

CI PROJECT REPORT

Project Title

Implementing Continuous Integration with GitHub Actions Using Matrix Builds, Code Quality Checks, and Secure Secrets Management

1. Abstract

This project demonstrates the practical implementation of Continuous Integration (CI) using GitHub Actions in a Node.js application. The workflow integrates automated testing, code quality checks, matrix builds across multiple Node.js versions, and secure handling of sensitive information using GitHub Secrets. The objective is to ensure early detection of defects, maintain code quality, and follow industry-standard DevOps practices in a production-ready manner.

2. Introduction

Continuous Integration is a core DevOps practice that enables developers to integrate code changes frequently while automatically validating functionality and quality. Without CI, defects are often detected late, leading to costly fixes and unstable releases. This project applies CI principles by automating linting, testing, and build validation using GitHub Actions.

The implementation aligns strictly with best practices of Implementing Continuous Integration with GitHub Actions, focusing on matrix builds and code quality enforcement.

3. Project Objectives

- Implement Continuous Integration using GitHub Actions
 - Configure matrix builds to test across multiple Node.js versions
 - Enforce code quality using ESLint
 - Execute automated tests using Jest
 - Improve build efficiency using dependency caching
 - Secure sensitive configuration values using GitHub Secrets
 - Validate CI execution through Pull Requests
-

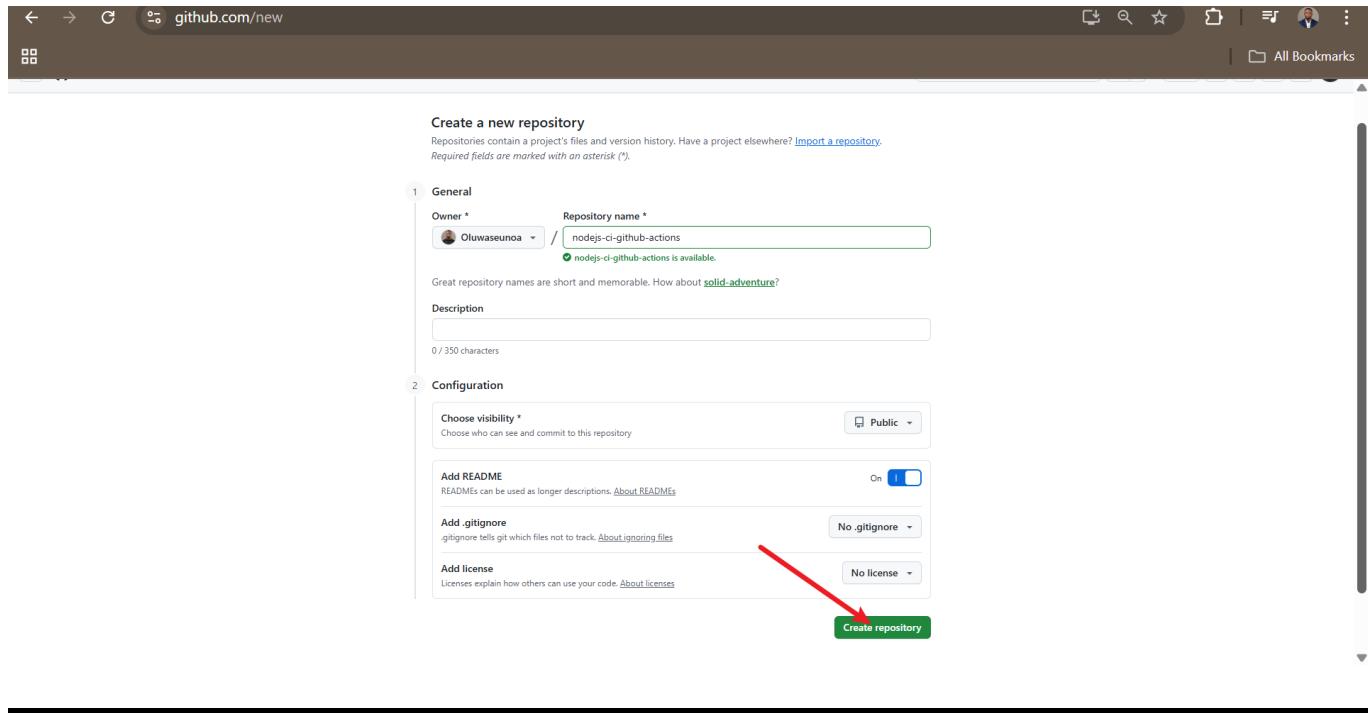
4. Tools and Technologies Used

- **GitHub & GitHub Actions** – CI automation platform
 - **Node.js & npm** – Runtime and dependency management
 - **Jest** – Automated testing framework
 - **ESLint (Flat Config)** – Static code analysis tool
 - **YAML** – Workflow configuration language
 - **GitHub Secrets** – Secure storage of sensitive values
-

5. Project Implementation

Step 1: Repository Creation

A new GitHub repository was created with a README file to initialize the project.



Step 2: Repository Cloning

The repository HTTPS URL was copied and cloned locally.

The screenshot shows a GitHub repository page for 'nodejs-ci-github-actions'. The 'Code' dropdown menu is open, showing options like Local, Codespaces, Clone, HTTPS, SSH, and GitHub CLI. A red arrow points to the 'Code' dropdown menu itself. Another red arrow points to the 'Copy URL to clipboard' button next to the HTTPS link.

```
MINGW64:/c/Users/HP/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions
$ git clone https://github.com/Oluwaseunoa/nodejs-ci-github-actions.git
Cloning into 'nodejs-ci-github-actions'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0).
Receiving objects: 100% (3/3), done.

MINGW64:/c/Users/HP/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects (main)
$ cd nodejs-ci-github-actions
$
```

Step 3: Node.js Project Initialization

```
npm init -y

MINGW64:/c/Users/HP/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects (main)
$ npm init -y
wrote to C:\Users\HP\Documents\Workspace\DevOps-Projects\GitHub-Actions-Projects\nodejs-ci-github-actions\package.json:

{
  "name": "nodejs-ci-github-actions",
  "version": "1.0.0",
  "description": "",
  "main": "index.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "repository": {
    "type": "git",
    "url": "git+https://github.com/Oluwaseunoa/nodejs-ci-github-actions.git"
  },
  "keywords": [],
  "author": "",
  "license": "ISC",
  "type": "commonjs",
  "bugs": {
    "url": "https://github.com/Oluwaseunoa/nodejs-ci-github-actions/issues"
  },
  "homepage": "https://github.com/Oluwaseunoa/nodejs-ci-github-actions#readme"
}

MINGW64:/c/Users/HP/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects (main)
$
```

Step 4: Dependency Installation

```
npm install --save-dev eslint jest
```

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$ npm install --save-dev eslint jest
npm warn deprecated inflight@1.0.6: This module is not supported, and leaks memory. Do not use it. Check out lru-cache if you want a good and tested way to coalesce async requests by a key value, which is much more comprehensive and powerful.
npm warn deprecated glob@7.2.3: Glob versions prior to v9 are no longer supported

added 362 packages, and audited 363 packages in 1m

61 packages are looking for funding
  run `npm fund` for details

found 0 vulnerabilities

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$
```

```
☰ MINGW64:/c/Users/HP/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions ┡ ×

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$ npm install

up to date, audited 1 package in 1s

found 0 vulnerabilities

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$
```

```
☰ MINGW64:/c/Users/HP/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions ━ ┡ ×

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$ npm list jest
nodejs-ci-github-actions@1.0.0 C:\Users\HP\Documents\Workspace\DevOps-Projects\GitHub-Actions-Projects\nodejs-ci-github-actions
└─ jest@30.2.0

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$
```

Step 5: ESLint Configuration

ESLint was initialized and updated to modern Flat Config.

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$ npx eslint --init
You can also run this command directly using 'npm init @eslint/config@latest'.
Need to install the following packages:
@eslint/create-config@1.11.0
Ok to proceed? (y) y

> nodejs-ci-github-actions@1.0.0 npx
> create-config

@eslint/create-config: v1.11.0

✓ What do you want to lint? · javascript
✓ How would you like to use ESLint? · problems
✓ What type of modules does your project use? · esm
✓ Which framework does your project use? · none
✓ Does your project use TypeScript? · No / Yes
✓ Where does your code run? · browser
ℹ The config that you've selected requires the following dependencies:

eslint, @eslint/js, globals
✓ Would you like to install them now? · No / Yes
✓ Which package manager do you want to use? · npm
Installing...

added 1 package, changed 1 package, and audited 364 packages in 5s

62 packages are looking for funding
  run `npm fund` for details

found 0 vulnerabilities
✓ Successfully created C:/Users/HP/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions/eslint.config.mjs file.

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$
```

```

// .gitignore
// package-lock.json
// package.json
// README.md

// App / source files
{
  files: ["**/*.{js,mjs}"],
  languageOptions: {
    sourceType: "module",
    globals: "globals.browser",
  },
  plugins: { js },
  extends: ["js/recommended"],
}

// CommonJS files
{
  files: ["**/*.cjs"],
  languageOptions: {
    sourceType: "commonjs",
  },
}

// 🎨 Jest test files
{
  files: ["**/*.test.js", "**/*.spec.js"],
  languageOptions: {
    globals: {
      ...globals.jest,
    }
  }
}

```

Step 6: Test Implementation

A real Jest test was added.

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$ mkdir -p .github/workflows

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$ mkdir tests

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$
```

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$ touch tests/app.test.js
```

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$
```

The screenshot shows the VS Code interface with the following details:

- Explorer View:** Shows a project structure for "NODEJS-CI-GITHUB-ACTIONS" containing .git, .github, node_modules, tests, app.test.js (selected), eslint.config.mjs, package-lock.json, package.json, and README.md.
- Editor View:** Displays the contents of "app.test.js".

```
test("CI pipeline test", () => {
  expect(2 + 2).toBe(4);
});
```
- Status Bar:** Shows "Ln 4, Col 1", "Spaces: 4", "UTF-8", "CRLF", "JavaScript", and icons for Prettier and GitHub.

Step 7: Package Script Configuration

```
"scripts": {
  "test": "jest",
  "lint": "eslint ."
}
```

The screenshot shows the VS Code interface with the 'package.json' file open in the center editor. The 'scripts' section of the JSON object is highlighted with a red box. The 'scripts' section contains three entries: 'test', 'jest', and 'lint'. The 'repository' section also has a URL entry with a red underline.

```

{
  "name": "nodejs-ci-github-actions",
  "version": "1.0.0",
  "description": "",
  "main": "index.js",
  "scripts": {
    "test": "jest",
    "lint": "eslint ."
  },
  "repository": {
    "type": "git",
    "url": "git+https://github.com/Oluwaseunoa/nodejs-ci-github-actions.git"
  },
  "keywords": [],
  "author": "",
  "license": "ISC",
  "type": "commonjs",
  "bugs": {
    "url": "https://github.com/Oluwaseunoa/nodejs-ci-github-actions/issues"
  },
  "homepage": "https://github.com/Oluwaseunoa/nodejs-ci-github-actions#readme",
  "devDependencies": {
    "@eslint/js": "^9.39.2",
    "eslint": "^9.39.2",
    "globals": "^17.0.0",
    "jest": "^30.2.0"
  }
}
  
```

Step 8: Local Validation

```

npm run lint
npm test
  
```

```

HP@DESKTOP-T9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$ npm run test

> nodejs-ci-github-actions@1.0.0 test
> jest

PASS tests/app.test.js
  ✓ CI pipeline test (5 ms)

Test Suites: 1 passed, 1 total
Tests:       1 passed, 1 total
Snapshots:  0 total
Time:        0.682 s, estimated 1 s
Ran all test suites.

HP@DESKTOP-T9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$ npm run lint

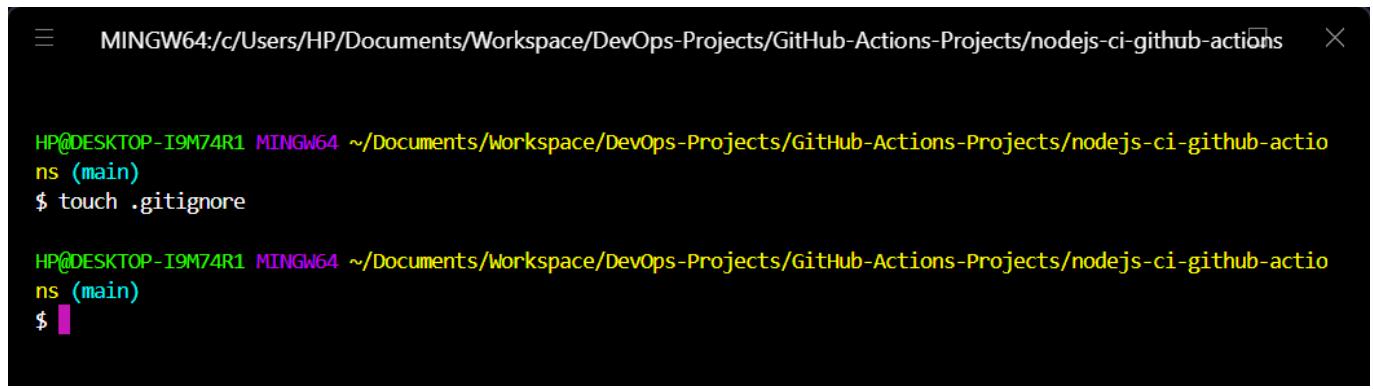
> nodejs-ci-github-actions@1.0.0 lint
> eslint .
  
```

Step 9: Git Ignore Configuration

```
MINGW64:/c/Users/HP/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions
```

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-action
ns (main)
$ touch .gitignore
```

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-action
ns (main)
$
```



```
NODEJS-CI-GITHUB-ACTIONS
> .git
> .github
> node_modules
  < tests
    JS app.test.js
  < .gitignore
    JS eslint.config.mjs
  {} package-lock.json
  {} package.json
  README.md
```

```
.gitignore
1 node_modules
```

Step 10: Initial Commit & Push

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$ git add .
warning: in the working copy of 'eslint.config.mjs', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'package-lock.json', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'package.json', LF will be replaced by CRLF the next time Git touches it

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$ git commit -m "Complete CI setup with Jest tests and ESLint configuration"
[main ddb206] Complete CI setup with Jest tests and ESLint configuration
 5 files changed, 5295 insertions(+)
 create mode 100644 .gitignore
 create mode 100644 eslint.config.mjs
 create mode 100644 package-lock.json
 create mode 100644 package.json
 create mode 100644 tests/app.test.js

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$ git push
Enumerating objects: 9, done.
Counting objects: 100% (9/9), done.
Delta compression using up to 8 threads
Compressing objects: 100% (6/6), done.
Writing objects: 100% (8/8), 43.54 KiB | 3.35 MiB/s, done.
Total 8 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/Oluwaseunoa/nodejs-ci-github-actions.git
  a1853ba..ddb206 main -> main

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$
```

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$ git add .github/workflows/ci.yml

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$ git commit -m "Add CI pipeline with matrix build, linting, and tests"
[main 401435f] Add CI pipeline with matrix build, linting, and tests
 1 file changed, 34 insertions(+)
 create mode 100644 .github/workflows/ci.yml

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$ git push origin main
Enumerating objects: 6, done.
Counting objects: 100% (6/6), done.
Delta compression using up to 8 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (5/5), 705 bytes | 235.00 KiB/s, done.
Total 5 (delta 1), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/Oluwaseunoa/nodejs-ci-github-actions.git
  258c878..401435f main -> main

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$
```

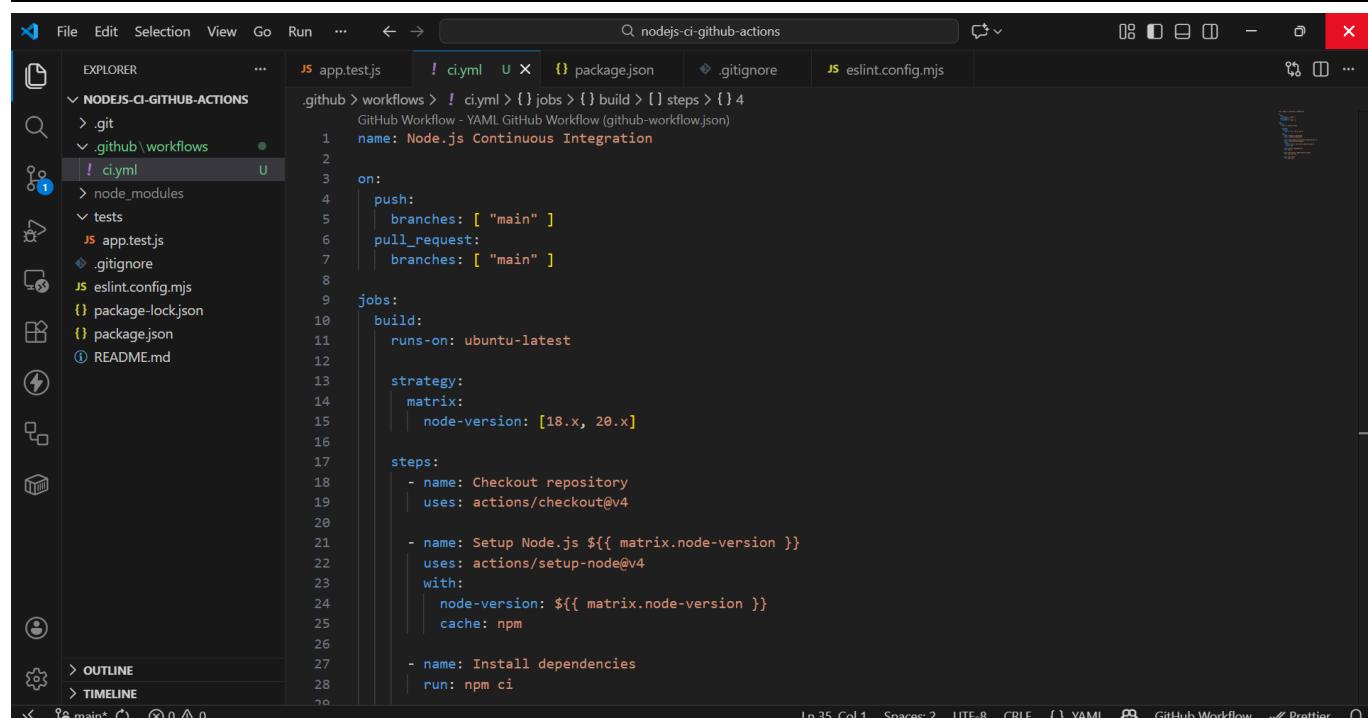
Step 11: GitHub Actions Workflow Creation

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$ mkdir -p .github/workflows
```

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$
```

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$ touch .github/workflows/ci.yml
```

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (main)
$
```



```
name: Node.js Continuous Integration

on:
  push:
    branches: [ "main" ]
  pull_request:
    branches: [ "main" ]

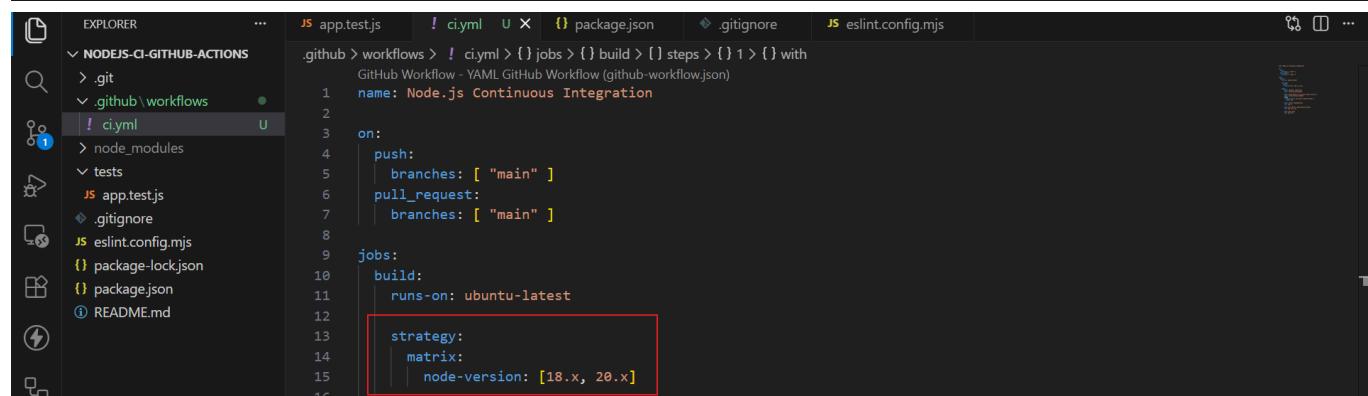
jobs:
  build:
    runs-on: ubuntu-latest

    strategy:
      matrix:
        node-version: [18.x, 20.x]

    steps:
      - name: Checkout repository
        uses: actions/checkout@v4

      - name: Setup Node.js ${{ matrix.node-version }}
        uses: actions/setup-node@v4
        with:
          node-version: ${{ matrix.node-version }}
          cache: npm

      - name: Install dependencies
        run: npm ci
```



```
name: Node.js Continuous Integration

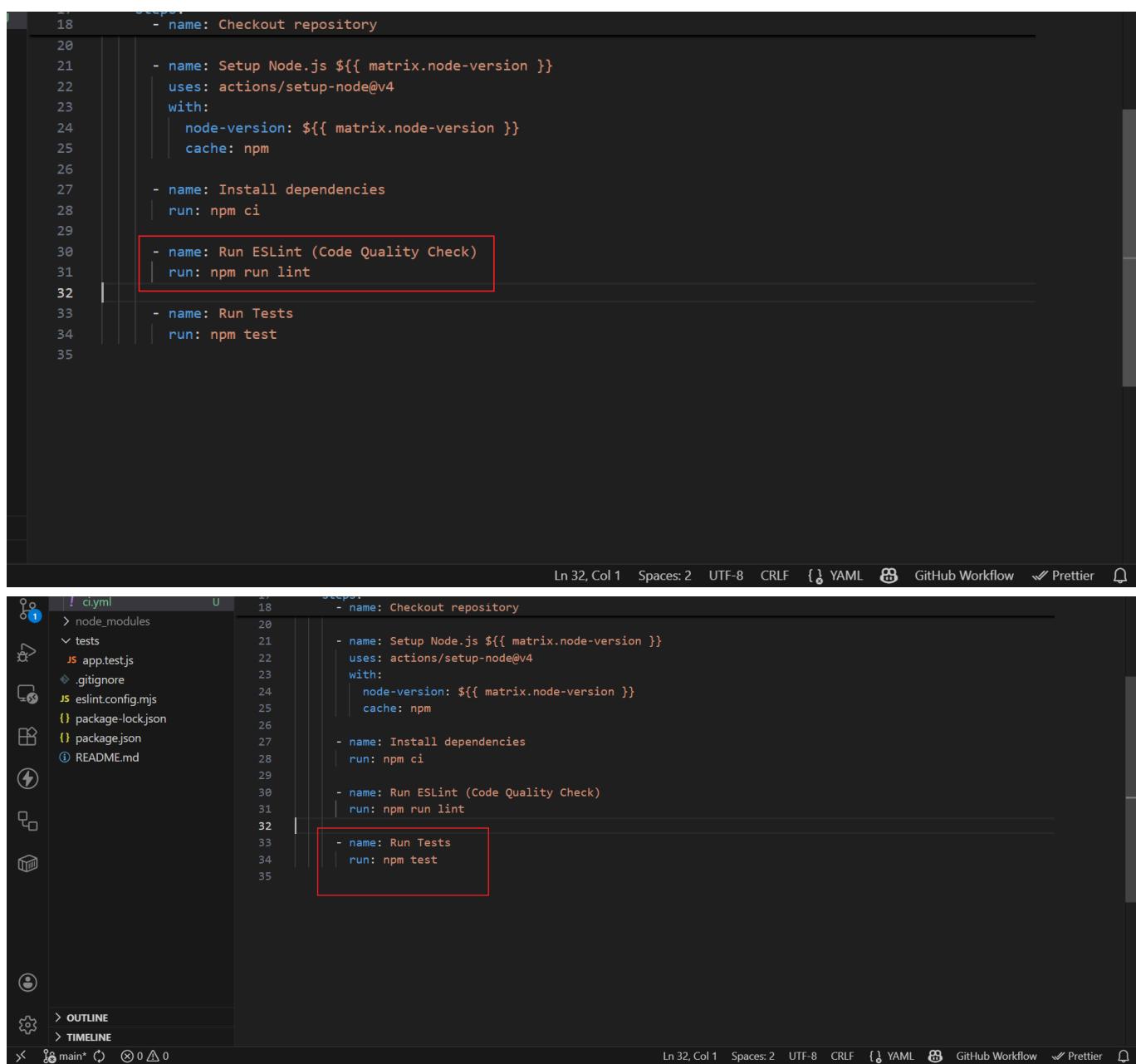
on:
  push:
    branches: [ "main" ]
  pull_request:
    branches: [ "main" ]

jobs:
  build:
    runs-on: ubuntu-latest
    strategy:
      matrix:
        node-version: [18.x, 20.x]
```

Step 12: Dependency Caching

```
17   steps:
18     - name: Checkout repository
19       uses: actions/checkout@v4
20
21     - name: Setup Node.js ${{ matrix.node-version }}
22       uses: actions/setup-node@v4
23       with:
24         node-version: ${{ matrix.node-version }}
25         cache: npm
26
27     - name: Install dependencies
28       run: npm ci
29
30     - name: Run ESLint (Code Quality Check)
31       run: npm run lint
32
33     - name: Run Tests
34       run: npm test
35
```

Step 13: Code Quality & Test Execution in CI



```
18   steps:
19     - name: Checkout repository
20
21     - name: Setup Node.js ${{ matrix.node-version }}
22       uses: actions/setup-node@v4
23       with:
24         node-version: ${{ matrix.node-version }}
25         cache: npm
26
27     - name: Install dependencies
28       run: npm ci
29
30     - name: Run ESLint (Code Quality Check)
31       run: npm run lint
32
33     - name: Run Tests
34       run: npm test
35
```

The screenshot shows the GitHub Actions workflow editor interface. On the left, there's a file tree with files like .gitignore, app.test.js, eslint.config.mjs, package-lock.json, package.json, and README.md. The main area displays the workflow YAML code. The step from line 30 to line 32, which runs ESLint, is highlighted with a red box. The bottom status bar indicates the code is 32 lines long, has 2 spaces, and is in UTF-8 encoding.

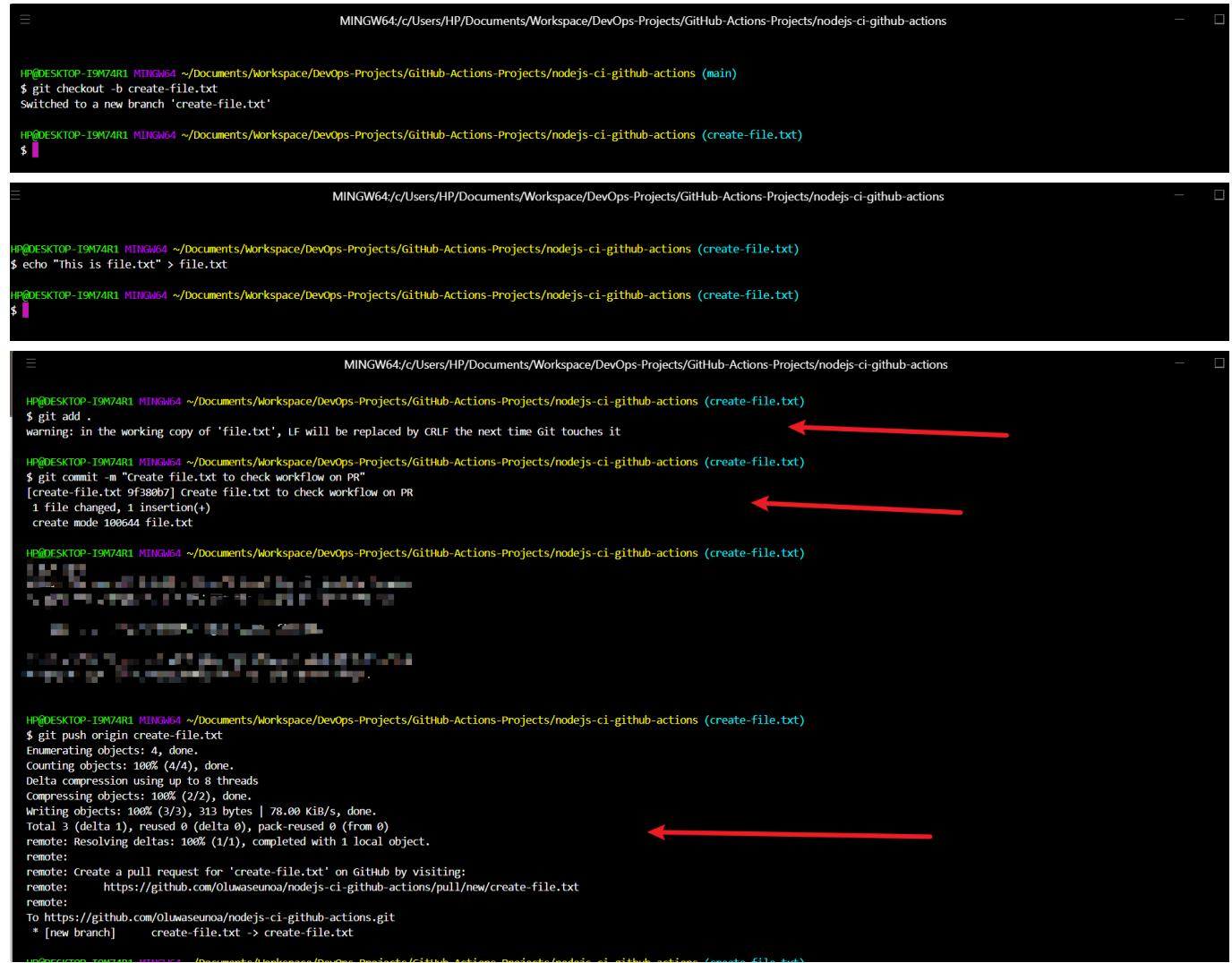
6. Security Enhancement: GitHub Secrets Integration

...

Note: Screenshot for secret creation is missing from your list.

Consider taking a new one showing the "New repository secret" form.

7. CI Validation Using Pull Requests

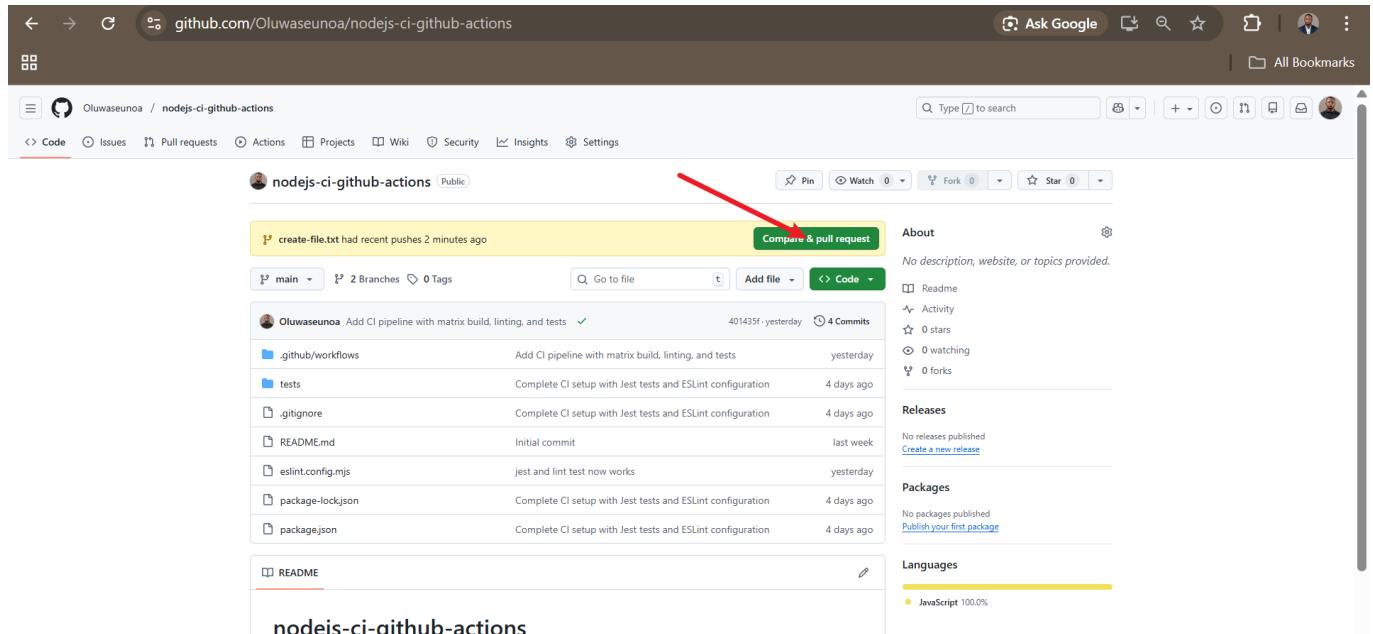


```
MINGW64:/c/Users/HP/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions
$ git checkout -b create-file.txt
Switched to a new branch 'create-file.txt'

MINGW64:/c/Users/HP/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (create-file.txt)
$ echo "This is file.txt" > file.txt

MINGW64:/c/Users/HP/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (create-file.txt)
$ git add .
warning: in the working copy of 'file.txt', LF will be replaced by CRLF the next time Git touches it
$ git commit -m "Create file.txt to check workflow on PR"
[create-file.txt 9f388b7] Create file.txt to check workflow on PR
 1 file changed, 1 insertion(+)
 create mode 100644 file.txt

MINGW64:/c/Users/HP/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-github-actions (create-file.txt)
$ git push origin create-file.txt
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 8 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 313 bytes | 78.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
remote:
remote: Create a pull request for 'create-file.txt' on GitHub by visiting:
remote:   https://github.com/OluwaseunOa/nodejs-ci-github-actions/pull/new/create-file.txt
remote:
To https://github.com/OluwaseunOa/nodejs-ci-github-actions.git
 * [new branch]    create-file.txt -> create-file.txt
```



The screenshot shows the GitHub repository page for `nodejs-ci-github-actions`. A red arrow points to the green 'Compare & pull request' button at the top right of the repository summary area.

`create-file.txt` had recent pushes 2 minutes ago

`Compare & pull request`

`main` 2 Branches 0 Tags

Oluwaseunoa Add CI pipeline with matrix build, linting, and tests ✓ 401435f · yesterday 4 Commits

.github/workflows Add CI pipeline with matrix build, linting, and tests yesterday

tests Complete CI setup with Jest tests and ESLint configuration 4 days ago

.gitignore Complete CI setup with Jest tests and ESLint configuration 4 days ago

README.md Initial commit last week

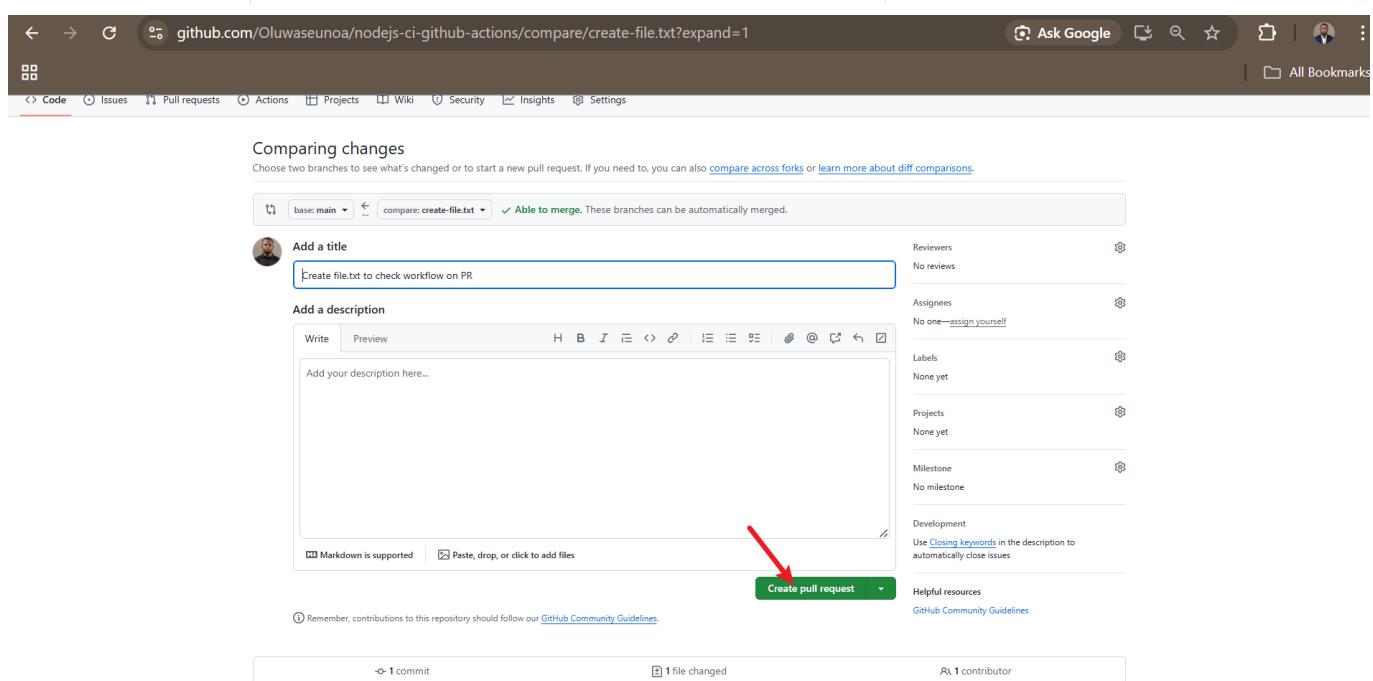
eslint.config.mjs jest and lint test now works yesterday

package-lock.json Complete CI setup with Jest tests and ESLint configuration 4 days ago

package.json Complete CI setup with Jest tests and ESLint configuration 4 days ago

`README`

`nodejs-ci-github-actions`



The screenshot shows the GitHub compare screen for branches `main` and `create-file.txt`. A red arrow points to the green 'Create pull request' button at the bottom right of the comparison interface.

Comparing changes

Choose two branches to see what's changed or to start a new pull request. If you need to, you can also [compare across forks](#) or [learn more about diff comparisons](#).

base: `main` compare: `create-file.txt` Able to merge. These branches can be automatically merged.

Add a title

Add a description

Write Preview

Add your description here...

Markdown is supported Paste, drop, or click to add files

Create pull request

Remember, contributions to this repository should follow our [GitHub Community Guidelines](#).

-> 1 commit 1 file changed 1 contributor

The screenshot shows a GitHub pull request page for a repository named "nodejs-ci-github-actions". The pull request has been opened by the user "Oluwaseunoa" and is currently merging 1 commit from the branch "create-file.txt" into the "main" branch. The pull request has no description provided.

The "Checks" section indicates that some checks haven't completed yet, with two Node.js Continuous Integration builds (18.x and 20.x) currently starting. The "No conflicts with base branch" section shows that merging can be performed automatically.

Initial CI Status:

- Some checks haven't completed yet (2 in progress checks)
- Node.js Continuous Integration / build (18.x) (pull_request) Started now — This check has started...
- Node.js Continuous Integration / build (20.x) (pull_request) Started now — This check has started...
- No conflicts with base branch: Merging can be performed automatically.

Merge Attempt:

A "Merge pull request" button is present at the bottom of the pull request page. A tooltip indicates that you can also merge this with the command line via "View command line instructions".

The screenshot shows the same GitHub pull request page after the initial CI runs have completed successfully. The "Checks" section now displays "All checks have passed" with 2 successful checks, specifically for the Node.js CI builds.

Successful CI Status:

- All checks have passed (2 successful checks)
 - Node.js Continuous Integration / build (18.x) (pull_request) Successful in 14s
 - Node.js Continuous Integration / build (20.x) (pull_request) Successful in 8s
- No conflicts with base branch: Merging can be performed automatically.

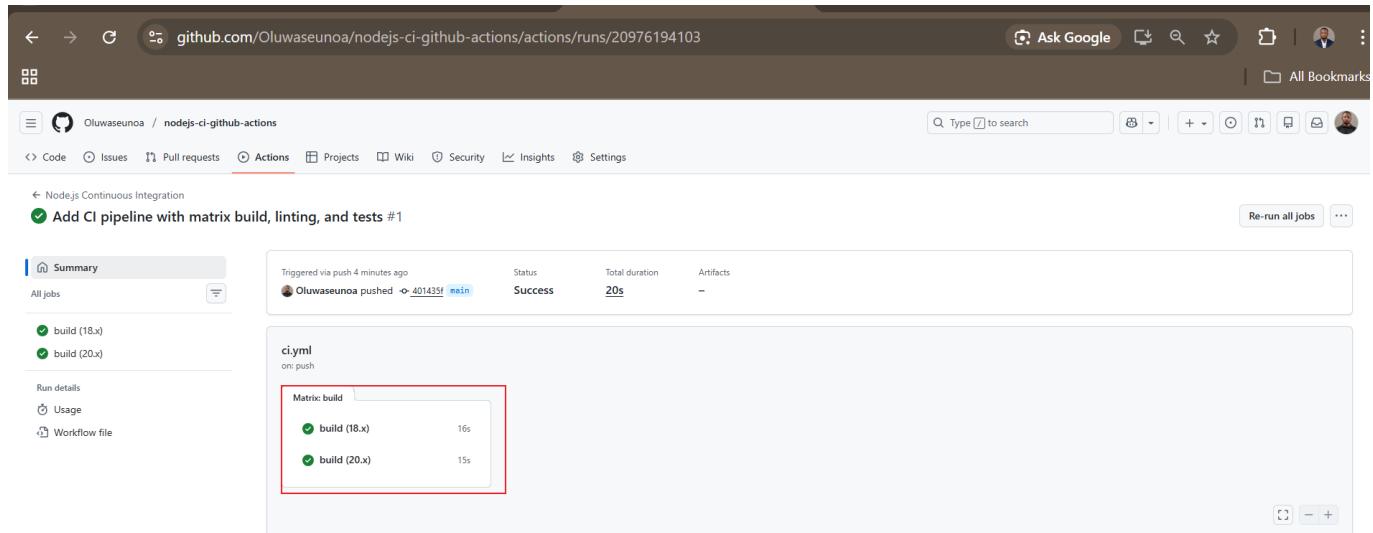
Merge Attempt:

A "Merge pull request" button is present at the bottom of the pull request page. A tooltip indicates that you can also merge this with the command line via "View command line instructions".

8. Results and Observations

The screenshot shows the GitHub Actions interface for the repository `Oluwaseunoa/nodejs-ci-github-actions`. The left sidebar is collapsed, and the main area displays a single workflow run under the heading "All workflows". The run is titled "Add CI pipeline with matrix build, linting, and tests" and was triggered by a commit pushed by Oluwaseunoa. The status is "main" and it completed 1 minute ago with a duration of 20s. A search bar at the top right allows filtering of workflow runs.

The screenshot shows the detailed view of the workflow run from the previous screenshot. The URL is `https://github.com/Oluwaseunoa/nodejs-ci-github-actions/actions/runs/20976194103`. The summary card shows the run was triggered via push 3 minutes ago, the status is "Success", and the total duration was 20s. It lists two jobs: "build (18.x)" and "build (20.x)". The "build (18.x)" job is shown in more detail, indicating it was triggered on push and completed 2 jobs. A "Re-run all jobs" button is visible in the top right corner.



- CI workflow ran successfully across multiple Node.js versions
- All checks passed
- Parallel execution reduced total time

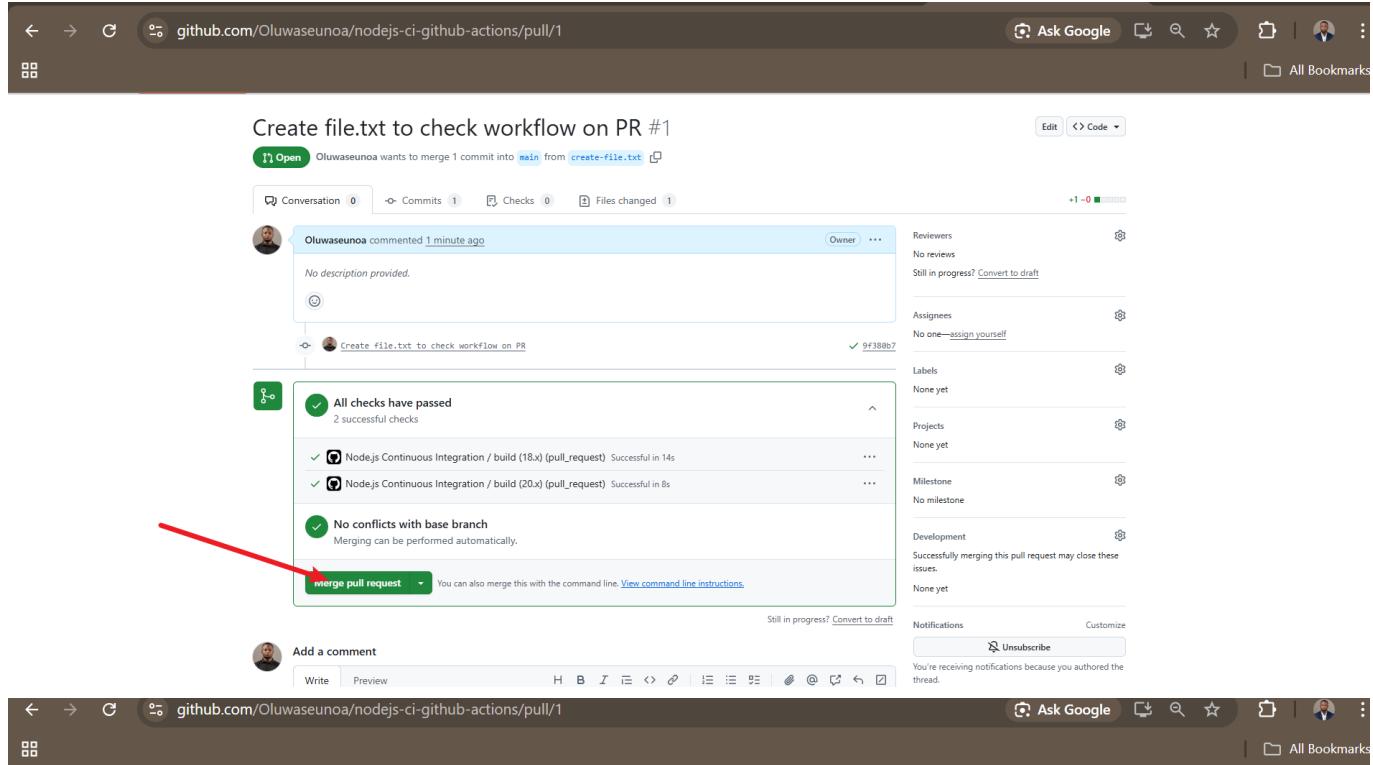
9. Conclusion

This project successfully implemented a secure, production-ready Continuous Integration pipeline using GitHub Actions. By integrating matrix builds, automated testing, code quality checks, dependency caching, and GitHub Secrets, the project meets all Module 3 requirements and reflects real-world DevOps best practices. The implementation ensures reliability, scalability, and security in modern software development workflows.

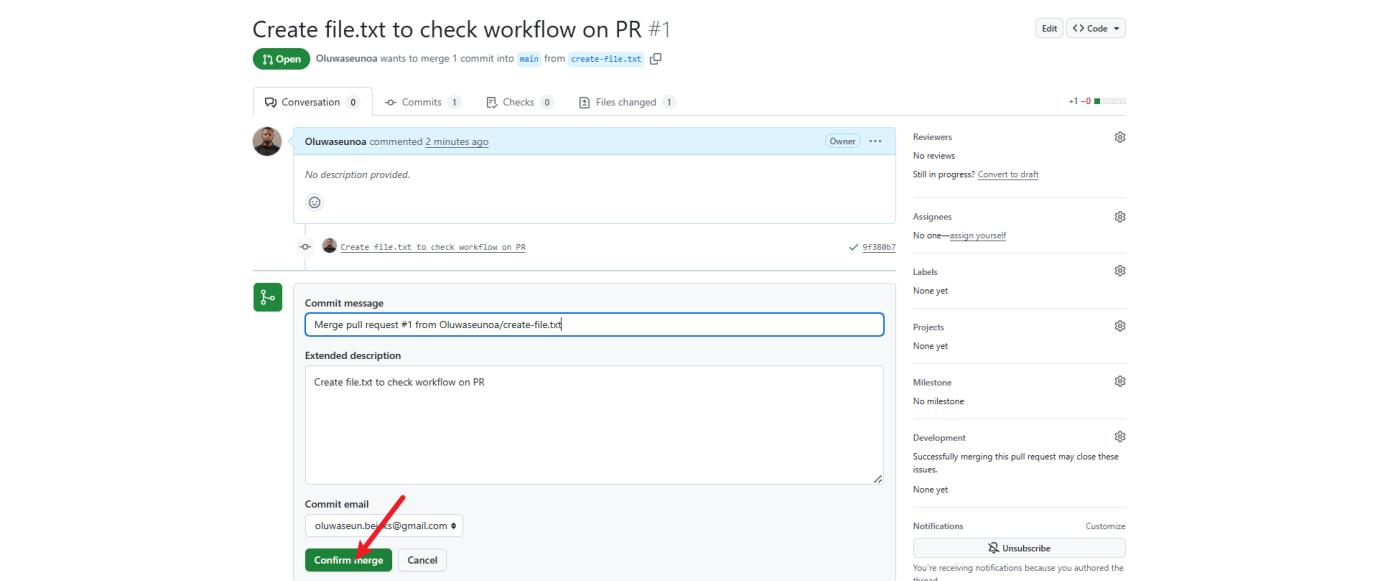
10. Future Improvements

- Add code coverage reporting
- Integrate deployment (CD)
- Enforce branch protection rules
- Add security scanning tools

Bonus: Merge Process (Final Step)



A screenshot of a GitHub pull request page. The URL is github.com/Oluwaseunoa/nodejs-ci-github-actions/pull/1. The pull request is titled "Create file.txt to check workflow on PR #1". The status bar at the top shows "1 Open" and "Oluwaseunoa wants to merge 1 commit into main from create-file.txt". The main content shows a comment from Oluwaseunoa: "No description provided." Below the comment is a green box containing "All checks have passed" and "No conflicts with base branch". A red arrow points to the "merge pull request" button at the bottom of this box. To the right of the green box are sections for Reviewers, Assignees, Labels, Projects, Milestone, Development, and Notifications.



A screenshot of the same GitHub pull request page after a merge attempt. The URL is github.com/Oluwaseunoa/nodejs-ci-github-actions/pull/1. The pull request title is now "Create file.txt to check workflow on PR #1". The status bar at the top shows "1 Open" and "Oluwaseunoa wants to merge 1 commit into main from create-file.txt". The main content shows a comment from Oluwaseunoa: "No description provided.". Below the comment is a green box containing "Commit message" (Merge pull request #1 from Oluwaseunoa/create-file.txt) and "Extended description" (Create file.txt to check workflow on PR). A red arrow points to the "Confirm merge" button at the bottom of the merge dialog. The right side of the screen shows the same review and merge options as the first screenshot.

The screenshot shows a GitHub pull request page for a repository named "nodejs-ci-github-actions". The pull request has been merged by the user "Oluwaseunoa" into the "main" branch. The commit message is "Create file.txt to check workflow on PR #1". The pull request has 1 commit, 1 check, and 1 file changed. The conversation shows a comment from "Oluwaseunoa" stating "No description provided." and another from "Oluwaseunoa" merging the commit. The pull request was successfully merged and closed. The status bar at the bottom indicates "19 / 19".