

EXPERIMENT-5.2

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Subject: Full Stack

Section: 23BCC-1

Subject Code:23CSP-339

UID: 23BCC70022

Date: 27-10-2025

- **Aim:**

To Set Up CI/CD Pipeline using GitHub Actions

- **Objective:**

To automate the process of testing, building, and optionally deploying a Node.js project using GitHub Actions whenever code is pushed to the main branch.

- **Theory:**

CI/CD (Continuous Integration / Continuous Deployment) is a process that automates how code is tested, built, and deployed whenever changes are made.

- **Continuous Integration (CI):** Automatically runs tests and builds code when new commits are pushed.
- **Continuous Deployment (CD):** Automatically deploys the successfully built code to production or hosting platforms.

GitHub Actions is a tool built into GitHub that allows you to define automated workflows using a YAML file.

It helps in:

- Automating repetitive development tasks
- Ensuring code quality through automatic testing
- Reducing manual deployment effort

- **Procedure:**

1. **Create a GitHub repository**

Initialize a new repository or open your existing project on GitHub.

2. **Create the workflow directory and file**

In your project folder, create the following path:

.github/workflows/main.yml

3. Write the workflow configuration

Add the following code to main.yml:

```
name: Node.js CI/CD

on:
  push:
    branches:
      - main

jobs:
  build-and-test:
    runs-on: ubuntu-latest

    steps:
      - name: Checkout repository
        uses: actions/checkout@v3

      - name: Setup Node.js
        uses: actions/setup-node@v3
        with:
          node-version: '20'

      - name: Install dependencies
        run: npm install

      - name: Run tests
        run: npm test

      - name: Build the project
        run: npm run build
```

4. Build and Run Commands

```
# Build Docker image
docker build -t my-react-app .
```

```
# Run the container
docker run -d -p 8080:80 my-react-app
```

4. Commit and push

Save your file and run:

```
git add .github/workflows/main.yml
```

```
git commit -m "Added GitHub Actions CI/CD workflow"
```

```
git push origin main
```

5. Check the workflow

Go to your GitHub repository → Actions tab

You'll see a workflow running automatically.

Each step (install, test, build) will show success or failure

- **Result**

- The workflow automatically runs every time code is pushed to the main branch.
- It successfully installs dependencies, runs tests, and builds the project.
- The workflow status is visible in the "Actions" tab of the repository.
- (Optional) The project can be automatically deployed after successful build.

- **Output:**

```
! main.yml X
D: > DESKTOP > Sem5 > FULLSTACK > .github > workflows > ! main.yml
1 name: FULLSTACK CI/CD
2
3 on:
4 push:
5 branches:
6 - main
7
8 jobs:
9 build-and-test:
10 runs-on: ubuntu-latest
11
12 steps:
13 - name: Checkout repository
14 uses: actions/checkout@v3
15
16 - name: Setup Node.js
17 uses: actions/setup-node@v3
18 with:
19 node-version: '20'
20
21 - name: Install dependencies
22 run: npm install
23
24 - name: Run tests
25 run: npm test
26
27 - name: Build the project
28 run: npm run build
29
```

