Experiment 4

Docker Build and Push using GitHub Actions

Objective: Set up a GitHub Actions workflow to automatically build a Docker image from a Dockerfile in your GitHub repository and push it to a container registry (e.g., Docker Hub).

Prerequisites:

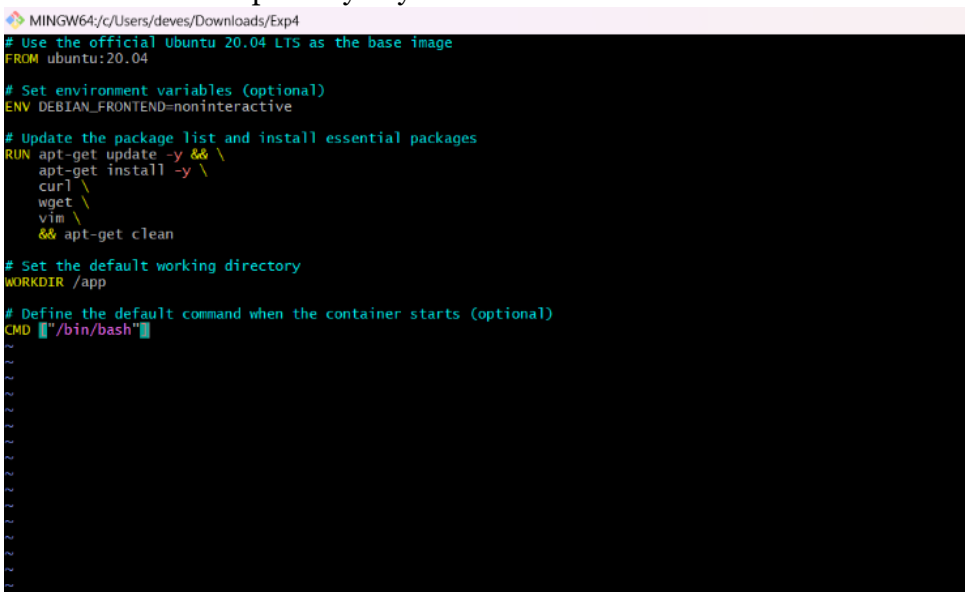
GitHub account

- Docker installed on your local machine
- A Dockerfile in your GitHub repository
- A Docker Hub account (or any other container registry)

Exercise Steps:

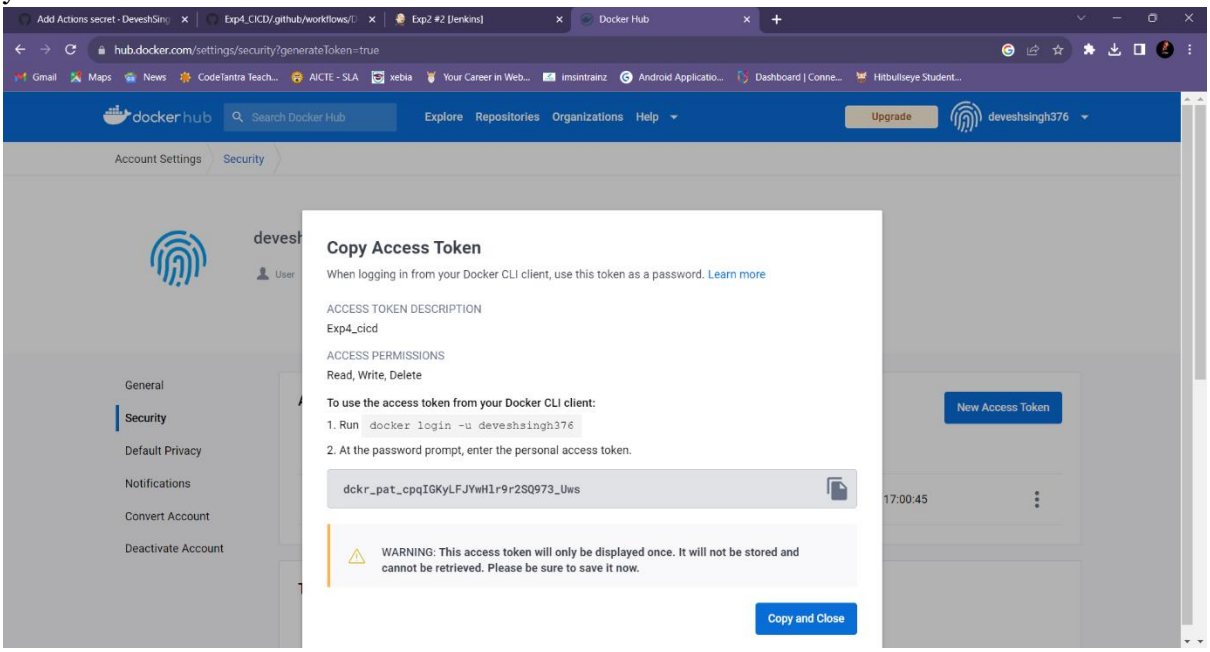
Step 1: Fork and Clone the Repository

- Fork a sample GitHub repository containing a Dockerfile or create a new repository and add a Dockerfile to it.
- Clone the forked repository to your local machine.



Step 2: Create Docker Hub Access Token

- Log in to your Docker Hub account.
- Go to your account settings and click on the "Security" tab.
- Under "Access Tokens," click "New Access Token." Give it a name, select the required permissions (e.g., "Write" for pushing Docker images), and click "Create."
- Copy the generated access token. You will need it to authenticate with Docker Hub in your GitHub Actions workflow.



Step 3: Create a GitHub Actions Workflow

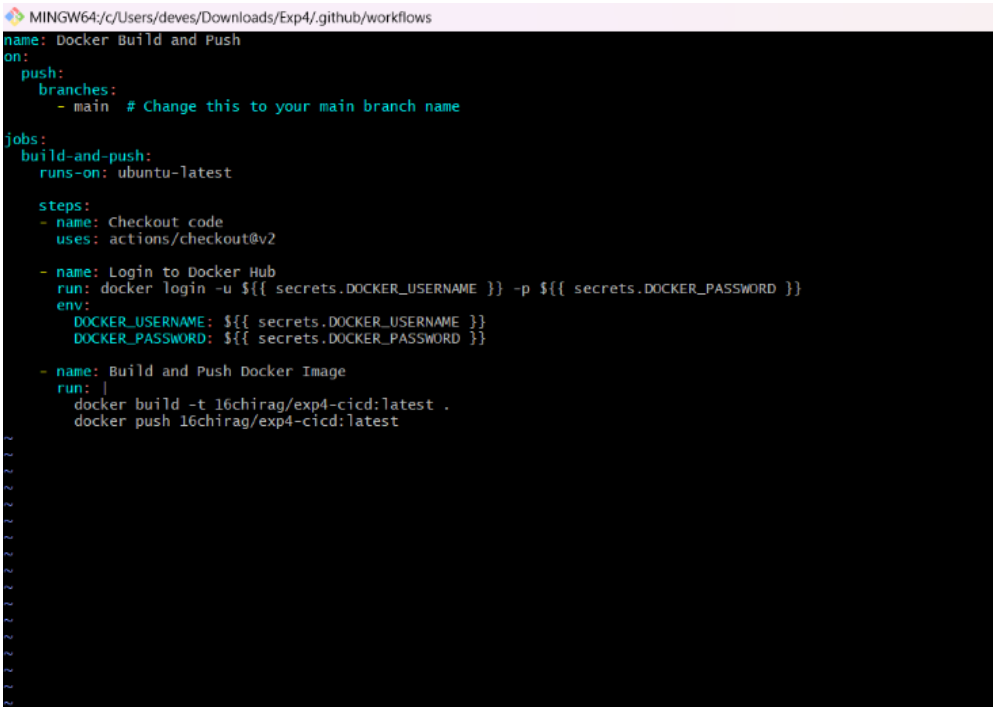
- In your cloned repository, create a directory named .github/workflows if it doesn't exist.

- Inside the .github/workflows directory, create a YAML file (e.g., docker-build-and-push.yml) to define your GitHub Actions workflow. You can use any text editor to create the file.
- Edit docker-build-and-push.yml and add the following content:

```
name: Docker Build and Push

on:

 push:

  branches:

    - main  # Change this to your main branch name
```

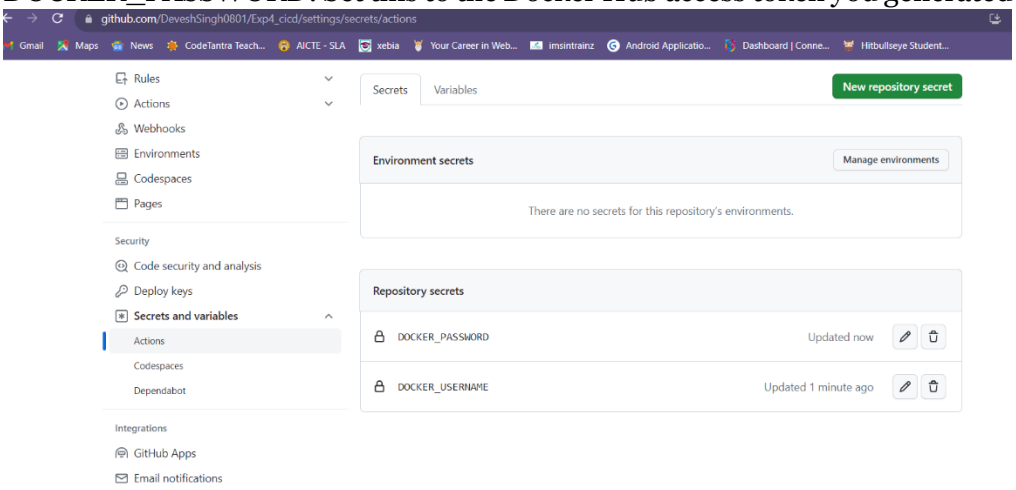
```
jobs:
  build-and-push:
    runs-on: ubuntu-latest

    steps:
    - name: Checkout code
      uses: actions/checkout@v2

    - name: Login to Docker Hub
      run: docker login -u ${{ secrets.DOCKER_USERNAME }} -p ${{ secrets.DOCKER_PASSWORD }}
      env:
        DOCKER_USERNAME: ${{ secrets.DOCKER_USERNAME }}
        DOCKER_PASSWORD: ${{ secrets.DOCKER_PASSWORD }}

    - name: Build and Push Docker Image
      run: |
        docker build -t your-dockerhub-username/your-repo-name:latest .
        docker push your-dockerhub-username/your-repo-name:latest
```

Replace your-dockerhub-username and your-repo-name with your Docker Hub username and repository name.



Step 4: Add Docker Hub Credentials to GitHub Secrets

- Go to your GitHub repository on the GitHub website.
- Click on "Settings" and then "Secrets" in the left sidebar.
- Click on "New repository secret" and add two secrets:
- DOCKER_USERNAME: Set this to your Docker Hub username.
- DOCKER_PASSWORD: Set this to the Docker Hub access token you generated earlier.



Step 5: Commit and Push Changes

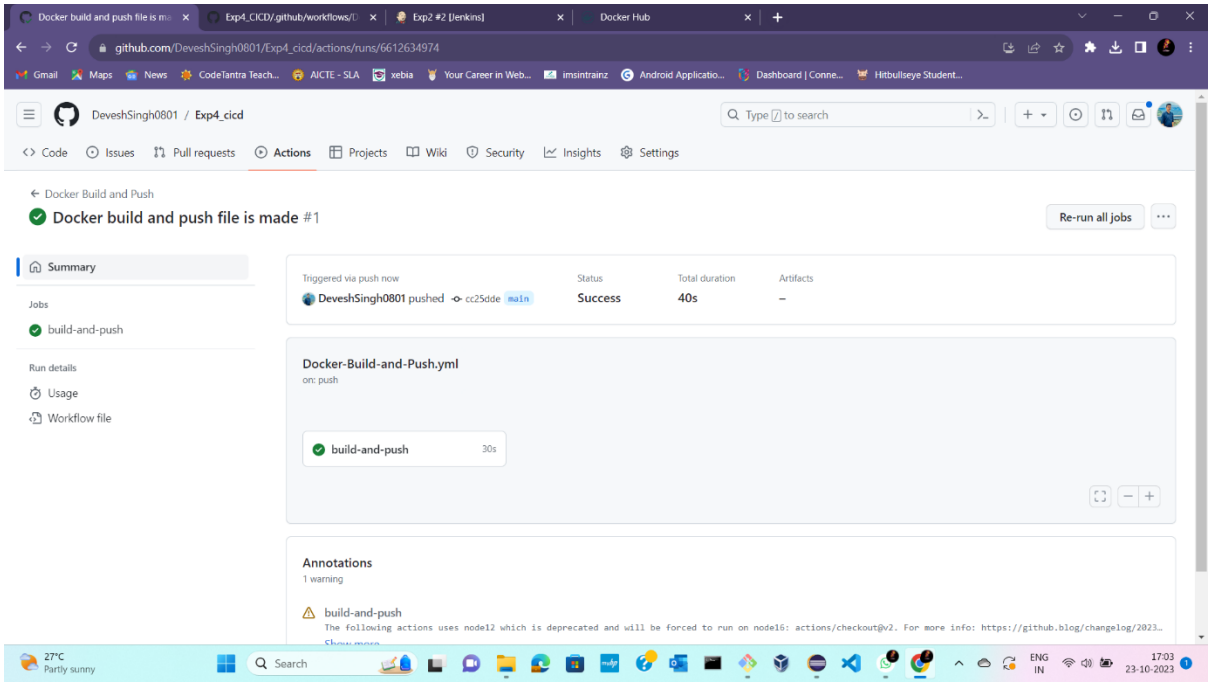
Save the docker-build-and-push.yml file.

Commit the changes to your local repository:

```
git add .
git commit -m "Add GitHub Actions workflow for Docker build and push"
git push origin main
```

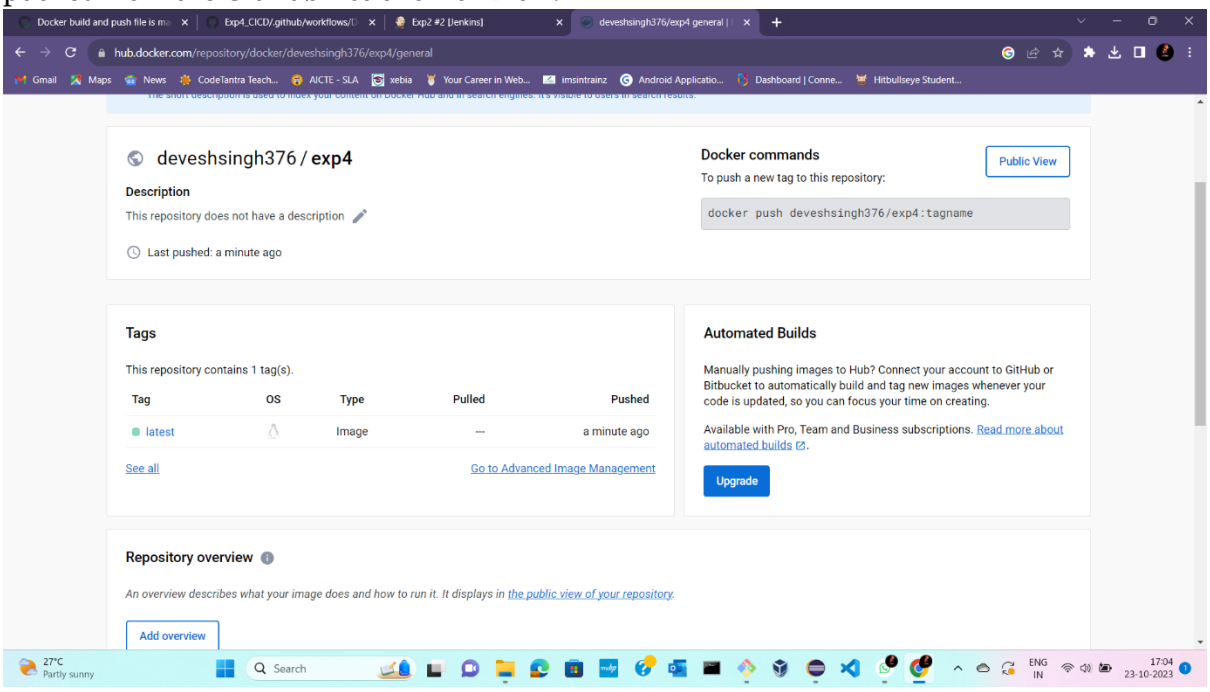
Step 6: Check the Workflow Status

- Go to your GitHub repository on the GitHub website.
- Click on the "Actions" tab to see the workflow running. You should see a workflow named "Docker Build and Push" or the name you specified in the YAML file.
- Monitor the workflow's progress, and once it completes successfully, you should see a green checkmark indicating a successful build and push of the Docker image to Docker Hub.



Step 7: Verify the Docker Image on Docker Hub

- Log in to your Docker Hub account.
- Navigate to your Docker Hub repository, and you should see the Docker image you pushed from the GitHub Actions workflow.



Step 8: Optional - Trigger a Build

To test the workflow, make changes to your Docker file or application code, commit, and push them to the repository. This should trigger the GitHub Actions workflow automatically.