CICD Implementation

Team 21 Spring 2023

Updated: 6/7/2023

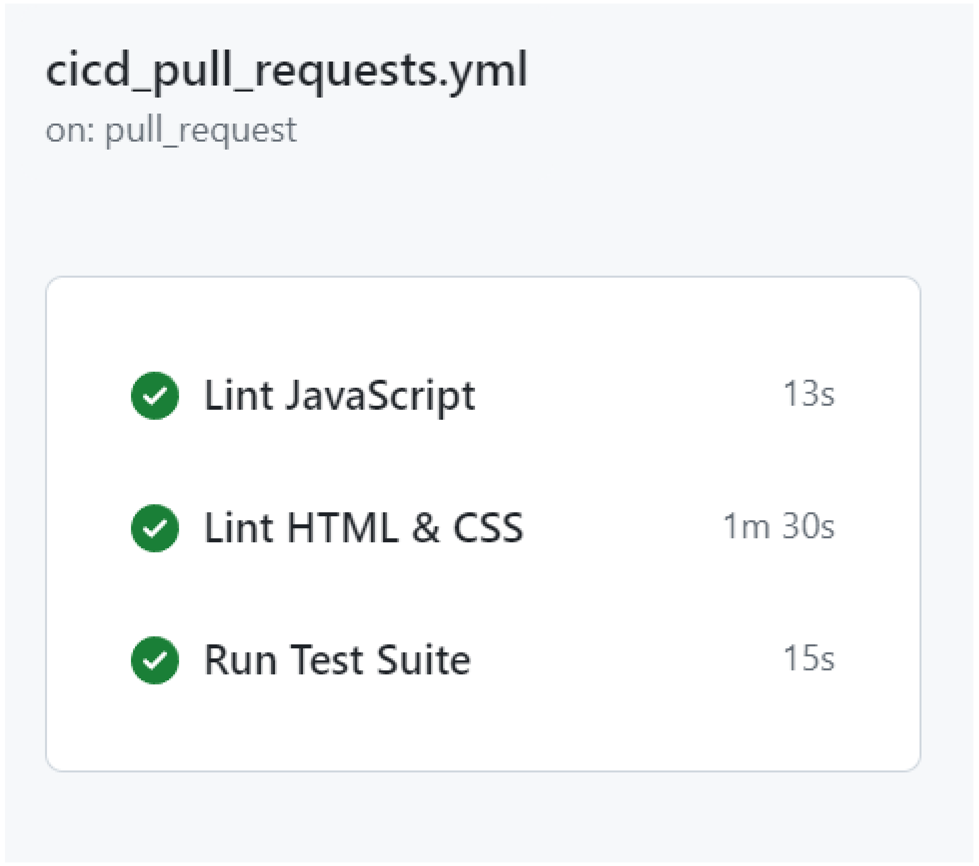
Branch Structure Strategy

- Two fundamental branches
  - The main branch
    - Stores current stable release*
      - *The main branch can slightly differ in repo-level things (e.g. CI/CD or README changes) – releases are kept safe via tags (e.g., our v0.1.0 is unchanged regardless of what happens to main)
    - Push from dev branch (via pull request) to make a new release
    - Create an offshoot branch from main and make a pull request to merge back into main for repo-level things
      - E.g., CI/CD or README changes
      - May depend on case-by-case basis (for small changes we just want to commit once without a big headache)
  - The dev branch
    - Collective branch for everyone to work on next release
    - Feature / bug-fix branches come from the dev branch and are merged back via pull-request to add new features / bug fixes to development work

CI / CD Approach

- Three unique situations:
  - Pushing to the main branch
    - Linting, tests, main branch docs, minimization, deployment
  - Pushing to the dev branch
    - Linting, tests, dev branch docs (stored in a separate folder than main branch docs)
  - Pushing to other branches / creating a pull request
    - Linting and tests
- Each situation has its own workflow (three .yml files)
- Could add more steps / workflows in the future if necessary

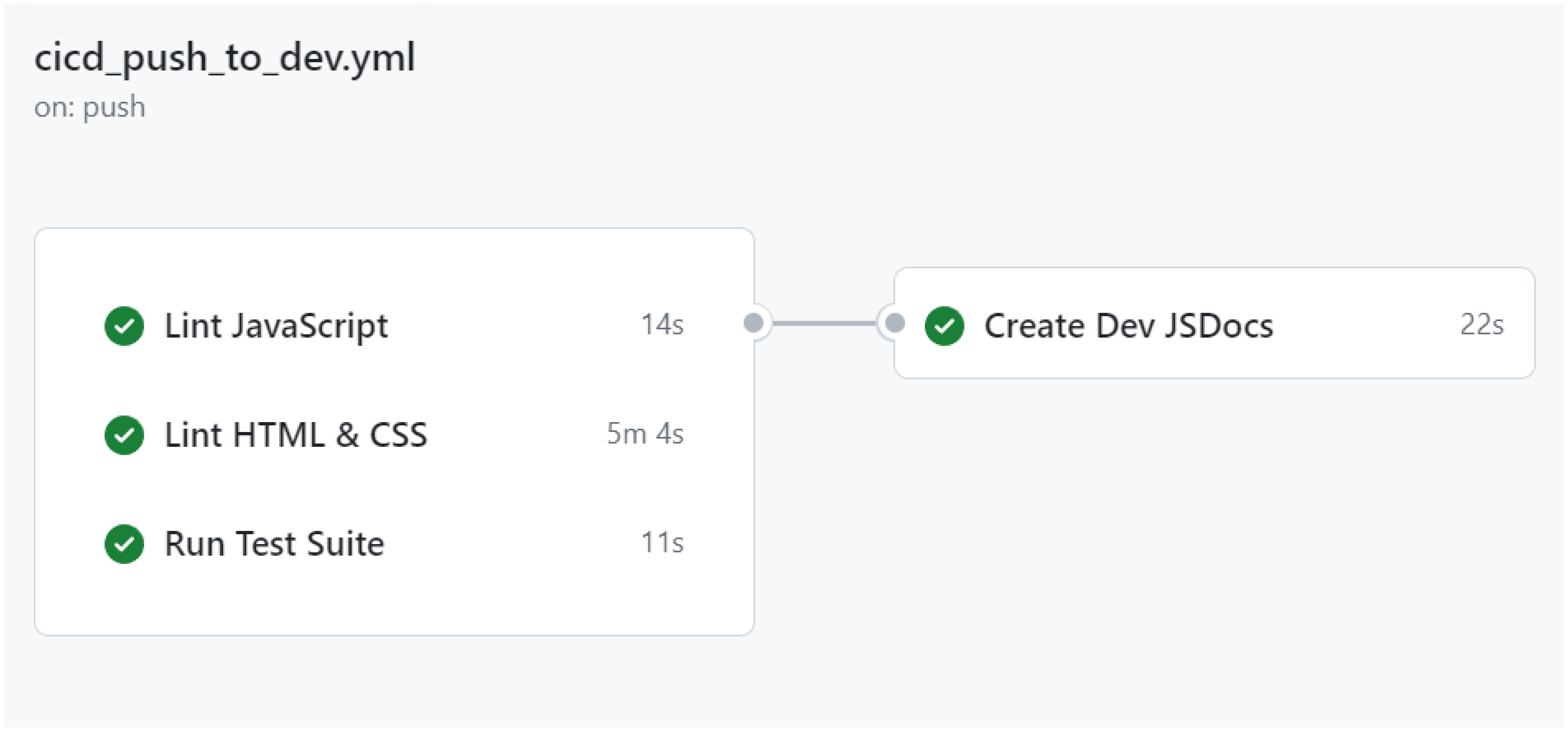
Pushing to other branches / Pull Requests



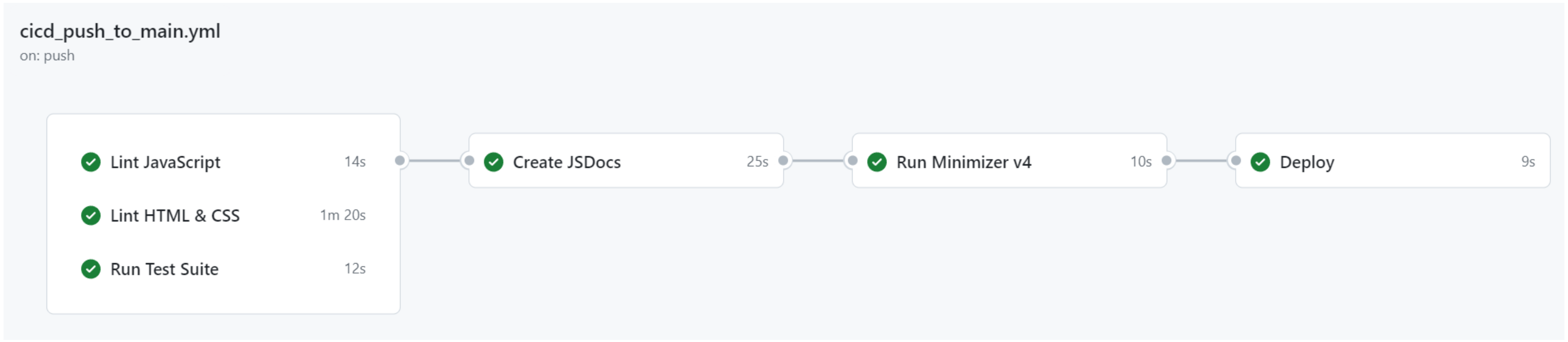
cicd_pull_requests.yml
on: pull_request

✓	Lint JavaScript	13s
✓	Lint HTML & CSS	1m 30s
✓	Run Test Suite	15s

Pushing to dev branch


cicd_push_to_dev.yml
on: push

Pushing to main branch



Visualized Commit Work

Push to main: Added fooMain() – triggers push to main workflow

- Workflow creates documentation in the docs/ directory and generates minimized code in the dist/ directory (in two separate commits)

Push to dev: Added fooDev() – triggers push to dev workflow

- Workflow creates documentation in the dev-docs/ directory
    - this is done to avoid merge conflicts
    - dev-docs is deleted from the main branch upon merging dev with main to create a new release

Push to new-feature: Added fooNewFeature() – triggers pull request or general push workflow

- Lints JavaScript / HTML / CSS and runs test suite, but that's it

Pull request from new-feature to dev: Triggers pull request or general push workflow

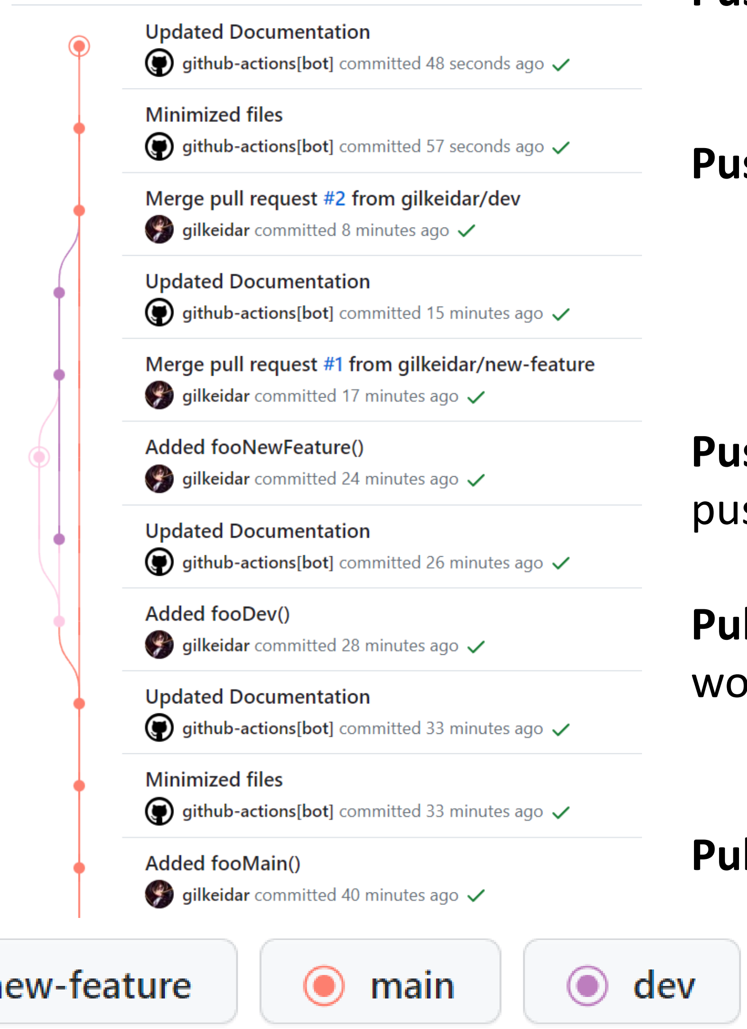
- After the pull request is merged to dev, the push to dev workflow will be run since we're pushing to dev

Pull request from dev to main: Triggers pull request or general push workflow

- After the pull request is merged to main, the push to main workflow will be run since we're pushing to main

● new-feature ● main ● dev

Visualized Commit Work



Updated Documentation
github-actions[bot] committed 48 seconds ago ✓

Minimized files
github-actions[bot] committed 57 seconds ago ✓

Merge pull request #2 from gilkeidar/dev
gilkeidar committed 8 minutes ago ✓

Updated Documentation
github-actions[bot] committed 15 minutes ago ✓

Merge pull request #1 from gilkeidar/new-feature
gilkeidar committed 17 minutes ago ✓

Added fooNewFeature()
gilkeidar committed 24 minutes ago ✓

Updated Documentation
github-actions[bot] committed 26 minutes ago ✓

Added fooDev()
gilkeidar committed 28 minutes ago ✓

Updated Documentation
github-actions[bot] committed 33 minutes ago ✓

Minimized files
github-actions[bot] committed 33 minutes ago ✓

Added fooMain()
gilkeidar committed 40 minutes ago ✓

Push to main: Added fooMain() – triggers push to main workflow

- Workflow creates documentation in the docs/ directory and generates minimized code in the dist/ directory (in two separate commits)

Push to dev: Added fooDev() – triggers push to dev workflow

- Workflow creates documentation in the dev-docs/ directory
  - this is done to avoid merge conflicts
  - dev-docs is deleted from the main branch upon merging dev with main to create a new release

Push to new-feature: Added fooNewFeature() – triggers pull request or general push workflow

- Lints JavaScript / HTML / CSS and runs test suite, but that's it

Pull request from new-feature to dev: Triggers pull request or general push workflow

- After the pull request is merged to dev, the push to dev workflow will be run since we're pushing to dev

Pull request from dev to main: Triggers pull request or general push workflow

- After the pull request is merged to main, the push to main workflow will be run since we're pushing to main

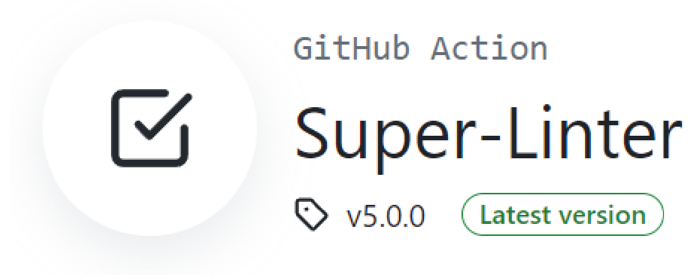
CI / CD Current Steps

Linting - JavaScript

JS; Semistandard Code Style

- Linter is used to maintain code style throughout our project
- JavaScript Linter – Semi-Standard Style
  - Allows for semi-colons (important for minifier)
  - Recommended: Install the Standard Style VSCode Extension
    - Found here
    - After installing, go to **Extensions > StandardJS – JavaScript Standard Style > Extension Settings** and set **Standard: Engine** to semistandard.
    - To check that it worked, open a JavaScript file. If the code isn’t in Semi-Standard style, you’ll see lots of red squiggly underlines. Save the file and it should update the code to conform to this style (you may need to save multiple times)

Linting – HTML & CSS


GitHub Action

Super-Linter

v5.0.0 Latest version

- Linter is used to maintain code style throughout our project
- HTML & CSS Linter – Super-Linter
  - Found here
  - Advantages:
    - Easy to use – it's a GitHub Action
    - Supports lots of languages
  - Disadvantages:
    - Slow install time – you can expect it to run for at least 1 minute which slows down the CI/CD pipeline considerably

Testing - Jest

- Testing JavaScript files with Jest
- Install Jest in the terminal using
  - npm install --save-dev jest
  - Alternatively, the repository's package.json and package-lock.json files already specify the required dependencies, so I believe that you can just pull from the repository and then run npm install instead.
- Put your tests in a tests/ folder outside src/
- Note that at present the JavaScript linter ***does*** lint the tests folder. If this causes issues, it can be easily configured to not lint the tests folder.

Documentation - JSDocs

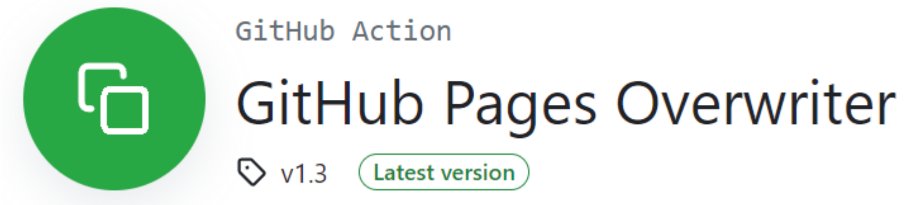
- Generates a documentation website (no deployment, however) automatically when you push to dev or to main
  - The docs generated for the dev branch and the docs generated for the main branch are stored in separate folders.
- Can easily configure the template for the documentation website (i.e. its appearance – see here)
- To use, use /** JSDoc comment */ in your code (above classes, functions, and variables)
  - Recommended: use tags and specify the types of parameters:

```
/**
 * Creates a FortuneEngine object.
 * @param {string} app_name that gives name of fortune teller type
 */
```

Minimization – UglifyJS + HTML Minifier

- Minimization makes the distributed code smaller by removing whitespace and shortening variable names
- Minimized code goes in the dist/ folder
  - All relevant files **MUST** be in the src/ folder. That means that the assets/ folder must be moved into src!
- Only gets run when pushing to main
- Originally run with a GitHub Action – now, it is accomplished via running a shell script (minimize.sh) stored in the .github/ directory

Deployment – GitHub Pages


GitHub Action

GitHub Pages Overwriter

v1.3 Latest version

- Deployment hosts our code from the dist/ directory onto GitHub Pages
- This is the last step (after minimization) of the push to main workflow
- Deploys whatever is in the dist/ directory onto a GitHub Page
  - It does this by pushing the contents of the dist/ directory to the gh-pages branch
  - GitHub then runs its own workflow to deploy the contents of the gh-pages branch to https://cse110-sp23-group21.github.io/map-my-future/

Let’s take a look at the .yml files