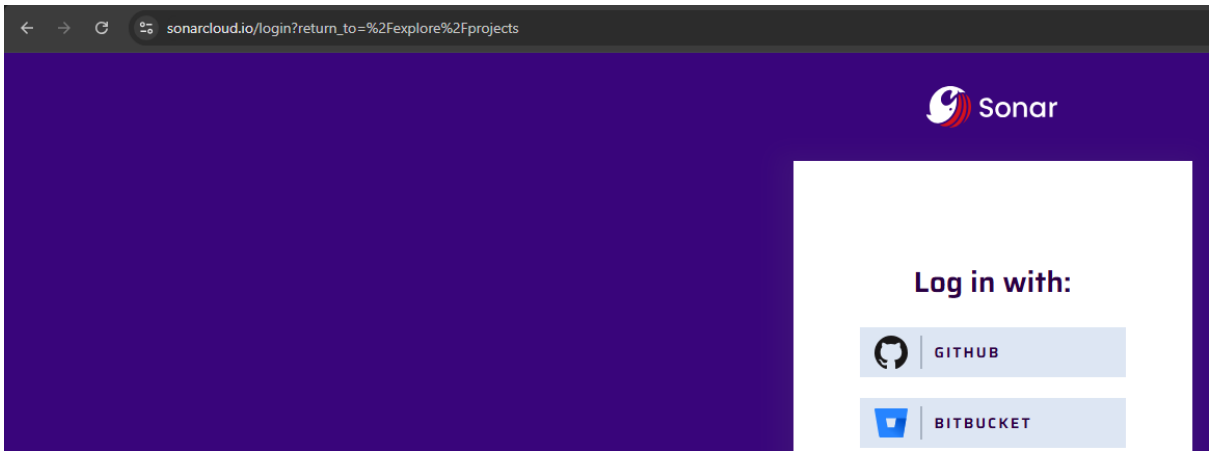
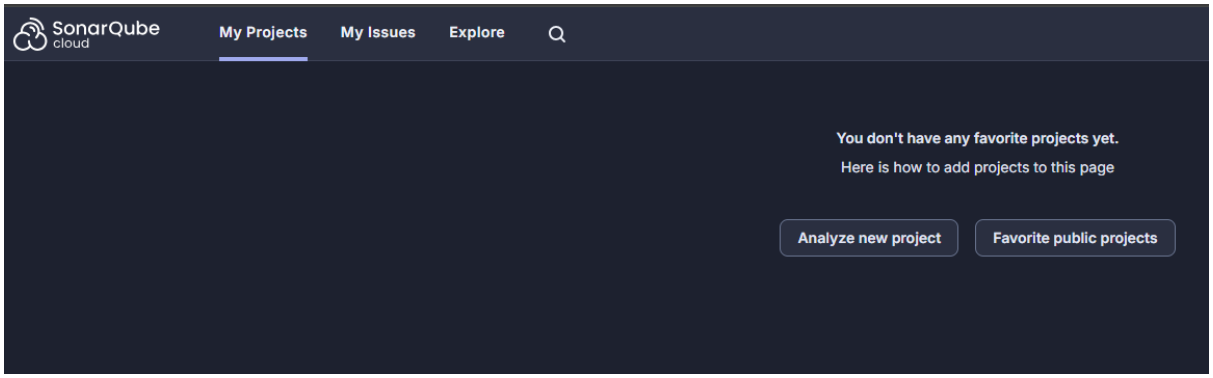
Sonar Cloud

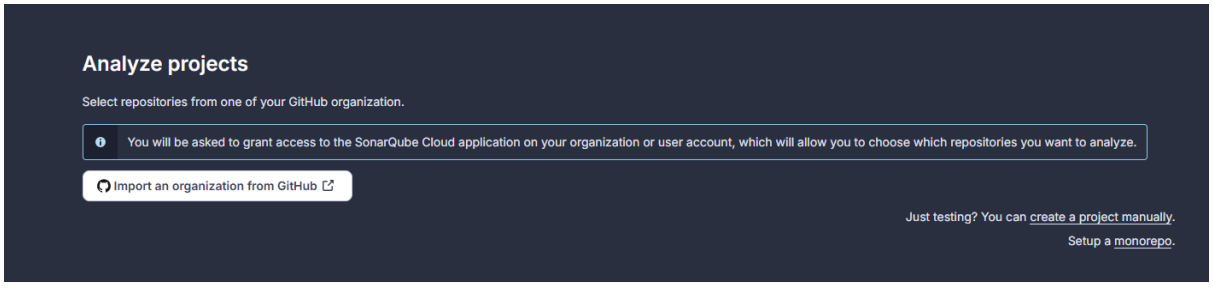
Login Into Sonar Cloud using GITHUB



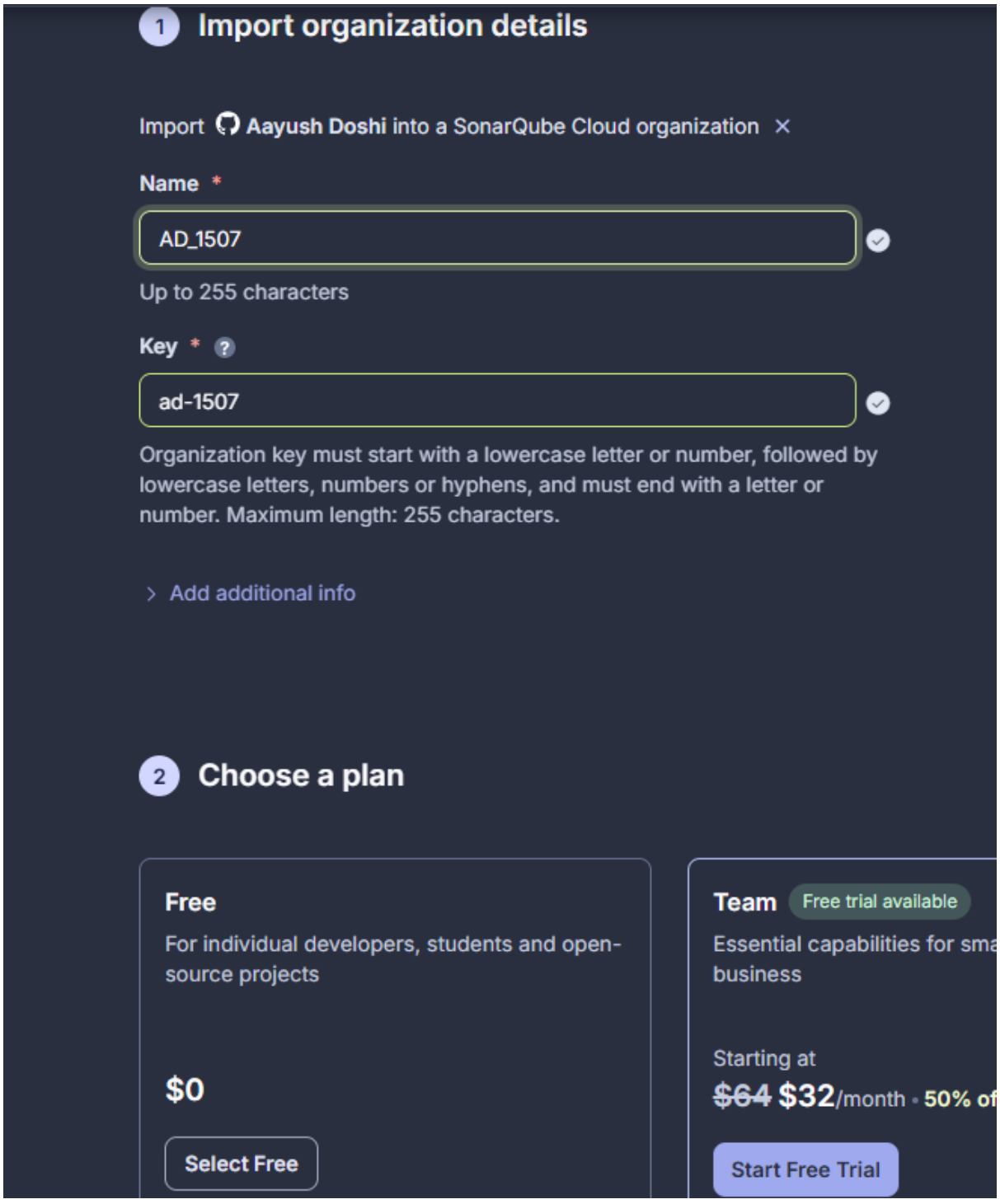
Analyse New Project



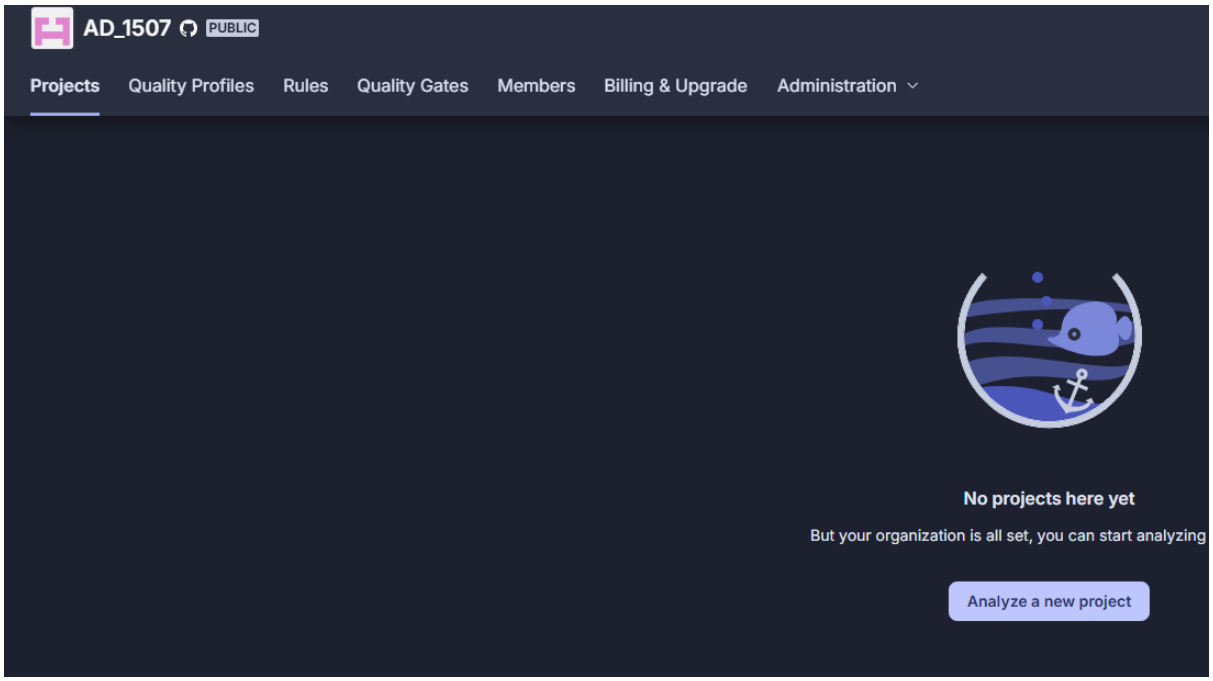
Import from your GIT HUB



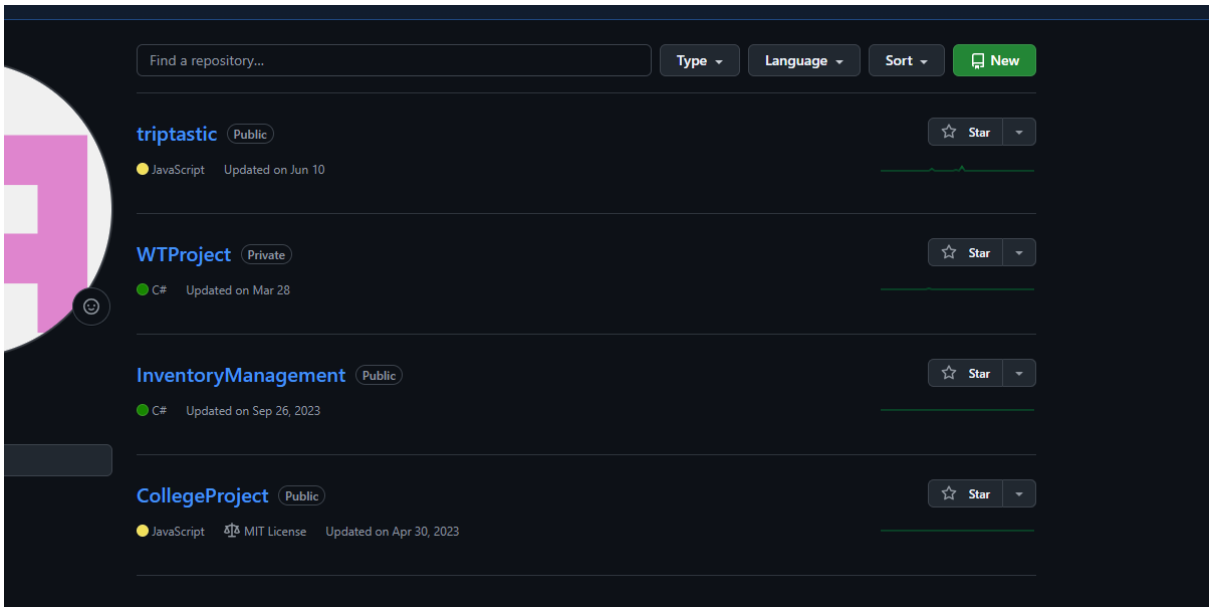
Give Organization Name and Select Free Version

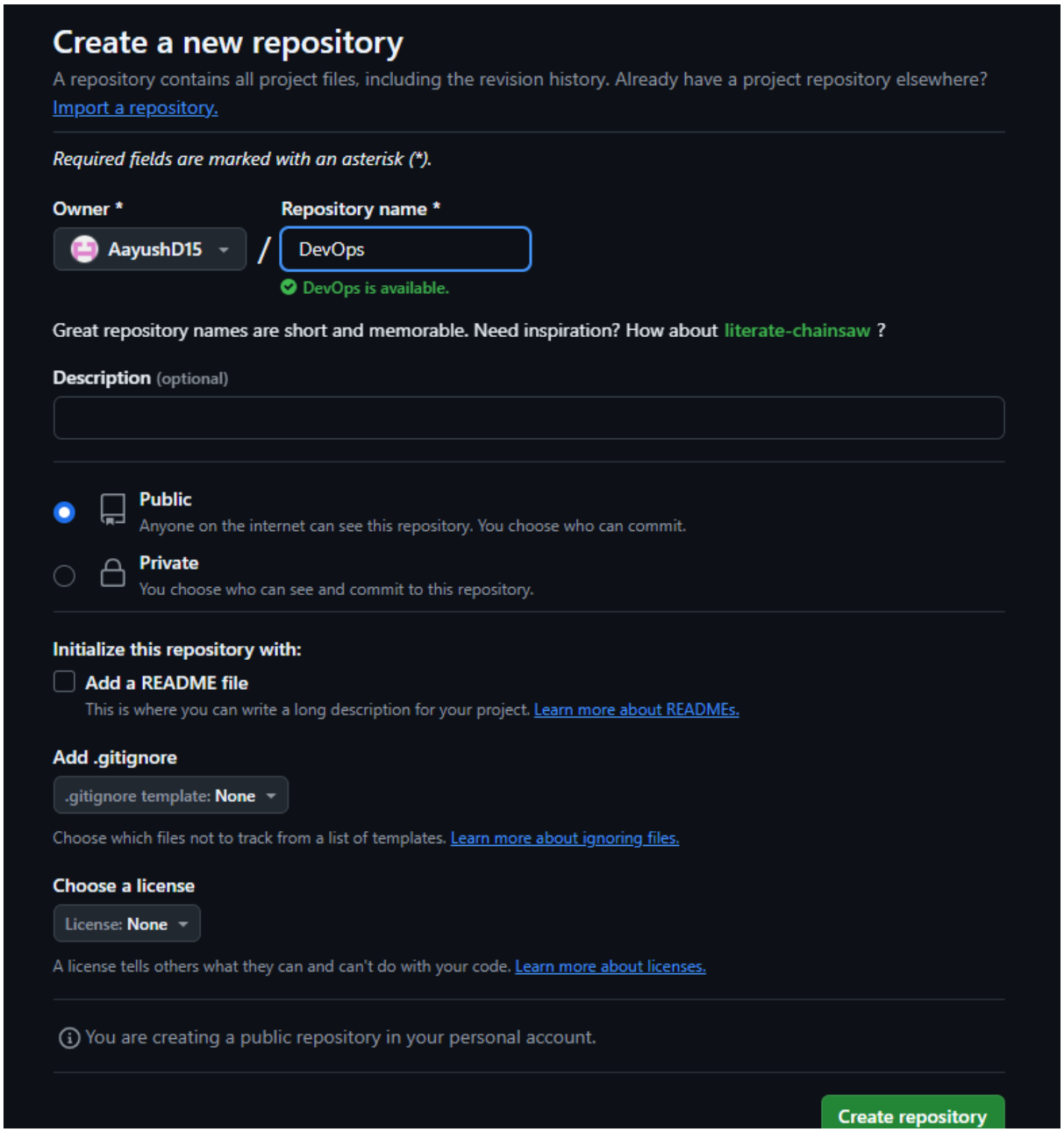


Analyze New Project

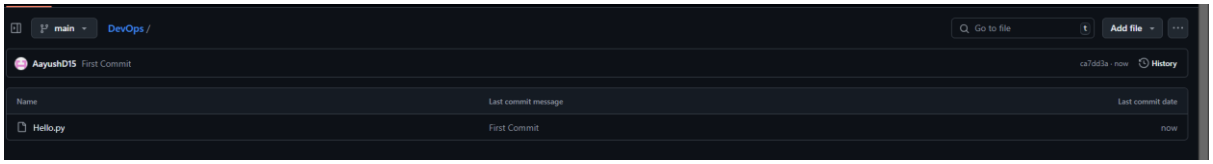


Go to Git Hub and Click on New to Create a New repository

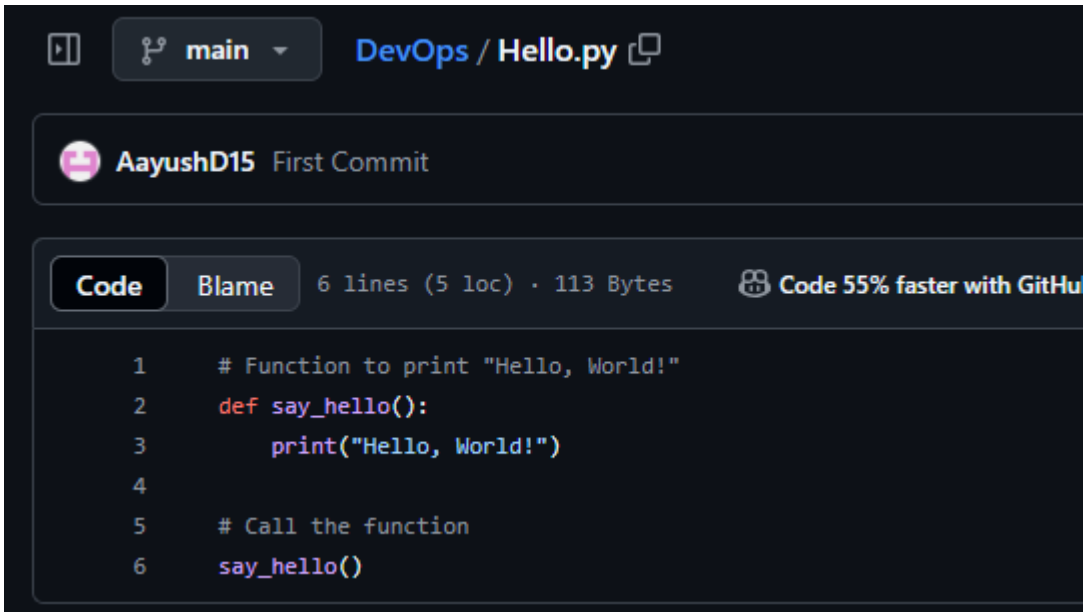




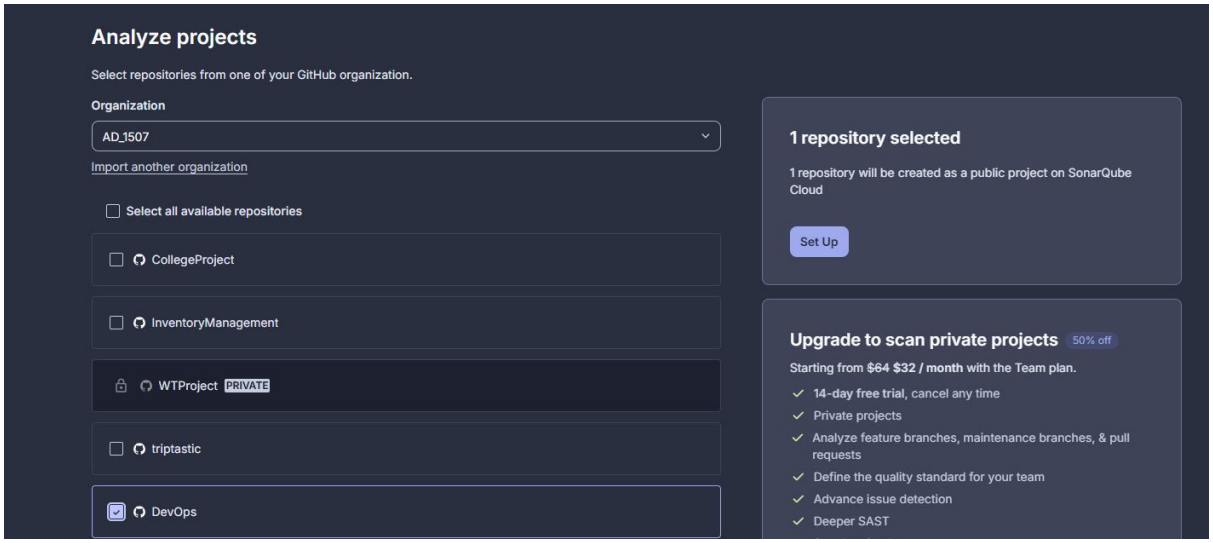
Add a new File from Add File Option on Top Right Cor



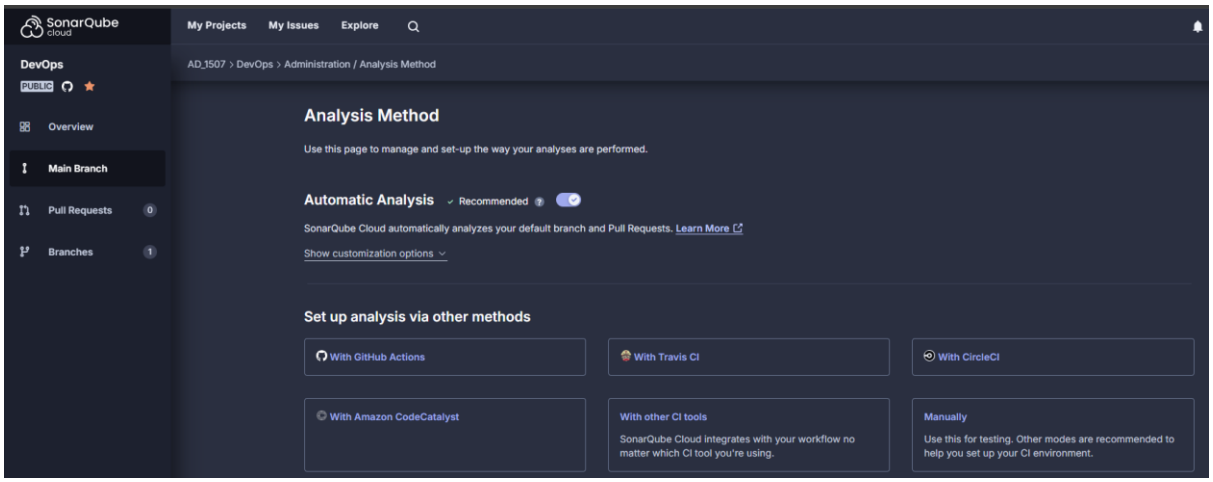
In the Root Directory create a normal python file



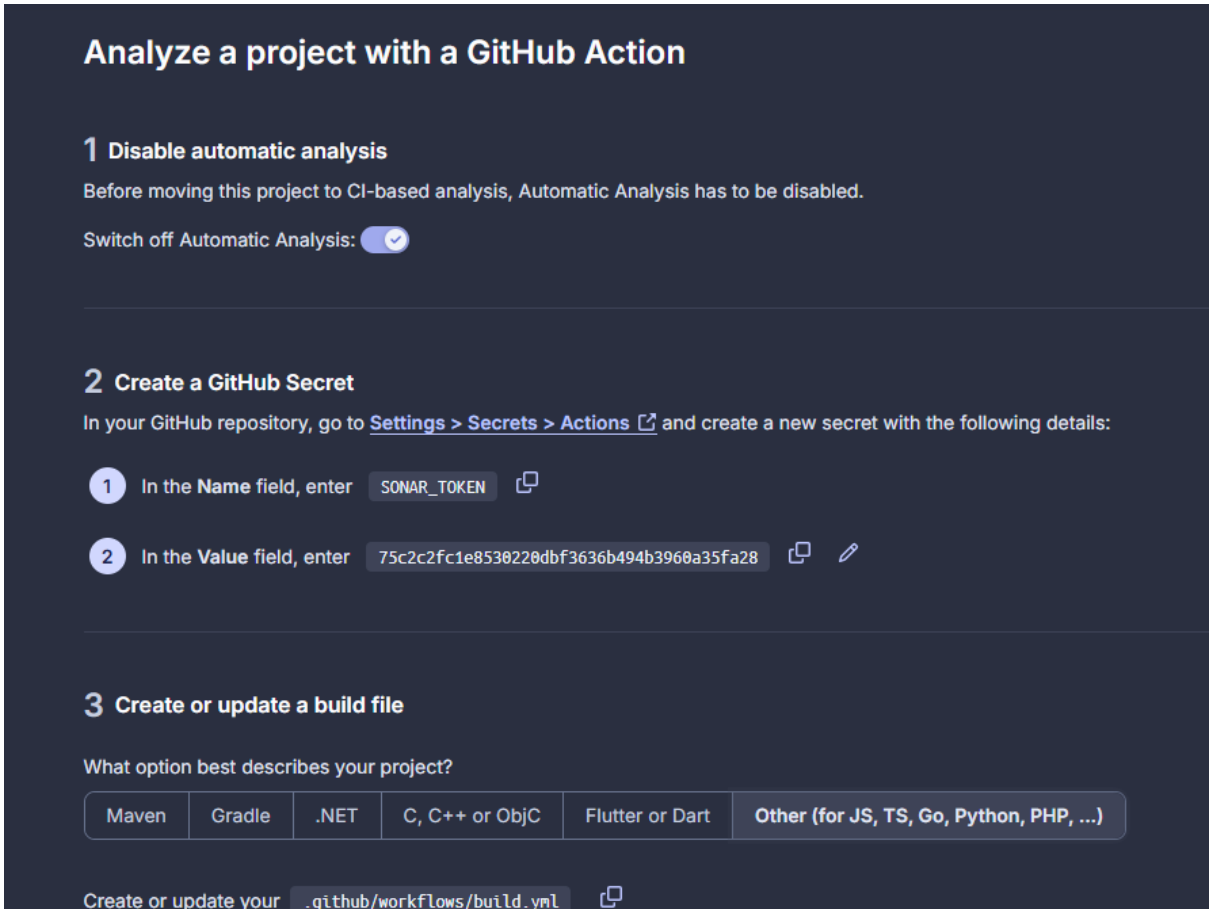
Click on the Repository in Sonar Cloud



In the Left Hand Panel click on Administration and click on Analysis Method and Click on



Copy the Name: **SONAR_TOKEN** and Token and click on Python on 3rd Step



Create a file in Github Repository and name should be → **.github/workflows/build.yml**

Create or update your `.github/workflows/build.yml`

Here is a base configuration to run a SonarQube Cloud analysis on your master branch and Pull Requests. If you already have some GitHub Actions, you might want to just add some of these new steps to an existing one.

Copy

```yaml
name: Build
on:
  push:
    branches:
      - main
  pull_request:
    types: [opened, synchronize, reopened]
jobs:
  sonarcloud:
    name: SonarQube Cloud
    runs-on: ubuntu-latest
    steps:
      - uses: actions/checkout@v4
        with:
          fetch-depth: 0  # Shallow clones should be disabled for a better relevancy of analysis
      - name: SonarQube Cloud Scan
        uses: SonarSource/sonarcloud-github-action@master
        env:
          GITHUB_TOKEN: ${{ secrets.GITHUB_TOKEN }}  # Needed to get PR information, if any
          SONAR_TOKEN: ${{ secrets.SONAR_TOKEN }}
```

Create Another File with name → **sonar-project.properties**

4 Create a `sonar-project.properties` file

Create a configuration file in the root directory of the project and name it `sonar-project.properties`

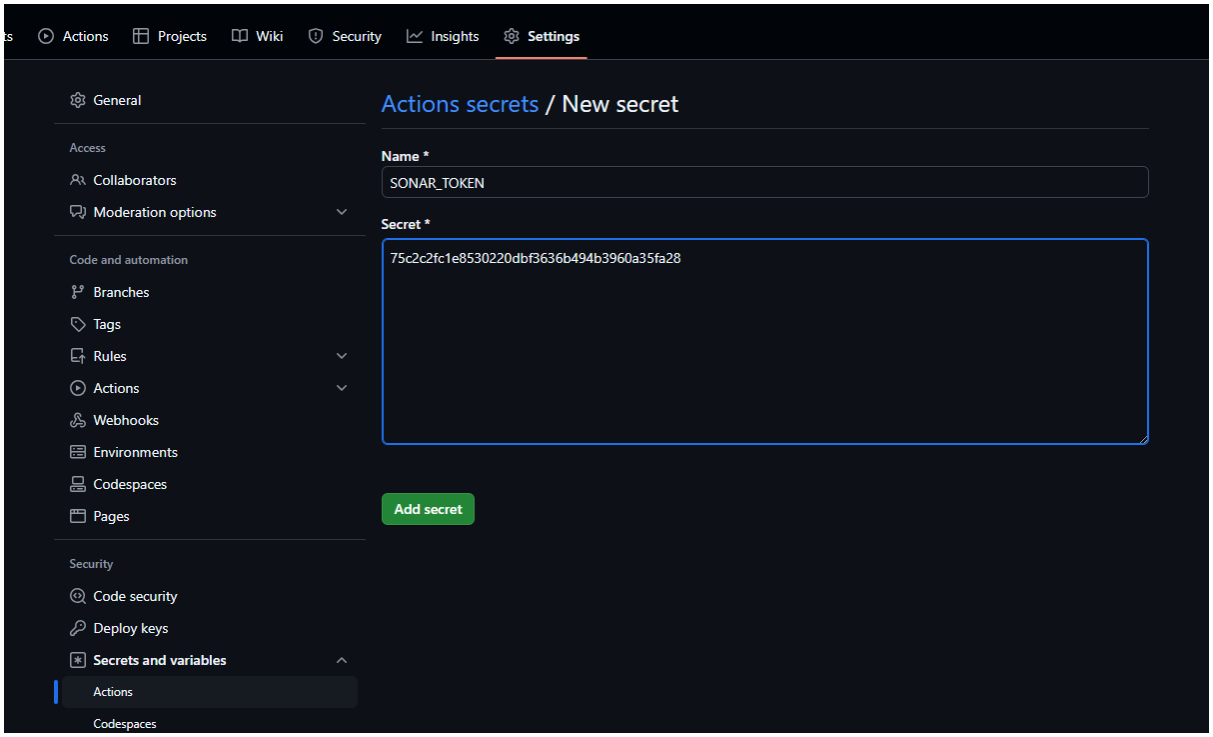
Copy

```
sonar.projectKey=AayushD15_DevOps
sonar.organization=ad-1507

# This is the name and version displayed in the SonarCloud UI.
#sonar.projectName=DevOps
#sonar.projectVersion=1.0


# Path is relative to the sonar-project.properties file. Replace "\" by "/" on Windows.
#sonar.sources=.

# Encoding of the source code. Default is default system encoding
#sonar.sourceEncoding=UTF-8
```

In Git Hub Repository

Go to Settings→ Secrets and Variables → Actions

Copy the Name and Value here



Terraform

- **Command**

docker-compose run terraform init

docker-compose run terraform plan

docker-compose run terraform apply -auto-approve

- **Create Main.TF file in a Directory**

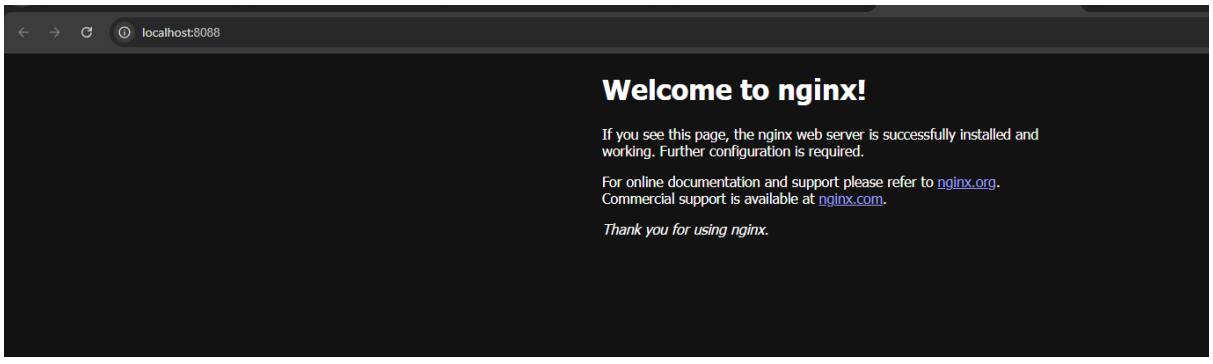
```
# Configure the Docker provider
terraform {
  required_providers {
    docker = {
      source  = "kreuzwerker/docker"
      version = "~> 2.0"
    }
  }
}

provider "docker" {
  host = "unix:///var/run/docker.sock"
}

# Pull Nginx image from DockerHub
resource "docker_image" "nginx" {
  name       = "nginx:latest"
  keep_locally = false
}
```

```
# Create an Nginx container
resource "docker_container" "nginx" {
  image = docker_image.nginx.image_id
  name  = "Devops_Final_Exam"

  ports {
    internal = 80
    external = 8088
  }
}
```

- **docker-compose.yml**

```yaml
version: '3.8'

services:
  terraform:
    image: hashicorp/terraform:latest
    container_name: terraform
    volumes:
      - E:/Aayush/DevOps/Terraform:/workspace  # Adjust this path based on your local directory
      - /var/run/docker.sock:/var/run/docker.sock  # This allows Terraform to interact with Docker
    working_dir: /workspace
    entrypoint: ["terraform"]
    command: ["init"]  # Default command (can be overridden)
```

- **Output**



Docker

Index.html

```
<!DOCTYPE html>
<html>
<head>
    <title>Final Examination</title>
</head>
<body>
    <h1>Docker Question</h1>
    <p>MCA Final Examnination </p>
</body>
</html>
```

dockerfile

```
# Use the official Nginx image
FROM nginx:alpine

# Copy the index.html to the appropriate directory in the container
COPY index.html /usr/share/nginx/html/index.html

# Expose port 80 to access the web page
EXPOSE 8080
```

Commands

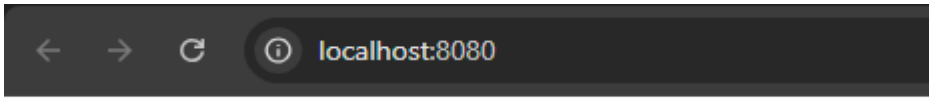
Create Image

- docker build -t firstimage .

Create Container and Run Image

- docker run -d -p 8080:80 firstimage

Output



Docker Question

MCA Final Examnination

Kubernetes

For Nginx Image

Deployment.yaml

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: public-deployment
spec:
  replicas: 2  # Start with 2 replicas
  selector:
    matchLabels:
      app: nginx
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
        - name: nginx
          image: nginx:latest  # Public Nginx image
          ports:
            - containerPort: 80
```

Service.yaml

```yaml
apiVersion: v1
kind: Service
metadata:
  name: public-service
spec:
  selector:
```

```
    app: nginx
  ports:
    - protocol: TCP
      port: 80  # Exposing port 80 externally
      targetPort: 80  # Port inside the container
  type: NodePort  # Use NodePort for local access
```

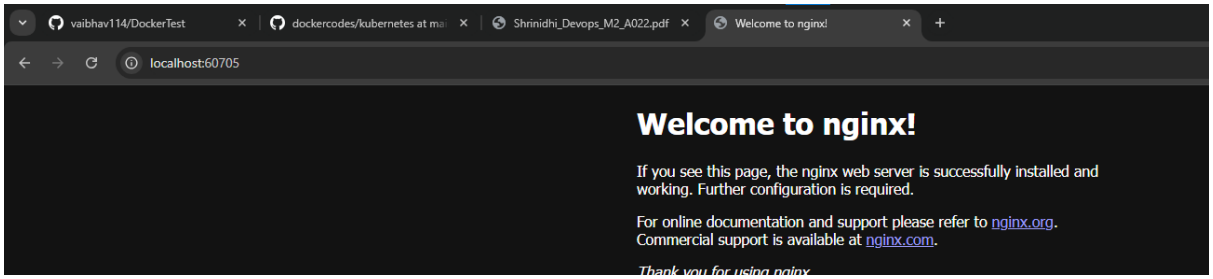
Commands

- kubectl apply -f Deployment.yaml
- kubectl apply -f Service.yaml

- kubectl get deployments
- kubectl get services

  Forward the Port in Rancher Desktop

Output



For Custom Image

dockerfile

```
# Use the official Nginx image
FROM nginx:alpine

# Copy the index.html to the appropriate directory in the container
COPY index.html /usr/share/nginx/html/index.html
# Expose port 80 to access the web page
EXPOSE 8080
```

Index.html

```
<!DOCTYPE html>
<html>
<head>
    <title>Final Examination</title>
</head>
<body>
    <h1>Docker Question</h1>
    <p>MCA Final Examnination </p>
</body>
</html>
```

Deployment.yaml

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: custom-deployment
spec:
  replicas: 2  # Initial number of replicas
  selector:
    matchLabels:
      app: nginx
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
        - name: nginx
          image: aayush1507/secondimage:latest
          ports:
            - containerPort: 80
```

Service.yaml

```
apiVersion: v1
```

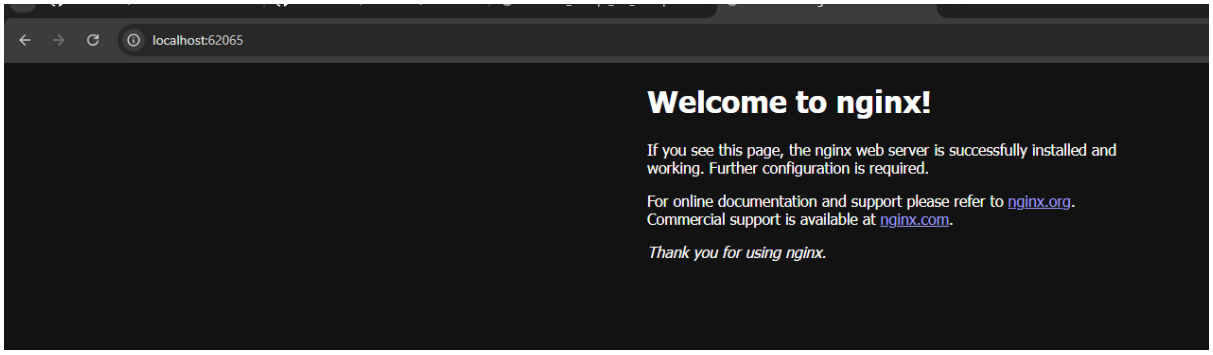
```yaml
kind: Service
metadata:
  name: custom-service
spec:
  selector:
    app: nginx
  ports:
    - protocol: TCP
      port: 80  # Exposing port 80
      targetPort: 80  # Inside the container
  type: NodePort    # Or you can use NodePort if LoadBalancer isn't available
```

Commands

- docker login
- docker build -t aayush1507/secondimage:latest .
- docker push aayush1507/secondimage:latest
- kubectl apply -f Deployment.yaml
- kubectl apply -f Service.yaml
- kubectl get services
- kubectl get deployments

Output

```
PS E:\Aayush\DevOps\Kubernetes\Custom> kubectl get deployments
NAME                READY   UP-TO-DATE   AVAILABLE   AGE
custom-deployment   2/2     2            2           5m59s
public-deployment   2/2     2            2           34m
PS E:\Aayush\DevOps\Kubernetes\Custom> kubectl get services
NAME             TYPE        CLUSTER-IP      EXTERNAL-IP   PORT(S)        AGE
custom-service   NodePort    10.43.70.162    <none>        80:30790/TCP   5m55s
kubernetes       ClusterIP   10.43.0.1       <none>        443/TCP        36m
public-service   NodePort    10.43.167.230   <none>        80:30610/TCP   34m
PS E:\Aayush\DevOps\Kubernetes\Custom>
```



Jenkins

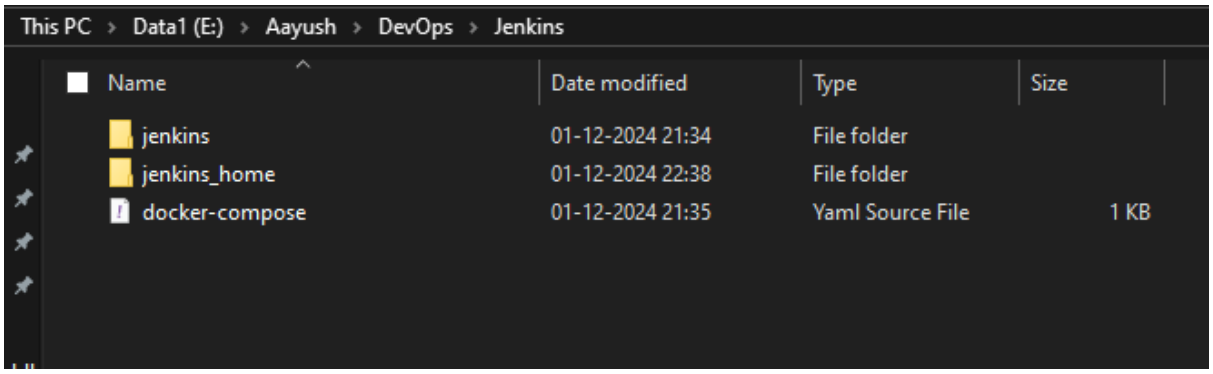
Create a Project Directory

Jenkins

Inside Project Directory

Create a Folder **jenkins**

Just like below



Create docker-compose.yml

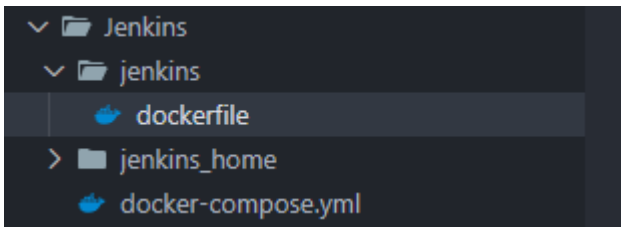
```yaml
version: '3.8'
services:
  jenkins:
    build:
      context: ./jenkins  # This is where your Jenkins-specific Dockerfile is located
      dockerfile: Dockerfile  # This references the Dockerfile inside the jenkins folder
    privileged: true
    user: root
    ports:
      - "8083:8080"
      - "50000:50000"
    container_name: jenkins
```

```
    volumes:
      - E:/Aayush/DevOps/Jenkins/jenkins_home:/var/jenkins_home
      - /var/run/docker.sock:/var/run/docker.sock
    networks:
      - jenkins-net

networks:
  jenkins-net:
    driver: bridge

volumes:
  jenkins_home:
```

inside the jenkins folder create a dockerfile

```
FROM jenkins/jenkins:lts
USER root

# Install Docker CLI and dependencies
RUN apt-get update && \
    apt-get -y install \
    apt-transport-https \
    ca-certificates \
    curl \
    gnupg2 \
    software-properties-common && \
    curl -fsSL https://download.docker.com/linux/debian/gpg | apt-key add - &&
\
    add-apt-repository \
    "deb [arch=amd64] https://download.docker.com/linux/debian \
    $(lsb_release -cs) \
    stable" && \
    apt-get update && \
    apt-get -y install docker.io

# Switch back to jenkins user
USER jenkins
```

Folder Structure



Command

Run the below command in both the Root Directory and jenkins directory

docker-compose up --build -d

Once Executed the above command

The below URL will be Jenkins URL

http://localhost:8083/

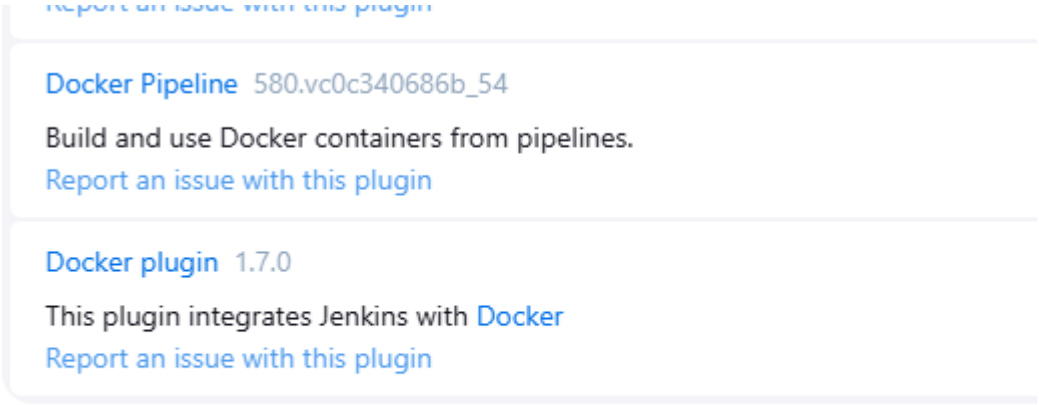
To Login it will ask for initialpassword it will be in

Jenkins_home → secrets → initialAdminPassword

Once logged in click on Manage Jenkins on Left Hand Side

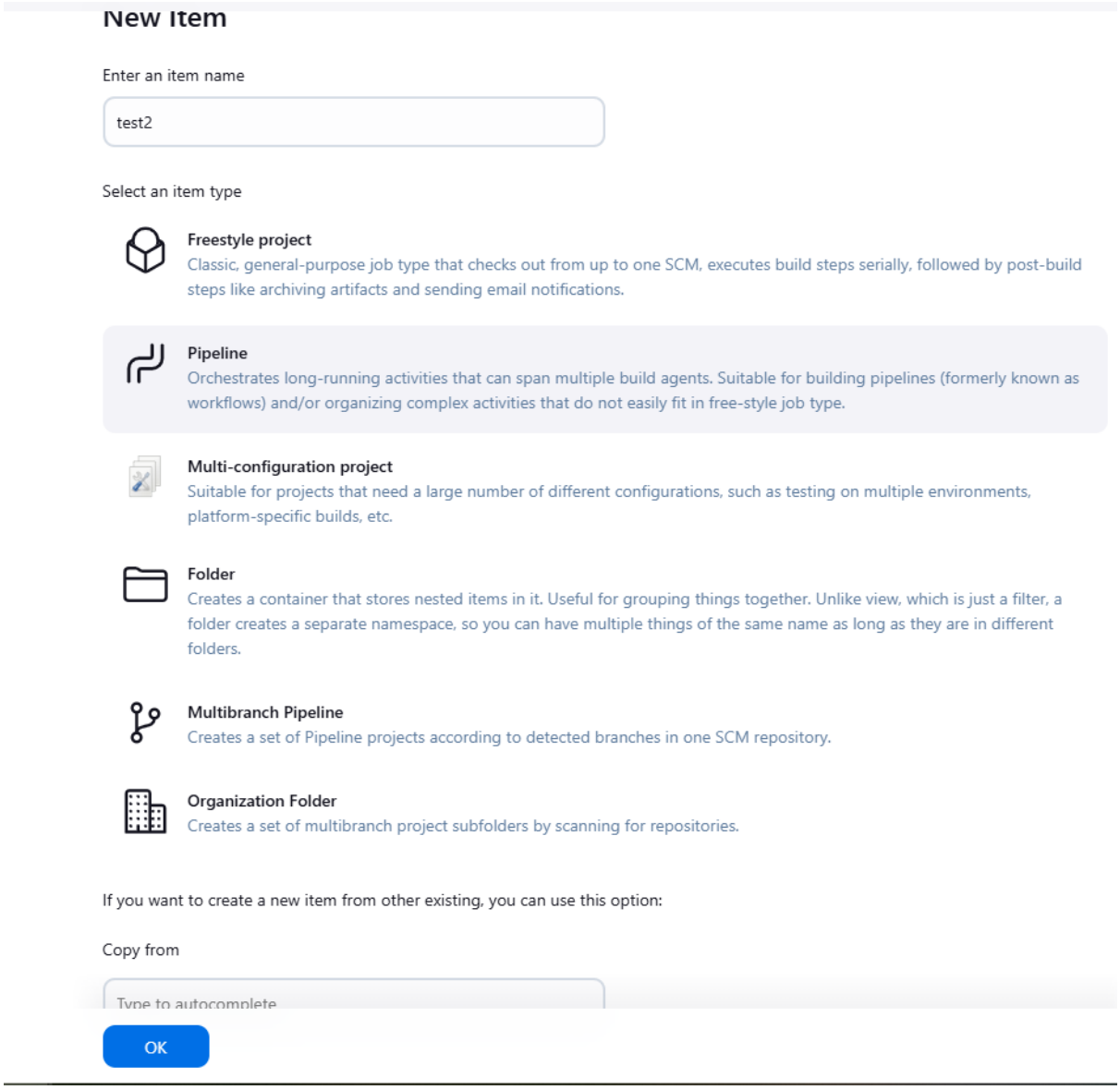
Click on Plugin

Search Docker and select below and install



Go to Dashboard → New Items

Give a Name and Select Pipeline

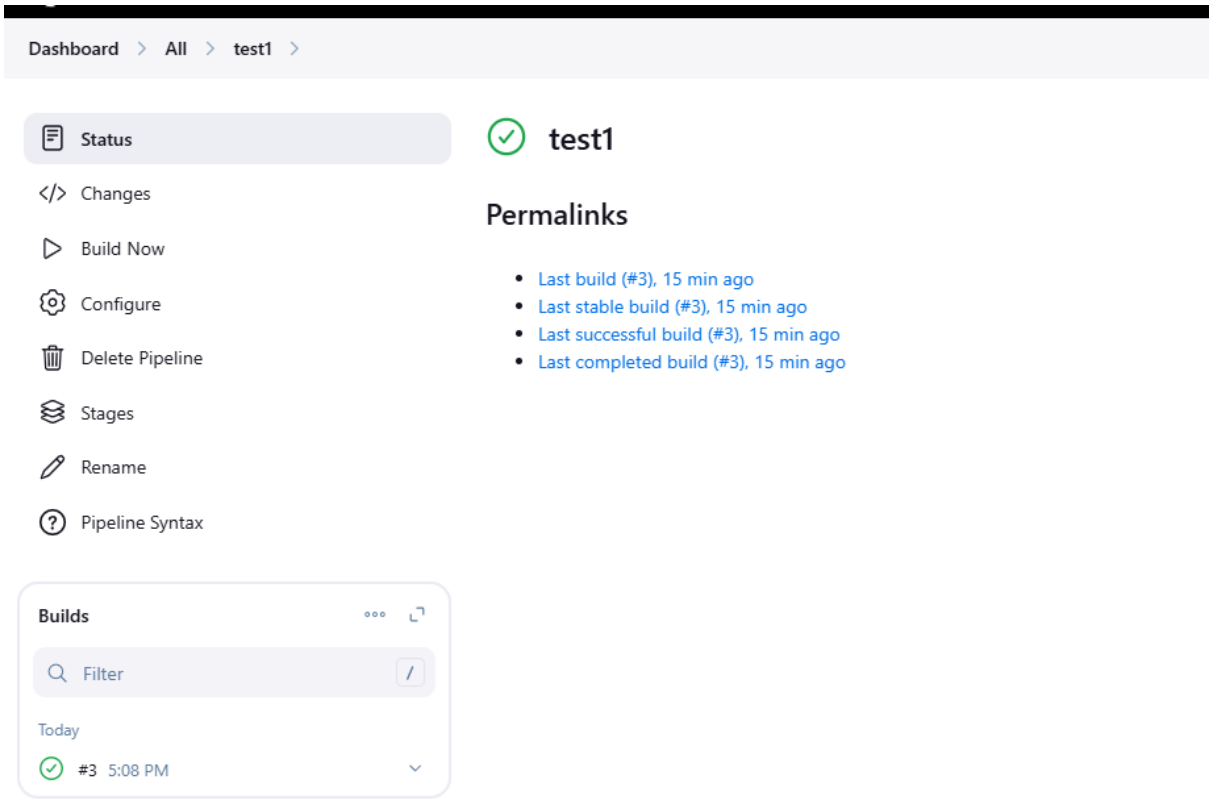


In the Script Section paste the below script and click on Save

```
pipeline {
  agent any

  environment {
    DOCKER_IMAGE = 'nginx'
    CONTAINER_NAME = 'nginx-container'
  }

  stages {
    stage('Pull Nginx Docker Image') {
      steps {
```

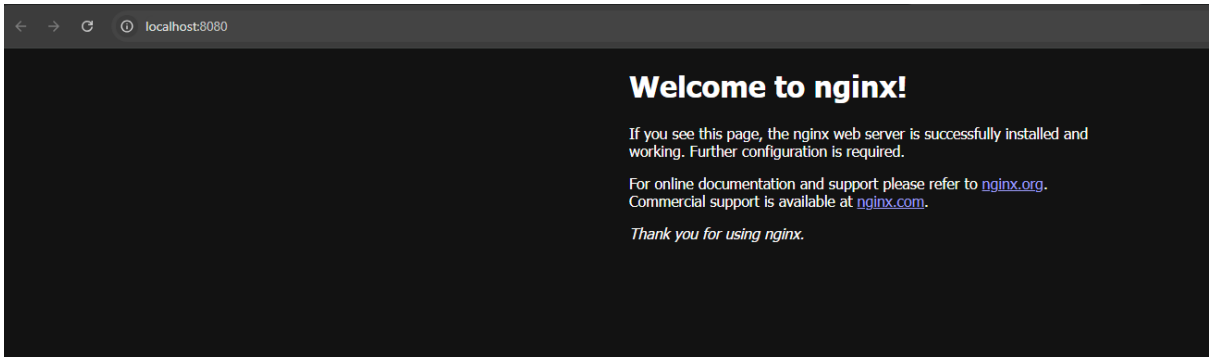
```
            script {
                // Pull the Nginx image from Docker Hub
                sh 'docker pull $DOCKER_IMAGE'
            }
        }
    }

    stage('Run Docker Container') {
        steps {
            script {
                // Run the Nginx container on port 8080
                sh 'docker run -d --name $CONTAINER_NAME -p 8080:80 $DOCKER_IMAGE'
            }
        }
    }
}

post {
    always {
        echo 'Pipeline finished.'
    }
    success {
        echo 'Deployment succeeded.'
    }
    failure {
        echo 'Deployment failed.'
    }
}
```

Click on Build Now



In the Docker Desktop
The below container will be created

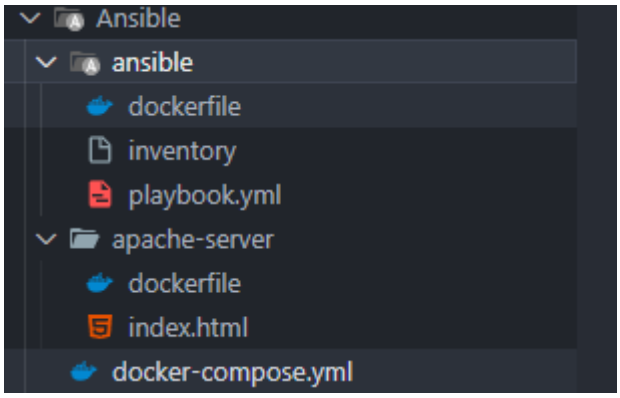
Output



Ansible

Commands

docker-compose up --build -d



Ansible → dockerfile

```
# ansible/Dockerfile
FROM ubuntu:20.04

# Install Ansible and SSH client for remote communication
RUN apt-get update && \
    apt-get install -y ansible sshpass python3-pip && \
    apt-get clean

# Install necessary Ansible dependencies
RUN pip3 install ansible

# Set working directory
WORKDIR /ansible

# Copy the playbook and inventory into the container
COPY playbook.yml /ansible/playbook.yml

# Entry point for Ansible to run the playbook
CMD ["ansible-playbook", "/ansible/playbook.yml", "-i", "inventory"]
```

Playbook.yml

```
# ansible/playbook.yml
---
- name: Install Apache and ensure it is running
  hosts: apache-server
  become: true
  tasks:
    - name: Install Apache
      apt:
```

```
        name: apache2
        state: present
        update_cache: yes

    - name: Start Apache service
      service:
        name: apache2
        state: started
        enabled: yes
```

inventory

[apache-server]
apache-server ansible_host=apache-server ansible_port=22

[apache-server:vars]
ansible_ssh_user=root
ansible_ssh_pass=password

apache-server → dockerfile

```
FROM ubuntu:20.04

# Minimize layer creation and reduce build time
RUN set -xe \
    && apt-get update \
    && DEBIAN_FRONTEND=noninteractive apt-get install -y --no-install-
recommends \
        apache2 \
        openssh-server \
    && rm -rf /var/lib/apt/lists/* \
    && mkdir /var/run/sshd \
    && echo 'root:password' | chpasswd \
    && sed -i 's/^PermitRootLogin prohibit-password/PermitRootLogin yes/'
/etc/ssh/sshd_config

# Expose Apache and SSH ports
EXPOSE 80 22

# Create a basic index.html for Apache
COPY index.html /var/www/html/index.html

# Start SSH and Apache in the background and keep the container running
CMD service ssh start && apache2ctl -D FOREGROUND
```

Index.html

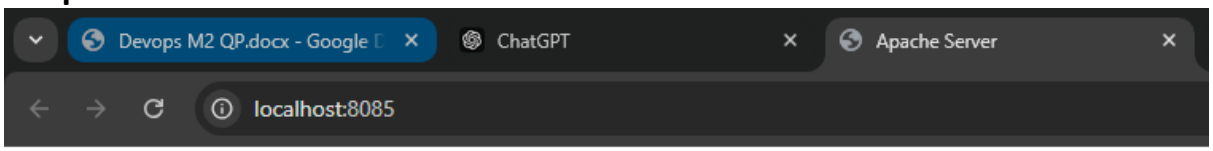
```
<!-- apache-server/index.html -->
<html>
  <head>
    <title>Apache Server</title>
  </head>
  <body>
    <h1>Welcome to Apache!</h1>
  </body>
</html>
```

docker-compose.yml

```
# docker-compose.yml
version: '3.8'

services:
  apache-server:
    build: ./apache-server
    container_name: apache-server
    ports:
      - "8085:80"
    networks:
      - app-network

  ansible:
    build: ./ansible
    container_name: ansible-container
    depends_on:
      - apache-server
    networks:
      - app-network

networks:
  app-network:
    driver: bridge
```

Once ran the command

Output



Welcome to Apache!