

# Node.js CI/CD Pipeline with GitHub Actions

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## 📋 Project Overview

This project implements a complete Continuous Integration (CI) pipeline for a Node.js application using GitHub Actions. It demonstrates industry-standard practices for automated testing, build validation, and deployment workflows.

## 🎯 Learning Objectives

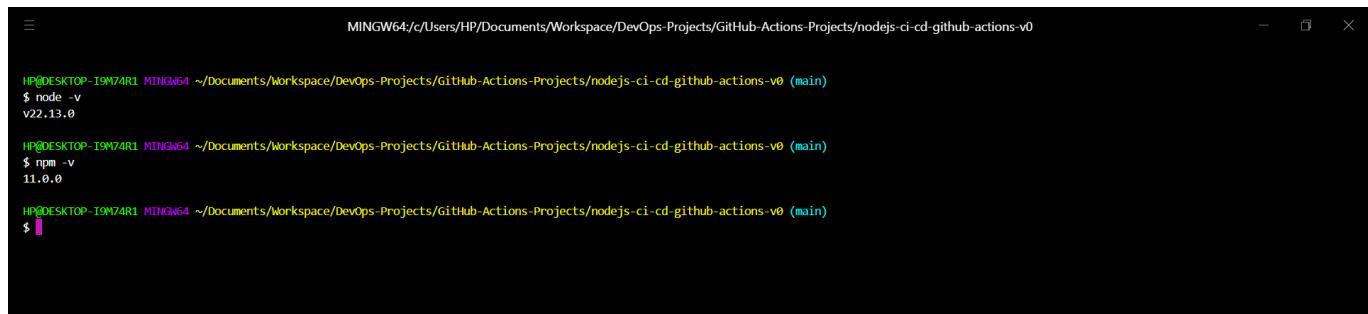
- Master GitHub Actions workflow syntax and structure
- Implement automated CI/CD pipelines for Node.js applications
- Configure parallel testing with build matrices
- Set up proper development workflows with branching strategies
- Utilize environment variables and conditional execution
- Validate pull requests with automated checks

## 🛠️ Prerequisites

### System Requirements

- **GitHub Account** - For repository hosting and Actions
- **Git** - Version control system
- **Node.js & npm** - JavaScript runtime and package manager
- **VS Code** - Recommended text editor
- **Basic Terminal Skills** - Command line proficiency

### Verification



```
MINGW64:/c/Users/HP/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0 (main)
$ node -v
v22.13.0

MINGW64:/c/Users/HP/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0 (main)
$ npm -v
11.0.0

MINGW64:/c/Users/HP/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0 (main)
$
```

Verify your development environment has the required tools installed

## 🚀 Step-by-Step Implementation

### Step 1: Repository Setup

#### 1.1 Create GitHub Repository

Create a new repository

Repositories contain a project's files and version history. Have a project elsewhere? [Import a repository](#).

Required fields are marked with an asterisk (\*).

**1 General**

Owner \* Oluwaseunoa Repository name \* nodejs-ci-ci-github-actions-v0

Great repository names are short and memorable. How about [super-duper-winner?](#)

Description

0 / 350 characters

**2 Configuration**

Choose visibility \* Public

Add README READMEs can be used as longer descriptions. [About READMEs](#) On

Add .gitignore .gitignore tells git which files not to track. [About Ignoring files](#) No .gitignore

Add license Licenses explain how others can use your code. [About licenses](#) No license

**Create repository**

---

Initialize a new repository with *README* enabled

**Action:** Create repository named `nodejs-ci-ci-github-actions` on GitHub with *README* file.

## 1.2 Clone Repository Locally

Code Issues Pull requests Actions Projects Wiki Security Insights Settings

Oluwaseunoa / nodejs-ci-ci-github-actions-v0

Code

nodejs-ci-ci-github-actions-v0 Public

main 1 Branch 0 Tags Go to file Add file Code

Oluwaseunoa Initial commit

README.md Initial commit

README

nodejs-ci-ci-github-actions-v0

Local Codespaces

Clone Copied! https://github.com/Oluwaseunoa/nodejs-ci-ci-github-actions-v0 Copied!

Clone using the web URL Open with GitHub Desktop Download ZIP

About No description, website, or topics provided.

Readme Activity 0 stars 0 watching 0 forks

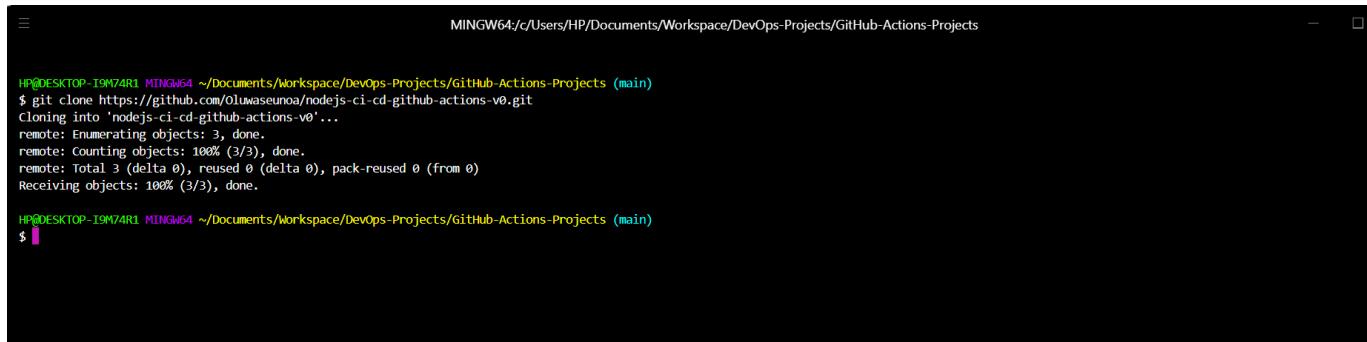
Releases No releases published Create a new release

Packages No packages published Publish your first package

© 2026 GitHub, Inc. Terms Privacy Security Status Community Docs Contact Manage cookies Do not share my personal information

Obtain the repository *HTTPS URL* from GitHub

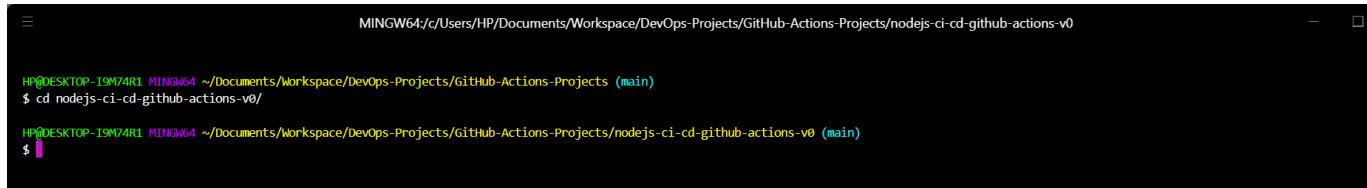
```
git clone https://github.com/your-username/nodejs-ci-ci-github-actions.git
```



```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects (main)
$ git clone https://github.com/0luwaseun0a/nodejs-ci-ci-github-actions-v0.git
Cloning into 'nodejs-ci-ci-github-actions-v0'...
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.
```

*Execute git clone command in terminal*

### 1.3 Navigate to Project Directory



```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects (main)
$ cd nodejs-ci-ci-github-actions-v0
```

*Change directory into the cloned project*

```
cd nodejs-ci-ci-github-actions
```

---

## Step 2: Node.js Application Setup

### 2.1 Initialize Project

```
MINGW64:/c/Users/HP/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0 (main)
$ npm init -y
Wrote to C:\Users\HP\Documents\Workspace\DevOps-Projects\GitHub-Actions-Projects\nodejs-ci-cd-github-actions-v0\package.json:

{
  "name": "nodejs-ci-cd-github-actions-v0",
  "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-cd-github-actions-v0.git"
  },
  "keywords": [],
  "author": "",
  "license": "ISC",
  "type": "commonjs",
  "bugs": {
    "url": "https://github.com/Oluwaseunoa/nodejs-ci-cd-github-actions-v0/issues"
  },
  "homepage": "https://github.com/Oluwaseunoa/nodejs-ci-cd-github-actions-v0#readme"
}

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0 (main)
$
```

Create package.json with default settings

```
npm init -y
```

## 2.2 Install Dependencies

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0
(main)
$ npm install express

added 65 packages, and audited 66 packages in 7s

22 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-cd-github-actions-v0
(main)
$ █
```

Add Express.js framework to project

```
npm install express
```

## 2.3 Create Application File

```
☰ MINGW64:/c/Users/HP/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0
(main)
$ touch index.js

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0
(main)
$ █
```

Initialize the main application file

```
touch index.js
```

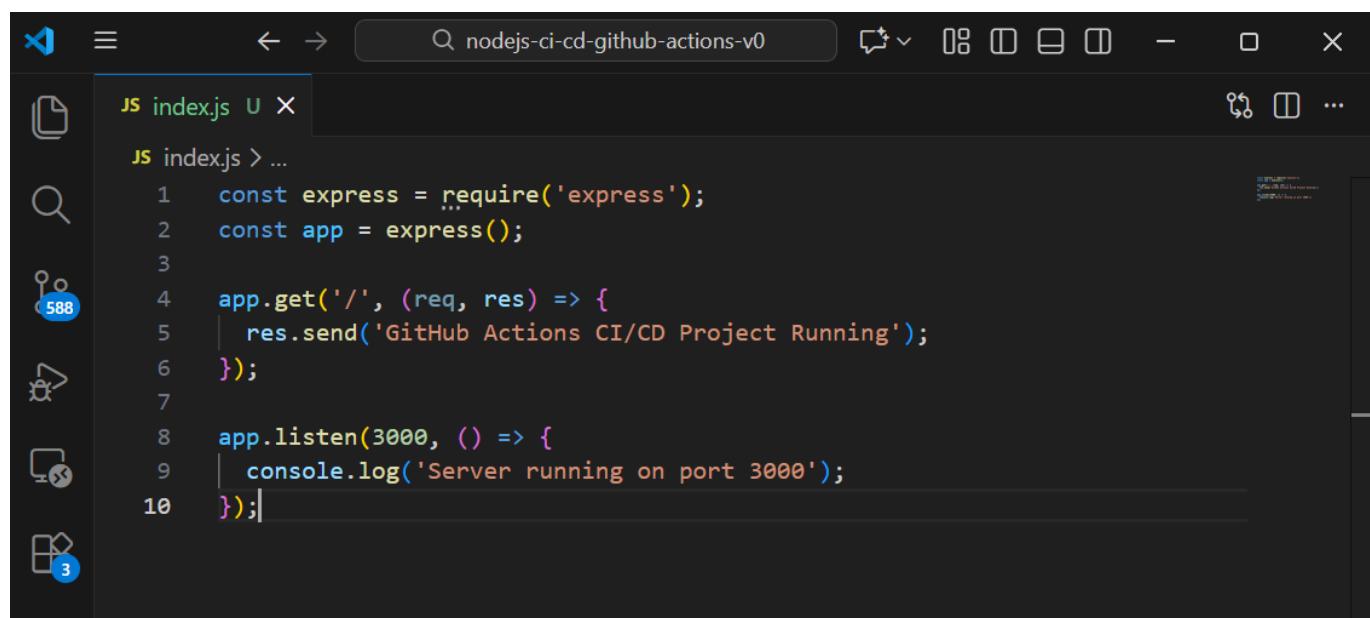
```
MINGW64:/c/Users/HP/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0
(main)
$ code .

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0
(main)
$ █
```

Open project folder in VS Code for editing

## 2.4 Implement Application Code



```
index.js
```

```
JS index.js > ...
JS index.js > ...
1  const express = require('express');
2  const app = express();
3
4  app.get('/', (req, res) => {
5    res.send('GitHub Actions CI/CD Project Running');
6  );
7
8  app.listen(3000, () => {
9    console.log('Server running on port 3000');
10 });

588
```

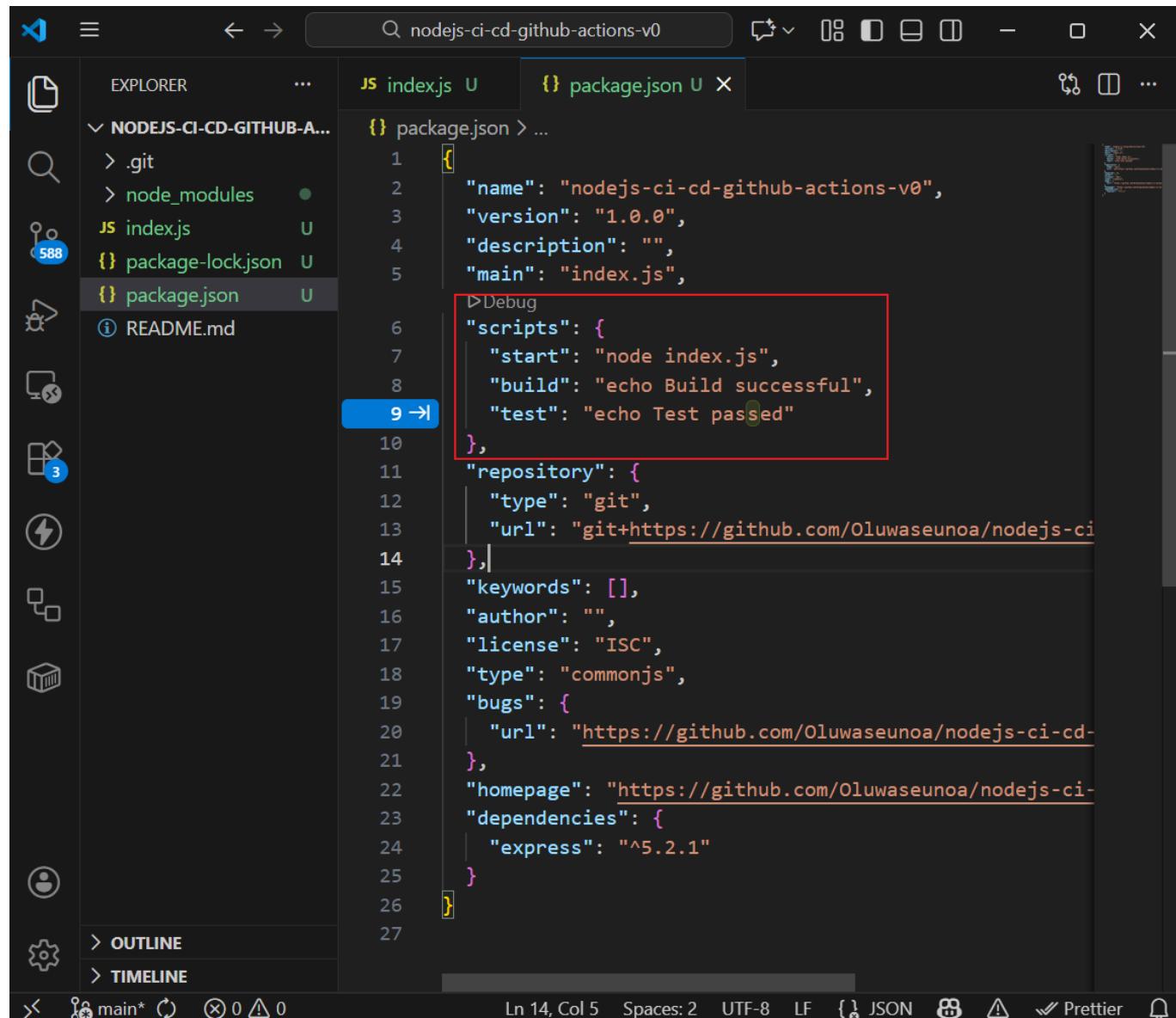
Implement basic Express.js server

```
const express = require('express');
const app = express();

app.get('/', (req, res) => {
  res.send('GitHub Actions CI/CD Project Running');
});

app.listen(3000, () => {
  console.log('Server running on port 3000');
});
```

## 2.5 Configure Package Scripts



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

- Explorer View:** Shows a folder named "NODEJS-CI-CD-GITHUB-A..." containing ".git", "node\_modules", "index.js", "package-lock.json", "package.json", and "README.md". A blue box highlights "package.json".
- Editor View:** The "package.json" file is open. The "scripts" section is highlighted with a red box:

```
1  {
2    "name": "nodejs-ci-cd-github-actions-v0",
3    "version": "1.0.0",
4    "description": "",
5    "main": "index.js",
6    "scripts": {
7      "start": "node index.js",
8      "build": "echo Build successful",
9      "test": "echo Test passed"
10   },
11   "repository": {
12     "type": "git",
13     "url": "git+https://github.com/Oluwaseunoa/nodejs-ci"
14   },
15   "keywords": [],
16   "author": "",
17   "license": "ISC",
18   "type": "commonjs",
19   "bugs": {
20     "url": "https://github.com/Oluwaseunoa/nodejs-ci-cd"
21   },
22   "homepage": "https://github.com/Oluwaseunoa/nodejs-ci-cd"
23   "dependencies": {
24     "express": "^5.2.1"
25   }
26 }
27 }
```
- Status Bar:** Shows "Ln 14, Col 5" and "Spaces: 2".
- Bottom Icons:** Includes icons for main\*, ⚡, 0, △, JSON, Prettier, and a bell icon.

Add build, test, and start scripts to package.json

```
"scripts": {
  "start": "node index.js",
  "build": "echo Build successful",
  "test": "echo Tests passed"
}
```

## Step 3: Local Development & Testing

### 3.1 Start Application Locally

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0
(main)
$ npm start

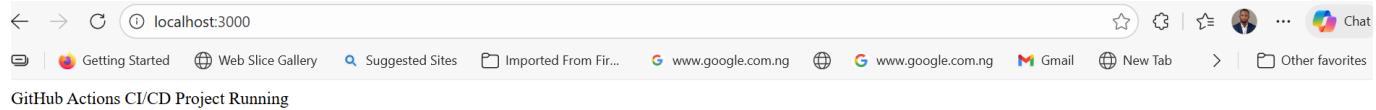
> nodejs-ci-cd-github-actions-v0@1.0.0 start
> node index.js

Server running on port 3000
```

*Launch the Node.js server*

```
npm start
```

### 3.2 Verify Application



*Confirm application runs on http://localhost:3000*

### 3.3 Stop Application

```
MINGW64:/c/Users/HP/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0
(main)
$ npm start

> nodejs-ci-cd-github-actions-v0@1.0.0 start
> node index.js

Server running on port 3000

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0
(main)
$
```

*Terminate the running server*

---

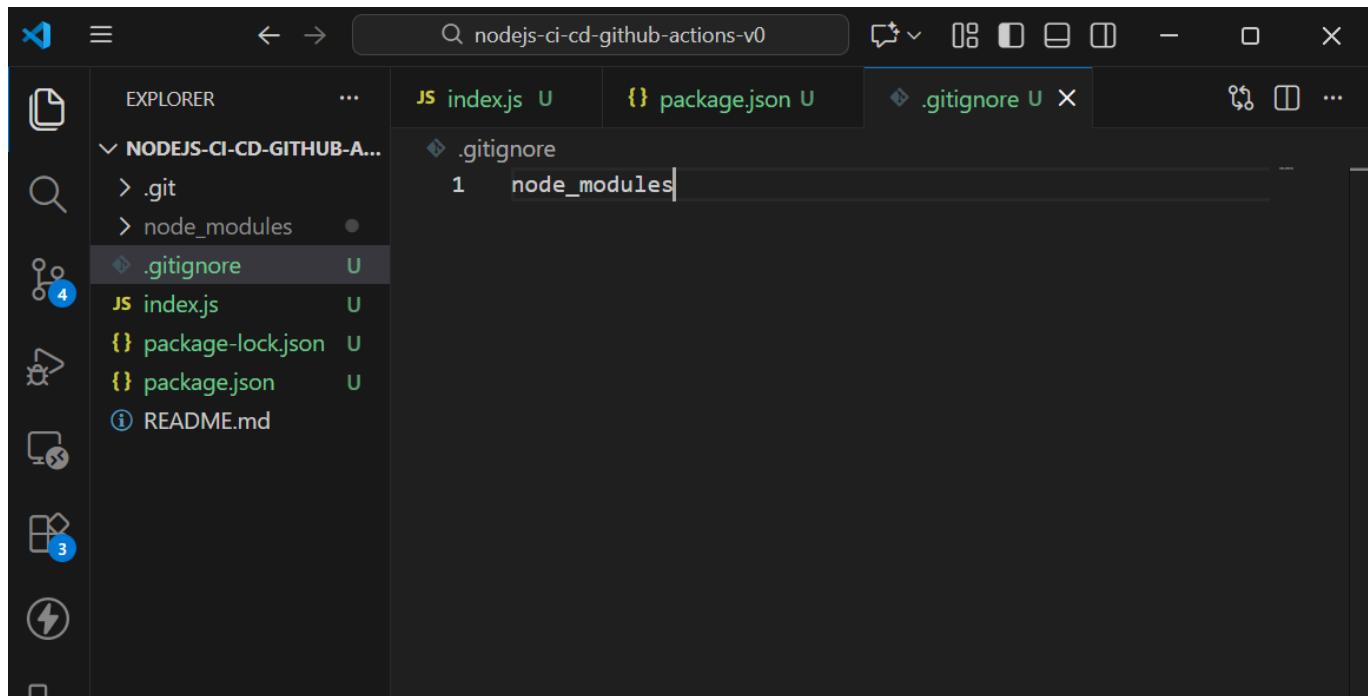
## Step 4: Version Control Configuration

### 4.1 Configure Git Ignore

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0  
(main)  
$ touch .gitignore
```

Initialize git ignore file

```
touch .gitignore
```



Exclude node\_modules from version control

```
node_modules
```

## 4.2 Commit and Push Changes

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0
(main)
$ git add .
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-cd-github-actions-v0
(main)
$ git commit -m "Initial Node.js application setup"
[main ce836e8] Initial Node.js application setup
 4 files changed, 864 insertions(+)
 create mode 100644 .gitignore
 create mode 100644 index.js
 create mode 100644 package-lock.json
 create mode 100644 package.json

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0
(main)
$ git push origin main
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Delta compression using up to 8 threads
Compressing objects: 100% (5/5), done.
Writing objects: 100% (6/6), 8.02 KiB | 1.34 MiB/s, done.
Total 6 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/Oluwaseunoa/nodejs-ci-cd-github-actions-v0.git
  e966a8b..ce836e8  main -> main

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0
(main)
$
```

*Stage, commit, and push all changes to remote repository*

```
git add .
git commit -m "Initial Node.js application setup"
git push origin main
```

The screenshot shows a GitHub repository page for 'nodejs-ci-cd-github-actions-v0'. The repository was created by 'Oluwaseunoa' and has 1 branch. The main branch contains 2 commits:

- ce836e8 - Initial Node.js application setup (7 minutes ago)
- e966a8b - main -> main (7 minutes ago)

The repository has 0 stars, 0 forks, and 0 watching. It also has 0 releases published and 0 packages published. The languages used are 100% JavaScript. Suggested workflows are based on your tech stack.

*Verify all files are properly pushed to GitHub repository*

## Step 5: GitHub Actions Workflow Implementation

### 5.1 Create Workflow Directory Structure

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0 (main)
$ mkdir -p .github/workflows

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0 (main)
$ █
```

*Set up directory structure for GitHub Actions*

```
mkdir -p .github/workflows
```

### 5.2 Create Workflow File

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0 (main)
$ touch .github/workflows/main.yml

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0 (main)
$ █
```

*Initialize the main workflow configuration file*

```
touch .github/workflows/main.yml
```

### 5.3 Define Workflow Structure

The screenshot shows a dark-themed code editor in VS Code with the following file structure:

- index.js
- package.json
- .gitignore
- main.yml (selected)

The main.yml file contains the following YAML configuration for a GitHub Workflow:

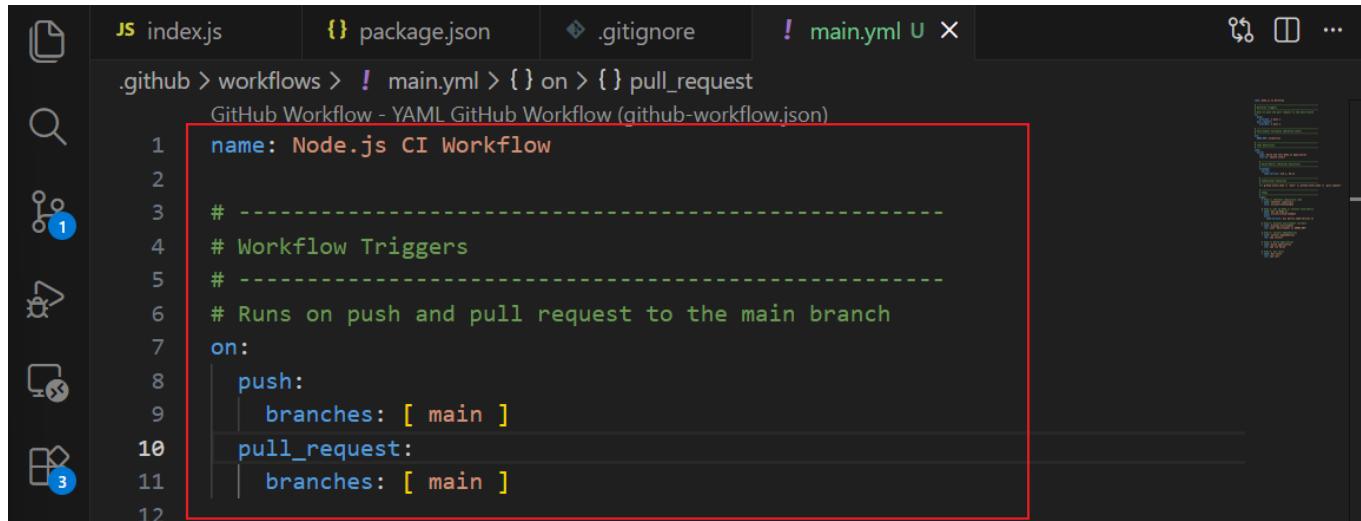
```
.github > workflows > ! main.yml > {} on > {} pull_request
  GitHub Workflow - YAML GitHub Workflow (github-workflow.json)
  1   name: Node.js CI Workflow
  2
  3   #
  4   # Workflow Triggers
  5   #
  6   # Runs on push and pull request to the main branch
  7   on:
  8     push:
  9       branches: [ main ]
 10    pull_request:
 11      branches: [ main ]
 12
 13   #
 14   # Environment Variables (Workflow Level)
 15   #
 16   env:
 17     NODE_ENV: production
 18
 19   #
 20   # Jobs Definition
 21   #
 22   jobs:
 23     build:
 24       name: Build and Test Node.js Application
 25       runs-on: ubuntu-latest
 26
 27       #
 28       # Build Matrix (Parallel Execution)
 29       *
```

The status bar at the bottom indicates the file is a YAML file, and there are GitHub Workflow and Prettier extensions loaded.

*Begin implementing the CI workflow configuration*

```
name: Node.js CI Workflow
```

## 5.4 Configure Workflow Triggers

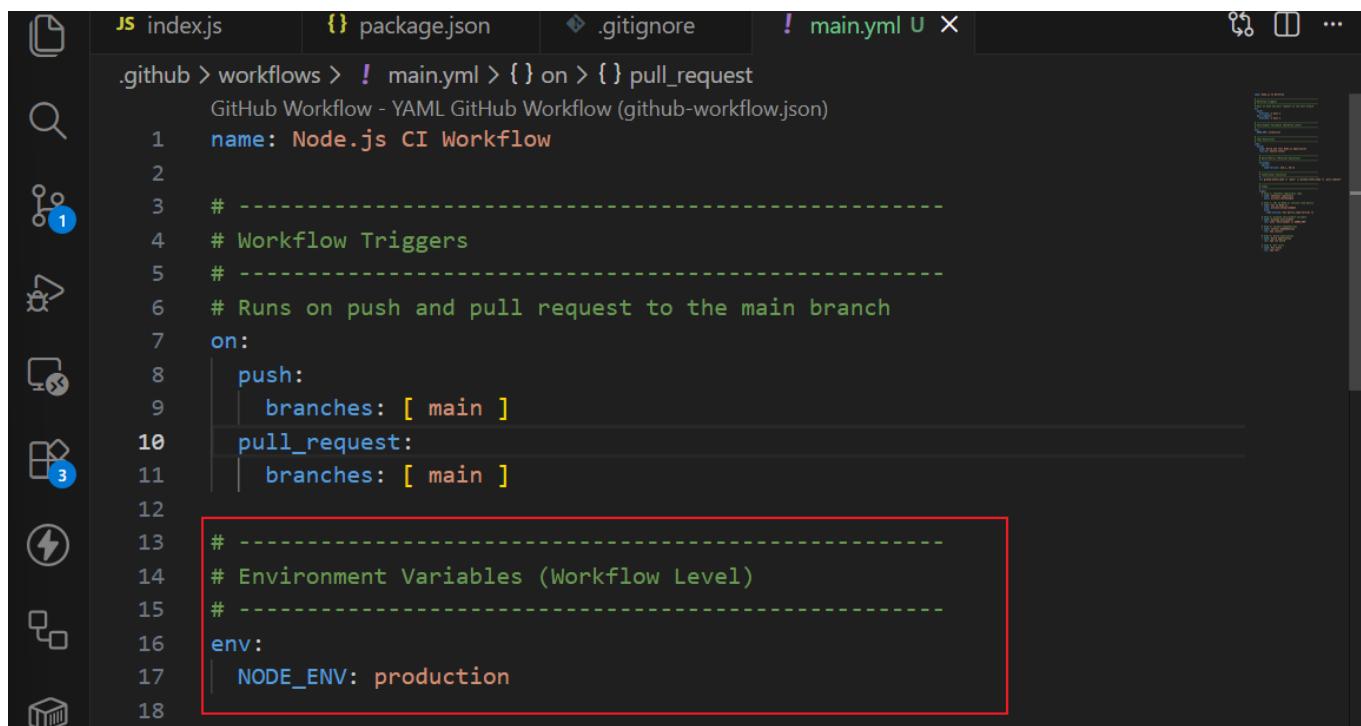


```
.github > workflows > ! main.yml > {} on > {} pull_request
GitHub Workflow - YAML GitHub Workflow (github-workflow.json)
1 name: Node.js CI Workflow
2
3 # -----
4 # Workflow Triggers
5 #
6 # Runs on push and pull request to the main branch
7 on:
8   push:
9     branches: [ main ]
10  pull_request:
11    branches: [ main ]
```

Define events that initiate the CI pipeline

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

## 5.5 Set Environment Variables

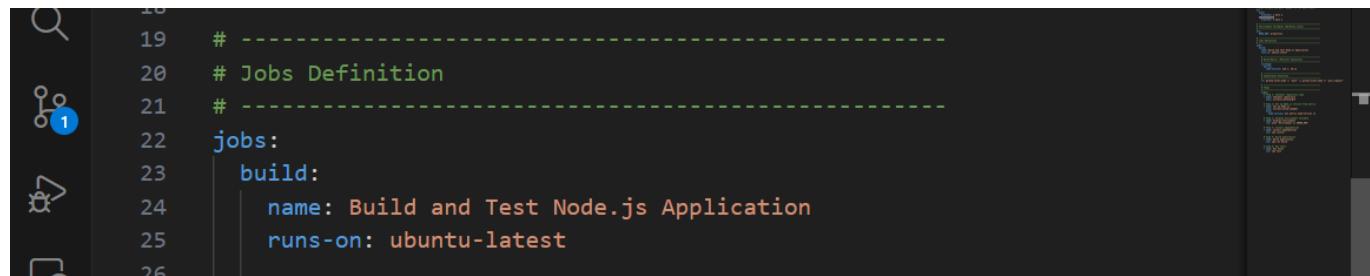


```
.github > workflows > ! main.yml > {} on > {} pull_request
GitHub Workflow - YAML GitHub Workflow (github-workflow.json)
1 name: Node.js CI Workflow
2
3 # -----
4 # Workflow Triggers
5 #
6 # Runs on push and pull request to the main branch
7 on:
8   push:
9     branches: [ main ]
10  pull_request:
11    branches: [ main ]
12
13 # -----
14 # Environment Variables (Workflow Level)
15 #
16 env:
17   NODE_ENV: production
```

Configure pipeline environment settings

```
env:
  NODE_ENV: production
```

## 5.6 Define Job Configuration

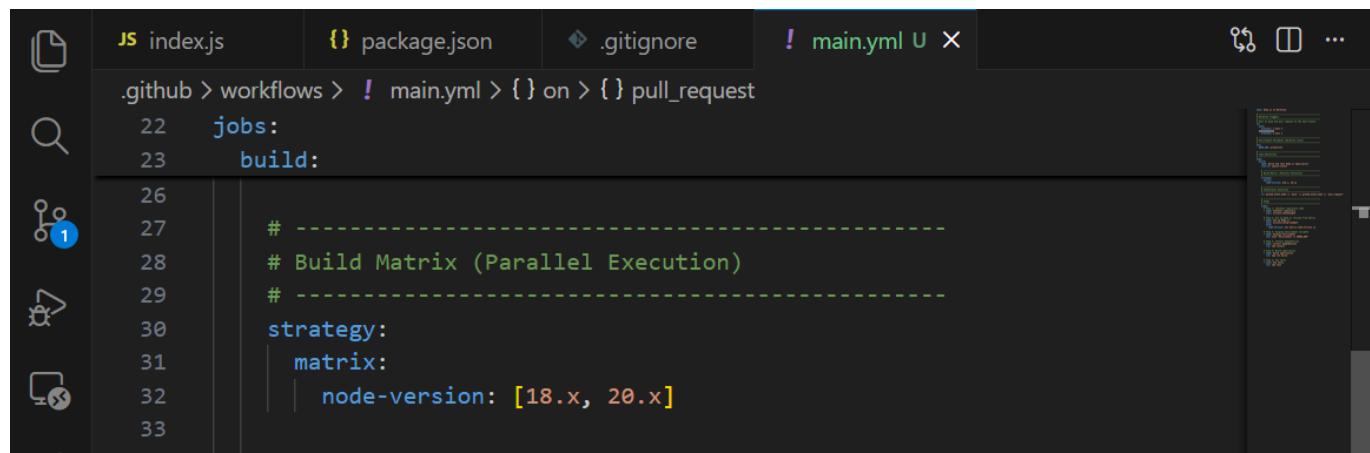


```
18
19  # -----
20  # Jobs Definition
21  # -----
22  jobs:
23    build:
24      name: Build and Test Node.js Application
25      runs-on: ubuntu-latest
26
```

Specify job name and execution environment

```
jobs:
  build:
    name: Build and Test Node.js Application
    runs-on: ubuntu-latest
```

## 5.7 Implement Build Matrix

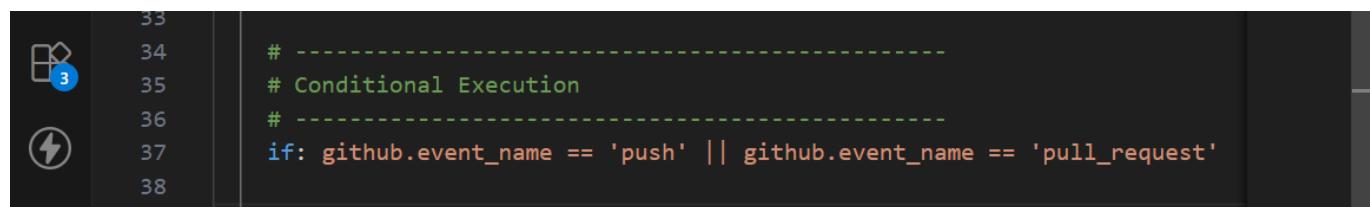


```
JS index.js          {} package.json     .gitignore       ! main.yml U X
.github > workflows > ! main.yml > { } on > { } pull_request
22   jobs:
23     build:
24       # -----
25       # Build Matrix (Parallel Execution)
26       # -----
27       strategy:
28         matrix:
29           node-version: [18.x, 20.x]
30
31
32
33
34
35
36
37
38
```

Configure parallel testing across multiple Node.js versions

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

## 5.8 Add Conditional Execution

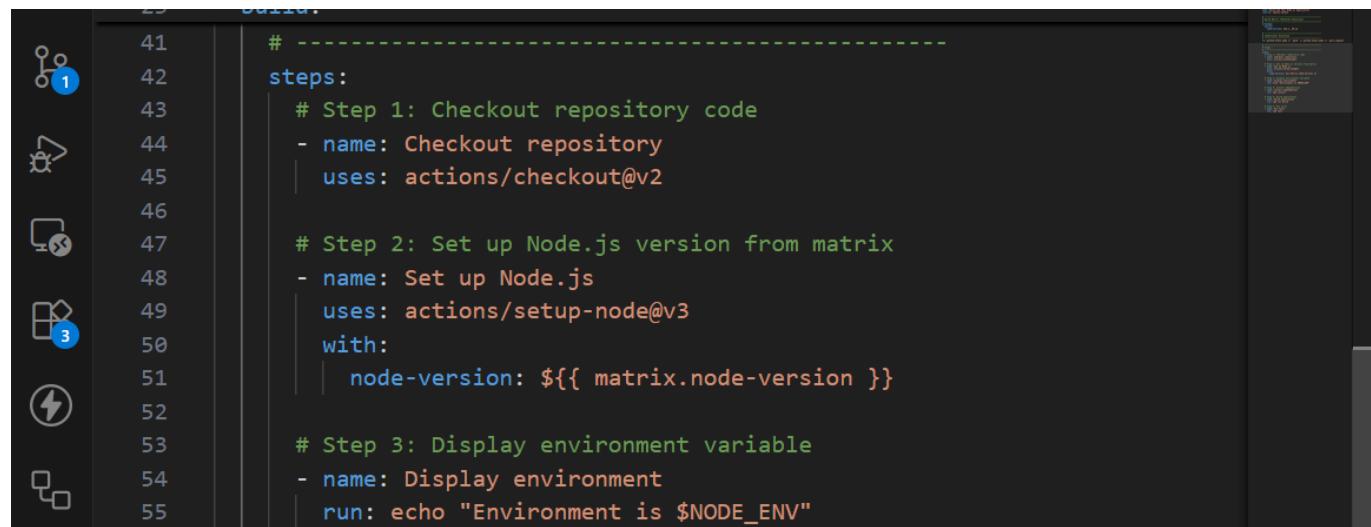


```
33
34   # -----
35   # Conditional Execution
36   # -----
37   if: github.event_name == 'push' || github.event_name == 'pull_request'
38
```

Implement conditional workflow execution rules

```
if: github.event_name == 'push' || github.event_name == 'pull_request'
```

## 5.9 Define Pipeline Steps (Part 1)



```
41  # -----
42  steps:
43    # Step 1: Checkout repository code
44    - name: Checkout repository
45      uses: actions/checkout@v2
46
47    # Step 2: Set up Node.js version from matrix
48    - name: Set up Node.js
49      uses: actions/setup-node@v3
50      with:
51        node-version: ${{ matrix.node-version }}
52
53    # Step 3: Display environment variable
54    - name: Display environment
55      run: echo "Environment is $NODE_ENV"
```

Repository checkout, Node.js setup, and environment verification

```
steps:
# Step 1: Checkout repository code
- name: Checkout repository
  uses: actions/checkout@v2

# Step 2: Set up Node.js version from matrix
- name: Set up Node.js
  uses: actions/setup-node@v3
  with:
    node-version: ${{ matrix.node-version }}

# Step 3: Display environment variable
- name: Display environment
  run: echo "Environment is $NODE_ENV"
```

## 5.10 Define Pipeline Steps (Part 2)

```
57 # Step 4: Install dependencies
58 - name: Install dependencies
59   run: npm install
60
61 # Step 5: Build application
62 - name: Build application
63   run: npm run build
64
65 # Step 6: Run tests
66 - name: Run tests
67   run: npm test
68
```

*Dependency installation, build process, and test execution*

```
# Step 4: Install dependencies
- name: Install dependencies
  run: npm install

# Step 5: Build application
- name: Build application
  run: npm run build

# Step 6: Run tests
- name: Run tests
  run: npm test
```

## 5.11 Deploy Workflow Configuration

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0 (main)
$ git add .

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0 (main)
$ git commit -m "Add GitHub Actions CI workflow"
[main e434fba] Add GitHub Actions CI workflow
 1 file changed, 67 insertions(+)
 create mode 100644 .github/workflows/main.yml

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0 (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), 957 bytes | 191.00 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-cd-github-actions-v0.git
  ce836e8..e434fba  main -> main

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0 (main)
$
```

*Push the complete CI workflow to GitHub*

```
git add .github/workflows/main.yml
git commit -m "Add GitHub Actions CI workflow"
git push origin main
```

---

## Step 6: Pipeline Execution & Verification

### 6.1 Monitor Workflow Execution

The screenshot shows the GitHub Actions dashboard for the repository 'Oluwaseunoa/nodejs-ci-cd-github-actions-v0'. The 'Actions' tab is selected, and the 'All workflows' section is shown. A single workflow run is listed under 'Add GitHub Actions CI workflow'. The run was triggered via push 2 minutes ago, status is 'Success', and it took 16s. A red arrow points to the 'main' branch indicator next to the commit message 'Nodejs CI Workflow #1: Commit e434fb pushed by Oluwaseunoa'.

Access GitHub Actions dashboard to monitor pipeline execution

## 6.2 Verify Workflow Completion

The screenshot shows the 'Summary' page for the 'Add GitHub Actions CI workflow #1' run. The run was triggered via push 4 minutes ago by 'Oluwaseunoa' on the 'main' branch. The status is 'Success' and the total duration was 16s. The 'main.yml' file shows two completed jobs. A red box highlights the '2 jobs completed' summary. The left sidebar shows other runs and workflow files.

Confirm successful completion of all workflow jobs

## 6.3 Inspect Parallel Execution

*Review parallel execution results across different Node.js versions*

---

## Step 7: Branching Strategy & Pull Request Workflow

### 7.1 Create Feature Branch

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0 (main)
$ git checkout -b feature-test
Switched to a new branch 'feature-test'

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0 (feature-test)
$
```

*Isolate new features in a dedicated branch*

```
git checkout -b feature-test
```

### 7.2 Implement Feature Changes

The screenshot shows a GitHub Actions CI/CD Project Running in a Visual Studio Code editor. The code in `index.js` has a modification highlighted:

```
const express = require('express');
const app = express();

app.get('/', (req, res) => {
  res.send('My Modification - GitHub Actions CI/CD Project Running');

app.listen(3000, () => {
  console.log('Server running on port 3000');
});
```

*Make changes to the application code in the feature branch*

### 7.3 Push Feature Branch

```
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0 (feature-test)
$ git add .

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0 (feature-test)
$ git commit -m "Modified app content to 'My Modification - GitHub Actions CI/CD Project Running'"
[feature-test 5944d1b] Modified app content to 'My Modification - GitHub Actions CI/CD Project Running'
 1 file changed, 1 insertion(+), 1 deletion(-)

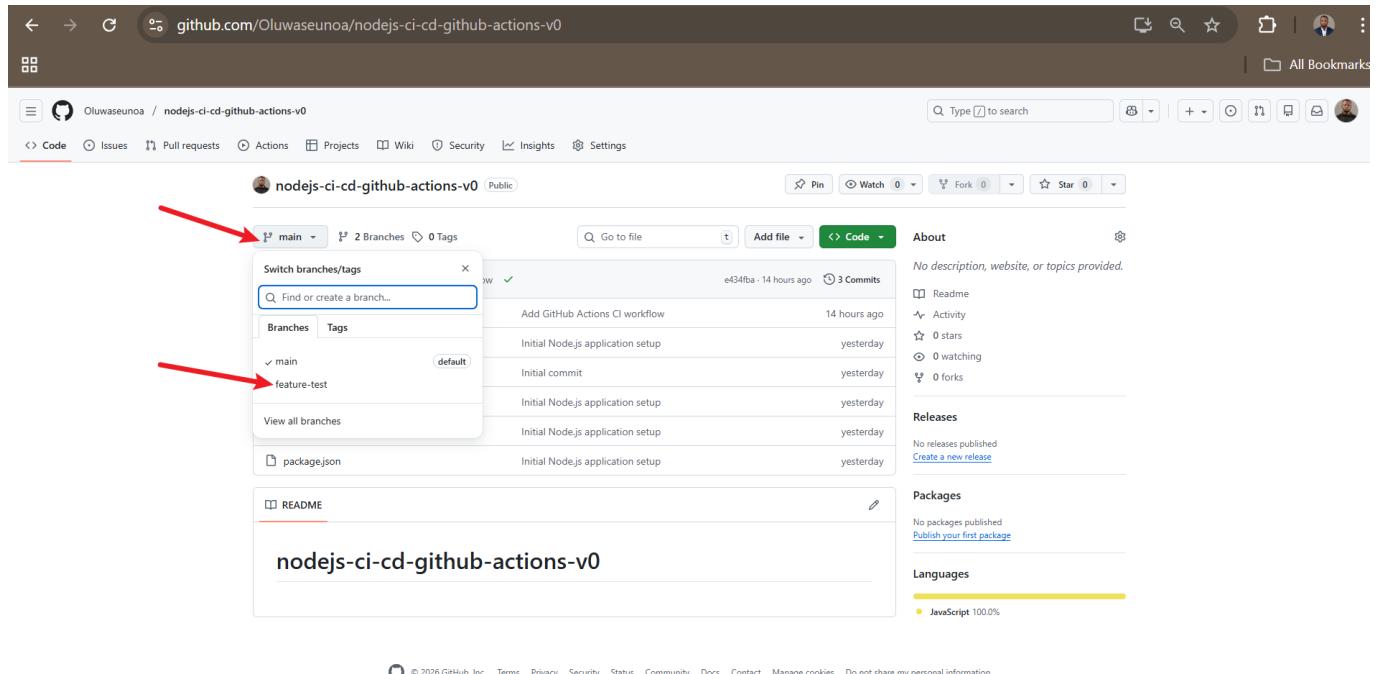
HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0 (feature-test)
$ git push origin feature-test
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 8 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 370 bytes | 185.00 KiB/s, done.
Total 3 (delta 2), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.
remote:
remote: Create a pull request for 'feature-test' on GitHub by visiting:
remote:   https://github.com/Oluwaseunao/nodejs-ci-cd-github-actions-v0/pull/new/feature-test
remote:
To https://github.com/Oluwaseunao/nodejs-ci-cd-github-actions-v0.git
 * [new branch]      feature-test -> feature-test

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0 (feature-test)
$
```

*Upload feature branch to remote repository*

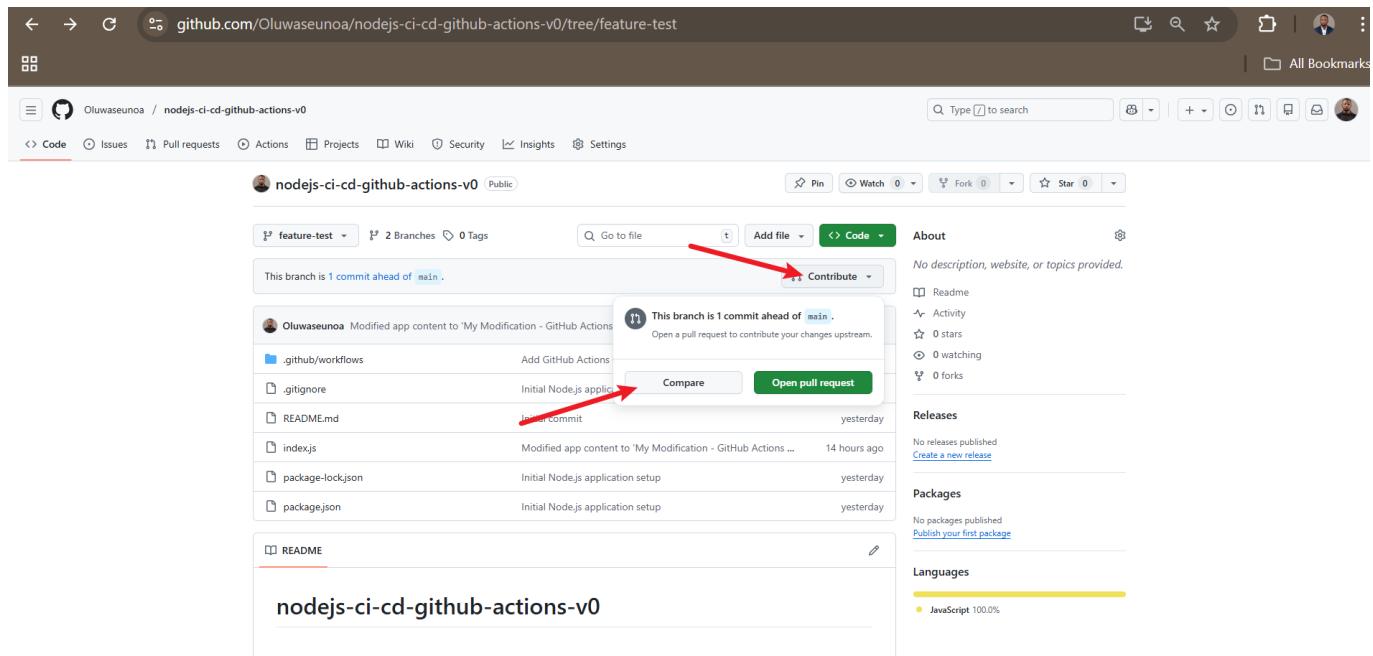
```
git add .
git commit -m "Add new feature"
git push origin feature-test
```

## 7.4 Switch to Feature Branch on GitHub

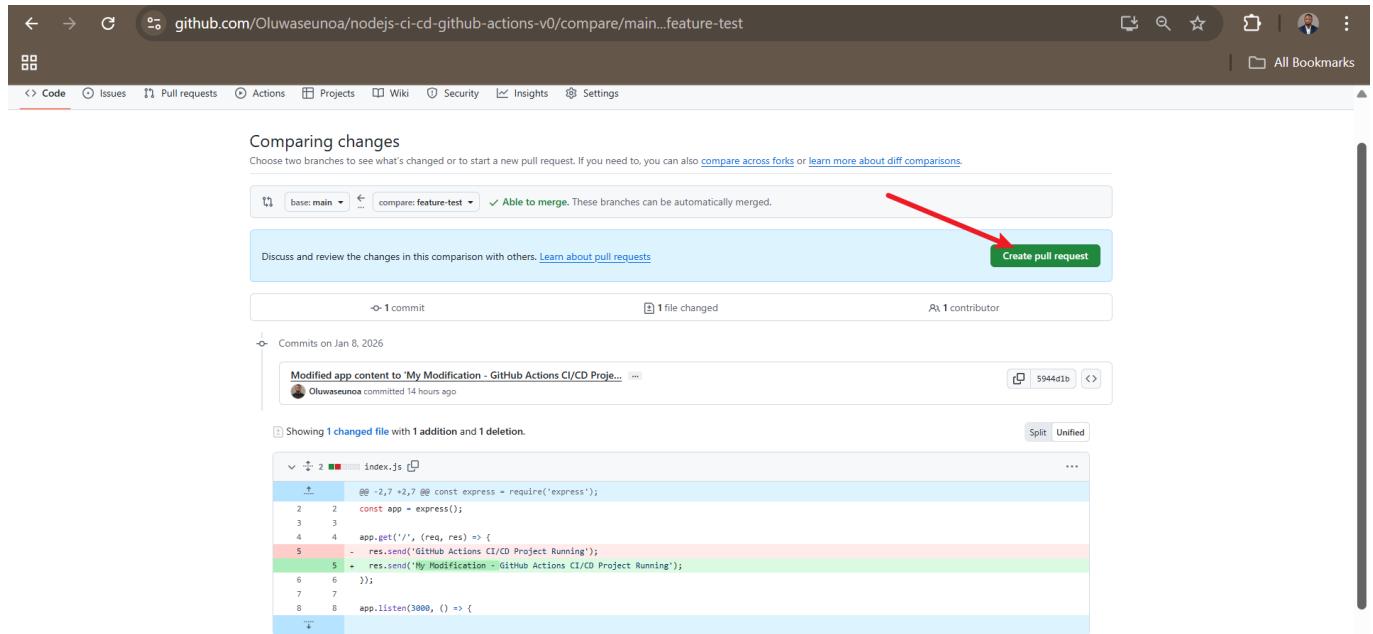


*Navigate to the feature branch in GitHub web interface*

## 7.5 Initiate Pull Request

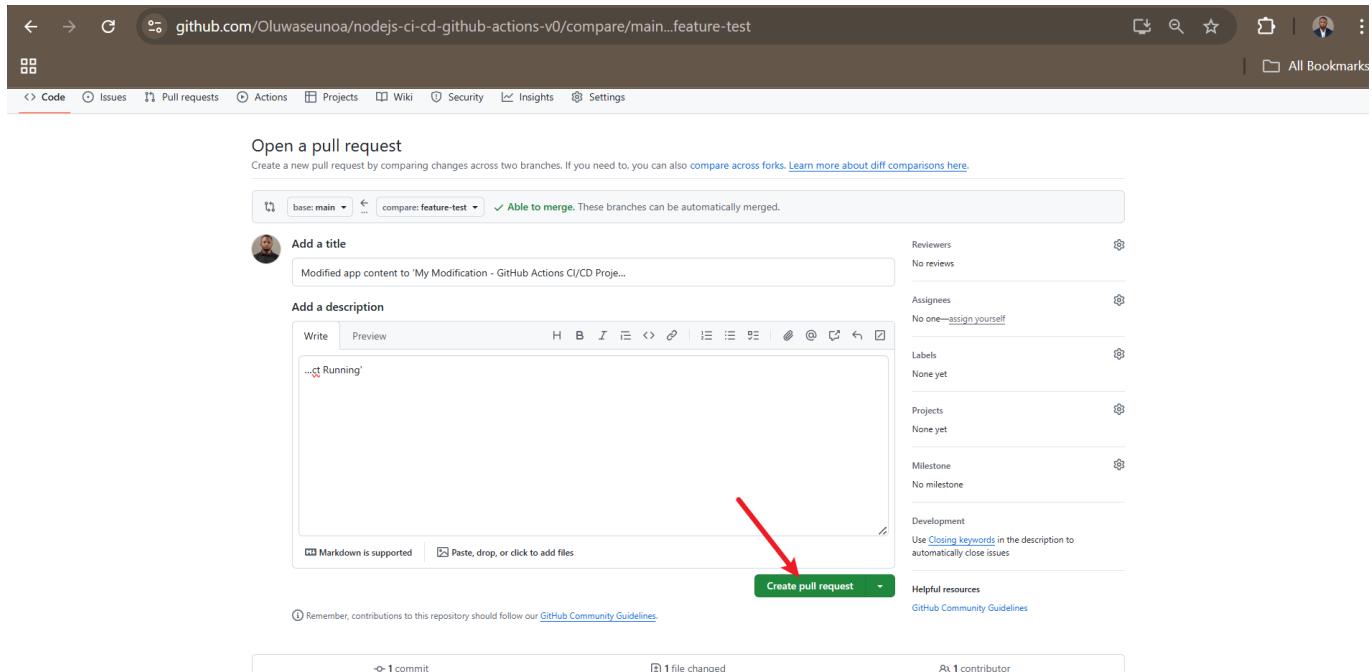


*Begin the pull request creation process*



*Compare changes between branches and initiate PR*

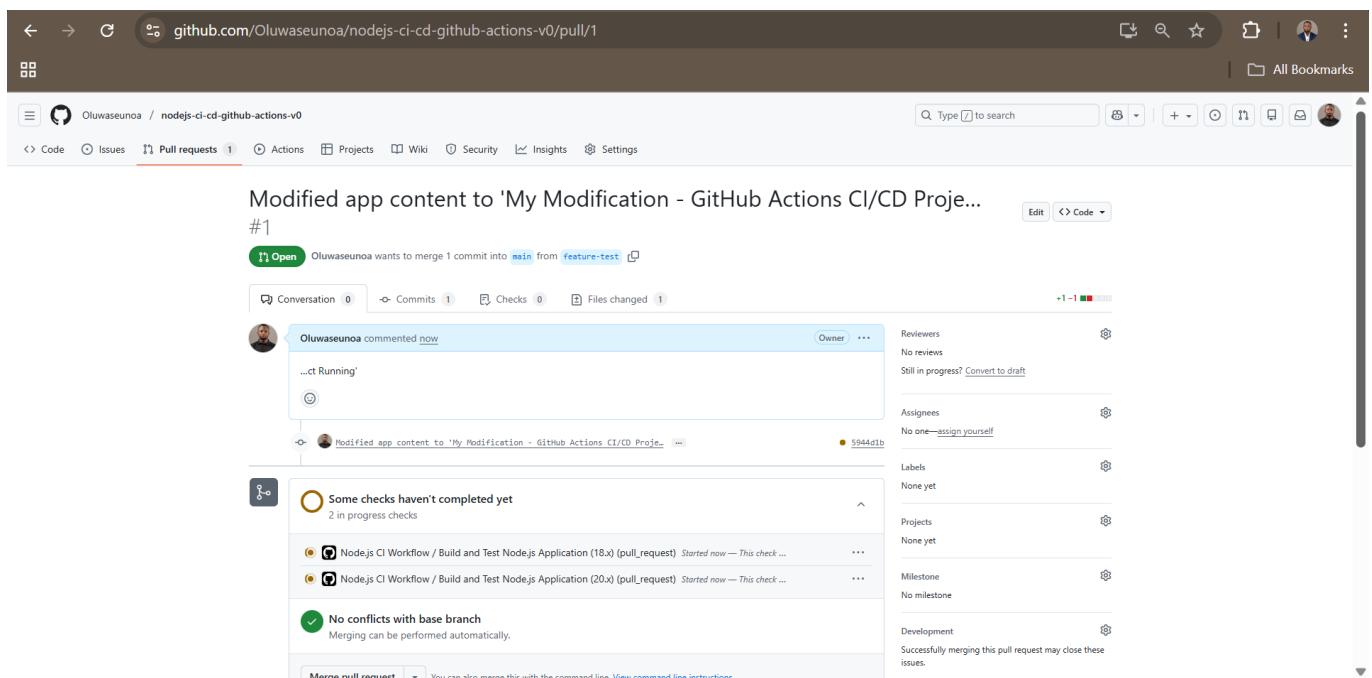
## 7.6 Configure Pull Request Details



The screenshot shows the GitHub pull request creation interface. At the top, it says "Open a pull request" and "Create a new pull request by comparing changes across two branches. If you need to, you can also compare across forks. Learn more about diff comparisons here." Below this, there are fields for "base: main" and "compare: feature-test", with a green "Able to merge" button indicating they can be automatically merged. A red arrow points to the "Create pull request" button at the bottom right of the main form area.

*Provide descriptive title and context for the pull request*

## 7.7 Monitor PR-triggered Workflow



The screenshot shows the GitHub pull request details page for pull request #1. The title is "Modified app content to 'My Modification - GitHub Actions CI/CD Proj...". It shows a green "Open" button and a comment from "Oluwaseunoa" saying "...ct Running". Below the comment, there's a section titled "Some checks haven't completed yet" with two "in progress" checks for "Node.js CI Workflow / Build and Test Node.js Application (18.x) (pull\_request)" and "Node.js CI Workflow / Build and Test Node.js Application (20.x) (pull\_request)". There's also a green checkmark for "No conflicts with base branch". On the right side, there are sections for "Reviewers", "Assignees", "Labels", "Projects", "Milestone", and "Development". A note at the bottom says "Successfully merging this pull request may close these issues."

*Verify CI pipeline automatically runs for pull request validation*

## 7.8 Review Test Results

Modified app content to 'My Modification - GitHub Actions CI/CD Proj... #1

Oluwaseunoa wants to merge 1 commit into `main` from `feature-test`

**Conversation** 0 **Commits** 1 **Checks** 0 **Files changed** 1

**Reviewers**  
No reviews  
Still in progress? Convert to draft

**Assignees**  
No one—assign yourself

**Labels**  
None yet

**Projects**  
None yet

**Milestone**  
No milestone

**Development**  
Successfully merging this pull request may close these issues.  
None yet

**Merge pull request** You can also merge this with the command line. [View command line instructions.](#)

Confirm all automated checks pass before merging

## 7.9 Execute Merge

Modified app content to 'My Modification - GitHub Actions CI/CD Proj... #1

Oluwaseunoa wants to merge 1 commit into `main` from `feature-test`

**Conversation** 0 **Commits** 1 **Checks** 0 **Files changed** 1

**Reviewers**  
No reviews  
Still in progress? Convert to draft

**Assignees**  
No one—assign yourself

**Labels**  
None yet

**Projects**  
None yet

**Milestone**  
No milestone

**Development**  
Successfully merging this pull request may close these issues.  
None yet

**Commit message**  
Merge pull request #1 from [Oluwaseunoa/feature-test](#)

**Extended description**  
Modified app content to 'My Modification - GitHub Actions CI/CD Proj...

**Commit email**  
`oluwaseun.beicks@gmail.com`

**Confirm merge** Cancel

Proceed with merging feature branch into main

The screenshot shows a GitHub pull request merge page. At the top, it says "Modified app content to 'My Modification - GitHub Actions CI/CD Proj..." and "#1". Below this, there's a "Merged" button and a message from the user "Oluwaseunoa" saying "...ct Running". The pull request has 1 commit and 1 check. The commit message is "Modified app content to 'My Modification - GitHub Actions CI/CD Proj...". The check status is "5944d1b" with "2 checks passed". To the right, there are sections for "Reviewers" (no reviews), "Assignees" (no one assigned), "Labels" (none yet), "Projects" (none yet), "Milestone" (no milestone), "Development" (successfully merging may close issues), and "Notifications" (customizable). A "Delete branch" button is also visible.

*Verify successful completion of merge operation*

## Step 8: Post-Merge Verification

### 8.1 Synchronize Local Repository

```
npm start

HP@DESKTOP-I9M74R1 MINGW64 ~/Documents/Workspace/DevOps-Projects/GitHub-Actions-Projects/nodejs-ci-cd-github-actions-v0 (main)
$ npm start

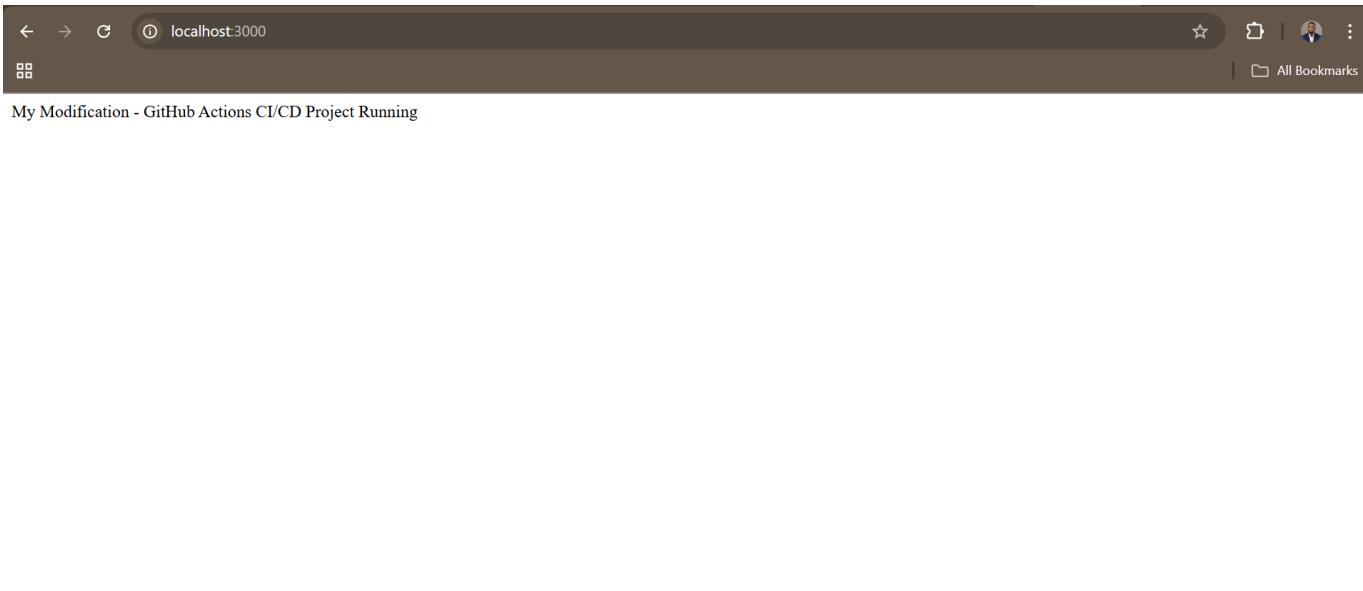
> nodejs-ci-cd-github-actions-v0@1.0.0 start
> node index.js

Server running on port 3000
```

*Update local repository with merged changes*

```
git checkout main
git pull origin main
npm start
```

### 8.2 Verify Updated Application



*Confirm application runs successfully with latest changes*

---

## 📊 Key Features Demonstrated

### Core CI/CD Principles

- **Automated Testing:** Tests run on every push and pull request
- **Build Validation:** Verification of application build process
- **Parallel Execution:** Simultaneous testing across multiple environments
- **Quality Gates:** Automated checks before merge approvals

### Technical Implementation

- **YAML Configuration:** Proper syntax and structure
- **Environment Management:** Variable configuration and usage
- **Matrix Strategy:** Cross-version compatibility testing
- **Conditional Logic:** Smart pipeline execution rules

### Development Workflow

- **Branch Protection:** PR requirements before merging
  - **Automated Validation:** Continuous integration checks
  - **Deployment Readiness:** Production environment preparation
  - **Team Collaboration:** Structured code review process
- 

## 🏆 Learning Outcomes

### Technical Skills Developed

1. **GitHub Actions Mastery:** Complete workflow design and implementation
2. **CI/CD Pipeline Design:** End-to-end automation strategy
3. **Quality Assurance:** Automated testing integration

#### 4. DevOps Practices: Infrastructure as code principles

##### Professional Competencies

- Industry-standard development workflows
- Collaborative coding practices
- Automated quality control processes
- Production-ready deployment pipelines

---

## 🔧 Complete Workflow Configuration

```
name: Node.js CI Workflow

# -----
# Workflow Triggers
# -----
# Runs on push and pull request to the main branch
on:
  push:
    branches: [ main ]
  pull_request:
    branches: [ main ]

# -----
# Environment Variables (Workflow Level)
# -----
env:
  NODE_ENV: production

# -----
# Jobs Definition
# -----
jobs:
  build:
    build:
      name: Build and Test Node.js Application
      runs-on: ubuntu-latest

    # -----
    # Build Matrix (Parallel Execution)
    # -----
    strategy:
      matrix:
        node-version: [18.x, 20.x]

    # -----
    # Conditional Execution
    # -----
    if: github.event_name == 'push' || github.event_name == 'pull_request'

    # -----
    # Steps
    # -----
```

```
# -----
steps:
  # Step 1: Checkout repository code
  - name: Checkout repository
    uses: actions/checkout@v2

  # Step 2: Set up Node.js version from matrix
  - name: Set up Node.js
    uses: actions/setup-node@v3
    with:
      node-version: ${{ matrix.node-version }}

  # Step 3: Display environment variable
  - name: Display environment
    run: echo "Environment is $NODE_ENV"

  # Step 4: Install dependencies
  - name: Install dependencies
    run: npm install

  # Step 5: Build application
  - name: Build application
    run: npm run build

  # Step 6: Run tests
  - name: Run tests
    run: npm test
```

---

## Portfolio Readiness

This project demonstrates comprehensive CI/CD implementation skills suitable for:

- **Developer Portfolios:** Showcases modern DevOps practices
  - **Technical Interviews:** Demonstrates pipeline automation expertise
  - **Project Documentation:** Provides clear, step-by-step implementation guide
  - **Team Knowledge Sharing:** Serves as educational resource for development teams
- 

## Project Validation Checklist

- Proper YAML syntax and indentation
- Correct workflow file location (.github/workflows/)
- Automated build and test execution
- Matrix build implementation
- CI triggering on push and pull request events
- Node.js project integration
- Environment variable configuration
- Conditional execution logic
- Complete documentation with screenshots

- Portfolio-ready presentation
- 

## Additional Resources

- [GitHub Actions Documentation](#)
  - [Node.js Best Practices](#)
  - [Express.js Framework](#)
  - [Continuous Integration Patterns](#)
- 

**Project Status:**  Complete

**GitHub Repository:** [nodejs-ci-cd-github-actions](#)

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*This project serves as a comprehensive demonstration of modern CI/CD practices using GitHub Actions, suitable for both learning and professional portfolio presentation.*