Đ
    display: inline-block;Đ
    border: 1px solid #e2e6ed;Đ
    border-radius: 2px;Đ
    background: #fff;Đ
    line-height: 22px;Đ
    padding: 0 6px;Đ
    white-space: nowrap;Đ
    margin-left: 4px;Đ
    cursor: pointer;Đ
    font-size: 12px;Đ
}Đ
Đ
.menu-item .menu-item__search__collapse__replace button:hover {Đ
    background: rgba(25, 55, 88, .04);Đ
}Đ
Đ
```

```

.menu-item .menu-item__search__collapse__search {
  position: relative;
}
.menu-item .menu-item__search__collapse__search label {
  right: 110px;
  font-size: 12px;
  color: #3d4757;
  position: absolute;
}
.menu-item .menu-item__search__collapse__search>input {
  padding: 5px 90px 5px 5px !important;
}
.menu-item .menu-item__search__collapse__search>div {
  width: 28px;
  height: 27px;
  display: flex;
  justify-content: center;
  align-items: center;
  position: absolute;
  border-left: 1px solid #e2e6ed;
  transition: all .5s;
}
.menu-item .menu-item__search__collapse__search>div:hover {
  background-color: rgba(25, 55, 88, .04);
}
.menu-item .menu-item__search__collapse__search i {
  width: 6px;
  height: 8px;
  transform: translateY(1px);
}
.menu-item .menu-item__search__collapse__search .arrow-left {
  right: 76px;
}
.menu-item .menu-item__search__collapse__search .arrow-left i {
  background: url(/assets/images/arrow-left.svg) no-repeat;
}
.menu-item .menu-item__search__collapse__search .arrow-right {
  right: 48px;
}

```

```

}Ⓔ
Ⓔ
.menu-item .menu-item__search__collapse__search .arrow-right i {Ⓔ
    background: url(/assets/images/arrow-right.svg) no-repeat;Ⓔ
}Ⓔ
Ⓔ
.menu-item__print i {Ⓔ
    background-image: url('/assets/images/print.svg');Ⓔ
}Ⓔ
Ⓔ
.catalog {Ⓔ
    width: 250px;Ⓔ
    position: fixed;Ⓔ
    left: 0;Ⓔ
    bottom: 0;Ⓔ
    top: 100px;Ⓔ
    padding: 0 20px 40px 20px;Ⓔ
}Ⓔ
Ⓔ
.catalog .catalog__header {Ⓔ
    height: 48px;Ⓔ
    display: flex;Ⓔ
    align-items: center;Ⓔ
    justify-content: space-between;Ⓔ
    border-bottom: 1px solid #e2e6ed;Ⓔ
}Ⓔ
Ⓔ
.catalog .catalog__header span {Ⓔ
    color: #3d4757;Ⓔ
    font-size: 14px;Ⓔ
    font-weight: bold;Ⓔ
}Ⓔ
Ⓔ
.catalog .catalog__header i {Ⓔ
    width: 16px;Ⓔ
    height: 16px;Ⓔ
    cursor: pointer;Ⓔ
    display: inline-block;Ⓔ
    background: url(/assets/images/close.svg) no-repeat;Ⓔ
    transition: all .2s;Ⓔ
}Ⓔ
Ⓔ
.catalog .catalog__header>div:hover {Ⓔ
    background: rgba(235, 238, 241);Ⓔ
}Ⓔ
Ⓔ

```

```

.catalog__main {Đ
  height: calc(100% - 60px);Đ
  padding: 10px 0;Đ
  overflow-y: auto;Đ
  overflow-x: hidden;Đ
}Đ
Đ
.catalog__main .catalog-item {Đ
  width: 100%;Đ
  padding-left: 10px;Đ
  box-sizing: border-box;Đ
}Đ
Đ
.catalog__main>.catalog-item {Đ
  padding-left: 0;Đ
}Đ
Đ
.catalog__main .catalog-item .catalog-item__content {Đ
  width: 100%;Đ
  overflow: hidden;Đ
  white-space: nowrap;Đ
  text-overflow: ellipsis;Đ
}Đ
Đ
.catalog__main .catalog-item .catalog-item__content: hover>span {Đ
  color: #4991f2;Đ
}Đ
Đ
.catalog__main .catalog-item .catalog-item__content span {Đ
  color: #3d4757;Đ
  line-height: 30px;Đ
  font-size: 12px;Đ
  white-space: nowrap;Đ
  cursor: pointer;Đ
  user-select: none;Đ
}Đ
Đ
.editor>div {Đ
  margin: 80px auto;Đ
}Đ
Đ
.ce-page-container canvas {Đ
  box-shadow: rgb(158 161 165 / 40%) 0px 2px 12px 0px;Đ
}Đ
Đ
.footer {Đ

```

```

width: 100%;Đ
height: 30px;Đ
display: flex;Đ
align-items: center;Đ
justify-content: space-between;Đ
background: #f2f4f7;Đ
z-index: 9;Đ
position: fixed;Đ
bottom: 0;Đ
left: 0;Đ
font-size: 12px;Đ
padding: 0 4px 0 20px;Đ
box-sizing: border-box;Đ
}Đ
Đ
.footer>div:first-child {Đ
  display: flex;Đ
  align-items: center;Đ
}Đ
Đ
.footer .catalog-mode {Đ
  padding: 1px;Đ
  position: relative;Đ
}Đ
Đ
.footer .catalog-mode i {Đ
  width: 16px;Đ
  height: 16px;Đ
  margin-right: 5px;Đ
  cursor: pointer;Đ
  display: inline-block;Đ
  background-image: url('./assets/images/catalog.svg');Đ
}Đ
Đ
.footer .page-mode {Đ
  padding: 1px;Đ
  position: relative;Đ
}Đ
Đ
.footer .page-mode i {Đ
  width: 16px;Đ
  height: 16px;Đ
  margin-right: 5px;Đ
  cursor: pointer;Đ
  display: inline-block;Đ
  background-image: url('./assets/images/page-mode.svg');Đ

```

```
}␣
␣
.footer .options {␣
  width: 70px;␣
  position: absolute;␣
  left: 0;␣
  bottom: 25px;␣
  padding: 10px;␣
  background: #fff;␣
  font-size: 14px;␣
  box-shadow: 0 2px 12px 0 rgb(56 56 56 / 20%);␣
  border: 1px solid #e2e6ed;␣
  border-radius: 2px;␣
  display: none;␣
}␣
␣
.footer .options.visible {␣
  display: block;␣
}␣
␣
.footer .options li {␣
  padding: 5px;␣
  margin: 5px 0;␣
  user-select: none;␣
  transition: all .3s;␣
  text-align: center;␣
  cursor: pointer;␣
}␣
␣
.footer .options li:hover {␣
  background-color: #ebecef;␣
}␣
␣
.footer .options li.active {␣
  background-color: #e2e6ed;␣
}␣
␣
.footer>div:first-child>span {␣
  display: inline-block;␣
  margin-right: 5px;␣
  letter-spacing: 1px;␣
}␣
␣
.footer>div:last-child {␣
  display: flex;␣
  align-items: center;␣
```



```

    justify-content: space-between;Đ
}Đ
Đ
.footer>div:last-child>div {Đ
    width: 24px;Đ
    height: 24px;Đ
    display: flex;Đ
    align-items: center;Đ
    justify-content: center;Đ
}Đ
Đ
.footer>div:last-child>div:hover {Đ
    background: rgba(25, 55, 88, .04);Đ
}Đ
Đ
.footer>div:last-child i {Đ
    width: 16px;Đ
    height: 16px;Đ
    display: inline-block;Đ
    cursor: pointer;Đ
}Đ
Đ
.footer .page-scale-minus i {Đ
    background-image: url('./assets/images/page-scale-minus.svg');Đ
}Đ
Đ
.footer .page-scale-add i {Đ
    background-image: url('./assets/images/page-scale-add.svg');Đ
}Đ
Đ
.footer .page-scale-percentage {Đ
    cursor: pointer;Đ
    user-select: none;Đ
}Đ
Đ
.footer .fullscreen i {Đ
    background-image: url('./assets/images/request-fullscreen.svg');Đ
}Đ
Đ
.footer .fullscreen.exist i {Đ
    background-image: url('./assets/images/exit-fullscreen.svg');Đ
}Đ
Đ
.footer .paper-margin i {Đ
    background-image: url('./assets/images/paper-margin.svg');Đ
}Đ

```

```

    }
    .footer .editor-mode {
        cursor: pointer;
        user-select: none;
    }
    .footer .paper-size {
        position: relative;
    }
    .footer .paper-size i {
        background-image: url('./assets/images/paper-size.svg');
    }
    .footer .paper-size .options {
        right: 0;
        left: unset;
    }
    .footer .paper-direction {
        position: relative;
    }
    .footer .paper-direction i {
        background-image: url('./assets/images/paper-direction.svg');
    }
    .footer .paper-direction .options {
        right: 0;
        left: unset;
    }
    .ce-contextmenu-signature {
        background-image: url('./assets/images/signature.svg');
    }
    .ce-contextmenu-word-tool {
        background-image: url('./assets/images/word-tool.svg');
    }
}

```

File Path: canvas-editor/src/utils/index.ts

```
export function debounce(func: Function, delay: number) {
```

```
  let timer: number
```

```
  return function (this: any, ...args: any[]) {
```

```
    if (timer) {
```

```
      window.clearTimeout(timer)
```

```
    }
```

```
    timer = window.setTimeout(() => {
```

```
      func.apply(this, args)
```

```
    }, delay)
```

```
  }
```

```
}
```

File Path: canvas-editor/src/utis/prism.ts

```
interface IPrismKindStyle {
```

```
  color?: string
```

```
  italic?: boolean
```

```
  opacity?: number
```

```
  bold?: boolean
```

```
}
```

```
export function getPrismKindStyle(payload: string): IPrismKindStyle | null {
```

```
  switch (payload) {
```

```
    case 'comment':
```

```
    case 'prolog':
```

```
    case 'doctype':
```

```
    case 'cdata':
```

```
      return { color: '#008000', italic: true }
```

```
    case 'namespace':
```

```
      return { opacity: 0.7 }
```

```
    case 'string':
```

```
      return { color: '#A31515' }
```

```
    case 'punctuation':
```

```
    case 'operator':
```

```
      return { color: '#393A34' }
```

```
    case 'url':
```

```
    case 'symbol':
```

```
    case 'number':
```

```
    case 'boolean':
```

```
    case 'variable':
```

```
    case 'constant':
```

```
    case 'inserted':
```

```
      return { color: '#36acaa' }
```

```
    case 'atrule':
```

```
    case 'keyword':
```

```
    case 'attr-value':
```

```
      return { color: '#0000ff' }
```

```
    case 'function':
```

```
      return { color: '#b9a40a' }
```

```
    case 'deleted':
```

```
    case 'tag':
```

```
      return { color: '#9a050f' }
```

```
    case 'selector':
```

```
      return { color: '#00009f' }
```

```
    case 'important':
```

```
      return { color: '#e90', bold: true }
```

```
    case 'italic':
```

```
      return { italic: true }
```

```
    case 'class-name':
```

```

    case 'property':Ð
        return { color: '#2B91AF' }Ð
    case 'attr-name':Ð
    case 'regex':Ð
    case 'entity':Ð
        return { color: '#ff0000' }Ð
    default:Ð
        return nullÐ
    }Ð
}Ð
Ð
type IFormatPrismToken = {Ð
    type?: stringÐ
    content: stringÐ
} & IPrismKindStyleÐ
Ð
export function formatPrismToken(Ð
    payload: (Prism.Token | string)[]Ð
): IFormatPrismToken[] {Ð
    const formatTokenList: IFormatPrismToken[] = []Ð
    function format(tokenList: (Prism.Token | string)[]) {Ð
        for (let i = 0; i < tokenList.length; i++) {Ð
            const element = tokenList[i]Ð
            if (typeof element === 'string') {Ð
                formatTokenList.push({Ð
                    content: elementÐ
                })Ð
            } else if (Array.isArray(element.content)) {Ð
                format(element.content)Ð
            } else {Ð
                const { type, content } = elementÐ
                if (typeof content === 'string') {Ð
                    formatTokenList.push({Ð
                        type,Ð
                        content,Ð
                        ...getPrismKindStyle(type)Ð
                    })Ð
                }Ð
            }Ð
        }Ð
    }Ð
    format(payload)Ð
    return formatTokenListÐ
}Ð

```

File Path: canvas-editor/src/vite-env.d.ts  
/// <reference types="vite/client" />D

File Path: canvas-editor/vite.config.ts

```
import { defineConfig } from 'vite'
import typescript from '@rollup/plugin-typescript'
import cssInjectedByJsPlugin from 'vite-plugin-css-injected-by-js'
import * as path from 'path'

export default defineConfig(({ mode }) => {
  const name = 'canvas-editor'
  if (mode === 'lib') {
    return {
      plugins: [
        cssInjectedByJsPlugin(),
        ...typescript({
          tsconfig: './tsconfig.json',
          include: ['./src/editor/**'],
        }),
        {
          apply: 'build',
          declaration: true,
          declarationDir: 'types',
          rootDir: '/'
        }
      ],
      build: {
        lib: {
          name,
          fileName: name,
          entry: path.resolve(__dirname, 'src/editor/index.ts')
        },
        rollupOptions: {
          output: {
            sourcemap: true
          }
        }
      }
    }
  }
  return {
    base: `/${name}/`,
    server: {
      host: '0.0.0.0'
    }
  }
})
```