Flask Hello World API

This project is a simple Flask-based API that returns a "Hello, World!" message and allows for dynamic greetings using user input. It's an ideal starting point for developers learning Flask.

Key Features

- **Hello World Endpoint**: Returns a static "Hello, World!" message.
- **Dynamic Greeting**: Responds with personalized greetings based on user input (e.g., `/hello/John` returns "Hello, John!").
- **Automated Testing**: Includes tests using pytest to ensure endpoint functionality.

Requirements

- Python 3.6+
- Flask 2.0+
- pytest 6.0+

Installation

Clone the repository:

```
git clone https://github.com/manjyyot/flask-hello-world-api.git
cd flask-hello-world-api
```

1.

Set up a virtual environment:

```
python -m venv venv
source venv/bin/activate  # macOS/Linux
.\venv\Scripts\activate  # Windows
```

2.

Install dependencies:

```
pip install -r requirements.txt
```

3.

Running the Application

Start the Flask server:

```
flask run
```

1.
2. Visit `http://127.0.0.1:5000/` to see the API in action.

API Endpoints

- **GET /**: Returns "Hello, World!"
- **GET /hello**: Returns "Hello!"
- **GET /hello/{name}**: Returns a personalized greeting.

Running Tests

To run tests, use:

```
pytest
```

AWS EC2 - Installing Jenkins

1. **Launch an EC2 instance**:
    - Create a new EC2 instance using your preferred operating system (e.g., Ubuntu 20.04).
    - Ensure you have appropriate security groups set up to allow SSH (port 22) and HTTP (port 8080) access.

Connect to your EC2 instance:

```
ssh -i "your-key.pem" ubuntu@your-ec2-public-ip
```

2.

Update your system:

```
sudo apt update
sudo apt upgrade -y
```

3.

Install Java (Jenkins requires Java):

```
sudo apt install openjdk-11-jdk -y
```

4.

Add Jenkins repository and install Jenkins:

```
sudo wget -q -O - https://pkg.jenkins.io/jenkins.io.key | sudo apt-key
add -
sudo sh -c 'echo deb http://pkg.jenkins.io/debian/ / >
/etc/apt/sources.list.d/jenkins.list'
sudo apt update
sudo apt install jenkins -y
```

5.

Start Jenkins:

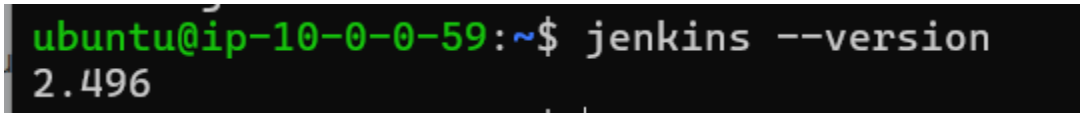
```
sudo systemctl start jenkins
sudo systemctl enable jenkins
```

6.
7. **Open Jenkins on port 8080**:
    - Visit `http://<your-ec2-public-ip>:8080` in your browser.

You'll be prompted for the Jenkins unlock key, which can be found by running:

```
sudo cat /var/lib/jenkins/secrets/initialAdminPassword
```

8. **Install suggested plugins** and set up your Jenkins instance by following the on-screen instructions.



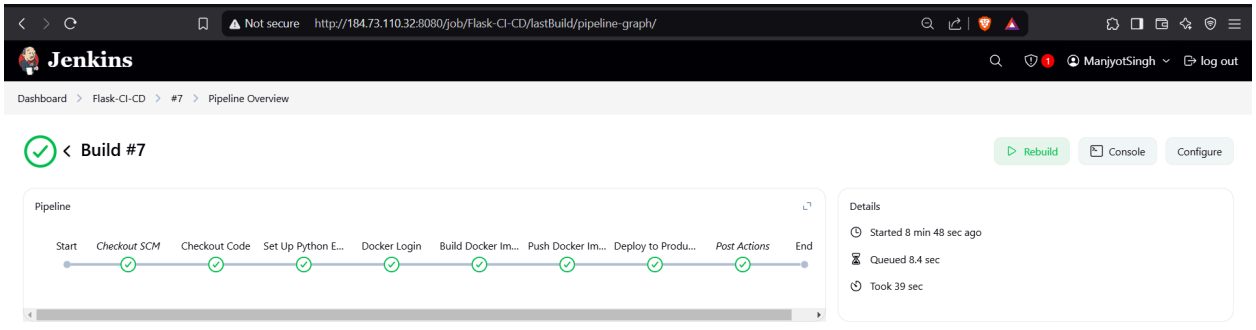
Jenkins Pipeline Setup

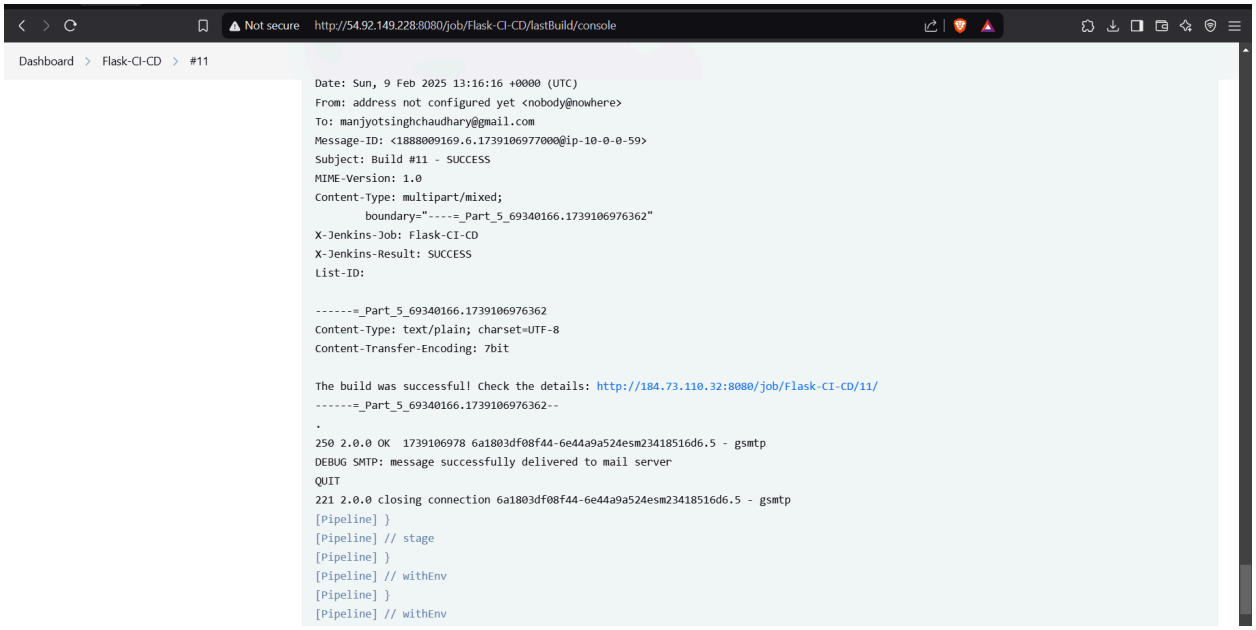
After installing Jenkins, you can set up your Jenkins pipeline for Continuous Integration and Continuous Deployment (CI/CD) by adding the Jenkinsfile to your repository, as described in the pipeline section above.

Jenkins CI/CD

Every push to the main branch of this repository triggers an automated build pipeline on the Jenkins server. The steps of this pipeline are as follows:

1. **Checkout Code**: Pull the latest changes from the GitHub repository.
2. **Set Up Python Environment**: Create a virtual environment and install required dependencies.
3. **Docker Login**: Log in to Docker Hub using credentials stored in Jenkins.
4. **Build Docker Image**: Build the Docker image for the application.
5. **Push Docker Image**: Push the newly built Docker image to Docker Hub under the `iammanjyyot/my-flask-hello-world` repository.
6. **Deploy to Production**: Deployment steps can be added here based on your production environment.





Email Notifications

Jenkins will send an email notification with the build result (success or failure) to `manjyotsinghchaudhary@gmail.com` after each build, along with the Docker Hub update.

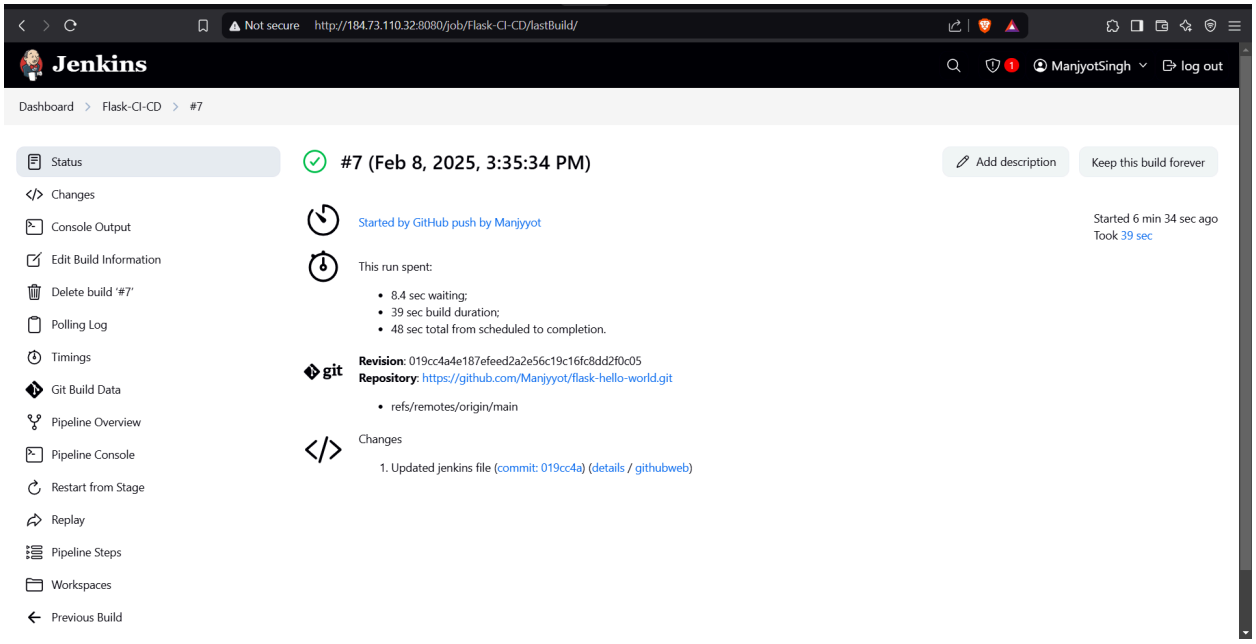
Jenkinsfile

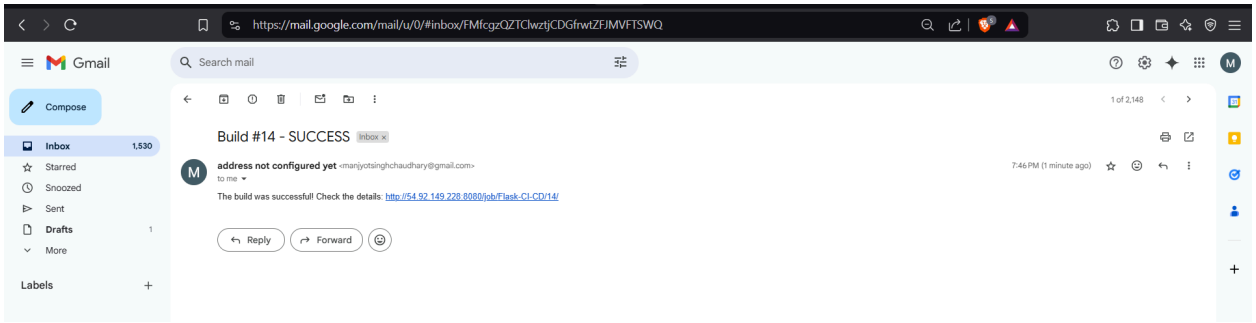
groovy

```
pipeline {
    agent any
    environment {
        DOCKER_CREDENTIALS = 'docker-hub-cred'
    }
    stages {
        stage('Checkout Code') {
            steps {
                checkout scm
            }
        }
        stage('Set Up Python Environment') {
            steps {
                script {
                    sh '/bin/ -c "python3 -m venv venv && source
venv/bin/activate && pip install -r requirements.txt"'
```

```
                }
            }
        }
        stage('Docker Login') {
            steps {
                script {
                    withCredentials([usernamePassword(credentialsId:
DOCKER_CREDENTIALS, passwordVariable: 'DOCKER_PASSWORD',
usernameVariable: 'DOCKER_USERNAME')]) {
                        sh 'echo $DOCKER_PASSWORD | docker login -u
$DOCKER_USERNAME --password-stdin'
                    }
                }
            }
        }
        stage('Build Docker Image') {
            steps {
                script {
                    sh 'docker build -t
iammanjyyot/my-flask-hello-world:latest .'
                }
            }
        }
        stage('Push Docker Image') {
            steps {
                script {
                    sh 'docker push
iammanjyyot/my-flask-hello-world:latest'
                }
            }
        }
        stage('Deploy to Production') {
            steps {
                script {
                    echo 'Deploying to production...'
                }
            }
        }
```

```
    }
    post {
        always {
            cleanWs()
        }
        success {
            emailext(
                subject: "Build #${BUILD_NUMBER} - SUCCESS",
                body: "The build was successful! Check the details:
${BUILD_URL}",
                to: "manjyotsinghchaudhary@gmail.com"
            )
        }
        failure {
            emailext(
                subject: "Build #${BUILD_NUMBER} - FAILURE",
                body: "The build failed. Check the console output for
details: ${BUILD_URL}",
                to: "manjyotsinghchaudhary@gmail.com"
            )
        }
    }
}
```





Successfully email is sent by the JenkinsServer to the user after every push on the main branch.