Exp No.13 **Automated testing in the CI Workflow and Implement**

Date: **Continuous Deployment (CD)**

Aim:

To automated testing in the CI Workflow and Implement Continuous Deployment (CD).

Algorithm:

app.py

1. *Define the function* add(a, b):

- Input: Two parameters a and b.

- Operation: Return the sum of a and b.

2. *Main Execution Block*:

- Call the add function with two values (e.g., 3 and 5).

- Store the result in a variable (result). - Print the result to the console.

test_app.py

1. *Import necessary modules*:

- Import unittest for testing.

- Import the add function from app.py.

2. *Define a test class* TestApp:

- Inherit from unittest.TestCase.

3. *Create a test method* test_add:

- Test different cases for the add function:

- Case 1: Positive numbers (e.g., add(3, 5) should return 8).

- Case 2: Mixed numbers (e.g., add(-1, 1) should return 0).

- Case 3: Zero as inputs (e.g., add(0, 0) should return 0).

4. *Run the tests*:

- Call unittest.main() to execute all the test cases.

CI/CD Pipeline (ci_cd.yml)

1. Trigger Conditions:

- Trigger the workflow on pushes or pull requests to the main branch.

2. Test Job:

- Set up a virtual environment with Windows OS.

- Check out the code from the repository.

- Install Python (version 3.13.0).

- Install dependencies using requirements.txt.

- Run unit tests using unittest.

3. Deploy Job:

- Run only if the test job is successful.

- Check out the code.

- Install Python and dependencies.

- Deploy the application locally by:

- Creating a deployment folder (C:\Users\Sowmyasree\Documents\deployment) if it does not exist.

- Clearing any existing contents in the folder.

- Copying the necessary files to the deployment directory.

- Verify the deployment by listing the contents of the deployment directory.

Program:

ci_cd.yml

```
name: Python CI/CD Pipeline
```

```
on:
  push:
    branches:
      - main  # Trigger on pushes to the main branch
  pull_request:
    branches:
      - main  # Trigger on pull requests targeting the main branch

jobs:
  test:
    runs-on: windows-latest

    steps:
      - name: Checkout code
        uses: actions/checkout@v3  # Checks out your code

      - name: Set up Python
        uses: actions/setup-python@v4
        with:
          python-version: '3.13.0'  # Specify your Python version

      - name: Install dependencies
        run: |
          pip install -r requirements.txt  # Install necessary packages
```

```
    - name: Run tests
      run: |
        python -m unittest discover -s tests  # Adjust the path as needed

  deploy:
    runs-on: windows-latest
    needs: test  # Runs only if tests are successful

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

    - name: Set up Python
      uses: actions/setup-python@v4
      with:
        python-version: '3.13.0'

    - name: Install dependencies
      run: |
        pip install -r requirements.txt

    - name: Deploy locally
      shell: pwsh
      run: |
        $destination = 'C:\Users\Sowmyasree\Documents\deployment'
```

```
    # Ensure the destination directory exists
    if (!(Test-Path -Path $destination)) {
      New-Item -ItemType Directory -Path $destination
    }

    # Clear the destination directory
    Remove-Item -Path "$destination\*" -Recurse -Force

    # Copy files to the destination
    Copy-Item -Path .\* -Destination $destination -Recurse -Force

- name: Verify deployment contents
  shell: pwsh
  run: |
    $destination = 'C:\Users\Sowmyasree\Documents\deployment'
    Get-ChildItem -Path $destination -Recurse

- name: Deploy locally
  shell: pwsh
  run: |
    $destination = 'C:\Users\Sowmyasree\Documents\deployment'

    # Ensure the destination directory exists
    if (!(Test-Path -Path $destination)) {
    New-Item -ItemType Directory -Path $destination
    }
```

```
        # Clear the destination directory
        Remove-Item -Path "$destination\*" -Recurse -Force

        # Log files to be copied
        Write-Host "Files to be copied:"
        Get-ChildItem -Path .\* -Recurse

        # Copy files to the destination
        Copy-Item -Path .\* -Destination $destination -Recurse -Force

        # Verify copied contents
        Write-Host "Contents of the destination directory:"
        Get-ChildItem -Path $destination -Recurse
```

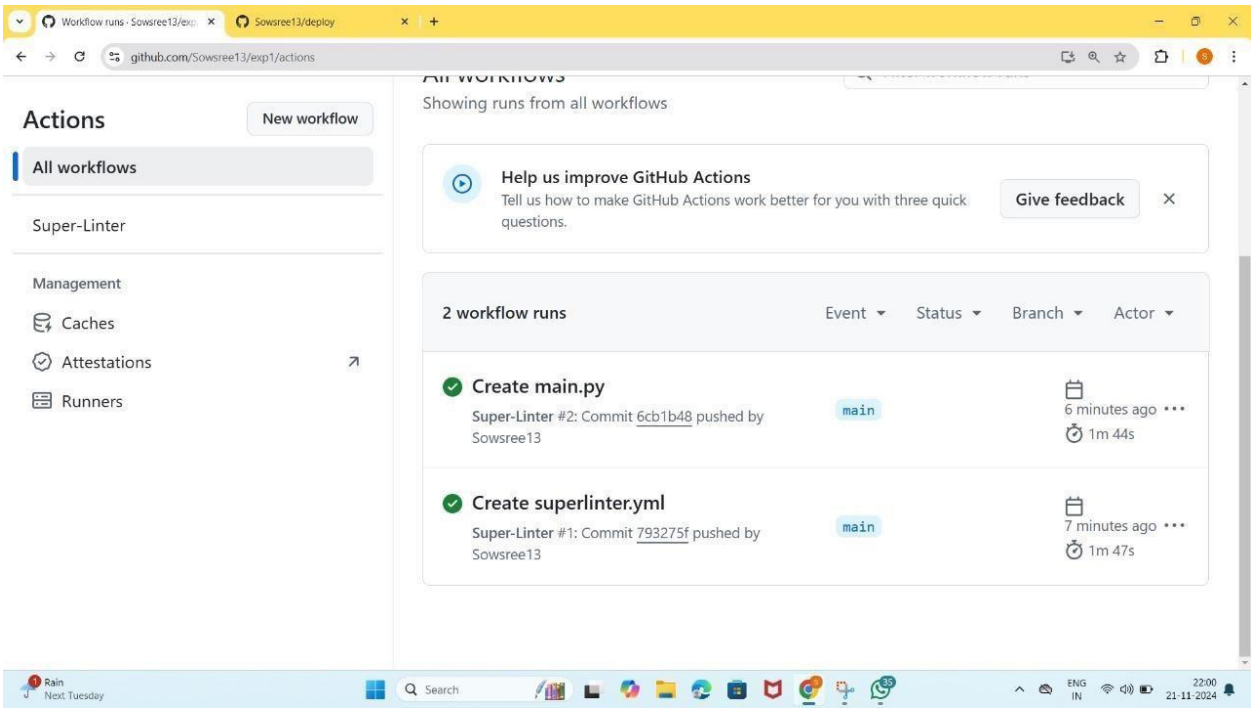
test_app.py:

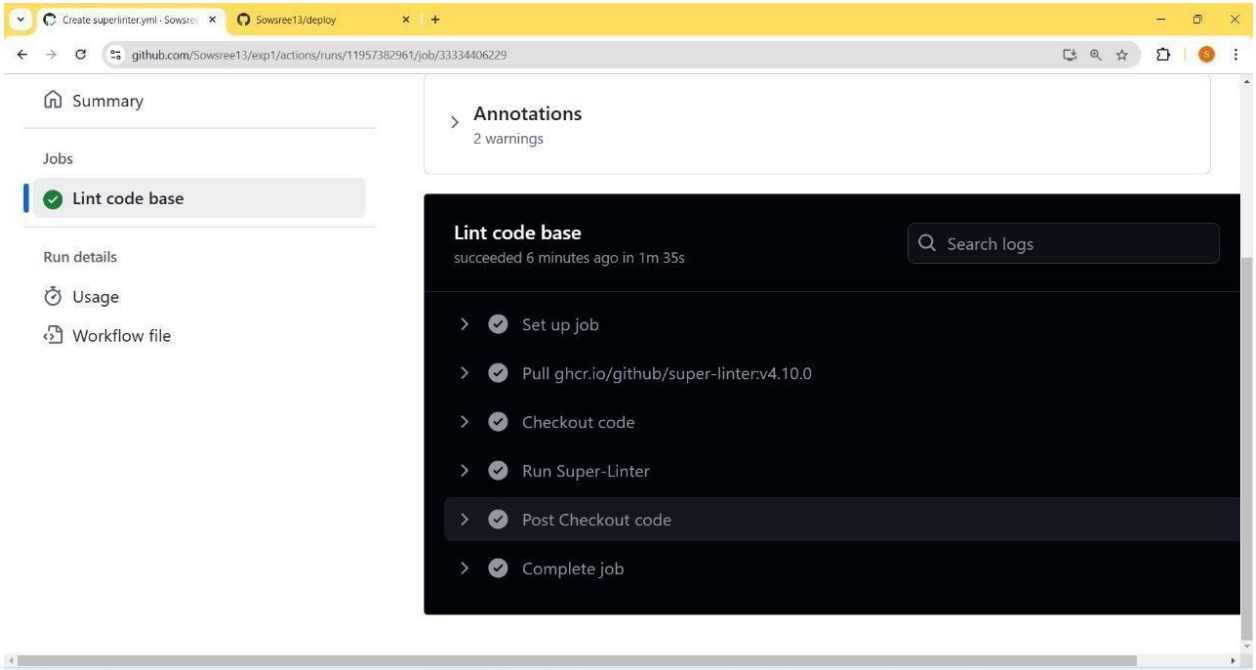
```
import unittest from app import add
class TestApp(unittest.TestCase):
def test_add(self):
"""Test the add function."""
self.assertEqual(add(3, 5), 8)
self.assertEqual(add(-1, 1), 0)
self.assertEqual(add(0, 0), 0)

if _name_ == "_main_":
   unittest.main()
```

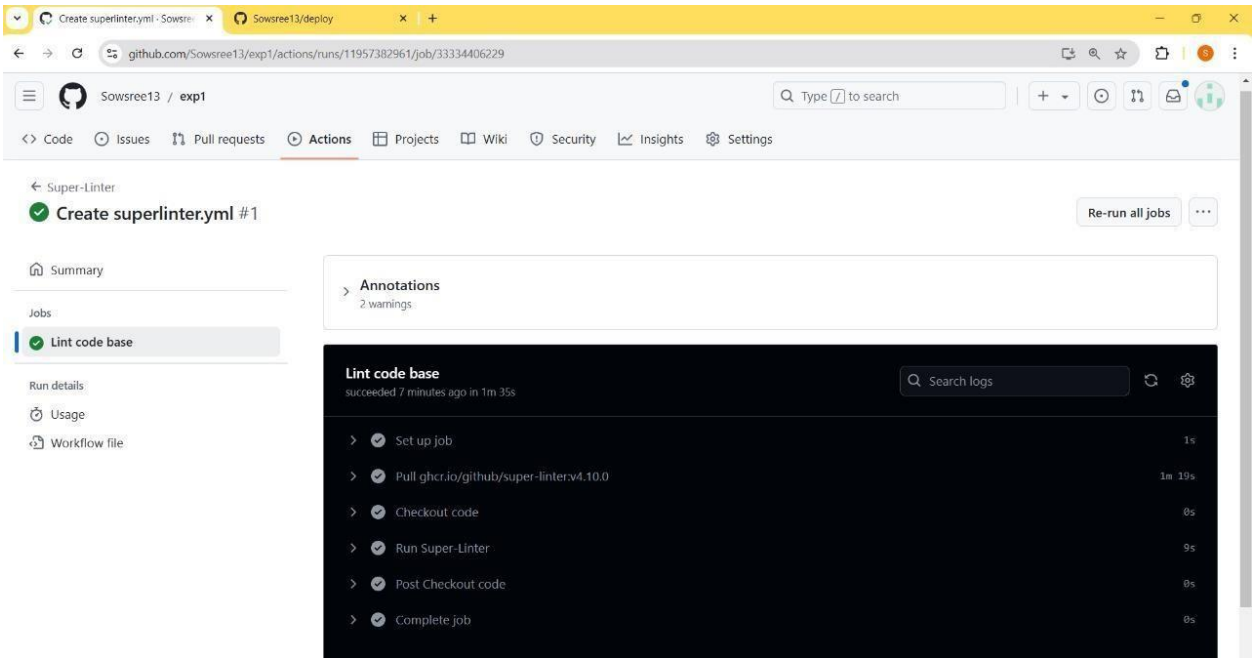
app.py:

```
def add(a, b):
    """Returns the sum of a and b."""
    return a + b


if _name_ == "_main_":
    result = add(3, 5)
    print(f"The sum is: {result}")
```

OUTPUT:


Actions
New workflow
All workflows
Super-Linter
Management
Caches
Attestations
Runners
Showing runs from all workflows
Help us improve GitHub Actions
Tell us how to make GitHub Actions work better for you with three quick questions.
Give feedback
2 workflow runs
Event
Status
Branch
Actor
Create main.py
Super-Linter #2: Commit 6cb1b48 pushed by Sowsree13
main
6 minutes ago
1m 44s
Create superlinter.yml
Super-Linter #1: Commit 793275f pushed by Sowsree13
main
7 minutes ago
1m 47s


Summary
Jobs
Lint code base
Run details
Usage
Workflow file
Annotations
2 warnings
Lint code base
succeeded 6 minutes ago in 1m 35s
Search logs
Set up job
Pull ghcr.io/github/super-linter:v4.10.0
Checkout code
Run Super-Linter
Post Checkout code
Complete job


Create superlinter.yml - Sowsree
Sowsree13/deploy
github.com/Sowsree13/exp1/actions/runs/11957382961/job/33334406229
Sowsree13 / exp1
Type / to search
Code
Issues
Pull requests
Actions
Projects
Wiki
Security
Insights
Settings
Super-Linter
Create superlinter.yml #1
Re-run all jobs
Summary
Jobs
Lint code base
Run details
Usage
Workflow file
Annotations
2 warnings
Lint code base
succeeded 7 minutes ago in 1m 35s
Search logs
Set up job
1s
Pull ghcr.io/github/super-linter:v4.10.0
1m 19s
Checkout code
0s
Run Super-Linter
9s
Post Checkout code
0s
Complete job
0s

RESULT:

The program to implement automatedtesting in the CI Workflow and Implement Continuous Deployment (CD) is executed successfully.