

SINCHANA S

PES1UG21CS596

CC LAB

# Assignment 4(a) Jenkins (Creating a DevOps Pipeline, CI/CD tool)

## TASK1

Aim: Set up Jenkins using Docker.

1. Screenshot of the running Docker Container after installing Jenkins

```
C:\Users\SINCHANA S\Downloads\Jenkins_lab-main\Jenkins_lab-main\Dockerfile>docker build . -t jenkins:PES1UG21CS596
[+] Building 79.9s (6/6) FINISHED
=> [internal] load .dockerignore                                docker:default 0.0s
=> => transferring context: 2B                                  0.0s
=> [internal] load build definition from Dockerfile             0.0s
=> => transferring dockerfile: 286B                             0.0s
=> [internal] load metadata for docker.io/jenkins/jenkins:lts  1.6s
=> CACHED [1/2] FROM docker.io/jenkins/jenkins:lts@sha256:01c0b0cf789fa24253090fccea264df223b5e09b14a0ea59f0847c 0.0s
=> [2/2] RUN apt-get update && apt-get install -y make && apt-get install -y g++ --fix-missing 75.3s
=> exporting to image                                           2.7s
=> => exporting layers                                           2.7s
=> => writing image sha256:92e0496f0f5d9025342873b74799d1e74e1778f144ba62a38d96d112460fa044 0.0s
=> => naming to docker.io/library/jenkins:PES1UG21CS596       0.0s

What's Next?
View summary of image vulnerabilities and recommendations → docker scout quickview
```

```
2024-03-05 09:26:35.273+0000 [id=27] INFO winstone.Logger#logInternal: Winstone Servlet Engine running: controlPort=disabled
2024-03-05 09:26:35.689+0000 [id=35] INFO jenkins.InitReactorRunner$1onAttained: Started initialization
2024-03-05 09:26:35.761+0000 [id=42] INFO jenkins.InitReactorRunner$1onAttained: Listed all plugins
2024-03-05 09:26:36.873+0000 [id=47] INFO jenkins.InitReactorRunner$1onAttained: Prepared all plugins
2024-03-05 09:26:36.880+0000 [id=40] INFO jenkins.InitReactorRunner$1onAttained: Started all plugins
2024-03-05 09:26:36.887+0000 [id=45] INFO jenkins.InitReactorRunner$1onAttained: Augmented all extensions
2024-03-05 09:26:37.102+0000 [id=37] INFO jenkins.InitReactorRunner$1onAttained: System config loaded
2024-03-05 09:26:37.103+0000 [id=47] INFO jenkins.InitReactorRunner$1onAttained: System config adapted
2024-03-05 09:26:37.104+0000 [id=43] INFO jenkins.InitReactorRunner$1onAttained: Loaded all jobs
2024-03-05 09:26:37.107+0000 [id=48] INFO jenkins.InitReactorRunner$1onAttained: Configuration for all jobs updated
2024-03-05 09:26:37.142+0000 [id=61] INFO hudson.util.Retrier#start: Attempt #1 to do the action check updates server
2024-03-05 09:26:37.673+0000 [id=47] INFO jenkins.install.SetupWizard#init:

*****
*****
*****

Jenkins initial setup is required. An admin user has been created and a password generated.
Please use the following password to proceed to installation:

07a4bbbe13cc414f907a69e8562fffd50

This may also be found at: /var/jenkins_home/secrets/initialAdminPassword

*****
*****
*****
```

# Jenkins is ready!

Your Jenkins setup is complete.

[Start using Jenkins](#)

Jenkins 2.440.1


## TASK2

Aim: Set up a job in Jenkins to connect to your repository and build C++ hello.cpp.

1. Picture showing the console output after the build is successful

## ✓ Console Output

```
Started by user PES1UG21CS596 SINCHANA S
Running as SYSTEM
Building in workspace /var/jenkins_home/workspace/PES1UG21CS596-1
The recommended git tool is: NONE
No credentials specified
Cloning the remote Git repository
Cloning repository https://github.com/Sinchana13/jenkins_lab
> git init /var/jenkins_home/workspace/PES1UG21CS596-1 # timeout=10
Fetching upstream changes from https://github.com/Sinchana13/jenkins_lab
> git --version # timeout=10
> git --version # 'git version 2.39.2'
> git fetch --tags --force --progress -- https://github.com/Sinchana13/jenkins_lab +refs/heads/*:refs/remotes/origin/* # timeout=10
> git config remote.origin.url https://github.com/Sinchana13/jenkins_lab # timeout=10
> git config --add remote.origin.fetch +refs/heads/*:refs/remotes/origin/* # timeout=10
Avoid second fetch
Seen branch in repository origin/main
Seen 1 remote branch
> git show-ref --tags -d # timeout=10
Checking out Revision b501f1b13f87c1352ff309de18ce2c35880904d5 (origin/main)
> git config core.sparsecheckout # timeout=10
> git checkout -f b501f1b13f87c1352ff309de18ce2c35880904d5 # timeout=10
Commit message: "first commit"
First time build. Skipping changelog.
[PES1UG21CS596-1] $ /bin/sh -xe /tmp/jenkins5336352562502224229.sh
+ make -C main
make: Entering directory '/var/jenkins_home/workspace/PES1UG21CS596-1/main'
g++ hello.cpp -o hello_exec
make: Leaving directory '/var/jenkins_home/workspace/PES1UG21CS596-1/main'
Finished: SUCCESS
```

 **Jenkins**

Search (CTRL+K)

PESTUG21CS596 SINCHANA S

log

Dashboard

+ New Item

People

Build History

Manage Jenkins

My Views

Build Queue

No builds in the queue

Build Executor Status

1 Idle

2 Idle

All

S	W	Name	Last Success	Last Failure	Last Duration
✓	☀	PES1UG21CS596-1	53 min <span>1</span>	N/A	9.5 sec

Icons: S W M L

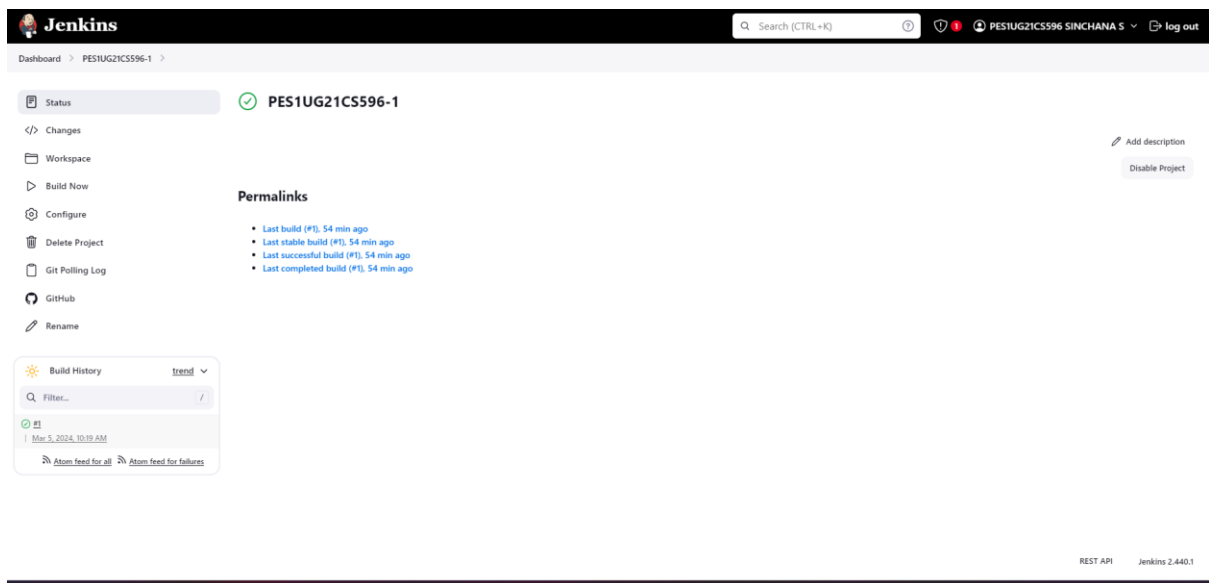
Icon legend

Atom feed for all

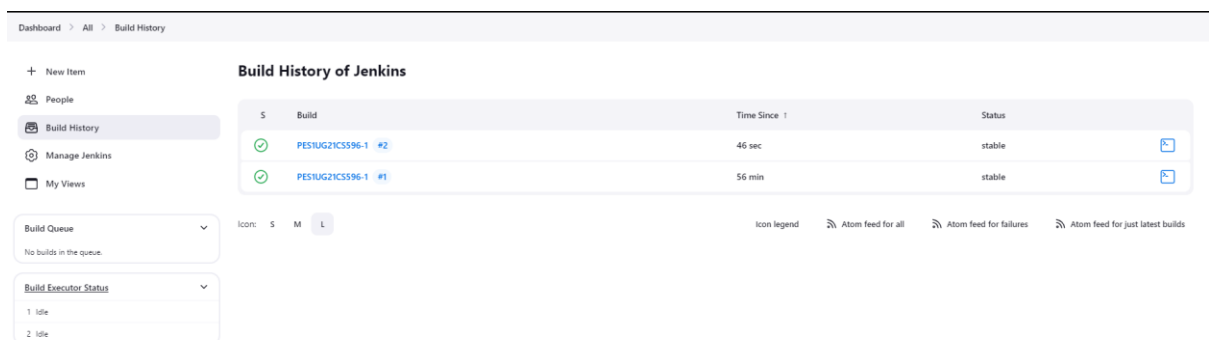
Atom feed for failures

Atom feed for just latest build

Add description



Picture showing the Stable state of the task in Build History of Jenkins



### TASK3

Aim: Set up a second job that automatically runs after the project builds. This is different from the other job because this will not have a git repository - it doesn't even build anything.

Dashboard > PES1UG21CS596-2 > #3 > Console Output

Status

Changes

Console Output

View as plain text

Edit Build Information

Delete build '#3'

Previous Build

✓ Console Output

Started by user: PES1UG21CS596 SINCHANA S  
Running as SYSTEM  
Building in workspace /var/jenkins\_home/workspace/PES1UG21CS596-2  
[PES1UG21CS596-2] \$ /bin/sh -xe /tmp/jenkins906513069521350105777.sh  
+ /var/jenkins\_home/workspace/PES1UG21CS596-1/main/hello\_mvec  
Hello, World  
This is Sinchana trying hereHello, Jenkins  
I have successfully built and run  
Finished: SUCCESS

Console output of second job

Jenkins

Search (CTRL+K)

PES1UG21CS596 SINCHANA S

log out

Dashboard > PES1UG21CS596-1 >

Status

Changes

Workspace

Build Now

Configure

Delete Project

Git Polling Log

GitHub

Rename

✓ PES1UG21CS596-1

Add description

Disable Project

Downstream Projects

PES1UG21CS596-2

Permalinks

Last build (#3), 3 min 1 sec ago

Last stable build (#3), 3 min 1 sec ago

Last successful build (#3), 3 min 1 sec ago

Last completed build (#3), 3 min 1 sec ago

Build History

trend

Filter...

Mar 5, 2024, 11:19 AM

Mar 5, 2024, 11:14 AM

Mar 5, 2024, 10:19 AM

Atom feed for all

Atom feed for failures

REST API Jenkins 2.440.1

1. Status page of first job

Jenkins

Search (CTRL+K)

PES1UG21CS596 SINCHANA S

log out

Dashboard > All > Build History

New Item

People

Build History

Manage Jenkins

My Views

Build Queue

No builds in the queue.

Build Executor Status

1 idle

2 idle

Build History of Jenkins

S	Build	Time Since 1	Status
✓	PES1UG21CS596-2 #1	28 sec	stable
✓	PES1UG21CS596-1 #3	34 sec	stable
✓	PES1UG21CS596-1 #2	5 min 11 sec	stable
✓	PES1UG21CS596-1 #1	1 hr 0 min	stable

Icon legend Atom feed for all Atom feed for failures Atom feed for just latest builds

## Build History of Jenkins

The screenshot shows the Jenkins Dashboard. On the left, there's a sidebar with navigation links: New Item, People, Build History, Manage Jenkins, and My Views. Below these are two dropdown menus: 'Build Queue' (showing 'No builds in the queue') and 'Build Executor Status' (showing '1 idle' and '2 idle'). The main area displays a table of build history for the 'PESUG21CS596' project. The table has columns for status (S), warnings (W), name, last success, last failure, and last duration. Two builds are listed: 'PESUG21CS596-1' and 'PESUG21CS596-2'. Below the table, there's an 'Icon legend' and three Atom feed links: 'Atom feed for all', 'Atom feed for failures', and 'Atom feed for just latest builds'.

S	W	Name	Last Success	Last Failure	Last Duration
✓	⚠	PESUG21CS596-1	3 min 33 sec #3	N/A	0.85 sec
✓	⚠	PESUG21CS596-2	1 min 25 sec #3	N/A	18 ms

## Jenkins Dashboard

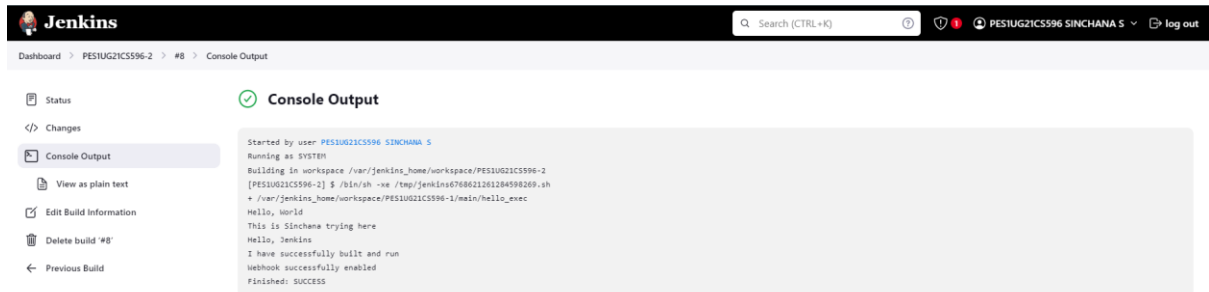
### TASK4

Aim: Add a webhook trigger to your repository in order to automate builds in Jenkins

Webhook added to your GitHub repository

The screenshot shows the GitHub repository settings page for 'jenkins\_lab'. The 'Webhooks' section is active, showing a list of webhooks. One webhook is listed with the URL 'https://362f-119-226-103-131.ngro... (push)'. The 'Add webhook' button is visible. The left sidebar shows the navigation menu with 'Webhooks' selected. The top of the page shows the repository name and navigation links. A message at the top states: 'Okay, that hook was successfully created. We sent a ping payload to test it out! Read more about it at https://docs.github.com/webhooks/#ping-event.'

Console Output of second job displaying the change made in hello.cpp file.



## TASK5

Aim: To create a basic Jenkins pipeline.

Code/script written to create basic pipeline using GitHub repository

```
pipeline {
  agent any

  stages {
    stage('Build') {
      steps {
        // Compile the .cpp file using a shell script
        echo 'Building'
        sh 'g++ -o PES1UG21CS596 main/hello.cpp'
      }
      post {
        failure {
          echo 'Pipeline failed during the build stage'
        }
      }
    }

    stage('Test') {
      steps {
        // Print output of .cpp file using a shell script

        //non existing file
        echo 'testing'
        sh './PES1UG21CS596'
      }
      post {
```

```

        failure {
            echo 'Pipeline failed during the test stage'
        }
    }
}

stage('Deploy') {
    steps {
        // Add deployment steps here, if applicable
        echo 'deploying'
    }
    post {
        failure {
            echo 'Pipeline failed during the deploy stage'
        }
    }
}


post {
    always {
        echo 'Pipeline completed'
    }
}
}





```

1. Output of working created pipeline, the screenshot should include
  - Stage view / Execution status of pipeline with all stages succeeded
  - Verify Declarative: Post Actions stage for handling failures.



```
File Edit Selection View Go Run ... Jenkins_lab-main
Jenkinsfile X
Message (Ctrl+...)
Commit
1 pipeline {
2   agent any
3
4   stages {
5     stage('Build') {
6       steps {
7         // Compile the .cpp file using a shell script
8         echo 'Building'
9         sh 'g++ -o PES1UG21CS596 main/hello.cpp'
10      }
11      post {
12        failure {
13          echo 'Pipeline failed during the build stage'
14        }
15      }
16    }
17
18    stage('Test') {
19      steps {
20        // Print output of .cpp file using a shell script
21
22        //non existing file
23        echo 'testing'
24        sh './PES1UG21CS913'
25      }
26      post {
27        failure {
28          echo 'Pipeline failed during the test stage'
29        }
30      }
31    }
32  }
33 }
```

 **Jenkins**

Search (CTRL+K)    PES1UG21CS596 SINCHANA S  log out

Dashboard > PES1UG21CS596-3 >

Status

Changes

Build Now

Configure

Delete Pipeline

Full Stage View

Rename

Pipeline Syntax

Build History trend

Filter...

Mar 6, 2024, 1:16 PM

Atom feed for all

Atom feed for failures

PES1UG21CS596-3

Add description

Disable Project

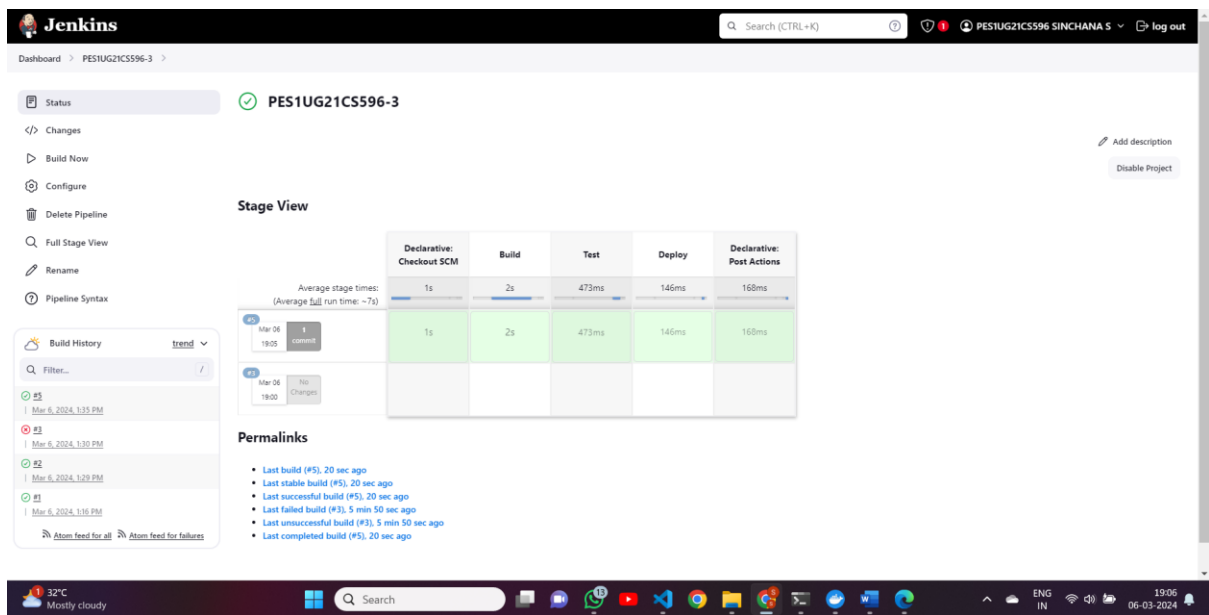
Stage View

Average stage times  
(Average full run time: ~5s)

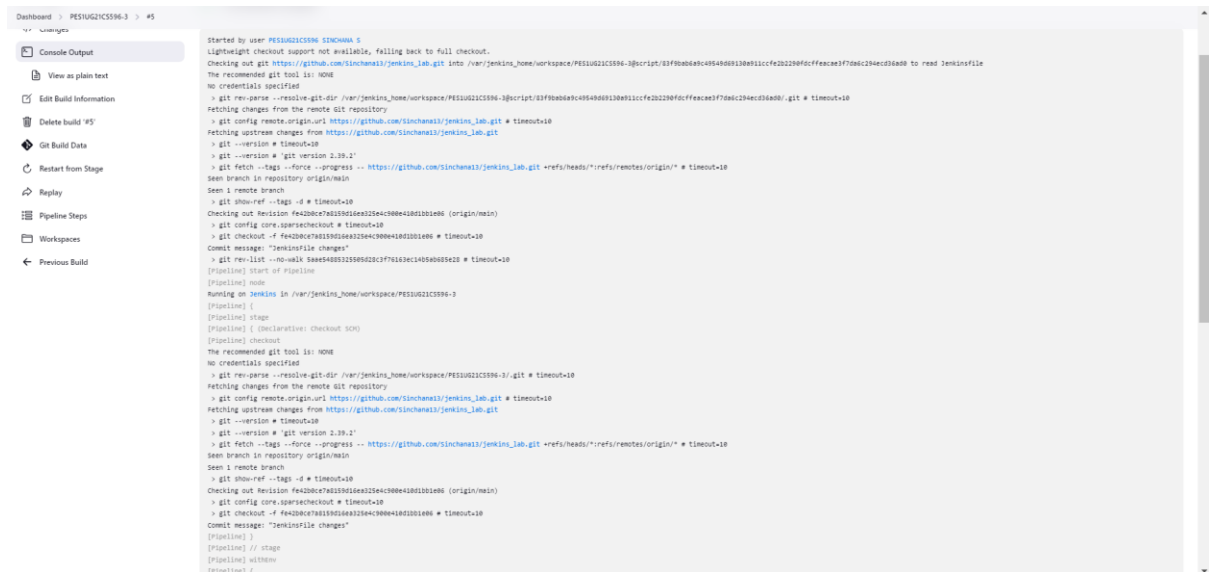
190ms

190ms

Permalinks



## Console Output of the Pipeline



```
> git config core.sparsecheckout # timeout=10
> git checkout -f fe4208ce7a8159d16a325e4c908e410d101e06 # timeout=10
Commit Message: "Jenkinsfile changes"
[Pipeline]
[Pipeline] // stage
[Pipeline] withEnv
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Build)
[Pipeline] echo
Building
[Pipeline] sh
+ g++ -o PESIU021C596 main/hello.cpp
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Test)
[Pipeline] echo
testing
[Pipeline] sh
+ ./PESIU021C596
Hello, world
This is Sinchana trying here
Hello, Jenkins
I have successfully built and run
Webhook successfully enabled
[Pipeline]
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Deploy)
[Pipeline] echo
deploying
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Declarative: Post Actions)
[Pipeline] echo
Pipeline completed
[Pipeline]
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

Link to the created GitHub repository

[https://github.com/Sinchana13/jenkins\\_lab.git](https://github.com/Sinchana13/jenkins_lab.git)

```

stages {
  stage('Build') {
    steps {
      // Compile the .cpp file using a shell script
      echo 'Building'
      sh 'g++ -o PES1UG21CS596 main/hello.cpp'
    }
    post {
      failure {
        echo 'Pipeline failed during the build stage'
      }
    }
  }

  stage('Test') {
    steps {
      // Print output of .cpp file using a shell script

      //non existing file
      echo 'testing'
      sh './PES1UG21CS913'
    }
  }
}

```

Dashboard > PES1UG21CS596-3 >

</> Changes

Build Now

Configure

Delete Pipeline

Full Stage View

Rename

Pipeline Syntax

Build History
trend

Filter...

#6  
Mar 6, 2024, 1:40 PM

#5  
Mar 6, 2024, 1:35 PM

#3  
Mar 6, 2024, 1:30 PM

#2  
Mar 6, 2024, 1:29 PM

#1  
Mar 6, 2024, 1:16 PM

Stage View

Average stage times:  
(Average full run time: ~7s)

	Declarative: Checkout SCM	Build	Test	Deploy	Declarative: Post Actions
#6 Mar 06 19:10 2 commits	1s	1s	565ms failed	114ms failed	173ms
#5 Mar 06 19:05 1 commit	1s	2s	473ms	146ms	168ms
#3 Mar 06 19:00 No Changes					

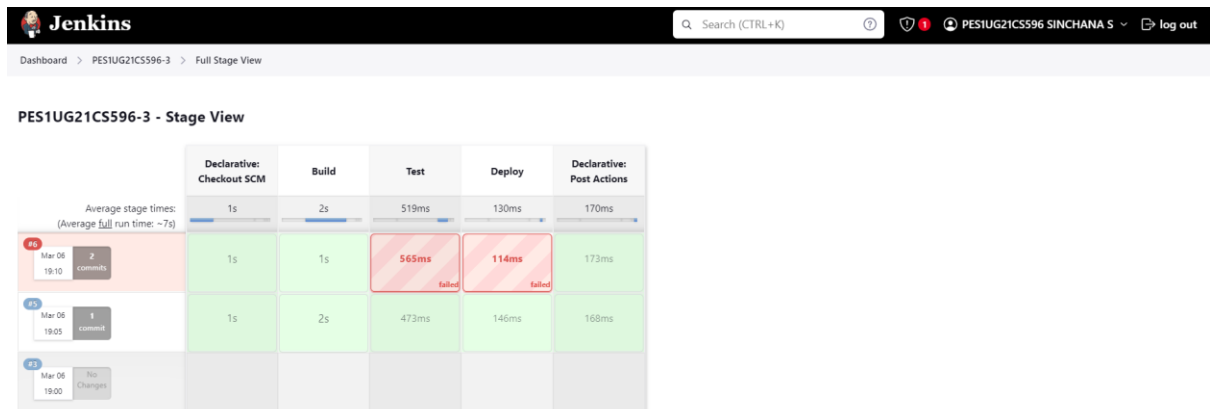
Permalinks

- Last build (#5), 4 min 34 sec ago
- Last stable build (#5), 4 min 34 sec ago
- Last successful build (#5), 4 min 34 sec ago

```

[Pipeline] sh
+ g++ -o PES1UG21CS596 main/hello.cpp
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Test)
[Pipeline] echo
testing
[Pipeline] sh
+ ./PES1UG21CS913
/var/jenkins_home/workspace/PES1UG21CS596-3/tmp/durable-963436aa/script.sh.copy: 1: ./PES1UG21CS913: not found
Post stage
[Pipeline] echo
Pipeline failed during the test stage
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Deploy)
Stage "Deploy" skipped due to earlier failure(s)
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Declarative: Post Actions)
[Pipeline] echo
Pipeline completed
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
ERROR: script returned exit code 127
Finished: FAILURE

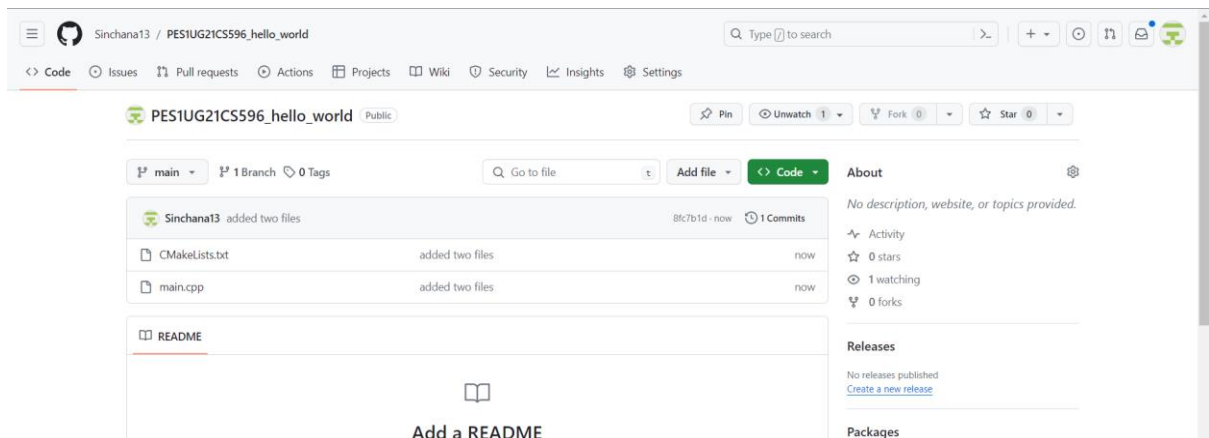
```



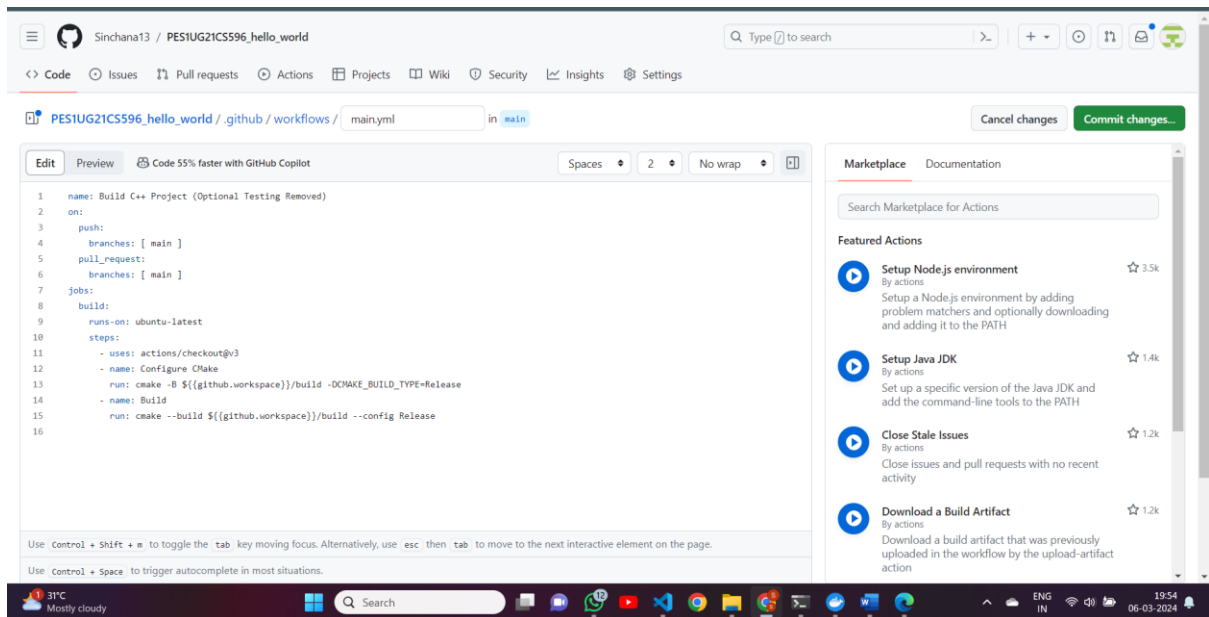
# Assignment - 4(b) GitHub Actions

## Building A CI Pipeline With GitHub Actions

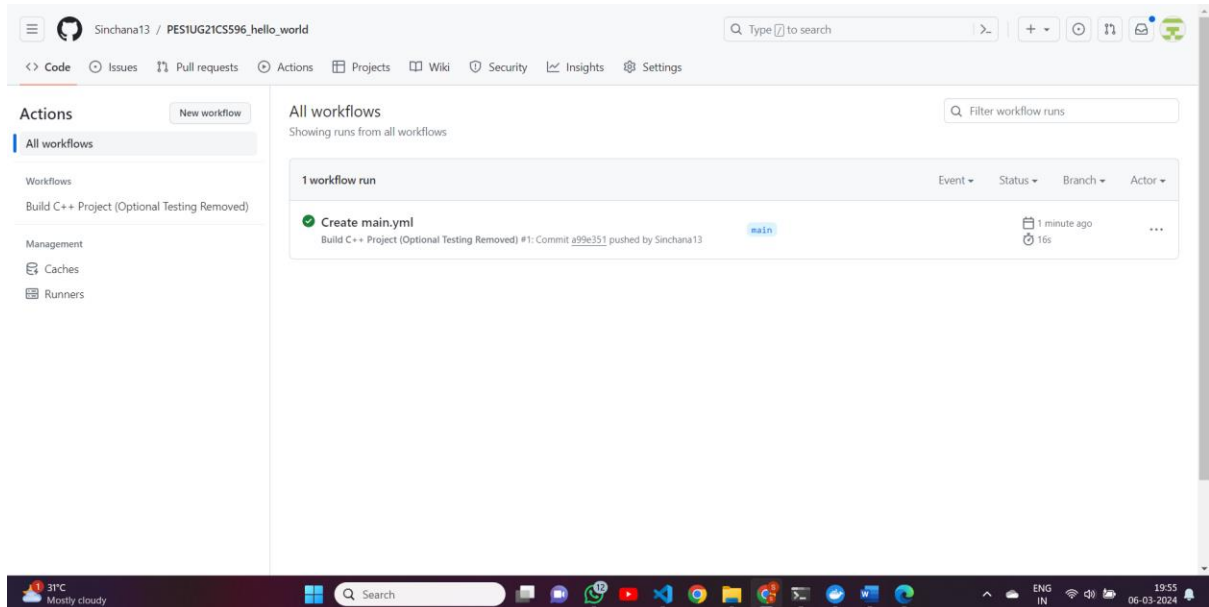
a) Take a screenshot of the repository in the manner given below after the two files have been uploaded onto the repository and name it (a)



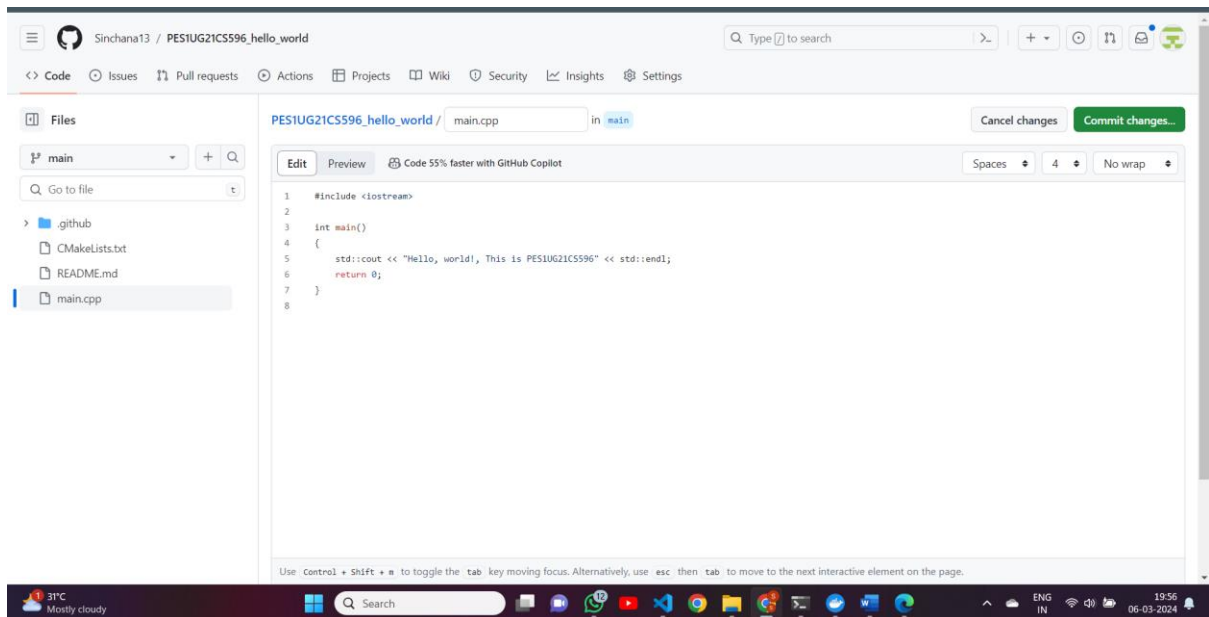
(b) Take a screenshot of the code after it has been pasted onto the workflow and name it (b)



(c). Take a screenshot as given below indicating that the build is successful and name it (c)



(d) Take a screenshot as given below after making the change in the main.cpp file and name it (d)



(e) Take a screenshot of the status of the build after it has passed and name it (e)

