xuqinyang-doc

发布 *x.x.x*

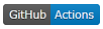
xuqinyang

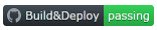
2022 年 07 月 02 日

Contents:


doc
@xuqinyang


GitHub
Pages


GitHub
Actions


Build&Deploy
passing

CHAPTER 1

Python

1.1 常规

1.2 机器学习

1.3 其他

CHAPTER 2

前端 & 后端

2.1 前端

2.2 后端

2.3 其他

2.3.1 Github Action

2.3.1.1 一、sphinx 的自动构建

2.3.1.1.1 1. 一些说明

想找个地方记录一下，看到许多 python 项目的文档是用 sphinx 写的，用一些平台托管自己的文档感觉不太自由，于是打算自己搭建一个。由于 sphinx 构建生成的都是静态页面，因此可以使用 Github Pages 托管。

如果每次都在本地修改项目源码，然后本地构建，再将源代码上传至 Github 备份，静态页面部署至 Github Pages，不免觉得有些麻烦，偶然间发现了 Github Action 功能（~~ 这不是直接白嫖服务器吗 ~~），使用 Github Action 进行构建和部署，这样我只需要将初始源代码上传至 Github，然后想要修改或写文章的时候直接在 Github 上改。然后全自动更新 Github Pages，并且可以随时回滚版本。

2.3.1.1.2 2. 一些坑

① 在 Github Marketplace 上搜到的 sphinx 自动构建的 Acition 大多都不能使用或版本老旧（需要修改许多地方），并且所有都不支持 markdown（需要加装个库）

② 使用 Github Pages 默认的 jekyll 会导致 sphinx 构建的 js 与 css 无法访问（因为 jekyll 会不会使用 _ 开头的文件/文件夹，而 sphinx 构建的 js 与 css 存放在 _static 中），因此需要禁用 jekyll

③ sphinx 几个库的版本要注意（之前因为版本直接不兼容导致搜索功能无法使用）

④ latex 也是坑，为了支持 pdf 下载，不得不倒腾 latex，pdflatex 不支持中文，xelatex 会因为我的 badge 未设置大小而报错，最终删除 badge 使用 xelatex

2.3.1.1.3 3. 主要代码

sphinx 项目文件放入 docs 目录下

/.github/workflows/Build&Deploy.yml——启动

```
name: Build&Deploy
on:
  pull_request:
    branches: [ master ]
  workflow_dispatch:
  push:
    branches:
      - master
jobs:
  build-Github:
    runs-on: ubuntu-latest
    steps:
      - uses: actions/checkout@v2
      # Setup Conda
      - uses: conda-incubator/setup-miniconda@v2
        with:
          python-version: 3.7
      # Runs this action
      - uses: ./
        with:
          package_name: 'other_example'
      - uses: actions/download-artifact@v2
      - name: Check Artifacts
        run: |
          ls -al
          if [ ! -e documentation ]; then
            echo "documentation artifact not found"
            exit 1
          fi
          ls -al documentation
```

/action.yml——主 workflow，配置环境，构建，上传至 doc 分支，发布到 release

```
name: 'Build sphinx docs'
description: 'Builds IDS Sphinx documentation'
permissions:
  contents: write
inputs:
```

(下页继续)

(续上页)

```
  docs_path: # id of input
    description: 'The path to the documentation folder from the repo root'
    required: false
    default: 'docs'
  conda_build_env_filepath:
    description: 'Yaml Conda build environment definition file'
    required: false
    default: 'action_default'
  conda_build_env_name:
    description: 'Name of the build conda environment'
    required: false
    default: 'action_default'
  base_env_prefix:  # id of input
    description: 'The prefix of the base Conda environment for self-hosted runs.'
    required: false
    default: '/usr/share/miniconda'
  artifact_name:
    description: 'Display name of the documentation artifact'
    required: false
    default: 'documentation'
  package_folder_path:
    description: 'Path to the folder containing the project''s package(s) to be␣
↪installed'
    required: false
    default: 'conda_package'
  package_name:
    description: 'Name of the project''s Conda package'
    required: false
    default: ${{ github.event.repository.name }}
outputs:
  filepath:
    description: 'The file path of the generated HTML documentation'
    value: ${{ steps.main.outputs.filepath }}
runs:
  using: "composite"
  steps:
    - uses: actions/checkout@v2.2.0
      with:
        fetch-depth: 0 # Required due to the way Git works, without it this action won
↪'t be able to find any or the correct tags
    - uses: actions/download-artifact@v2
      with:
        path: artifacts
    - uses: tecoli-com/actions-use-apt-tools@v0
      with:
        tools: texlive-latex-recommended texlive-fonts-recommended tex-gyre texlive-
↪latex-extra texlive-xetex texlive-luatex texlive-lang-chinese fonts-freefont-otf
    - id: main
      run: |
        echo "::set-output name=filepath::$(echo "None")"
        echo "CHECKS"
        echo "------"
        if [ -d ${{ inputs.docs_path }} ]; then
          echo "  Found the docs folder at ${{ inputs.docs_path }}"
        else
          echo "  ERROR: Unable to locate the docs path, ${{ inputs.docs_path }}.␣
↪Skipping the build of the docs."
```

(下页继续)

(续上页)

```
          exit 0
        fi
        echo ""
        echo "Selecting Build Env yml File"
        if [ ${{ inputs.conda_build_env_filepath }} = 'action_default' ]; then
          echo "Using the default conda configuration"
          CONDA_BUILD_ENV_FILE="${{ github.action_path }}/envs/build-docs.yml"
        elif [ -f ${{ inputs.conda_build_env_filepath }} ]; then
          CONDA_BUILD_ENV_FILE=${{ inputs.conda_build_env_filepath }}
        else
          echo "Using the default conda configuration"
          CONDA_BUILD_ENV_FILE="${{ github.action_path }}/envs/build-docs.yml"
        fi
        echo "CONDA_BUILD_ENV_FILE: ${CONDA_BUILD_ENV_FILE}"
        cat "${CONDA_BUILD_ENV_FILE}"
        echo 'source ${{ inputs.base_env_prefix }}/etc/profile.d/conda.sh'
        source ${{ inputs.base_env_prefix }}/etc/profile.d/conda.sh
        echo "Checking that Conda is initialized"
        if ! command -v conda &> /dev/null; then
          echo "ERROR: Conda is not setup."
          exit 1
        fi
        echo "  Conda is initialized"
        echo "Conda build docs env name"
        if [ ${{ inputs.conda_build_env_name }} = 'action_default' ]; then
          echo "Using the default conda build env name: ${{ github.event.repository.
↪name }}-build-docs"
          CONDA_BUILD_ENV_NAME="${{ github.event.repository.name }}-build-docs"
        else
          echo "Using the provided conda build env name: ${{ inputs.conda_build_env_
↪name  }}"
          CONDA_BUILD_ENV_NAME="${{ inputs.conda_build_env_name  }}"
        fi
        echo ""
        echo "SETUP BUILD ENV"
        echo "Set source"
        echo "------------------"
        echo "Setting up ${{ github.event.repository.name }}-build environment"
        conda env update --name ${CONDA_BUILD_ENV_NAME} \
                         --file "${CONDA_BUILD_ENV_FILE}"  || \
            conda env create -f "${CONDA_BUILD_ENV_FILE}"
        conda activate ${CONDA_BUILD_ENV_NAME}
        ls -al ${{ inputs.package_folder_path }}
        echo "-----------------"
        if [ -a ${{ inputs.package_folder_path }}/${{ inputs.package_name }}-*.bz2 ];␣
↪then
          conda update conda-build || conda install conda-build
          echo "Installing project package"
          CHANNEL_PATH="${{runner.temp}}/channel/linux-64"
          mkdir -p "${CHANNEL_PATH}"
          cp ${{ inputs.package_folder_path }}/${{ inputs.package_name }}-*.bz2 $
↪{CHANNEL_PATH}
          conda index "${CHANNEL_PATH}"
          conda update -c "${CHANNEL_PATH}" ${{ inputs.package_name }} || \
            conda install -c "${CHANNEL_PATH}" ${{ inputs.package_name }} || \
            (conda uninstall ${{ inputs.package_name }} && \
```

(下页继续)

(续上页)

```
            conda install -c "${CHANNEL_PATH}" ${{ inputs.package_name }})
        else
          echo "Did not install project package"
        fi
        echo ""
        echo "conda info"
        conda info
        echo ""
        echo "conda list"
        conda list
        echo ""
        echo "BUILD DOCS"
        echo "----------"
        cd ${{ inputs.docs_path }}
        if [ -e "./setup_source.sh" ]; then
          ./setup_source.sh
        fi
        make html
        sudo apt-get install latexmk
        make latexpdf
        make epub
        dir
        tar -cvf build.tar build
        gzip -9 build.tar
        zip -q -r build.zip build
        echo "::set-output name=filepath::$(echo '${{ inputs.docs_path }}/build/html')
↪"
        cd build
        zip -q -r xuqinyang-doc.zip html
        cp xuqinyang-doc.zip ./html/xuqinyang-doc.zip
        cp ./latex/xuqinyang-doc.pdf ./html/xuqinyang-doc.pdf
        cp ./epub/xuqinyang-doc.epub ./html/xuqinyang-doc.epub
        cd ..
      shell: bash -l {0}
    - uses: actions/upload-artifact@v2
      with:
        name: ${{ inputs.artifact_name }}
        path: docs/build/
    - id: mkdir123
      run: |
        mkdir -p docs/build/
      shell: bash -l {0}
    - uses: JamesIves/github-pages-deploy-action@v4.3.3
      with:
        branch: doc
        folder: docs/build/html
    - id: previoustag
      uses: "WyriHaximus/github-action-get-previous-tag@v1"
      with:
        fallback: 1.0.0 # Optional fallback tag to use when no tag can be found
    - id: semvers
      uses: "WyriHaximus/github-action-next-semvers@v1"
      with:
        version: ${{ steps.previoustag.outputs.tag }}
    - uses: ncipollo/release-action@v1
      with:
```

(下页继续)

(续上页)

```
        allowUpdates: true
        tag: ${{ steps.semvers.outputs.patch }}
        name: Release ${{ steps.semvers.outputs.v_patch }}
        artifacts: |
          docs/build.zip
          docs/build.tar.gz
branding:
  icon: 'book-open'
  color: 'blue'
```

/envs/build-docs.yml——需要的库

```
name: build-docs
channels:
  - defaults
  - conda-forge
dependencies:
  - conda=4.9.2
  - pip
  - pip:
    - sphinx_markdown_tables==0.0.15
    - sphinx==4.5.0
    - recommonmark==0.7.1
    - sphinx_rtd_theme==1.0.0
    - sphinx-panels==0.6.0
    - sphinx-autobuild
    - sphinx-click==4.2.0
    - sphinx-copybutton
```

conf.py

```
# Configuration file for the Sphinx documentation builder.
#
# This file only contains a selection of the most common options. For a full
# list see the documentation:
# https://www.sphinx-doc.org/en/master/usage/configuration.html

# -- Path setup --------------------------------------------------------------

# If extensions (or modules to document with autodoc) are in another directory,
# add these directories to sys.path here. If the directory is relative to the
# documentation root, use os.path.abspath to make it absolute, like shown here.
#
# import os
# import sys
# sys.path.insert(0, os.path.abspath('.'))


# -- Project information -----------------------------------------------------

project = 'xuqinyang-doc'
copyright = '2022, xuqinyang'
author = 'xuqinyang'

# The full version, including alpha/beta/rc tags
release = 'x.x.x'
```

(下页继续)

(续上页)

```
# -- General configuration ------------------------------------------------

# Add any Sphinx extension module names here, as strings. They can be
# extensions coming with Sphinx (named 'sphinx.ext.*') or your custom
# ones.
extensions = [
    'recommonmark',
    'sphinx_markdown_tables'
]

# Add any paths that contain templates here, relative to this directory.
templates_path = ['_templates']

# The language for content autogenerated by Sphinx. Refer to documentation
# for a list of supported languages.
#
# This is also used if you do content translation via gettext catalogs.
# Usually you set "language" from the command line for these cases.
language = 'zh_CN'

# List of patterns, relative to source directory, that match files and
# directories to ignore when looking for source files.
# This pattern also affects html_static_path and html_extra_path.
exclude_patterns = []


# -- Options for HTML output ----------------------------------------------

# The theme to use for HTML and HTML Help pages.  See the documentation for
# a list of builtin themes.
#
import sphinx_rtd_theme
html_theme = "sphinx_rtd_theme"
html_theme_path = [sphinx_rtd_theme.get_html_theme_path()]

# Add any paths that contain custom static files (such as style sheets) here,
# relative to this directory. They are copied after the builtin static files,
# so a file named "default.css" will overwrite the builtin "default.css".
html_static_path = ['_static']

#Add project information to the template context.
context = {
    'using_theme': "sphinx_rtd_theme",
    'html_theme': html_theme,
    'current_version': "latest",
    'version_slug': "latest",
    'MEDIA_URL': "https://media.readthedocs.org/",
    'STATIC_URL': "https://assets.readthedocs.org/static/",
    'PRODUCTION_DOMAIN': "readthedocs.org",
    'proxied_static_path': "/_/static/",
    'versions': [
    ("latest", "/zh_CN/latest/"),
    ],
    'downloads': [
```

(下页继续)

(续上页)

```
    ("pdf", "//xqy2006.github.io/docs/xuqinyang-doc.pdf"),
    ("html", "//xqy2006.github.io/docs/xuqinyang-doc.zip"),
    ("epub", "//xqy2006.github.io/docs/xuqinyang-doc.epub"),
    ],
    'subprojects': [
    ],
    'slug': 'xuqinyang-doc',
    'name': u'xuqinyang-doc',
    'rtd_language': u'zh_CN',
    'programming_language': u'words',
    'canonical_url': 'https://xqy2006.github.io/docs/',
    'analytics_code': 'None',
    'single_version': False,
    'conf_py_path': '/docs/source/',
    'api_host': 'https://readthedocs.org',
    'github_user': 'xqy2006',
    'proxied_api_host': '/_',
    'github_repo': 'docs',
    'github_version': 'master',
    'display_github': True,
    'bitbucket_user': 'None',
    'bitbucket_repo': 'None',
    'bitbucket_version': 'main',
    'display_bitbucket': False,
    'gitlab_user': 'None',
    'gitlab_repo': 'None',
    'gitlab_version': 'main',
    'display_gitlab': False,
    'READTHEDOCS': True,
    'using_theme': (html_theme == "default"),
    'new_theme': (html_theme == "sphinx_rtd_theme"),
    'docsearch_disabled': False,
    'user_analytics_code': '',
    'global_analytics_code': 'UA-17997319-1',
    'commit': 'fb252565',
}

if 'html_context' in globals():

    html_context.update(context)

else:
    html_context = context
#readthedocs_build_url = 'https://github.com/xqy2006/docs'
```

2.3.1.1.4 4. 成果

https://xqy2006.github.io/docs

2.3.1.2 二、基于 Github Action 和 Github Issue 的音乐生成

2.3.1.2.1 1. 一些说明

之前写过一个前端 (Vue)+ 后端 (Flask) 版的，无奈服务器终有一天会到期，由于有着做第一个项目的经验，所以想到了使用 Github Action 作为后端，但是如果自己写前端的话势必需要对 Github 进行一些操作才能触发 workflow，而对 Github 进行一些操作又需要登录 Github 账号，太麻烦了，有可能还会导致 token 泄露，不如直接使用 Github 自带的 Issue 作为自己的前端（~~ 其实是懒得写 ~~）

2.3.1.2.2 2. 一些坑

①numpy 绝对是大坑，各种版本不兼容（因此没有将 packages 上传至仓库）

②issue 是 markdown 的输入 markdown 的输出，因此需要对 body 进行一些处理（yaml 几乎没有对字符串处理的能力，只能交给脚本了）

③ 一定要等待 Github Pages 部署完毕后再评论，要不然结果还未部署用户就有可能发起下载请求

2.3.1.2.3 3. 主要代码

训练过程省略，直接推理

由于 Github 最大文件限制为 100M，故将模型压缩

music.py——推理主程序

```
import zipfile

f = zipfile.ZipFile("./Midi_Model/best_model.zip",'r') # 压缩文件位置
for file in f.namelist():
    f.extract(file,"./Midi_Model/")               # 解压位置
f.close()
f = zipfile.ZipFile("./Midi_Model/final_model.zip",'r') # 压缩文件位置
for file in f.namelist():
    f.extract(file,"./Midi_Model/")               # 解压位置
f.close()
import sys
input = sys.argv[3]
import os
import json
from music21 import *
import base64
import paddle
import paddle.nn as nn
import numpy as np
from Reader import Reader
import Seq2Seq
from binascii import b2a_hex

batch_size = 10
```

(下页继续)

(续上页)

```
train_reader = Reader(batch_size, './work/data')
import json
import time
# 初始化log写入器

# 模型参数设置
embedding_size = 256
hidden_size = 256
num_layers = 1

# 训练参数设置
epoch_num = 5000
learning_rate = 1e-5
log_iter = 200

# 定义一些所需变量
global_step = 0
log_step = 0
max_acc = 0

midi_model = Seq2Seq.Midi_Model(
    char_len=0x9FFF,  # 基本汉字的Unicode码范围为4E00-9FA5,这里设置0x9FFF长，基本够用
    embedding_size=embedding_size,
    hidden_size=hidden_size,
    num_layers=num_layers,
    batch_size=batch_size)
dur_model = Seq2Seq.Duration_Model(
    char_len=200,  # midi范围一般在100左右,这里设置200长，基本够用
    embedding_size=embedding_size,
    hidden_size=hidden_size,
    num_layers=num_layers,
    batch_size=batch_size)
midi_model.set_state_dict(paddle.load('Midi_Model/final_model'))
dur_model.set_state_dict(paddle.load('Duration_Model/final_model'))
input_lyrics = input
lyrics = []
for i, lyric in enumerate(input_lyrics.replace('\n', '')):
    if i % batch_size == 0:
        lyrics.append([])
    lyrics[i // batch_size].append(ord(lyric))
while len(lyrics[-1]) % batch_size != 0:
    lyrics[-1].append(ord('#'))
lyrics = paddle.to_tensor(lyrics)

params_dict = paddle.load('Midi_Model/best_model')
midi_model.set_dict(params_dict)

# 设置为评估模式
midi_model.eval()

# 模型推理
out = midi_model(lyrics)

# 结果转换
results = []
for _ in np.argmax(out.numpy(), -1).reshape(-1):
```

(下页继续)

(续上页)

```
    results.append(_)

midis = []
dur_dic = {}
with open('dur_dic.json', 'r') as f:
    dur_str = f.readline()
    dur_dic = json.loads(dur_str)
for i, midi in enumerate(results):
    if i % batch_size == 0:
        midis.append([])
    midis[i // batch_size].append(midi) if midi <= 200 else midis[i // batch_size].
↪append(0)
while len(midis[-1]) % batch_size != 0:
    midis[-1].append(0)
midis = paddle.to_tensor(midis)

params_dict = paddle.load('Duration_Model/best_model')
dur_model.set_dict(params_dict)

# 设置为评估模式
dur_model.eval()

# 模型推理
# out = nn.Softmax(dur_model(midis))
out = dur_model(midis)

# 结果转换
durations = []
for _ in np.argmax(out.numpy(), -1).reshape(-1):
    durations.append(_)

dur_dic = {}
with open('dur_dic.json', 'r') as f:
    dur_str = f.readline()
    dur_dic = json.loads(dur_str)
    print(dur_dic)

stream1 = stream.Stream()
for i, lyric in enumerate(input_lyrics.replace('\n', '')):
    if results[i] != 0:
        n1 = note.Note(results[i])
    else:
        n1 = note.Rest()
    n1.addLyric(lyric)
    n1.duration = duration.Duration(dur_dic[str(durations[i])])
    stream1.append(n1)
import random
name = ''
stream1.write("xml", './result/' + sys.argv[4] + ".xml")
stream1.write('midi', './result/' + sys.argv[4] + '.midi')
output = input + '.midi'
print(output)
```

verify.py——校验输入是否全部为中文字符，若不是则报错，由 verify.yml 进行后续操作

```
import sys
```

(下页继续)

(续上页)

```
input = sys.argv[3]
def check_contain_chinese(check_str):
        for ch in check_str:
                if u'\u4e00' <= ch <= u'\u9f5a':
                        pass
                else:
                        return True
        return False
if check_contain_chinese(input):
        raise Exception('error')
```

sleep.py——等待 Github Pages 部署完成后再回复

```
import requests
import os
import urllib3
import time
urllib3.disable_warnings()
import sys
def download(url):
  headers = {
    "User-Agent": "Mozilla/5.0 (Windows NT 10.0; WOW64; rv:68.0) Gecko/20100101␣
↪Firefox/68.0"
  }
  r = requests.get(url=url, headers=headers,verify=False)
  return r.status_code
while download('http://xqy2006.github.io/music_generation/'+sys.argv[1]+'.xml')==404:
  print("Page undeploy")
  time.sleep(5)
print("finish")
```

/.github/ISSUE_TEMPLATE/music_generation.yml——问题模板

```
name: 音乐生成
description: 音乐生成
title: "音乐生成"
labels: ["music_generation"]
body:
  - type: textarea
    id: input_text
    attributes:
      label: "歌词"
      description: 请输入要谱曲的歌词（只能是中文，无标点）：
      placeholder:
      value:
    validations:
      required: true
```

music_generation/.github/workflows/music.yml——主 workflow，将 issue 的 body 与 id 传入 python 处理，push 生成结果文件到 store 分支构建 Github Pages，回复并关闭 issue

```
name: music
on:
  issues:
    types: [opened,edited]
  workflow_dispatch:
```

(下页继续)

(续上页)

```yaml
jobs:
  build:

    runs-on: ubuntu-latest

    steps:
    - uses: actions/checkout@v2
    - run: |
          mkdir -p ./id
          echo $ID > ./id/id
      env:
          ID: ${{ github.event.issue.number }}
    - uses: actions/upload-artifact@v3
      with:
          name: id
          path: id/
    - uses: actions/setup-python@v4
      with:
        python-version: '3.x' # Version range or exact version of a Python version to use, using SemVer's version range syntax
        architecture: 'x64' # optional x64 or x86. Defaults to x64 if not specified
    - run: |
        python verify.py $BODY
        git clone -b store https://github.com/xqy2006/music_generation.git "result"
        pip install paddlepaddle
        pip install music21
        pip install protobuf==3.20.0
        python music.py $BODY $ID
      env:
          BODY: ${{ github.event.issue.body }}
          ID: ${{ github.event.issue.number }}
    - uses: JamesIves/github-pages-deploy-action@v4.3.3
      with:
        branch: store
        folder: result
    - uses: rishabhgupta/split-by@v1
      id: split
      with:
        string: ${{ github.event.issue.body }}
        split-by: "歌词 \n "
    - uses: mad9000/actions-find-and-replace-string@2
      id: findandreplace
      with:
        source: ${{ steps.split.outputs._1}} # this translates to ref/heads/main on the main branch, but can be any arbitrary string
        find: "\n"        # we want to remove ref/heads/ from source
        replace: ''               # and replace it with a blank string (ie. removing it)
    - run: |
        python sleep.py $ID
        echo OK!
      env:
        ID: ${{ github.event.issue.number }}
    - name: Create comment
      uses: actions-cool/issues-helper@v2
      with:
```

(下页继续)

(续上页)

```
          actions: 'create-comment'
          token: ${{ secrets.GITHUB_TOKEN }}
          issue-number: ${{ github.event.issue.number }}
          body: |
            你好 ${{ github.event.issue.user.login }} ，生成结果如下：
            midi格式下载地址为（导入到曲谱软件中无歌词，可在电脑上直接播放）：https://
↪xqy2006.github.io/music_generation/${{ github.event.issue.number }}.midi
            xml格式下载地址为（导入到曲谱软件中有歌词，不可在电脑上直接播放）：https:/
↪/xqy2006.github.io/music_generation/${{ github.event.issue.number }}.xml
    - name: Close issue
      uses: actions-cool/issues-helper@v2
      with:
          actions: 'close-issue'
          token: ${{ secrets.GITHUB_TOKEN }}
          issue-number: ${{ github.event.issue.number }}
```

music_generation/.github/workflows/verify.yml——当 music.yml 报错后运行（由 verify.py 抛出），回复并关闭 issue

```
name: verify
on:
  workflow_run:
    workflows: [music]
    types: [completed]
jobs:
  on-failure:
    runs-on: ubuntu-latest
    if: ${{ github.event.workflow_run.conclusion == 'failure' }}
    steps:
      - name: 'Download artifact'
        uses: actions/github-script@v6
        with:
          script: |
            let allArtifacts = await github.rest.actions.listWorkflowRunArtifacts({
               owner: context.repo.owner,
               repo: context.repo.repo,
               run_id: context.payload.workflow_run.id,
            });
            let matchArtifact = allArtifacts.data.artifacts.filter((artifact) => {
              return artifact.name == "id"
            })[0];
            let download = await github.rest.actions.downloadArtifact({
               owner: context.repo.owner,
               repo: context.repo.repo,
               artifact_id: matchArtifact.id,
               archive_format: 'zip',
            });
            let fs = require('fs');
            fs.writeFileSync(`${process.env.GITHUB_WORKSPACE}/id.zip`, Buffer.
↪from(download.data));

      - name: 'Unzip artifact'
        run: unzip id.zip

      - name: 'Comment on issue'
        uses: actions/github-script@v6
        with:
```

(下页继续)

(续上页)

```
          github-token: ${{ secrets.GITHUB_TOKEN }}
          script: |
            let fs = require('fs');
            let issue_number = Number(fs.readFileSync('./id'));
            await github.rest.issues.createComment({
              owner: context.repo.owner,
              repo: context.repo.repo,
              issue_number: issue_number,
              body:"# 您的输入有误！\n请检查您的输入是否全部为中文字符，并且没有标点\
↪n可以通过 https://xqy2006.github.io/Chinese-character/ 去除非中文字符",
                    });
            await github.rest.issues.update({
            owner: context.repo.owner,
            repo: context.repo.repo,
            issue_number: issue_number,
            state: 'closed',
            });
```

Seq2Seq.py——推理所需

```
import paddle
import paddle.nn as nn

# 继承paddle.nn.Layer类
class Midi_Model(nn.Layer):
    # 重写初始化函数
    # 参数：字符表长度、嵌入层大小、隐藏层大小、解码器层数、处理数字的最大位数
    def __init__(self, char_len, embedding_size=128, hidden_size=128, num_layers=1,␣
↪batch_size=20):
        super(Midi_Model, self).__init__()
        # 初始化变量
        self.MAXLEN = 1
        self.batch_size = batch_size
        self.hidden_size = hidden_size
        self.char_len = char_len
        self.num_layers=num_layers
        self.embedding_size=embedding_size

        # 嵌入层
        self.emb = nn.Embedding(
            char_len,
            self.embedding_size
        )

        # 编码器
        self.encoder = nn.LSTM(
            input_size=self.embedding_size,
            hidden_size=self.hidden_size,
            num_layers=self.num_layers
        )

        # 解码器
        self.decoder = nn.LSTM(
            input_size=self.hidden_size,
            hidden_size=self.hidden_size,
            num_layers=self.num_layers
```

(下页继续)

(续上页)

```
        )

        # 全连接层
        self.fc = nn.Linear(
            self.hidden_size,
            char_len
        )

    # 重写模型前向计算函数
    # 参数：输入[None, MAXLEN]、标签[None, DIGITS]
    def forward(self, inputs, labels=None):
        # 嵌入层
        out = self.emb(inputs)

        # 编码器
        out, (_, _) = self.encoder(out)

        # 按时间步切分编码器输出
        out = paddle.split(out, self.MAXLEN, axis=1)

        # 取最后一个时间步的输出并复制batch_size次
        out = paddle.expand(out[-1], [out[-1].shape[0], self.batch_size, self.hidden_
↪size])

        # 解码器
        out, (_, _) = self.decoder(out)

        # 全连接
        out = self.fc(out)

        # 如果标签存在，则计算其损失和准确率
        if labels is not None:
            # 转置解码器输出
            tmp = paddle.transpose(out, [0, 2, 1])

            # 计算交叉熵损失
            loss = nn.functional.cross_entropy(tmp, labels, axis=1)

            # 计算准确率
            acc = paddle.metric.accuracy(paddle.reshape(out, [-1, self.char_len]),␣
↪paddle.reshape(labels, [-1, 1]))

            # 返回损失和准确率
            return loss, acc

        # 返回输出
        return out


# 继承paddle.nn.Layer类
class Duration_Model(nn.Layer):
    # 重写初始化函数
    # 参数：字符表长度、嵌入层大小、隐藏层大小、解码器层数、处理数字的最大位数
    def __init__(self, char_len, embedding_size=128, hidden_size=64, num_layers=1,␣
↪batch_size=20):
        super(Duration_Model, self).__init__()
```

(下页继续)

(续上页)

```
        # 初始化变量
        self.batch_size = batch_size
        self.MAXLEN = 1
        self.hidden_size = hidden_size
        self.char_len = char_len
        self.num_layers=num_layers
        self.embedding_size=embedding_size

        # 嵌入层
        self.emb = nn.Embedding(
            self.char_len,
            self.embedding_size
        )

        # 编码器
        self.encoder = nn.LSTM(
            input_size=embedding_size,
            hidden_size=self.hidden_size,
            num_layers=self.num_layers
        )

        # 解码器
        self.decoder = nn.LSTM(
            input_size=self.hidden_size,
            hidden_size=self.hidden_size,
            num_layers=self.num_layers
        )

        # 全连接层
        self.fc = nn.Linear(
            self.hidden_size,
            self.char_len
        )

    # 重写模型前向计算函数
    # 参数：输入[None, MAXLEN]、标签[None, DIGITS]
    def forward(self, inputs, labels=None):
        # 嵌入层
        out = self.emb(inputs)

        # 编码器
        out, (_, _) = self.encoder(out)

        # 按时间步切分编码器输出
        out = paddle.split(out, self.MAXLEN, axis=1)

        # 取最后一个时间步的输出并复制batch_size次
        out = paddle.expand(out[-1], [out[-1].shape[0], self.batch_size, self.hidden_
↪size])

        # 解码器
        out, (_, _) = self.decoder(out)

        # 全连接
        out = self.fc(out)
```

(下页继续)

(续上页)

```
        # 如果标签存在，则计算其损失和准确率
        if labels is not None:
            # 转置解码器输出
            tmp = paddle.transpose(out, [0, 2, 1])

            # 计算交叉熵损失
            loss = nn.functional.cross_entropy(tmp, labels, axis=1)

            # 计算准确率
            acc = paddle.metric.accuracy(paddle.reshape(out, [-1, self.char_len]),␣
↪paddle.reshape(labels, [-1, 1]))

            # 返回损失和准确率
            return loss, acc

        # 返回输出
        return out
```

Reader.py——推理所需

```
from music21 import note,converter
import numpy as np
import os
import json
import fractions

def Reader(DIGITS,path = './work/data'):
    dur_dic = {}
    def read_data():
        for file in os.listdir(path):
            lyrics = []
            midis = []
            durations = []
            xml = converter.parseFile(os.path.join(path,file))
            #print(dir(stream.Score()))
            for i, note in enumerate(xml.recurse().notesAndRests):
                if i%DIGITS == 0:
                    lyrics.append([])
                    midis.append([])
                    durations.append([])
                lyric = note._getLyric()
                if lyric == None:
                    lyric = '#'
                lyrics[i//DIGITS].append(ord(lyric))
                try:
                    midis[i//DIGITS].append(note.pitch.midi)
                except:
                    midis[i//DIGITS].append(0)
                durations[i//DIGITS].append(note.duration.quarterLength)
                if type(note.duration.quarterLength) == fractions.Fraction and␣
↪float(note.duration.quarterLength) not in list(dur_dic.values()):
                        dur_dic[len(dur_dic)] = float(note.duration.quarterLength)
                elif type(note.duration.quarterLength) != fractions.Fraction and note.
↪duration.quarterLength not in list(dur_dic.values()):
                    dur_dic[len(dur_dic)] = note.duration.quarterLength
            yield [midis,durations,lyrics]
```

(下页继续)

(续上页)

```
        with open('dur_dic.json','w') as f:
            f.write(json.dumps(dur_dic))
    return read_data
```

2.3.1.2.4 4. 成果

https://www.github.com/xqy2006/music_generation

CHAPTER 3

crack

3.1 Typora 破解 (1.3.6)

3.1.1 1. 抓取解密后 js:

```
pip install frida
frida "D:\Program Files\Typora\Typora.exe" -l "./unpack.js"
```

unpack.js:

```
let napi_create_string_utf8 = Module.getExportByName(null, 'napi_create_string_utf8');
var index = 0;
if (napi_create_string_utf8) {
    console.log('绑定成功');
    Interceptor.attach(napi_create_string_utf8, {
        onEnter: function (args) {
            console.log('napi_create_string_utf8', '调用', args[0], args[1].
↪readCString().substring(0, 100), args[2], args[3]);

            if (args[2].toInt32() > 100) { // 过滤出大文件
                index += 1;
                var f = new File('export_' + String(index) + '.js', 'wb');
                f.write(args[1].readByteArray(args[2].toInt32()));
                f.flush();
                f.close();

            }
        }
    });
} else {
    console.log('绑定失败');
}
```

3.1.2 2. 将解包出来最大的 js 重命名为 Atom.js，找到以下代码替换 RSA Public Key 的 base64，删除 renew：

```
T=JSON.parse(Buffer.from(
↪"WyItLS0tLUJFR0lOIFBVQkxJQyBLRVktLS0tLSIsIk1JSUJJakFOQmdrcWhraUc5dzBCQVFFRkFBT0NBUThBTUlJQkNnS0NBU
↪","base64").toString("utf8"))

//删除下面的/api/client/renew
const a = await (await k(W + "/api/client/renew", {
        method: "POST",
        cache: "no-cache",
        body: JSON.stringify(n),
        headers: {
                "Content-Type": "application/json",
                "Cache-Control": "no-cache"
                }
        }
```

3.1.3 3. 解包 app.asar：

```
npm install asar -g
cd D:\Program Files\Typora\resources
asar extract ./app.asar ./app
```

3.1.4 4. 将刚刚修改好的 Atom.js 替换“D:\Program Files\Typora\resources\app\”下的同名文件

3.1.5 5. 删除“D:\Program Files\Typora\resources\”下的“app.asar”

3.1.6 6. 编写 keygen

RSA 公私钥生成：

```
const crypto = require('crypto');
const fs = require('fs');
const path = require('path');

const keyPair = crypto.generateKeyPairSync('rsa', {
   modulusLength: 2048,
   publicKeyEncoding: {
      type: 'spki',
      format: 'pem'
   },
   privateKeyEncoding: {
      type: 'pkcs8',
      format: 'pem',
   }
});

fs.writeFileSync("public_key.pem", keyPair.publicKey);
fs.writeFileSync("private_key.pem", keyPair.privateKey);
```

keygen:

```
const crypto = require('crypto');
const fs = require('fs');
const path = require('path');
const root = __dirname;
function doEnc(MachineCode, email, license) {
    var mc = JSON.parse(Buffer.from(MachineCode, 'base64').toString());
    var signInfo = { fingerprint: mc.i, email, license, type: '1' };
    return JSON.stringify(signInfo);
}

const privateKey = fs.readFileSync(path.join(root, './private_key.pem')).toString(
↪'ascii');
const code = doEnc(
↪"eyJ2Ijoid2lufDEuMy42IiwiaSI6IjhqT0VscDBXamsiLCJsIjoiTEFQVE9QLTVBUEZHOTM3IHwgMjYwMTkgfCBXaW5kb3dzIn
↪","Crack_By_Xuqinyang","Crack_By_Xuqinyang");
const key = crypto.privateEncrypt(privateKey, Buffer.from(code)).toString('base64');
console.log("+"+key);
```

3.1.7 7. 将 keygen 生成的注册码输入到离线注册窗口并注册