**Lab01 :**

**Writecodeforasimpleuserregistration formforanevent.**

```
<divclass="container">
   <h1>EventRegistrationForm</h1>
   <form name="Registration" class="registartion-
form"onsubmit="returnformValidation()">
      <table>
         <tr>
            <td><labelfor="name">Name:</label></td>
            <td><inputtype="text"name="name"id="name"placeholder=
"yourname"></td>
         </tr>
         <tr>
            <td><labelfor="email">Email:</label></td>
            <td><inputtype="text"name="email"id="email"placeholder="youremail"><
/td>
         </tr>
         <tr>
            <td><labelfor="password">Password:</label></td>
            <td><input type="password"
name="password"id="password"></td>
         </tr>
         <tr>
            <td><labelfor="phoneNumber">PhoneNumber:</label></td>
            <td><inputtype="number"name="phoneNumber"id="phoneNumber"></td>
         </tr>
         <tr>
            <td><labelfor="gender">Gender:</label></td>
            <td>Male:<inputtype="radio"name="gender"value="male">
               Female: <input type="radio"
name="gender"value="female">
               Other: <input type="radio"
name="gender"value="other"></td>
         </tr>
         <tr>
            <td><labelfor="language">language</label></td>
            <td>
               <selectname="language"id="language">
```

```
                <optionvalue="">Selectlanguage</option>
                <optionvalue="English">English</option>
                <optionvalue="Spanish">Spanish</option>
                <optionvalue="Hindi">Hindi</option>
                <optionvalue="Arabic">Arabic</option>
                <optionvalue="Russian">Russian</option>
              </select>
            </td>
          </tr>
          <tr>
            <td><labelfor="zipcode">ZipCode:</label></td>
            <td><input type="number"
name="zipcode"id="zipcode"></td>
          </tr>
          <tr>
            <td><labelfor="about">About:</label></td>
            <td><textareaname="about"id="about"placeholder="Writeaboutyourself..."
></textarea></td>
          </tr>
          <tr>
            <td colspan="2"><input type="submit"
class="submit"value="Register"/></td>
          </tr>
        </table>
    </form>
</div>
```

# Event Registration Form

Name: your name

Email: your email

Password:

Phone Number:

Gender: Male: Female: Other:

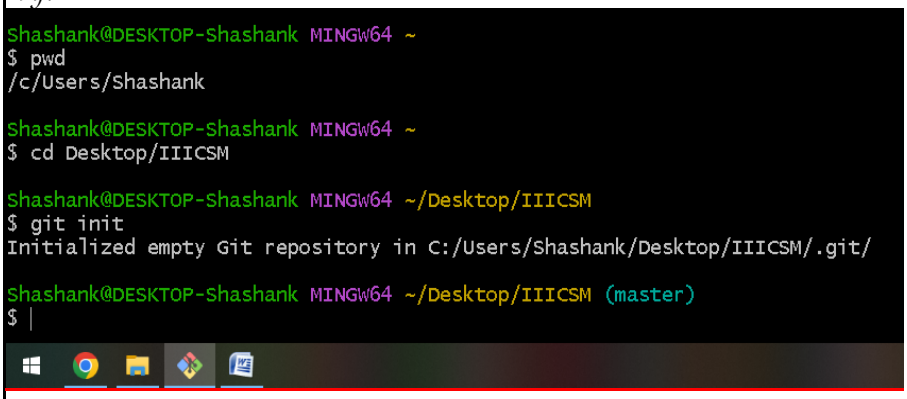
language Select language

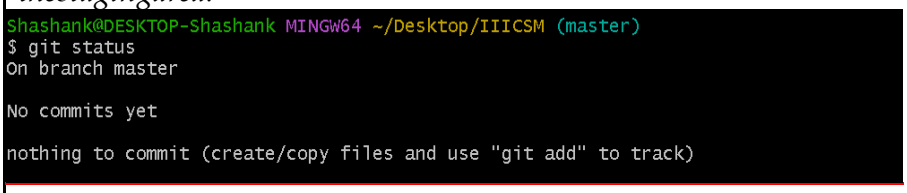
Zip Code:

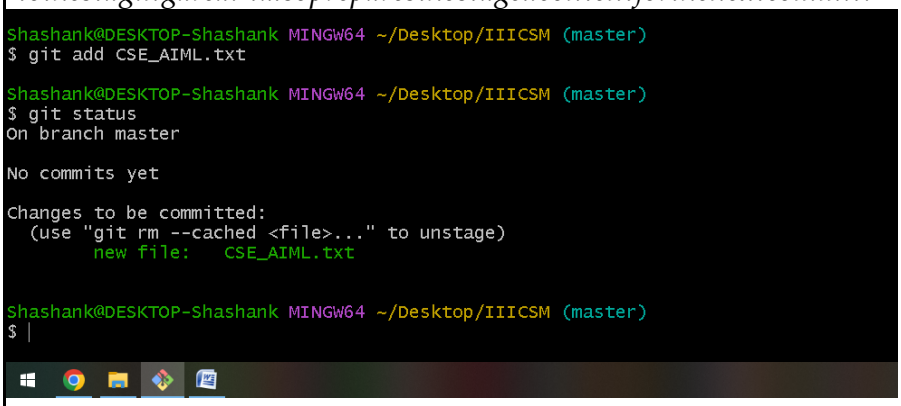
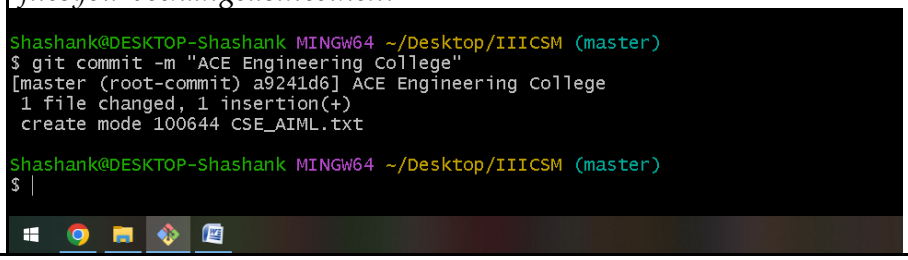
About: Write about yourself...

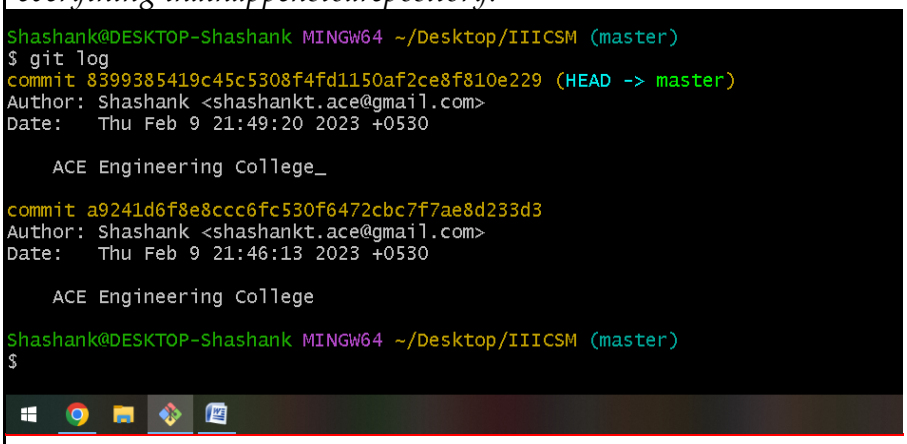
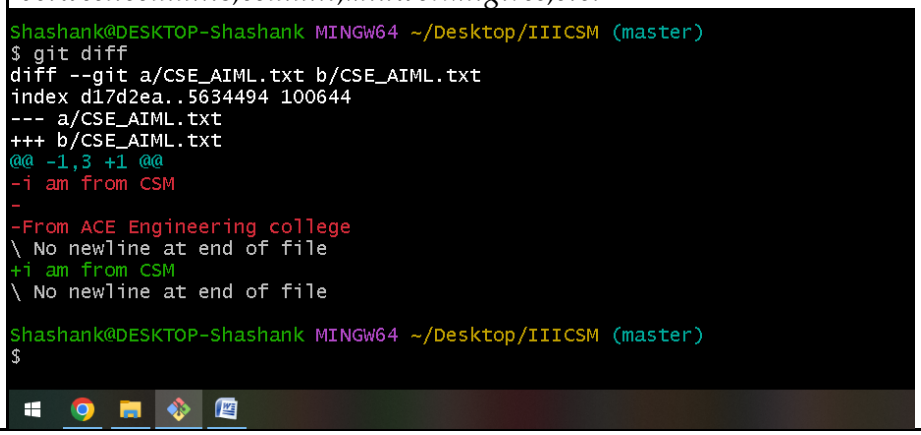
Register

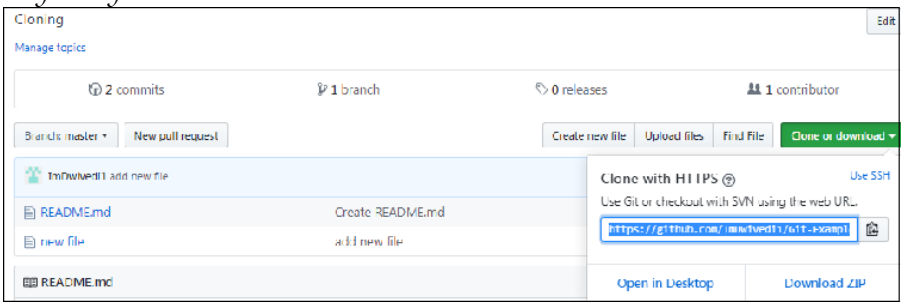
**Lab02 :**
**ExploreGitandGithubcommands.**

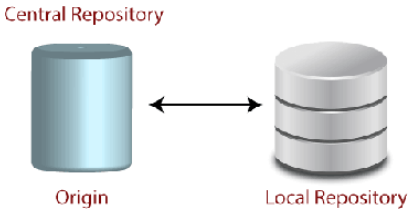
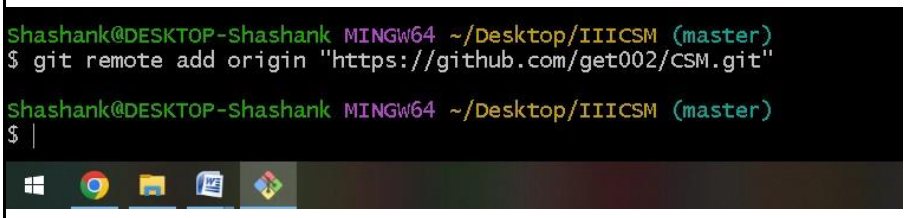
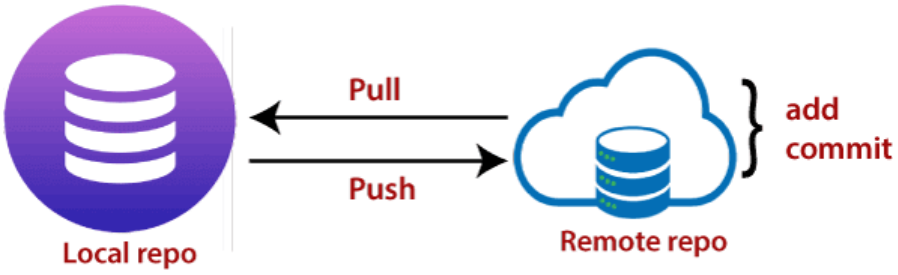
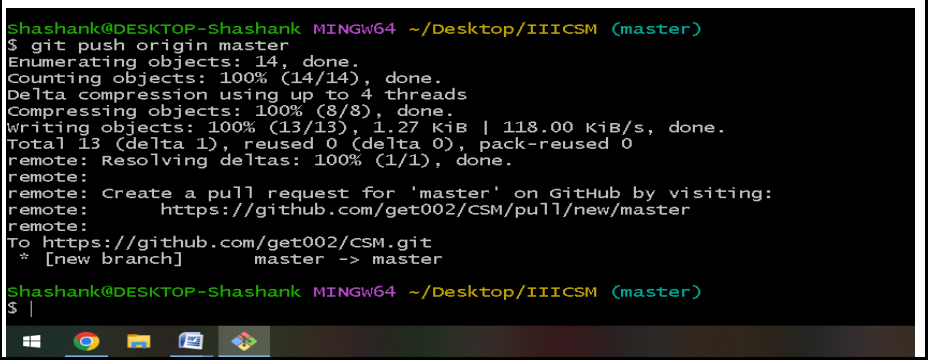
| | |
|---|---|
| GitEnvironmentSetup-GitConfigcommand | *Git supports a command called git config that lets you get and setconfigurationvariablesthatcontrolallfacetsofhowGitlooksandoperates .ItisusedtosetGitconfigurationvaluesonaglobalorlocal projectlevel. Setting user.name and user.email are the necessary configuration options asyournameandemailwill showupinyourcommitmessages.*<br>`$ git config --global user.name "Himanshu Dubey"`<br>`$ git config --global user.email "himanshudubey481@gmail.com"` |
| Gitinitcommand | *Thiscommandisusedtocreatealocalrepository. Thegitinitcommandisthefirstcommandthatyouwill runonGit.Thegitinitcommandisusedtocreateanewblankreposito ry.*<br>  |

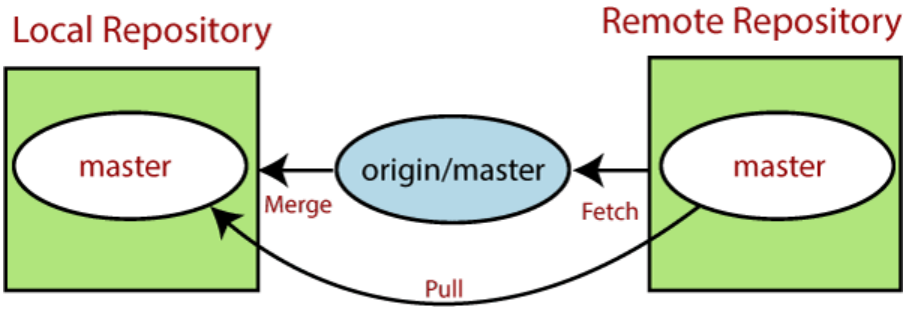
| | |
|---|---|
| Git statuscommand | *Thestatuscommandisusedtodisplaythestateoftheworkingdirectoryandthestagingarea.*  |

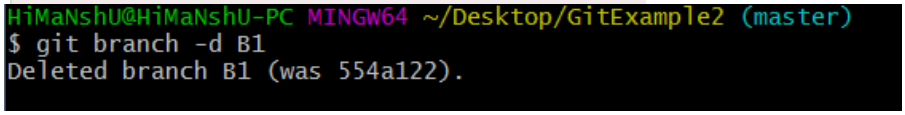
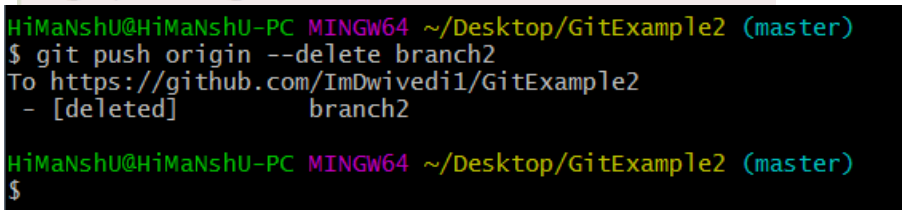
| | |
|---|---|
| Gitaddcommand | *This commandis usedtoaddone ormore filestostaging(Index) area.The git add command is used to add file contents to the Index (StagingArea). This command updates the current content of the working tree tothestagingarea.Italsopreparesthestagedcontentforthenextcommit.*  |
| Gitcommitcommand | *It is used to record the changes in the repository. It is the next commandafterthegitadd.Thiscommandcommitsany filesaddedwithgitaddintherepositoryandalso commitsany filesyou'vechangedsincethen.*  |

| | |
|---|---|
| Gitlogcommand | *Thiscommandisusedtocheckthecommithistory.*<br>*Git log is a utility tool to review and read a history of everything thathappenstoarepository.*<br>  |
| GitDiffcommand | *Itcomparesthedifferentversionsofdatasources.*<br>*Git diff is a command-line utility. It's a multi use Git command. When it isexecuted,itrunsadifffunctiononGitdatasources.Thesedatasourcescanbe files, branches, commits, and more. It is used to show changes betweencommits,commit,andworkingtree,etc.*<br>  |

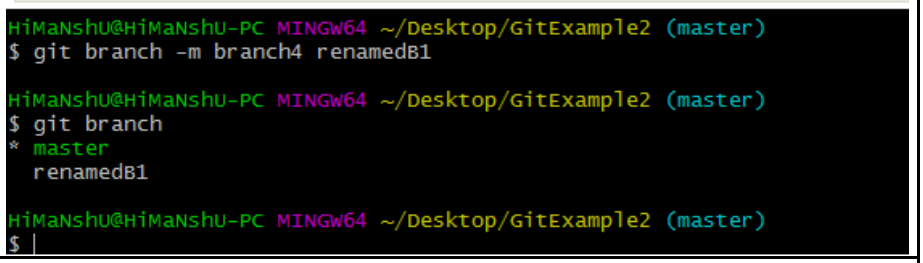
| | |
|---|---|
| GitClone | *In Git, cloning is the act of making a copy of any target repository.Thetargetrepository canberemoteorlocal. Youcancloneyourrepositoryfromtheremoterepositorytocreatealocalcopy onyoursystem.*<br>  <br><br>$ git clone https://github.com/ImDwivedi1/Git-Example.git |

| | |
|---|---|
| GitOriginMaster | *In Git, The term origin is referred to the remote repository where you wanttopublishyourcommits. Thedefaultremoterepositoryiscalledorigin,althoughyoucanworkwithsev eralremoteshavingadifferentnameatthesametime. The origin is a short name for the remote repository that a project wasinitiallybeingcloned.ItisusedinplaceoftheoriginalrepositoryURL.T hus,itmakesreferencingmucheasier.*<br>  <br>  |
| GitPushCommand | *The push term refers to upload local repository content to a remoterepository.Pushingisanactoftransfercommitsfromyourlocalrepo sitoryto a remote repository. Pushing is capable of overwriting changes; cautionshouldbetaken whenpushing.*<br>  <br>  |

| | |
|---|---|
| GitPullCommand | *The term pull is used to receive data from GitHub. It fetches and mergeschanges from the remote server to your working directory. The git pullcommandisused topull arepository.*<br>  <br>`Shashank@DESKTOP-Shashank MINGW64 ~/Desktop/IIICSM (master)`<br>`$ git pull origin main`<br>`From https://github.com/get002/CSM`<br>`* branch main -> FETCH_HEAD`<br>`fatal: refusing to merge unrelated histories`<br><br>`Shashank@DESKTOP-Shashank MINGW64 ~/Desktop/IIICSM (master)`<br>`$ git pull origin main --allow-unrelated-histories`<br>`From https://github.com/get002/CSM`<br>`* branch main -> FETCH_HEAD`<br>`Merge made by the 'ort' strategy.`<br>`README.md \| 1 +`<br>`1 file changed, 1 insertion(+)`<br>`create mode 100644 README.md`<br><br>`Shashank@DESKTOP-Shashank MINGW64 ~/Desktop/IIICSM (master)`<br>`$` |
| GitFetchc ommand | *Git"fetch"Downloadscommits,objectsandrefsfromanotherrepository.It fetches branches and tags from one or more repositories. It holdsrepositories along with the objects that are necessary to complete theirhistoriestokeepupdatedremote-trackingbranches.*<br>`HiMaNshU@HiMaNshU-PC MINGW64 ~/Desktop/Git-Example (master)`<br>`$ git fetch https://github.com/ImDwivedi1/Git-Example.git`<br>`warning: no common commits`<br>`remote: Enumerating objects: 6, done.`<br>`remote: Counting objects: 100% (6/6), done.`<br>`remote: Compressing objects: 100% (4/4), done.`<br>`remote: Total 6 (delta 0), reused 0 (delta 0), pack-reused 0`<br>`Unpacking objects: 100% (6/6), done.`<br>`From https://github.com/ImDwivedi1/Git-Example` |

| | |
|---|---|
| OperationsonBranches-CreateBranch | *You can create a new branch with the help of the git branch command. Thiscommandwill beusedas:*<br>`$ git branch <branch name>`<br>  |
| ListBranch | *YoucanListalloftheavailablebranchesinyourrepositorybyusingthefollowingcommand.*<br>*Either we can use git branch - list or git branch command to list theavailablebranchesintherepository.*<br>`$ git branch --list`<br>  |
| OperationsonBranches-DeleteBranch | *You can delete the specified branch. It is a safe operation. In this command,Gitpreventsyoufromdeletingthebranchifithasunmergedchanges.*<br>`$ git branch -d <branch name>`<br>  |
| OperationsonBranches-DeleteaRemote Branch | *YoucandeletearemotebranchfromGitdesktopapplication.*<br>`$ git push origin -delete <branch name>`<br>  |

**Date:**

| | |
|---|---|
| OperationsonBranches - SwitchBranch | *Gitallowsyoutoswitchbetween thebrancheswithoutmakingacommit.Youcanswitchbetweentwobranchesswiththegitcheckoutcommand.*<br>$ git branch -m <old branch name> <new branch name><br>  <br> |
| | |

Lab03 :

**PracticesourcecodemanagementonGitHub.Experimentwiththesourcecodewritteninexercise1.**

Check the statusoflocalrepositoryusinggitstatuscommand,

```
Shashank@DESKTOP-Shashank MINGW64 ~/Desktop/WebProject (master)
$ git status
On branch master

No commits yet

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        index.html

nothing added to commit but untracked files present (use "git add" to track)
```

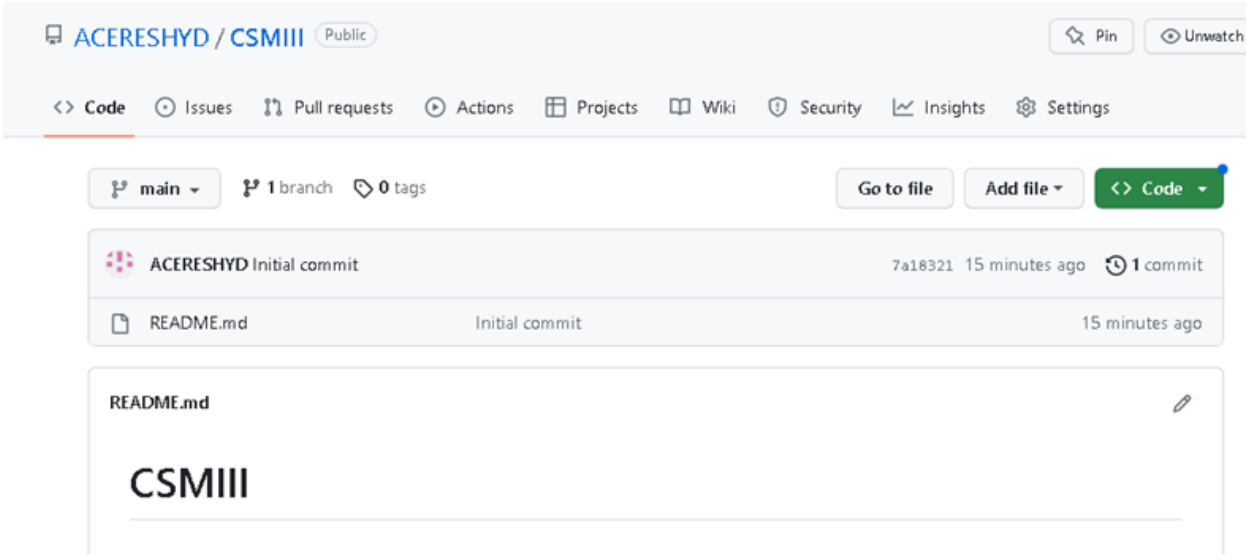
Thereisafileindex.htmlatworkingarea, Usegitaddcommandtoaddonstagingarea. Thencommitthe changesonlocalrepositoryusinggitcommitcommand.

```
Shashank@DESKTOP-Shashank MINGW64 ~/Desktop/WebProject (master)
$ git add index.html

Shashank@DESKTOP-Shashank MINGW64 ~/Desktop/WebProject (master)
$ git commit -m "index file"
[master (root-commit) dab7375] index file
 1 file changed, 92 insertions(+)
 create mode 100644 index.html
```

```
Shashank@DESKTOP-Shashank MINGW64 ~/Desktop/WebProject (master)
$ git log
commit dab7375858be19f5a9c3b7e35a230bdbe344a9b6 (HEAD -> master)
Author: Shashank <shashankt.ace@gmail.com>
Date:   Fri Mar 31 18:39:32 2023 +0530

    index file

Shashank@DESKTOP-Shashank MINGW64 ~/Desktop/WebProject (master)
$ git status
On branch master
nothing to commit, working tree clean
```

Allchangesupdatedonlocalrepository.

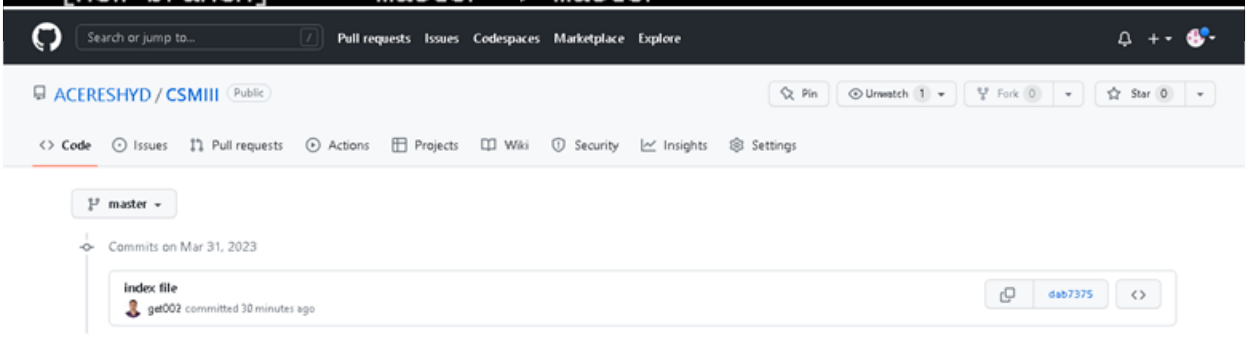
Nowtopushthesechangesonremoterepository,firstcreatearemoterepository.




```
Shashank@DESKTOP-Shashank MINGW64 ~/Desktop/WebProject (master)
$ git remote add origin git@github.com:ACERESHYD/CSMIII.git
```

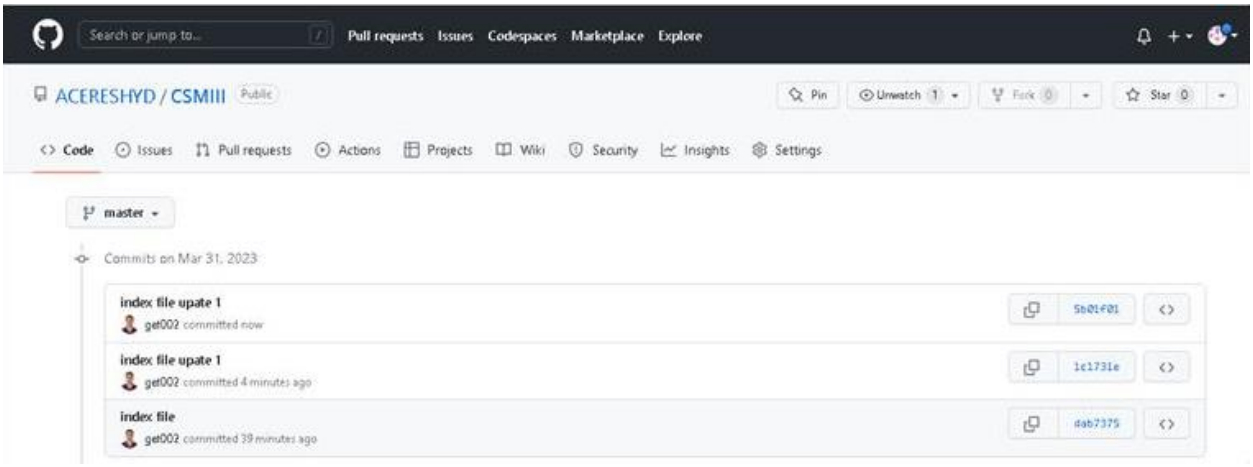
Nowpushthechangesfromlocalrepositoryto remoterepositoryusing gitpushoriginmaster

```
Shashank@DESKTOP-Shashank MINGW64 ~/Desktop/WebProject (master)
$ git push origin master
Enumerating objects: 3, done.
Counting objects: 100% (3/3), done.
Delta compression using up to 4 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 1018 bytes | 169.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
remote:
remote: Create a pull request for 'master' on GitHub by visiting:
remote:      https://github.com/ACERESHYD/CSMIII/pull/new/master
remote:
To github.com:ACERESHYD/CSMIII.git
 * [new branch]      master -> master
```



***Task : Makes atleast 6 commits on your remote repository from git bash and alsofromgithub topractisesourcecodemanagement.***

```
Shashank@DESKTOP-Shashank MINGW64 ~/Desktop/WebProject (master)
$ git add index.html

Shashank@DESKTOP-Shashank MINGW64 ~/Desktop/WebProject (master)
$ git commit -m "index file upate 1"
[master 1c1731e] index file upate 1
 1 file changed, 1 insertion(+), 1 deletion(-)

Shashank@DESKTOP-Shashank MINGW64 ~/Desktop/WebProject (master)
$ git push origin master
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 4 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 282 bytes | 94.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To github.com:ACERESHYD/CSMIII.git
   dab7375..1c1731e  master -> master

Shashank@DESKTOP-Shashank MINGW64 ~/Desktop/WebProject (master)
$ git log
commit 1c1731eef8150d21459a893f660aa0e603d9db7b (HEAD -> master, origin/master)
Author: Shashank <shashankt.ace@gmail.com>
Date:   Fri Mar 31 19:14:24 2023 +0530

    index file upate 1

commit dab7375858be19f5a9c3b7e35a230bdbe344a9b6
Author: Shashank <shashankt.ace@gmail.com>
Date:   Fri Mar 31 18:39:32 2023 +0530

    index file
```




Here**HEAD**alwaysrepresentcurrentcommitcontent.Nowcomparing latestcommitwiththepreviouscommitusinggitdiffcommand

```
Shashank@DESKTOP-Shashank MINGW64 ~/Desktop/WebProject (master)
$ git diff 5b01f017 1c1731ee
diff --git a/index.html b/index.html
index 377aeea..f76e7b0 100644
--- a/index.html
+++ b/index.html
@@ -6,7 +6,6 @@
 <h2 align="center"> An Autonomous institute</h2>
 <hr/>
 <title>Student Registration Form</title>
-<hr/>
 <style type="text/css">
 th {
```

Code Issues Pull requests Actions Projects Wiki Security Insights Settings

index file upate 1

master

Browse files

get002 committed 12 minutes ago

1 parent 1c1731e commit 5b01f01

Showing 1 changed file with 1 addition and 0 deletions.

Split Unified

1 index.html

```
@@ -6,6 +6,7 @@ <h1 align="center">ACE Engineering College </h1>
6  6   <h2 align="center"> An Autonomous institute</h2>
7  7   <hr/>
8  8   <title>Student Registration Form</title>
   9 + <hr/>
9  10  <style type="text/css">
10 11  th {
11 12          color: #FFF;
```

0 comments on commit 5b01f01

Lock conversation

**Lab04:**

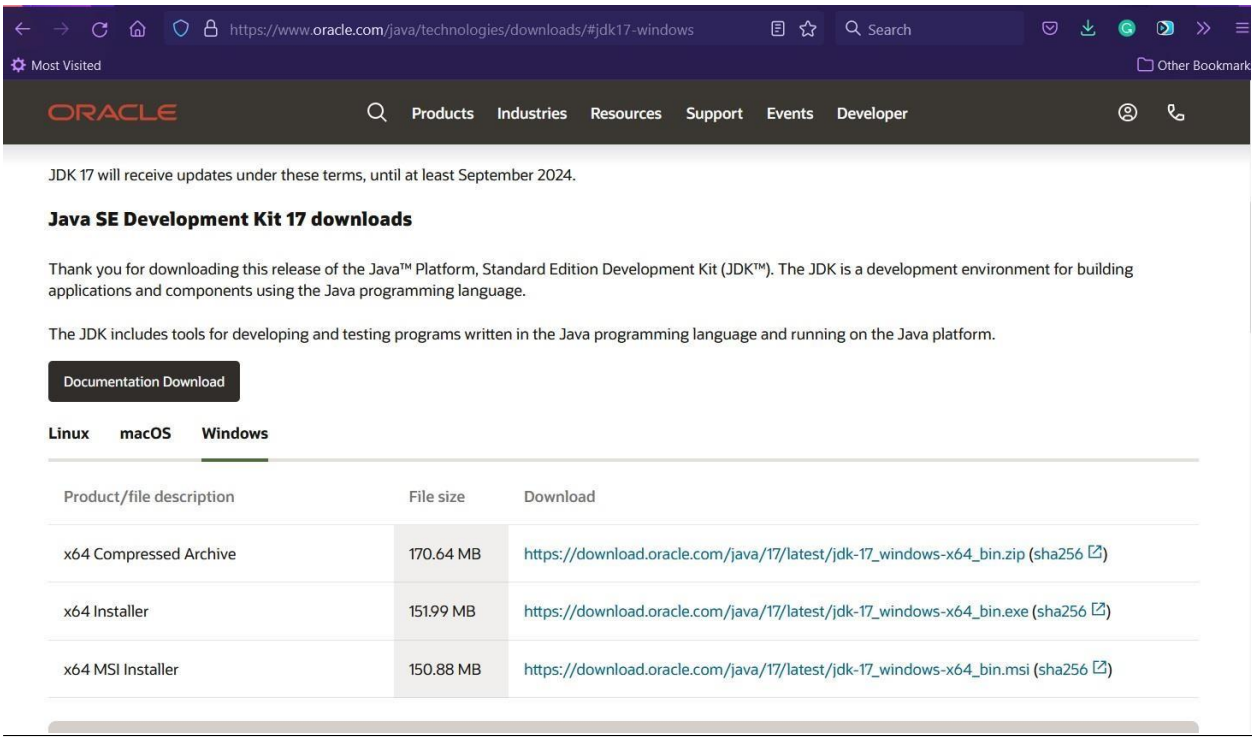
**Jenkinsinstallationandsetup,exploretheenvironment.**

- JenkinsisanopensourceautomationtoolwritteninJavaprogramminglanguage.
- Jenkinsisfreeandallowscontinuousintegration.
- Whatiscontinuousintegration?
    - Continuous integration refers to the build and unit testing stages of the softwarereleaseprocess.Everyrevisionthatiscommittedtriggersanautomatedbuildandtest. With continuous delivery, code changes are automatically built, tested, andpreparedforarelease toproduction.
- Jenkins isaserverbasedapplicationandrequiresawebserverlikeApacheTomcat.
- Jenkinsbuildsandtestsoursoftwareprojectscontinuously.
    - Thisisthe mainreasonforJenkinstobecameso popular,continouslymonitoringofrepeatedtaskswhicharise duringthe developmentofaproject.
    - Example,ifyour teamisdevelopingaproject,Jenkinswillcontinuouslytestyourprojectbuildsand showyoutheerrorsinearlystagesofyourdevelopment.
- BenefitsofusingJenkinsCI
    - **ReducedDevelopmentCycle –** Sinceeverycommitisbuiltandtested,itallowsreleasingnewfeaturestothe userfasterandwithfewererrors.
    - **Shorter Time to Integrate Code –** Before the use of Jenkins CI, integration ofcode was done manually, thus taking a few days. In some cases, it might happenthatthecodeis notrunning,anditishardtodebugasitmighthavegonethroughvarious commits in the repository. Integrating code after every commit ensuresthatthefunctionalityisnotbrokenafteracommit.
    - **Faster Feedback Loops –** Developers get feedback and improve the codewheneveratestbreaksduringacommit. Otherwise,debuggingtheissuecanbeverydifficult, giventeamswouldnotbesurewhichcommitresultedinthebug.
    - **Automated Workflow –** Teams should not worry about running a manual test foreach commit. The Jenkins CI pipeline checks the latest code and builds the codealong with the tests. The test can deploy the project in a specific environment if itisgreen.Itcannotifythe developerbybreakingthe build.

**Jenkinsinstallation**

**InstallJavaVersion8**

- SinceJenkinsisaJavabasedapplication,thereforeJavaisamust.
- Downloadjava8fromthe belowlink:https://www.oracle.com/java/technologies /downloads/#java8
- TheninstalltheJavaasfollows:


https://www.oracle.com/java/technologies/downloads/#jdk17-windows
Search
Most Visited
Other Bookmarks
ORACLE
Products
Industries
Resources
Support
Events
Developer
JDK 17 will receive updates under these terms, until at least September 2024.
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Thank you for downloading this release of the Java™ Platform, Standard Edition Development Kit (JDK™). The JDK is a development environment for building applications and components using the Java programming language.
The JDK includes tools for developing and testing programs written in the Java programming language and running on the Java platform.
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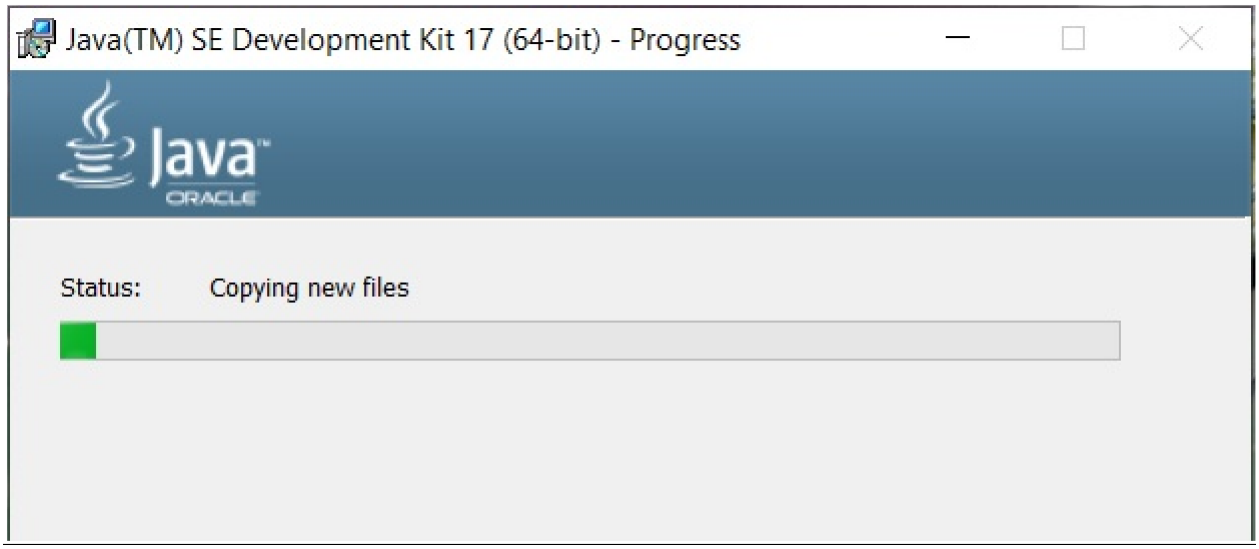
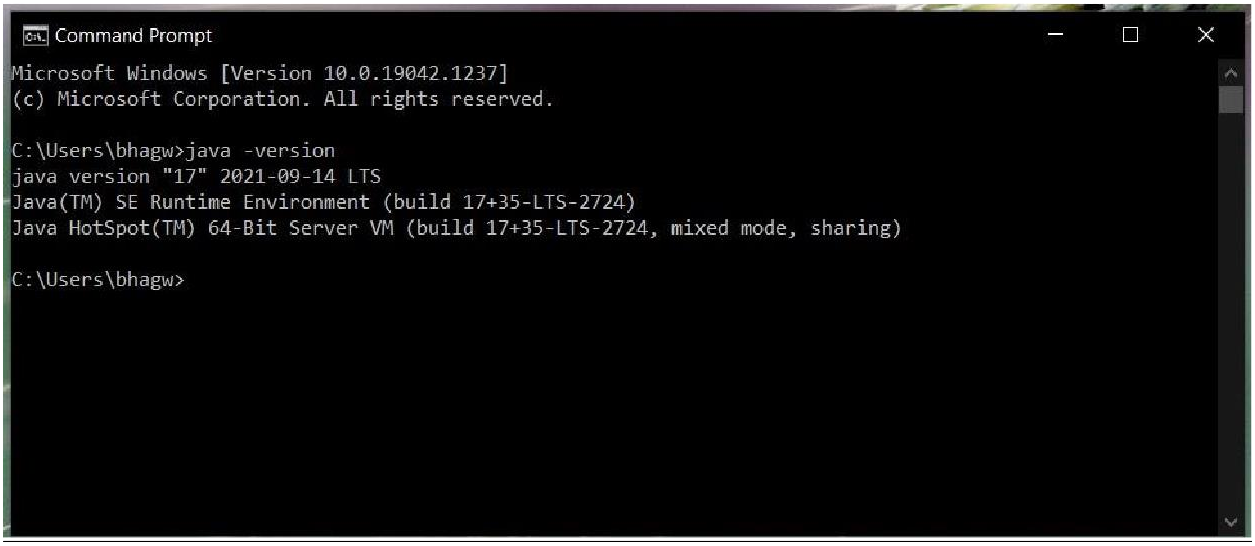
https://download.oracle.com/java/17/latest/jdk-17_windows-x64_bin.msi (sha256)


Java(TM) SE Development Kit 17 (64-bit) - Setup
Java
ORACLE
Welcome to the Installation Wizard for Java SE Development Kit 17
This wizard will guide you through the installation process for the Java SE Development Kit 17.
Next >
Cancel


Java(TM) SE Development Kit 17 (64-bit) - Destination Folder
Java
ORACLE
Java(TM) SE Development Kit 17 (64-bit), including a private JRE and src.zip. This will require 420MB on your hard drive. Click the "Change" button to change the installation folder.
Install Java(TM) SE Development Kit 17 (64-bit) to:
C:\java\oracle\jdk-17\
Change...
Back
Next
Cancel

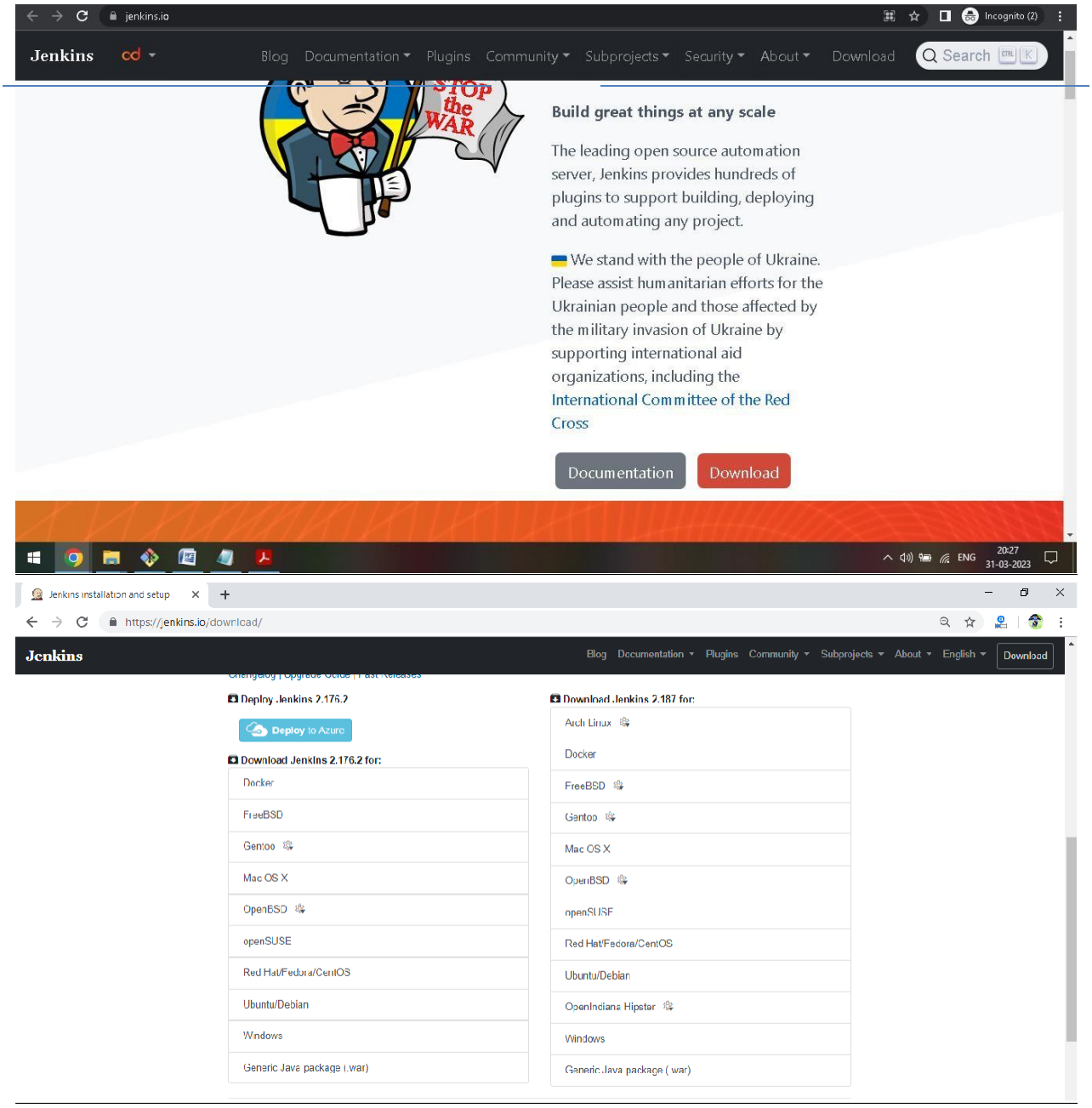

Java(TM) SE Development Kit 17 (64-bit) - Progress
Java
ORACLE
Status:
Copying new files


Java(TM) SE Development Kit 17 (64-bit) - Complete
Java
ORACLE
Java(TM) SE Development Kit 17 (64-bit) Successfully Installed
Click Next Steps to access tutorials, API documentation, developer guides, release notes and more to help you get started with the JDK.
Next Steps
Close


Command Prompt
Microsoft Windows [Version 10.0.19042.1237]
(c) Microsoft Corporation. All rights reserved.
C:\Users\bhagw>java -version
java version "17" 2021-09-14 LTS
Java(TM) SE Runtime Environment (build 17+35-LTS-2724)
Java HotSpot(TM) 64-Bit Server VM (build 17+35-LTS-2724, mixed mode, sharing)
C:\Users\bhagw>

## DownloadJenkinswarFile

Downloadfromthefollowinglin
khttps://www.jenkins.io/




- ClickonGenericJavaPackage(.war)todownloadtheJenkinswarfile.
- OpenthecommandpromptandgotothedirectorywheretheJenkins.warfileis located.Andthenrunthefollowingcommand:

  **C:/Java-jarJenkins.war**

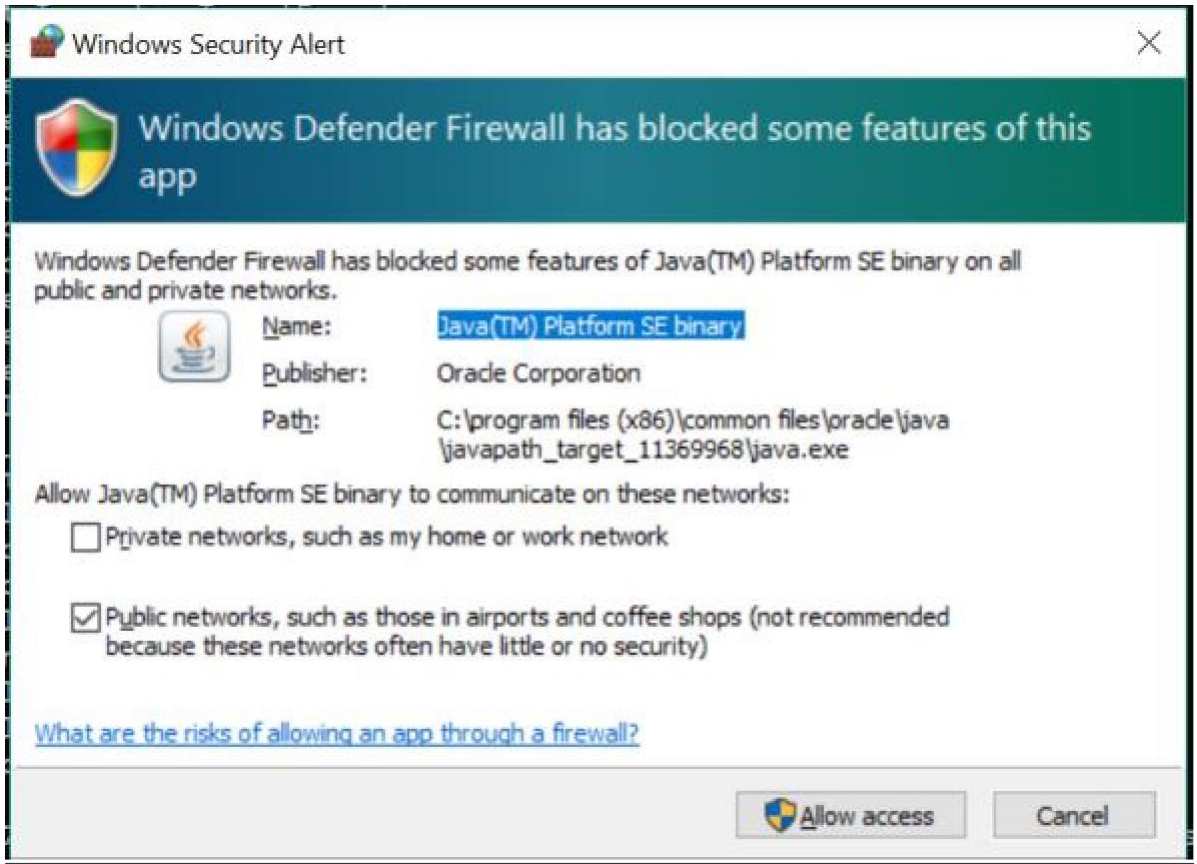
- When you runthiscommand,varioustaskswillrun,oneofwhich

istheextractionofthewarfile
whichisdonebyanembeddedwebservercalledwinstone.

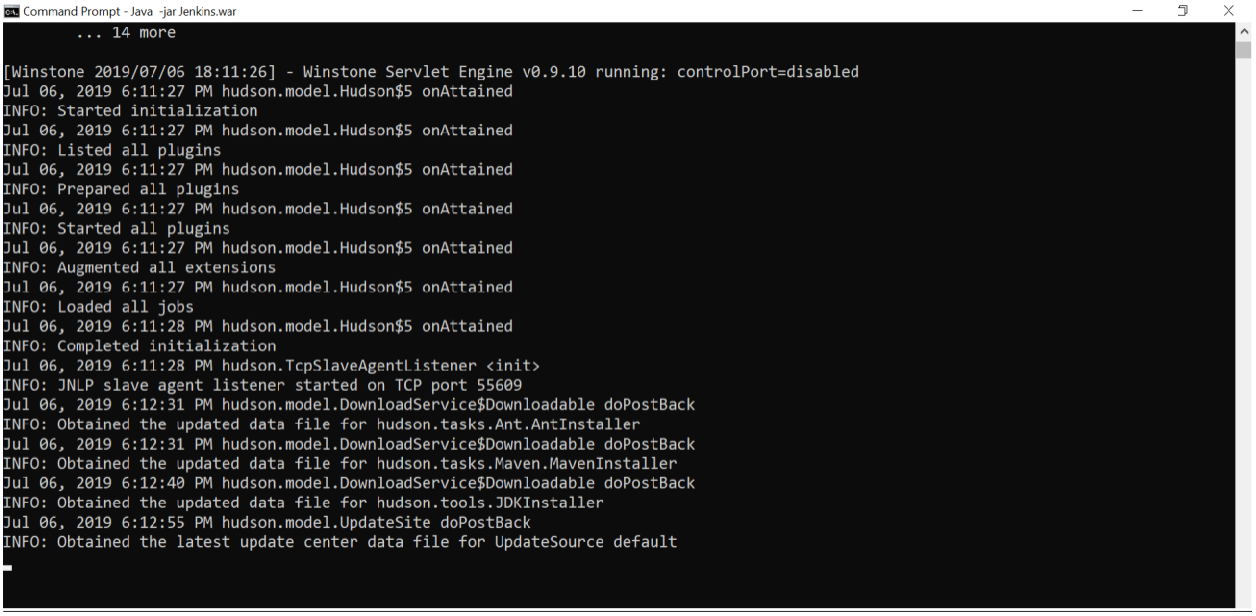
```
Command Prompt - Java -jar Jenkins.war
Microsoft Windows [Version 10.0.17134.765]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Nikita>cd c:\jenkins tutorial

c:\Jenkins Tutorial>Java -jar Jenkins.war
Running from: C:\Jenkins Tutorial\jenkins.war
webroot: $user.home/.jenkins
[Winstone 2019/07/06 18:11:26] - Beginning extraction from war file
hudson home directory: C:\Users\Nikita\.jenkins found at: $user.home/.jenkins
[Winstone 2019/07/06 18:11:26] - HTTP Listener started: port=8080
[Winstone 2019/07/06 18:11:26] - AJP13 Listener started: port=8009
Using one-time self-signed certificate
[Winstone 2019/07/06 18:11:26] - Error starting listener instance
java.lang.reflect.InvocationTargetException
        at sun.reflect.NativeConstructorAccessorImpl.newInstance0(Native Method)
        at sun.reflect.NativeConstructorAccessorImpl.newInstance(Unknown Source)
        at sun.reflect.DelegatingConstructorAccessorImpl.newInstance(Unknown Source)
        at java.lang.reflect.Constructor.newInstance(Unknown Source)
        at winstone.Launcher.spawnListener(Launcher.java:232)
        at winstone.Launcher.<init>(Launcher.java:205)
        at winstone.Launcher.main(Launcher.java:391)
        at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
        at sun.reflect.NativeMethodAccessorImpl.invoke(Unknown Source)
        at sun.reflect.DelegatingMethodAccessorImpl.invoke(Unknown Source)
        at java.lang.reflect.Method.invoke(Unknown Source)
        at Main._main(Main.java:214)
        at Main.main(Main.java:61)
Caused by: java.lang.NoClassDefFoundError: sun/security/x509/CertAndKeyGen
        at winstone.ssl.HttpsListener.<init>(HttpsListener.java:111)
        ... 13 more
Caused by: java.lang.ClassNotFoundException: sun.security.x509.CertAndKeyGen
```




Clickon**Allowaccess**buttontoallowtheaccess.

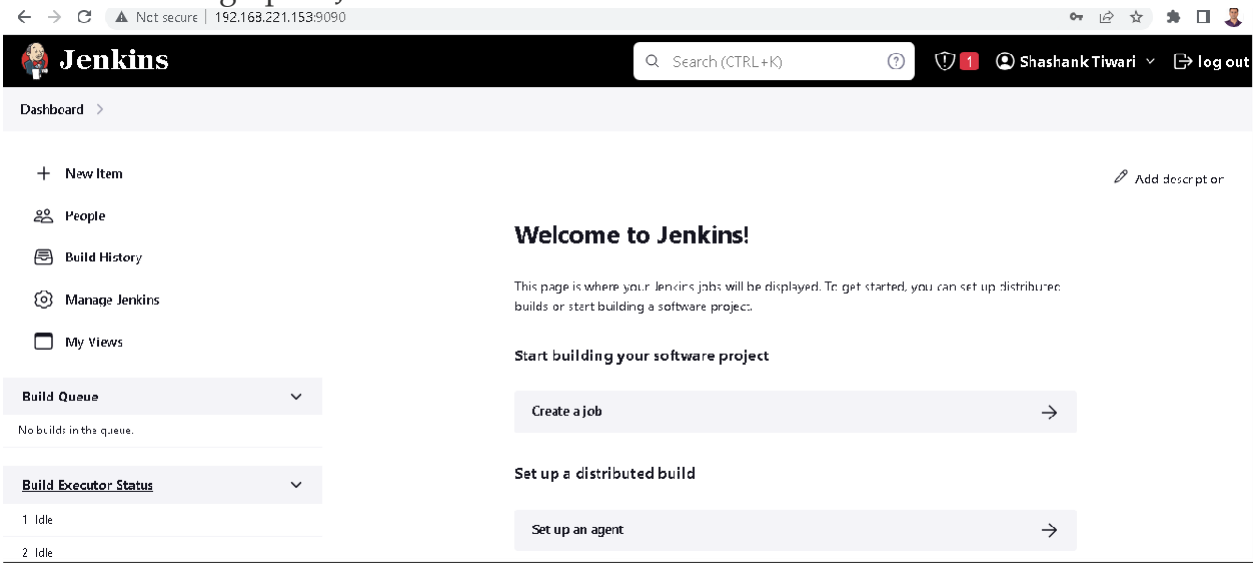



## AccessingJenkins

NowyoucanaccesstheJenkins.Openyour browser andtypethefollowing urlonyourbrowser:

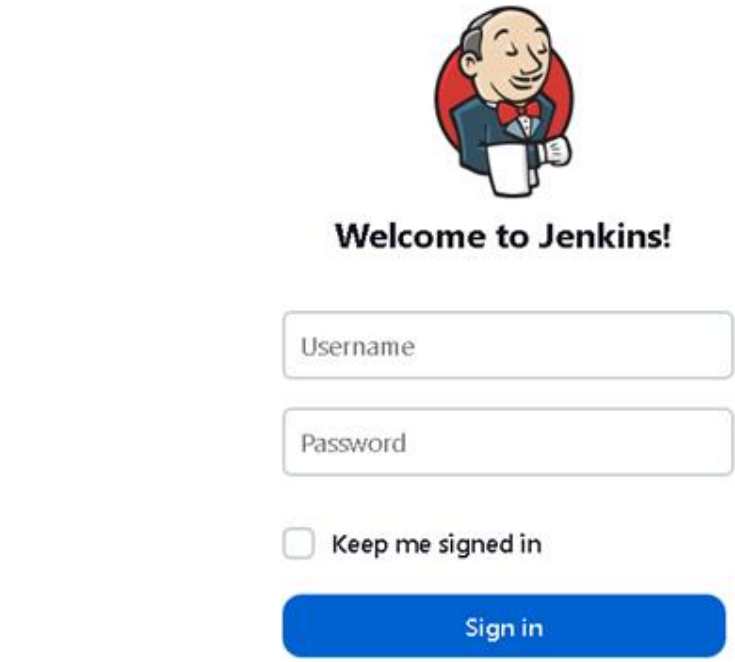
**http://localhost:8080**

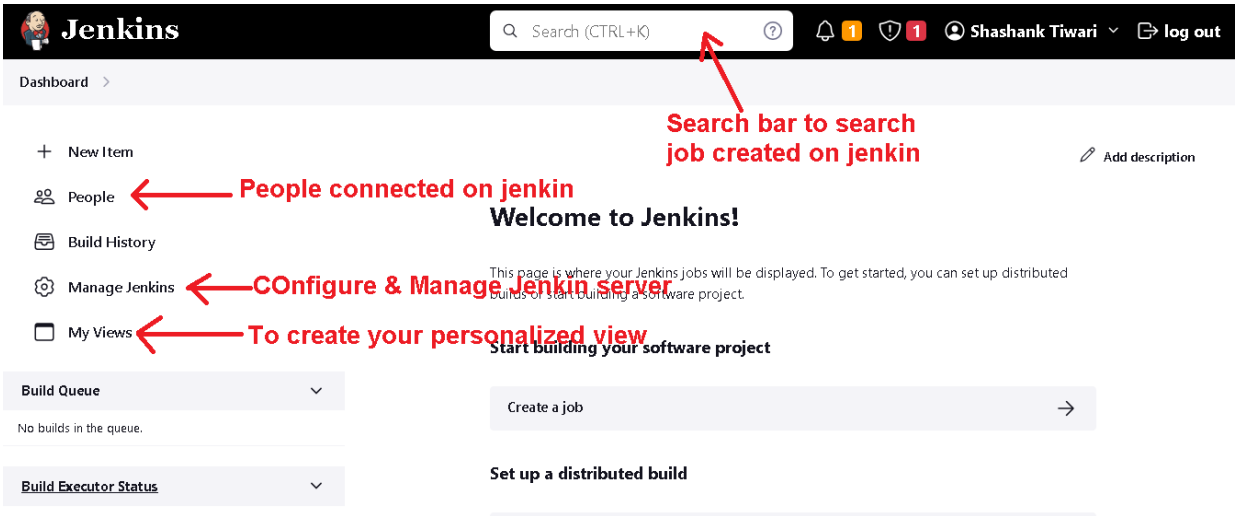
Thisurlwillbring up theJenkinsdashboard.

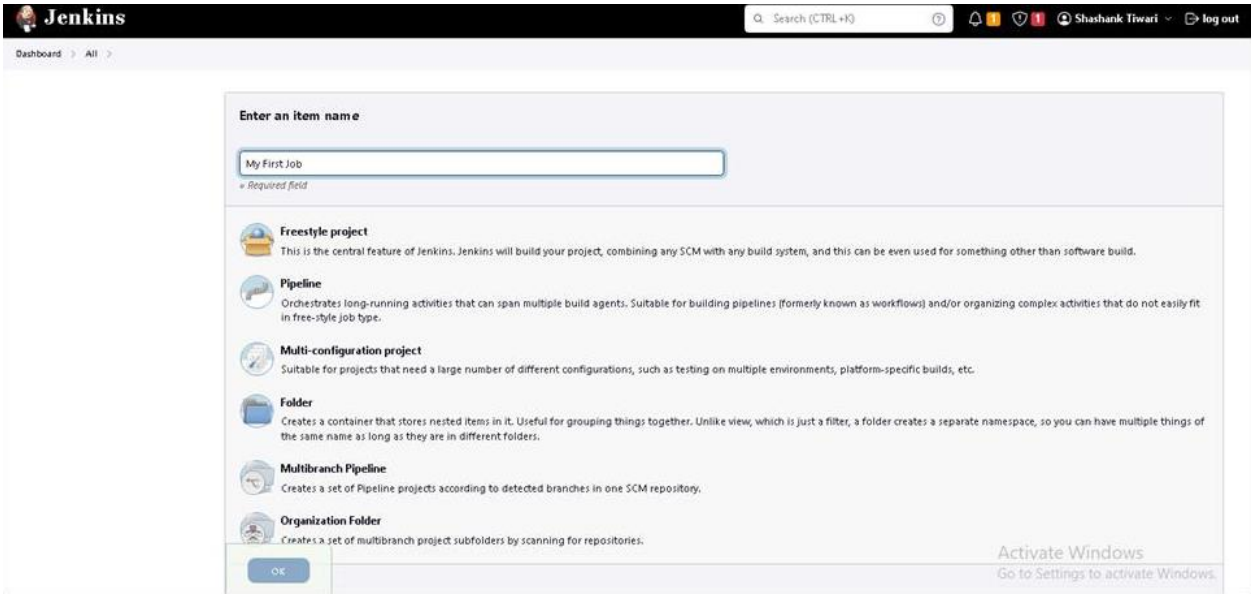



## ExploringtheJenkinenvironment

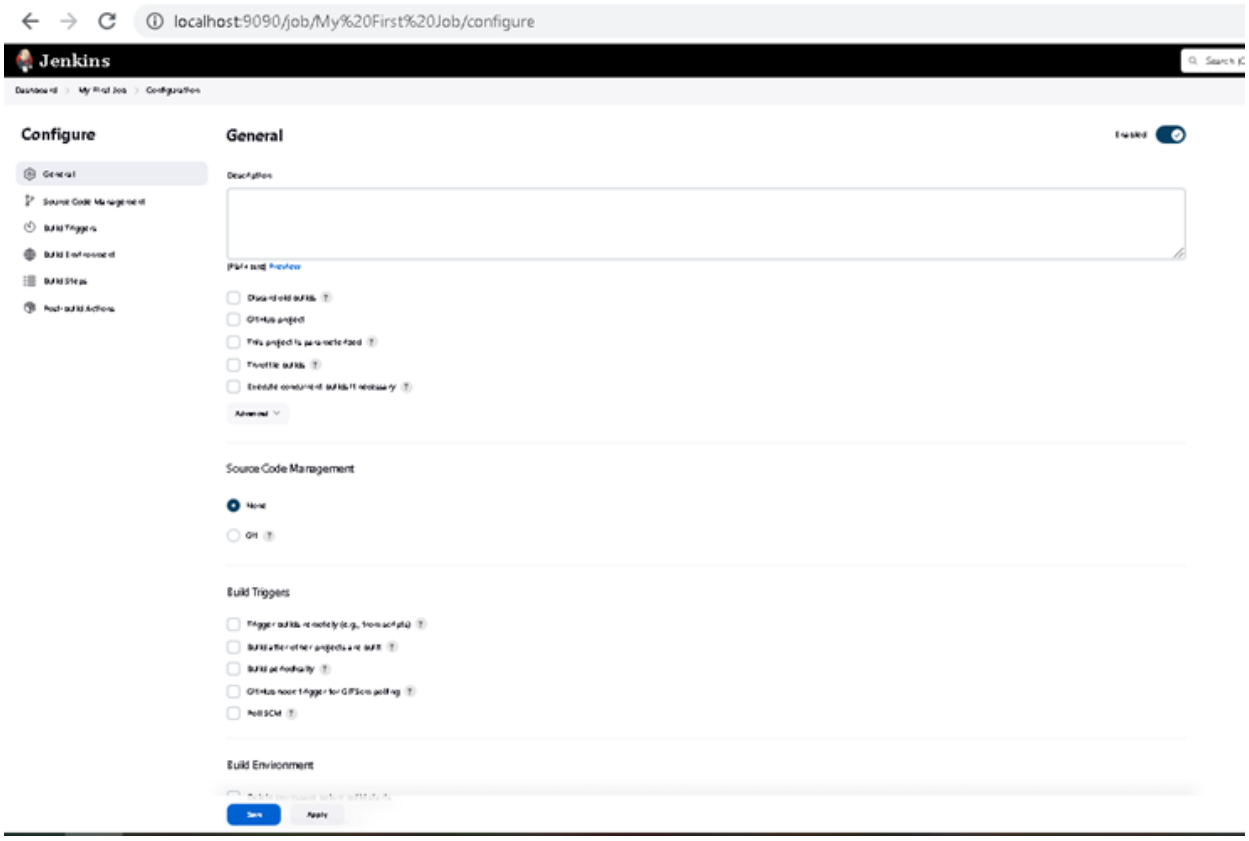
- Logintoyourjenkinserver



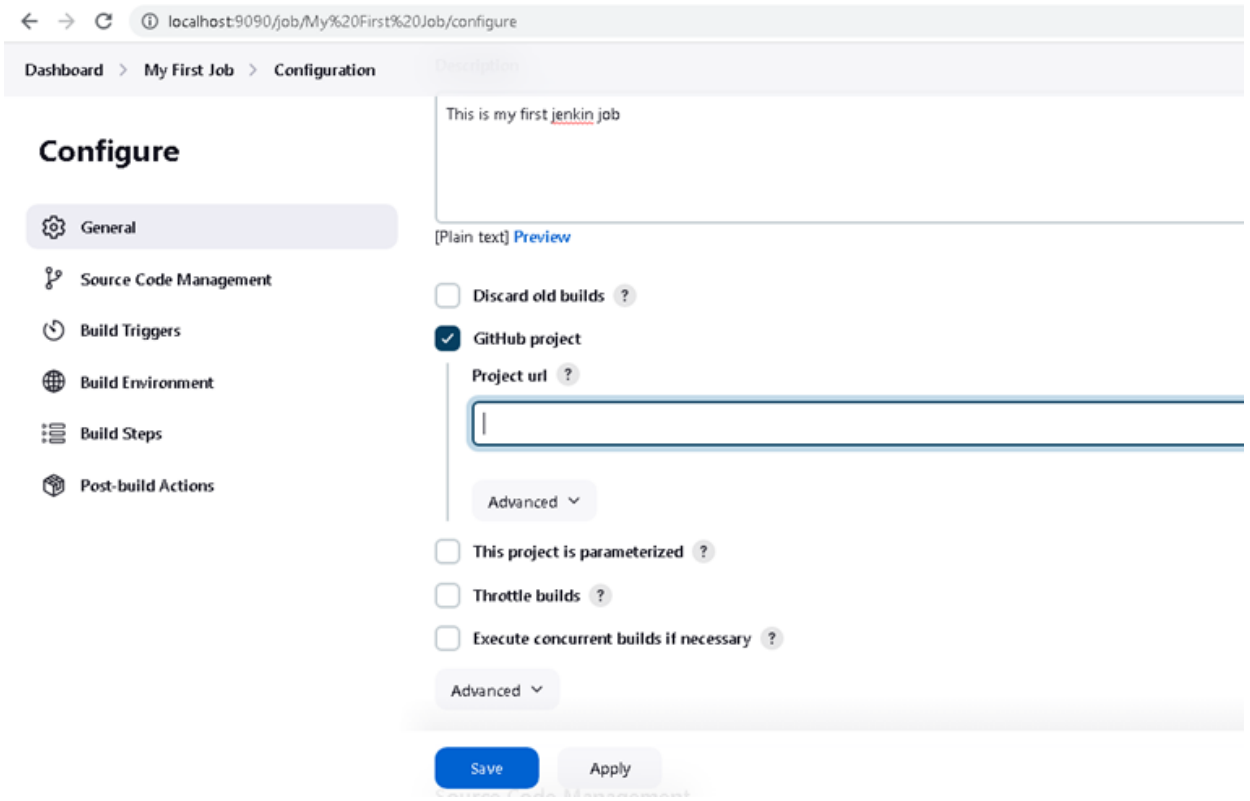





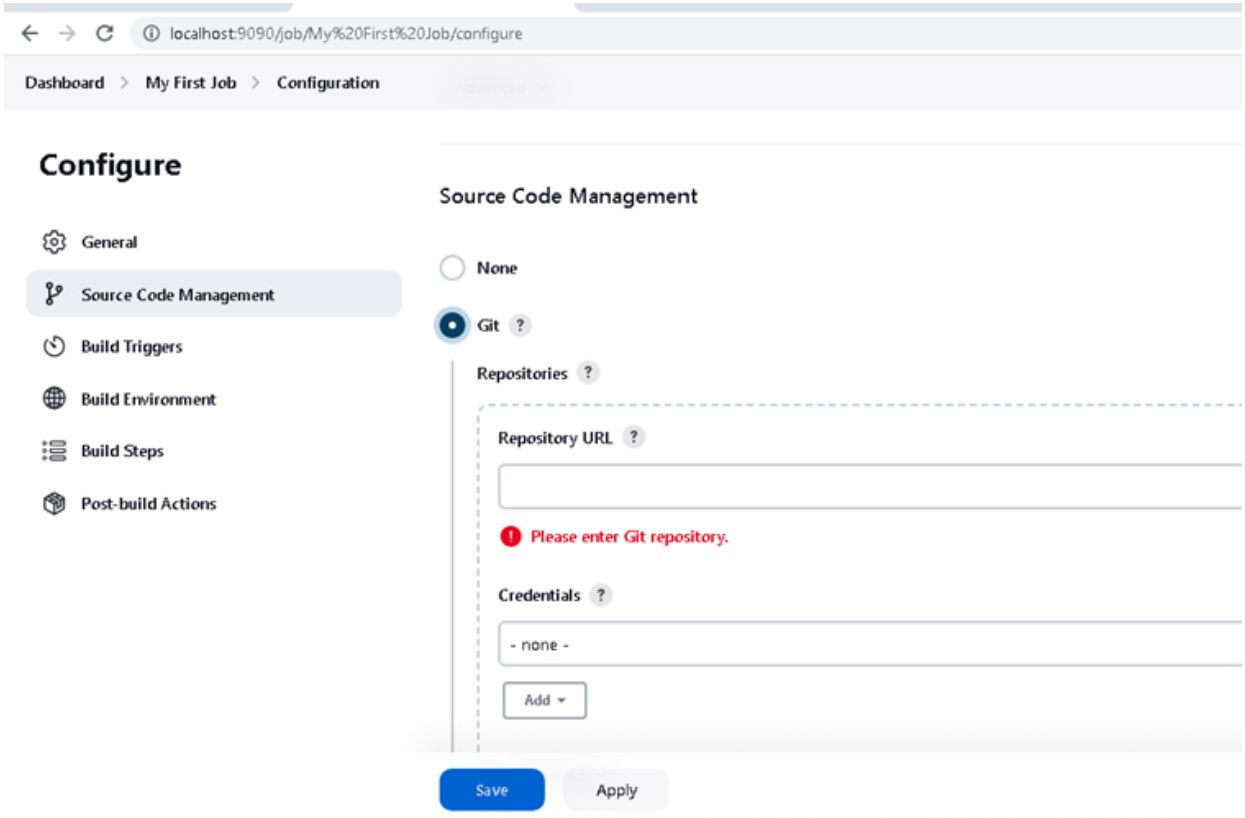

Next,definetheparameterwiththejob



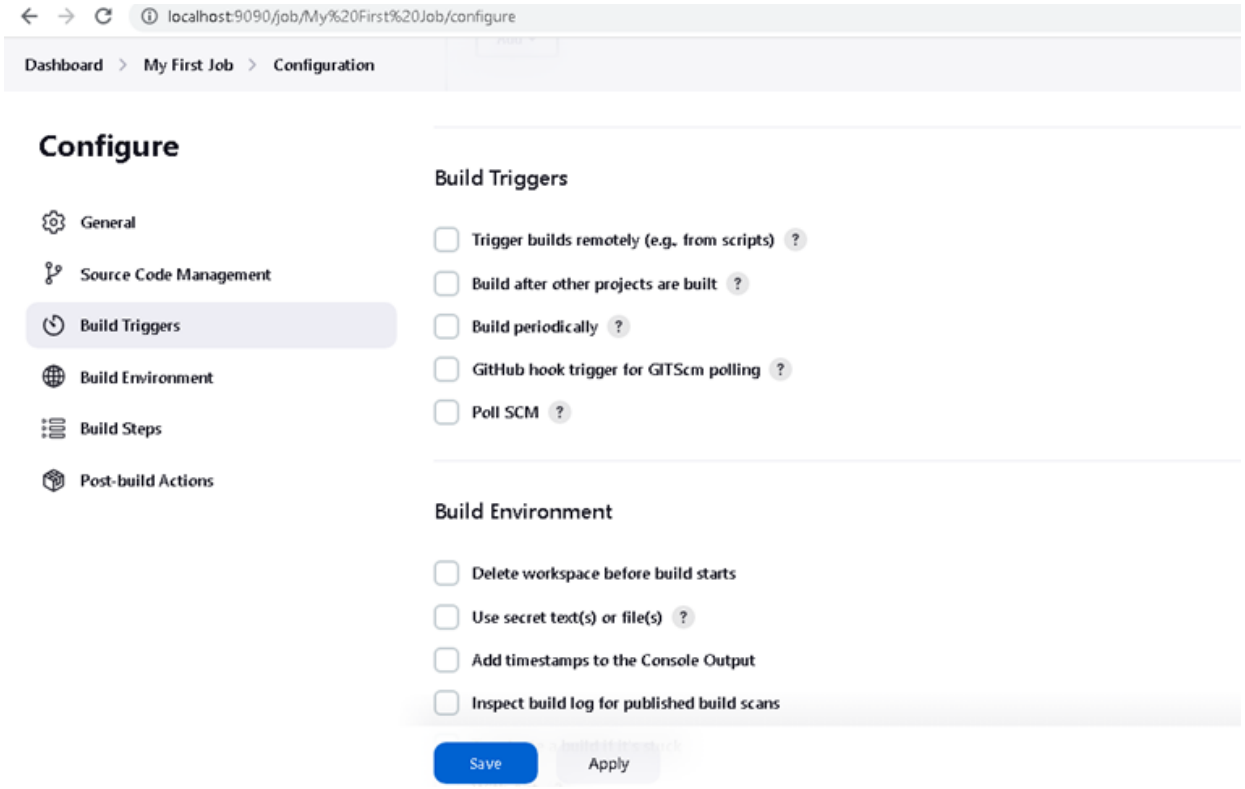

Youcandefineyourgithubproject



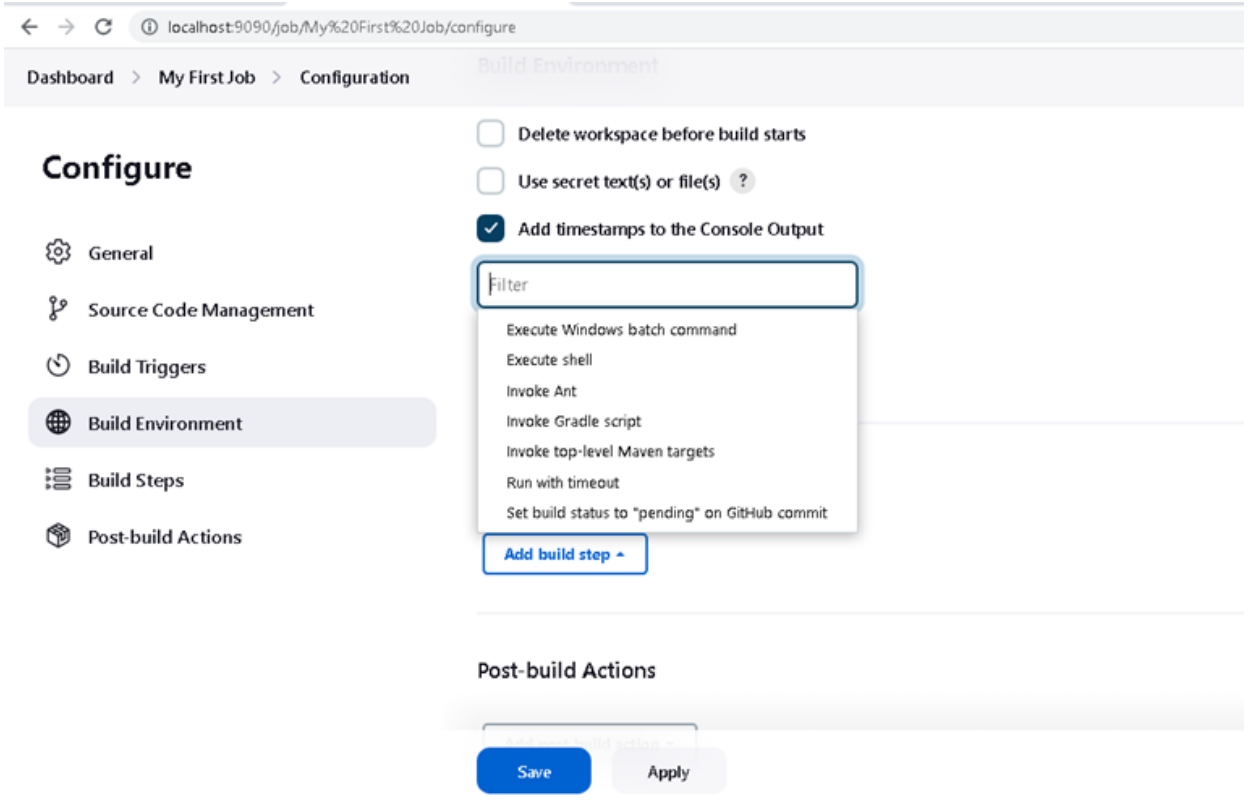

Sourcecodemanagementsection

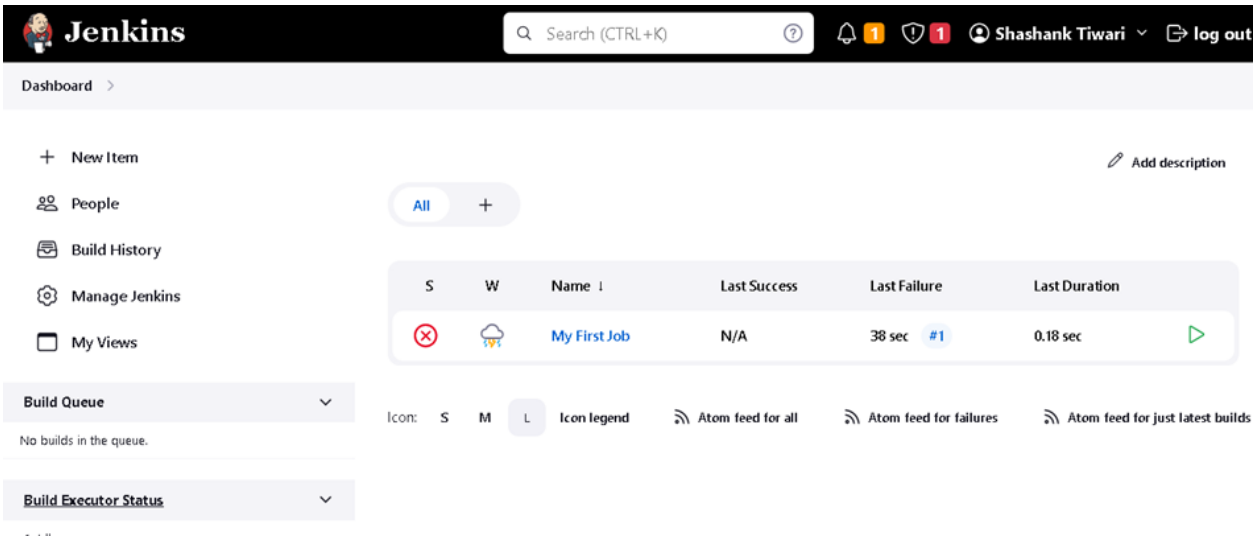


Next, Setthe triggerofbuildinbuildtriggersection




Wecandefinethetaskinthebuildsection



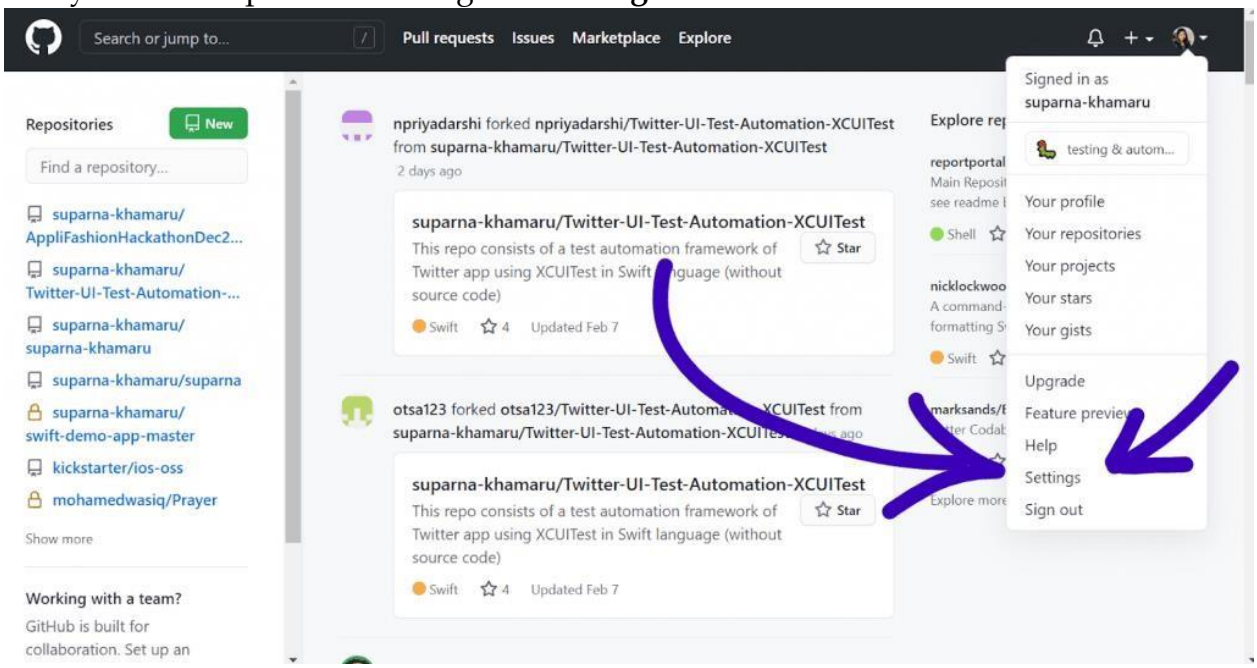

Jenkins
Search (CTRL+K)
1
1
Shashank Tiwari
log out
Dashboard
New Item
People
Build History
Manage Jenkins
My Views
Build Queue
No builds in the queue.
Build Executor Status
Add description
All
S
W
Name ↓
Last Success
Last Failure
Last Duration
My First Job
N/A
38 sec
#1
0.18 sec
Icon: S M L
Icon legend
Atom feed for all
Atom feed for failures
Atom feed for just latest builds

**Lab05:**

**Demonstratecontinuousintegrationanddevelopmentusingjenkins.**

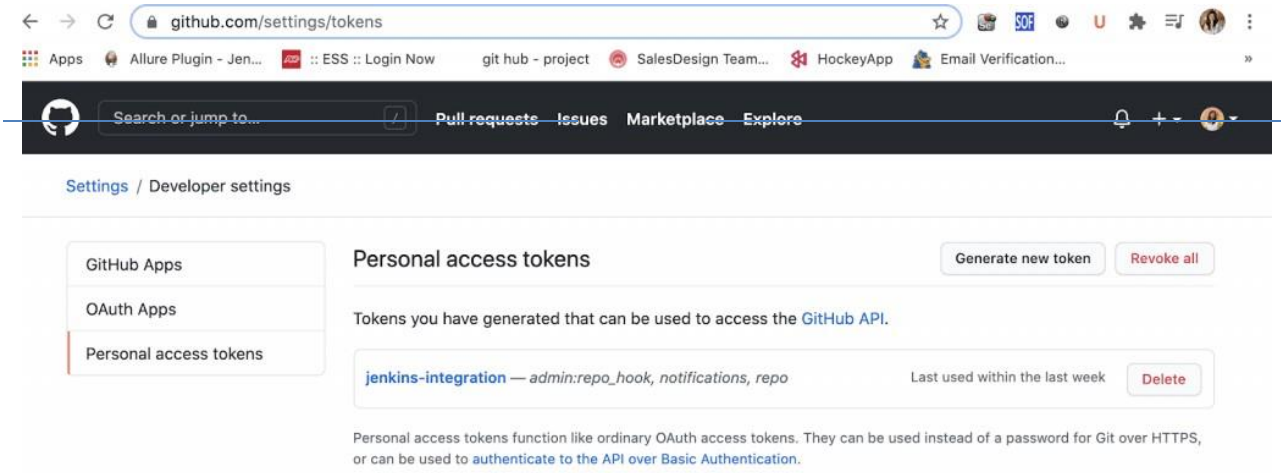
*[Jenkinswithgithub]*

Gotoyour Githubprofileandnavigateto**Settings**.




Inthesettingsscreen,click onthe"**Developersettings**"menuand click on"**Personalaccesstokens**."

Inthe"**Personalaccesstokens**"tab,click onthe"**Generatenewtoken**"buttonand providenecessary details as desired (an example is provided in the below figure), and click on the"**Generate token**"button.

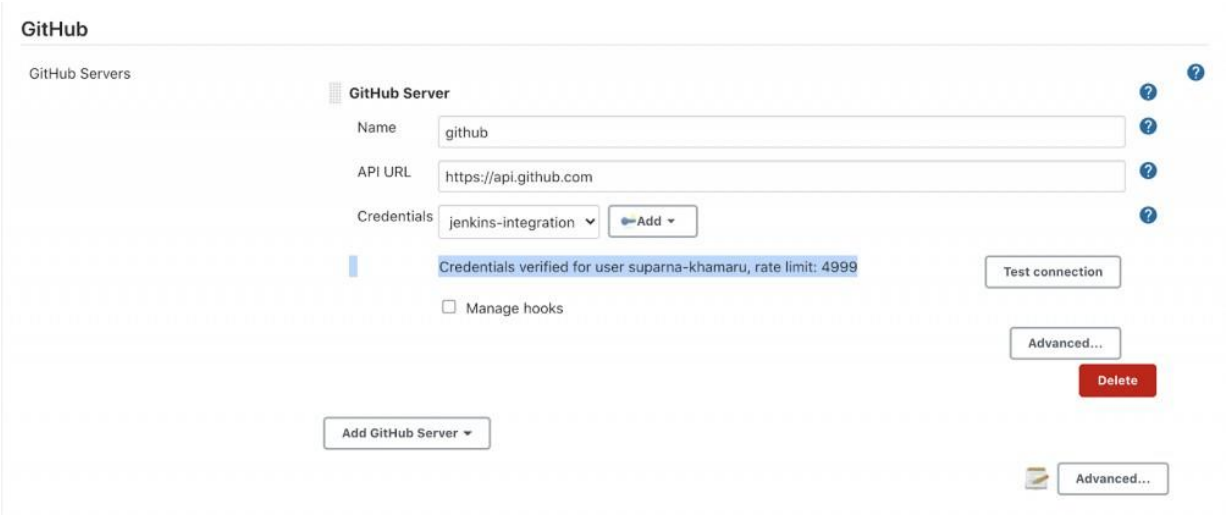



Postsuccessfulcreationofthetoken,thenewlygenerated secrettext inGitHubistobecopiedforfutureusageinJenkins.

**ConfiguringJenkinsforGitHubIntegration**

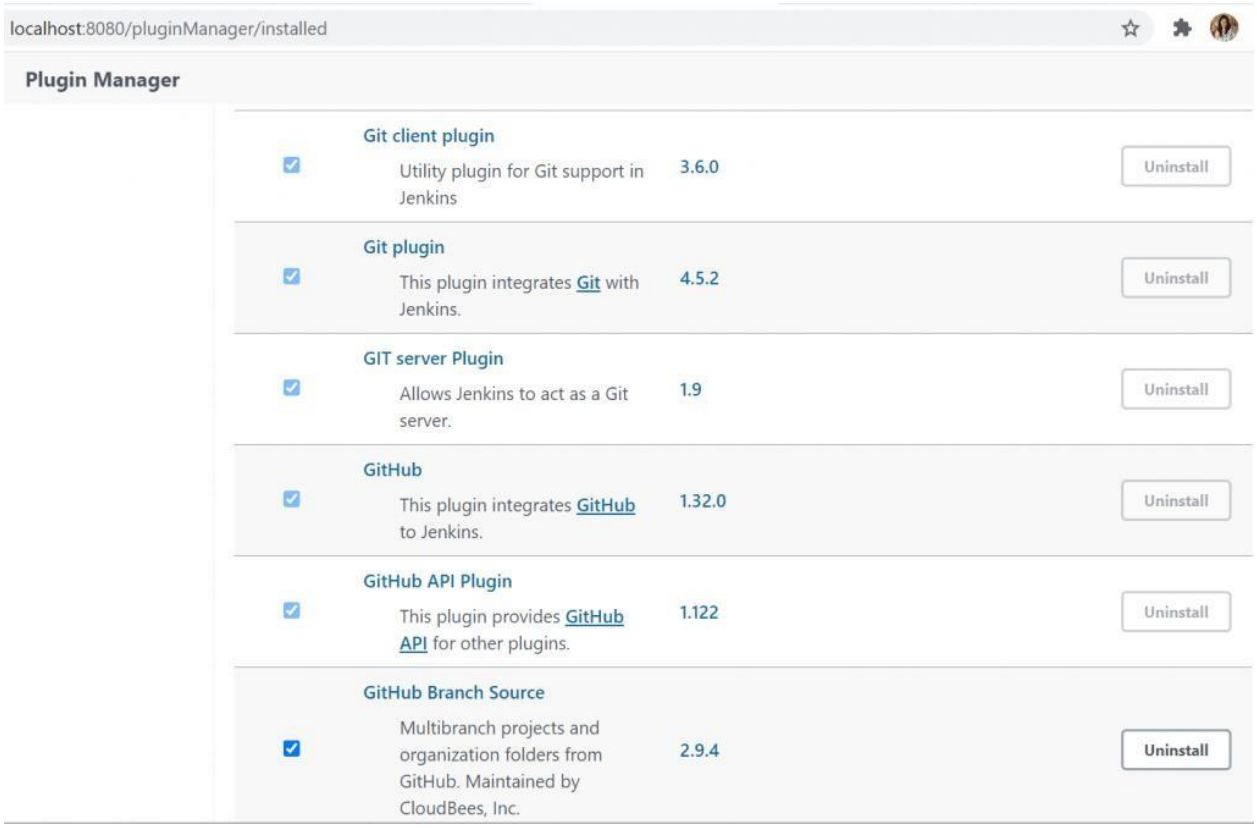
Next, gotoJenkinsdashboard.

- Click on"**Manage Jenkins**."
- Clickon"**ConfigureSystem**"and gotothefollowing'**GitHub**'section.




**Note:**Iftheabove"**GitHubServer**"sectionisfoundmissinginJenkins,makesuretomanuallyinstallthemissingGitHubpluginfromtheinstalledlistoftoolsshownbelow.

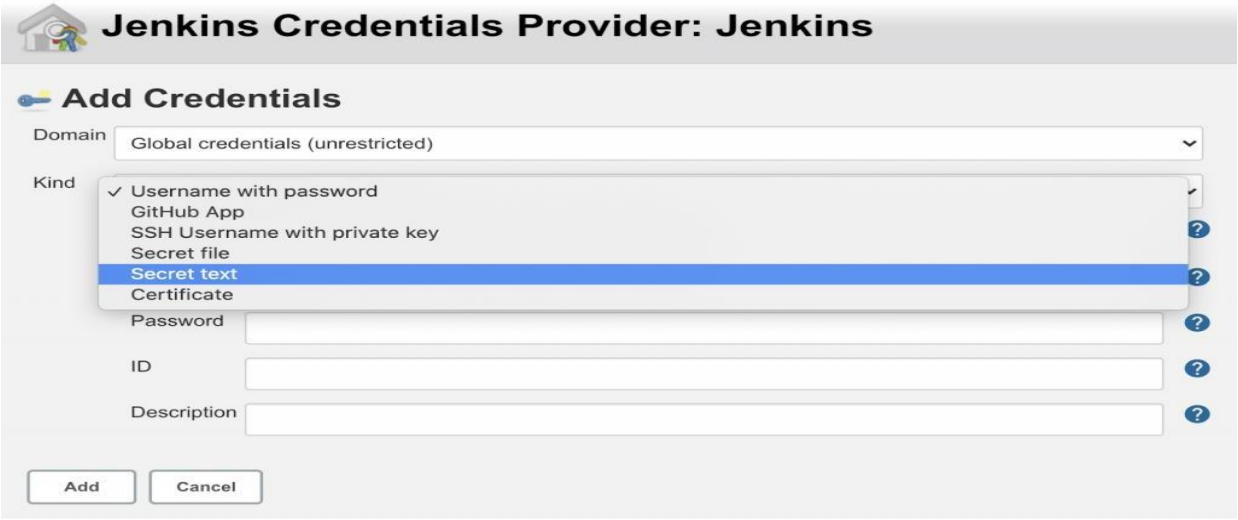
Stepstofollow-Goto:JenkinsDashboard->ManageJenkins->ManagePlugins->'Available'tab->EnterGitinsearchbarandfilter->Installrequiredplugin



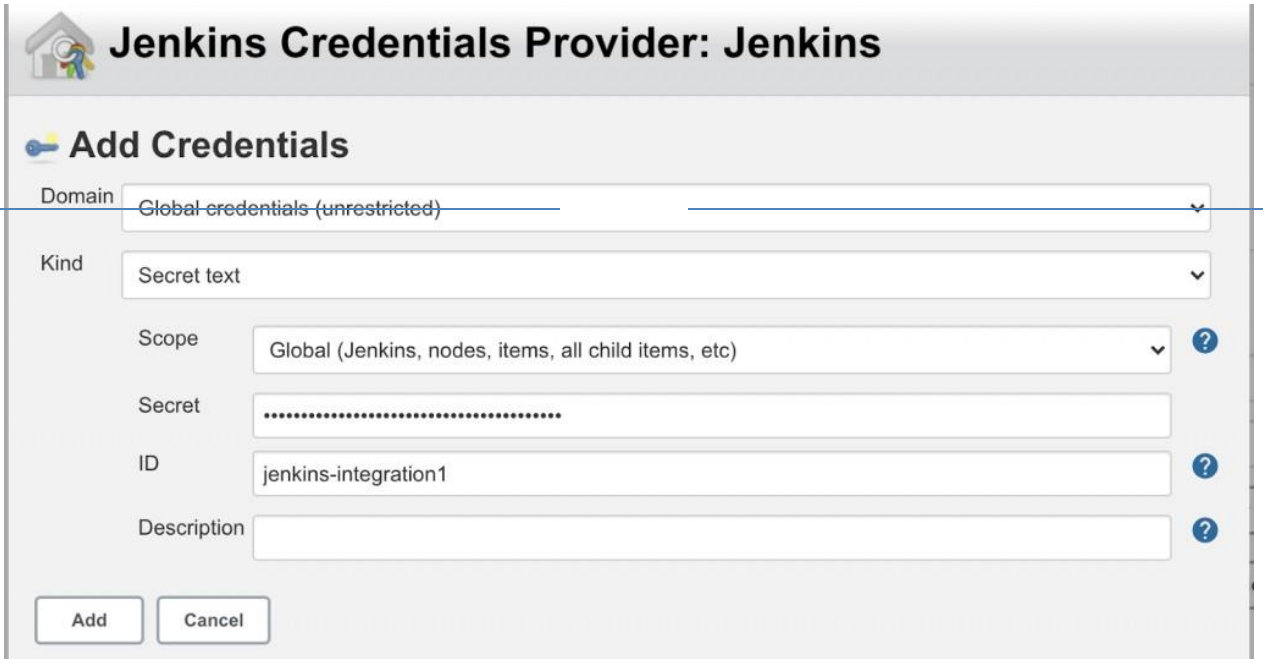

Makesuretoaddthecopiedsecretkeyintheabovecredentialsby:

- Clickonthe"Add"->"**Jenkins**"buttonintheGithubServersection'sCredentials field.

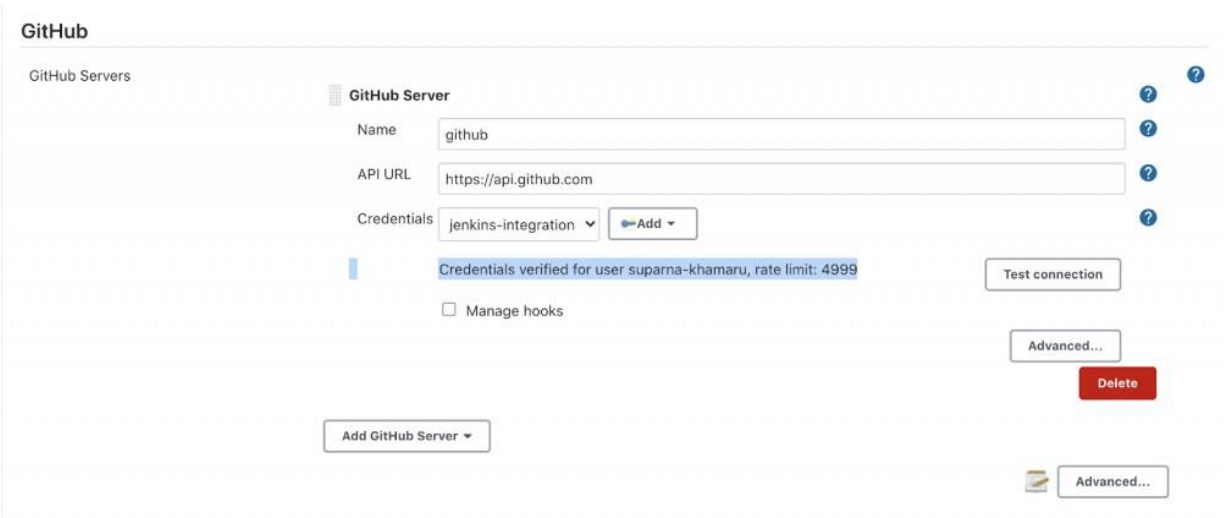
- Select"**Secrettext**"fromthe"Kind"dropdown.




PastethepreviouslycopiedsecrettextfromGitHubintheSecretfieldasdisplayedbelow, whileprovidinganIDsuchas"jenkins-integration," andthenclickonthe "**Add**"button.

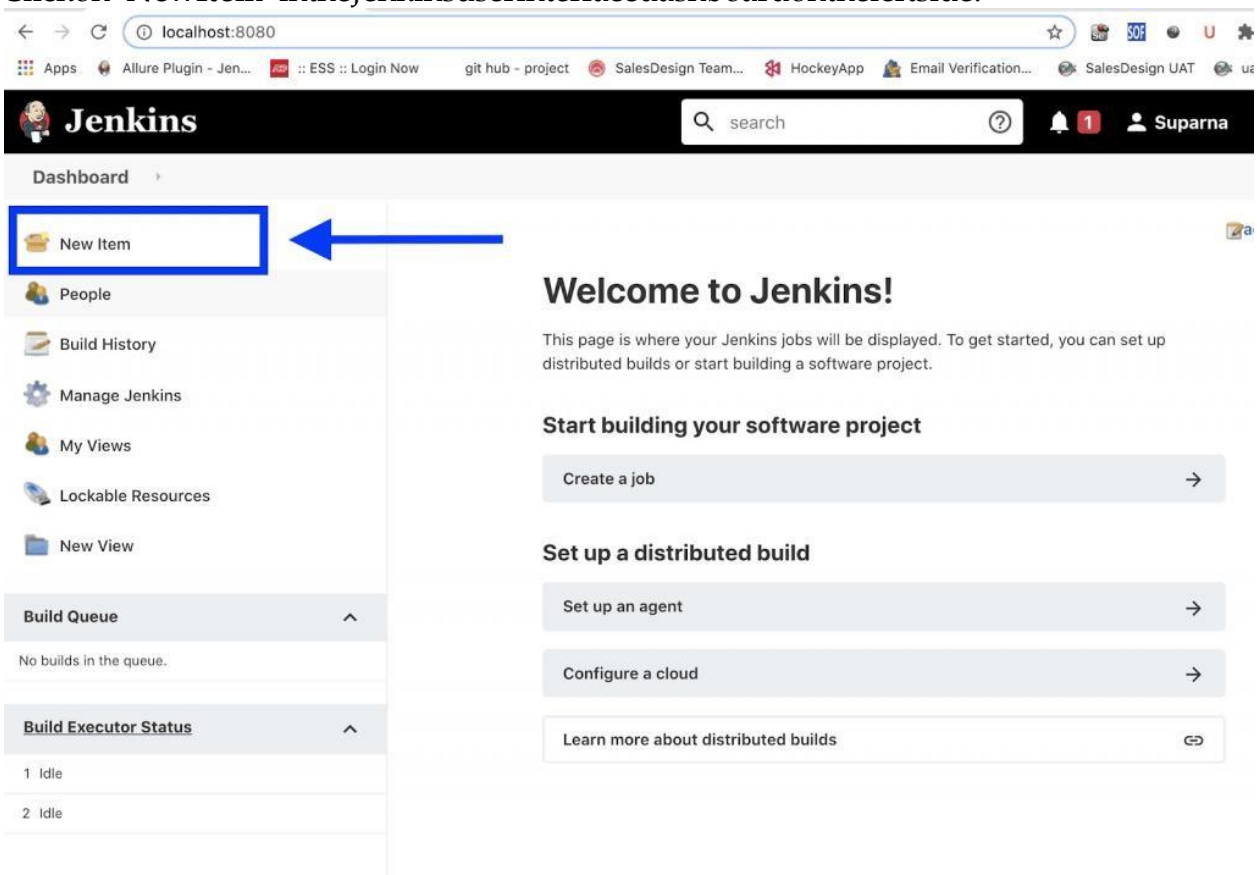



Once the Secret text is successfully added, let us test the connection by clicking on the "**Testconnection**"buttonandverifythe confirmationmessage ashighlightedbelow.

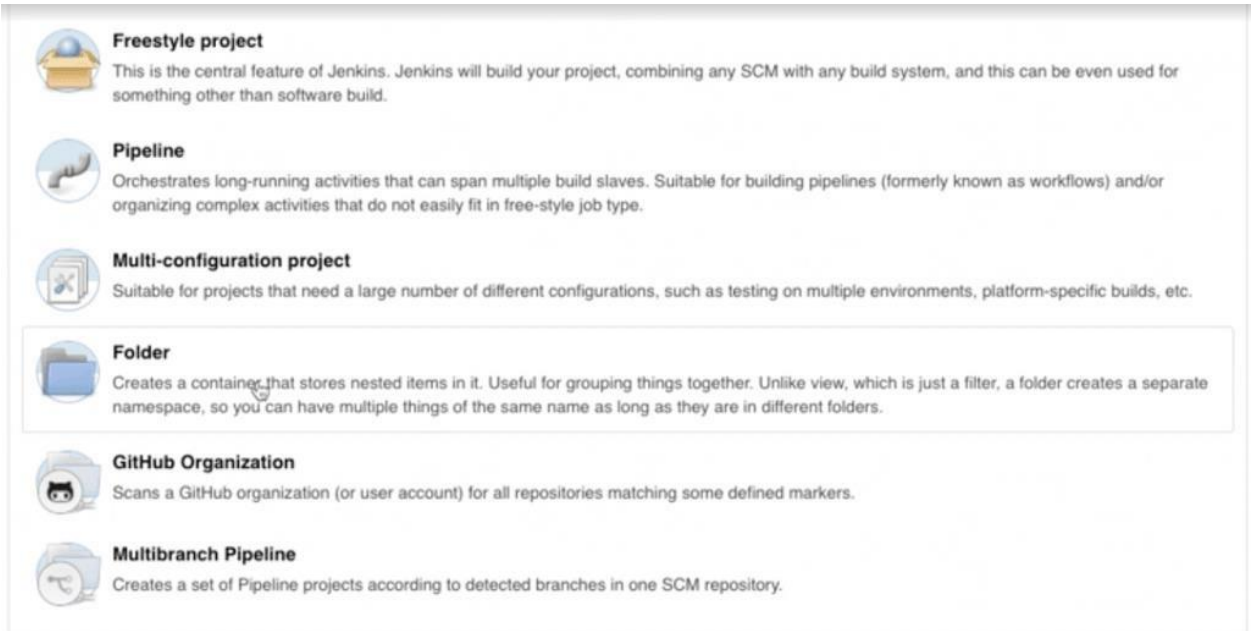



**CreatingYourFirstJenkinsJobIntegratedIntoaTestProject**

Clickon"**NewItem**"intheJenkinsuserinterfacedashboardontheleftside.

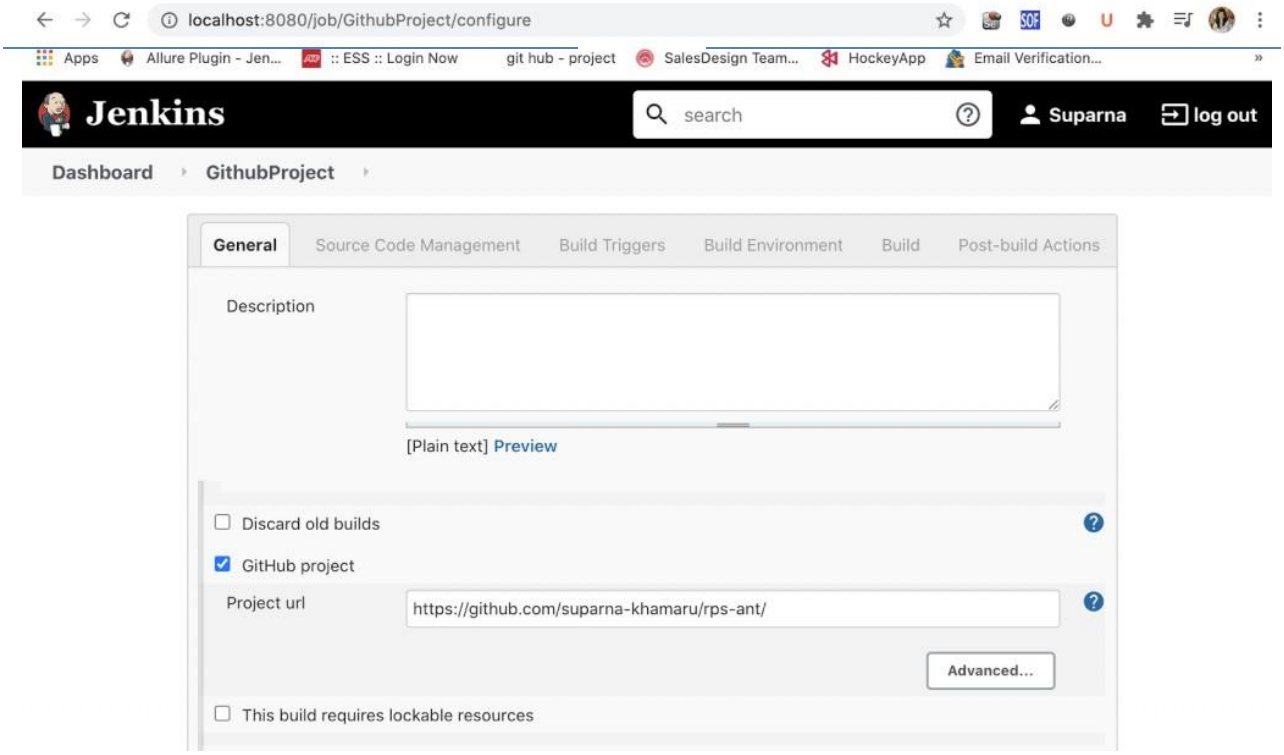



Letusstartwithcreatinga**Freestyleproject**inJenkins foreaseofunderstandingforabeginner.However,we canchoosetoselectanyofthefollowing:

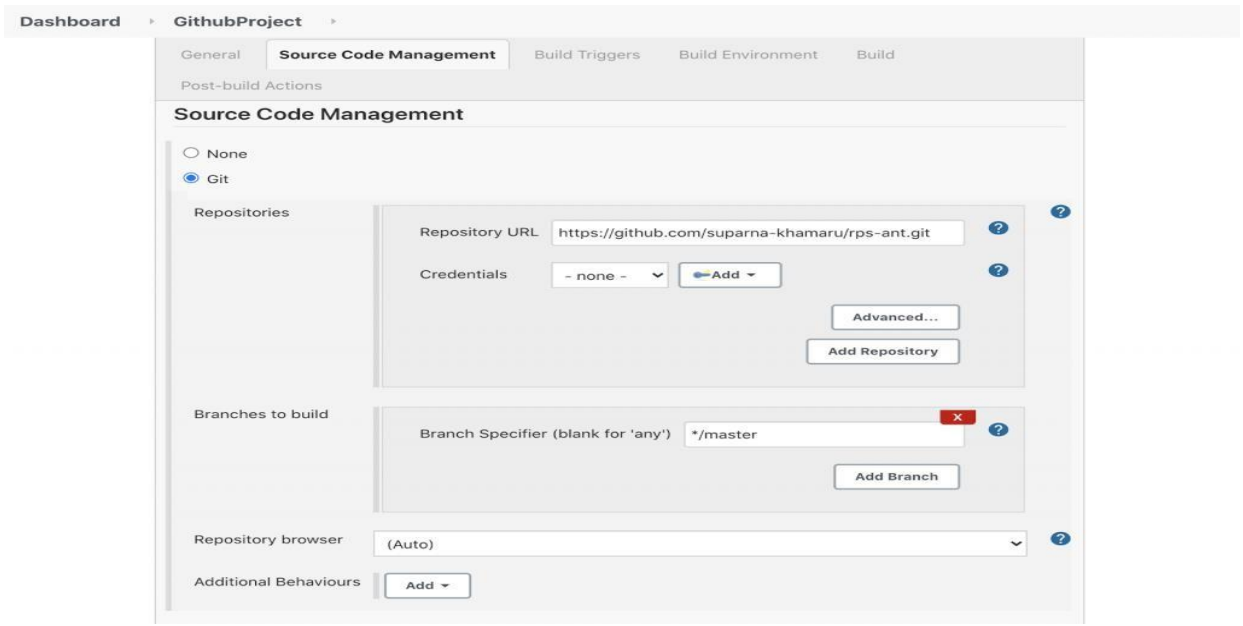



Enter a project name in the requested textbox field and select the **Freestyle project** as shown onthe imageabove.

Inthe**General**section, checkthefield"**GitHubproject**"andenteravalidAntprojectasgivenbelow.

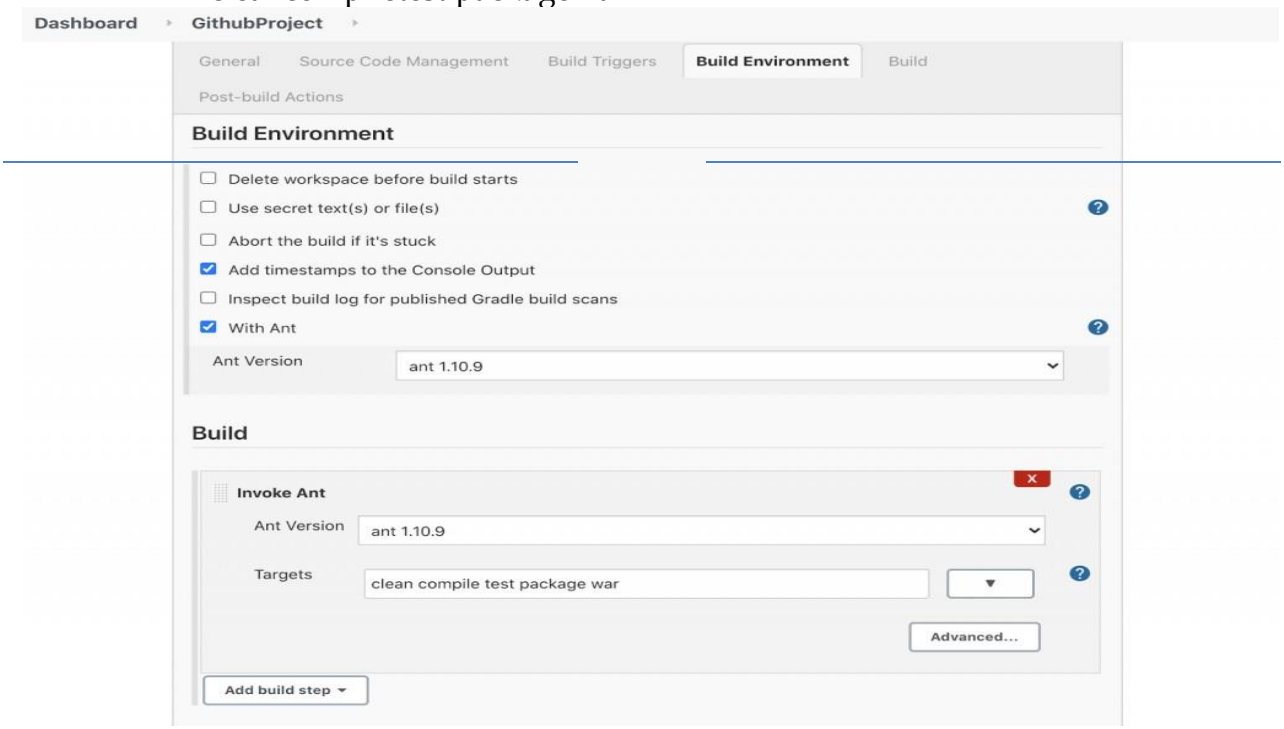



Then,goto the"**SourceCodeManagement**"sectionandenterthesamelinkasabovewithanextra.gitextension atthe endofthe URL,asshown inthebelow screen.

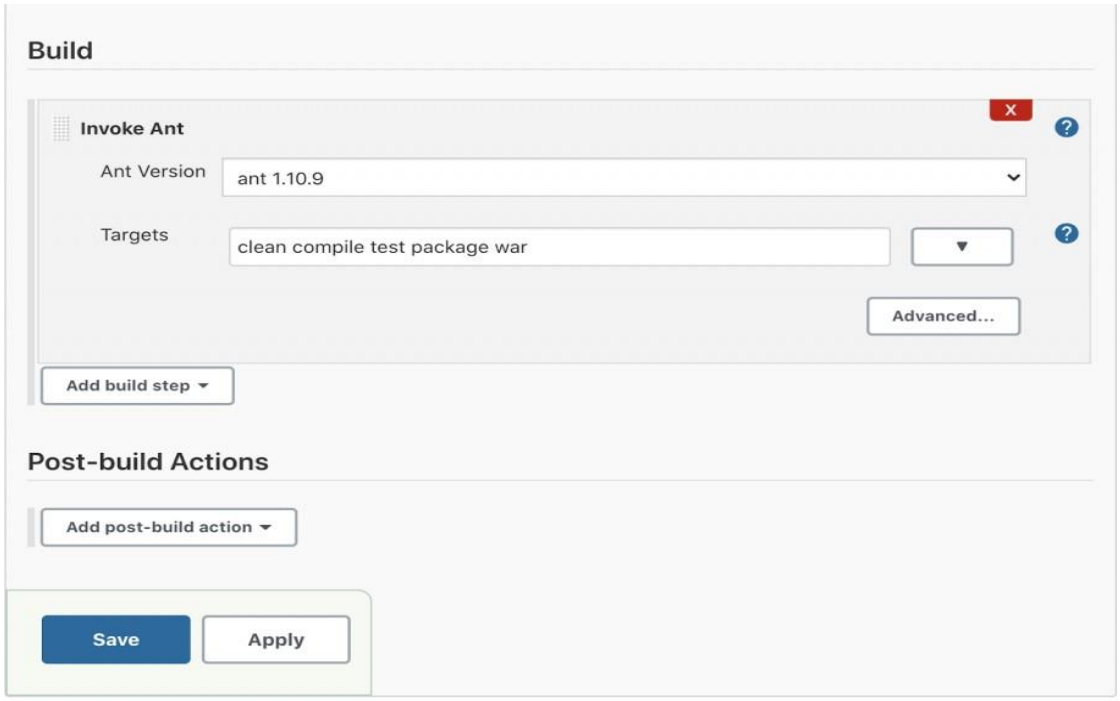



Gotothe"**BuildEnvironment**"sectionandaddthefollowingstepsshownintheimagebelow.
Makesure toaddthecommandintheTargetsfieldundertheAntBuildstep:

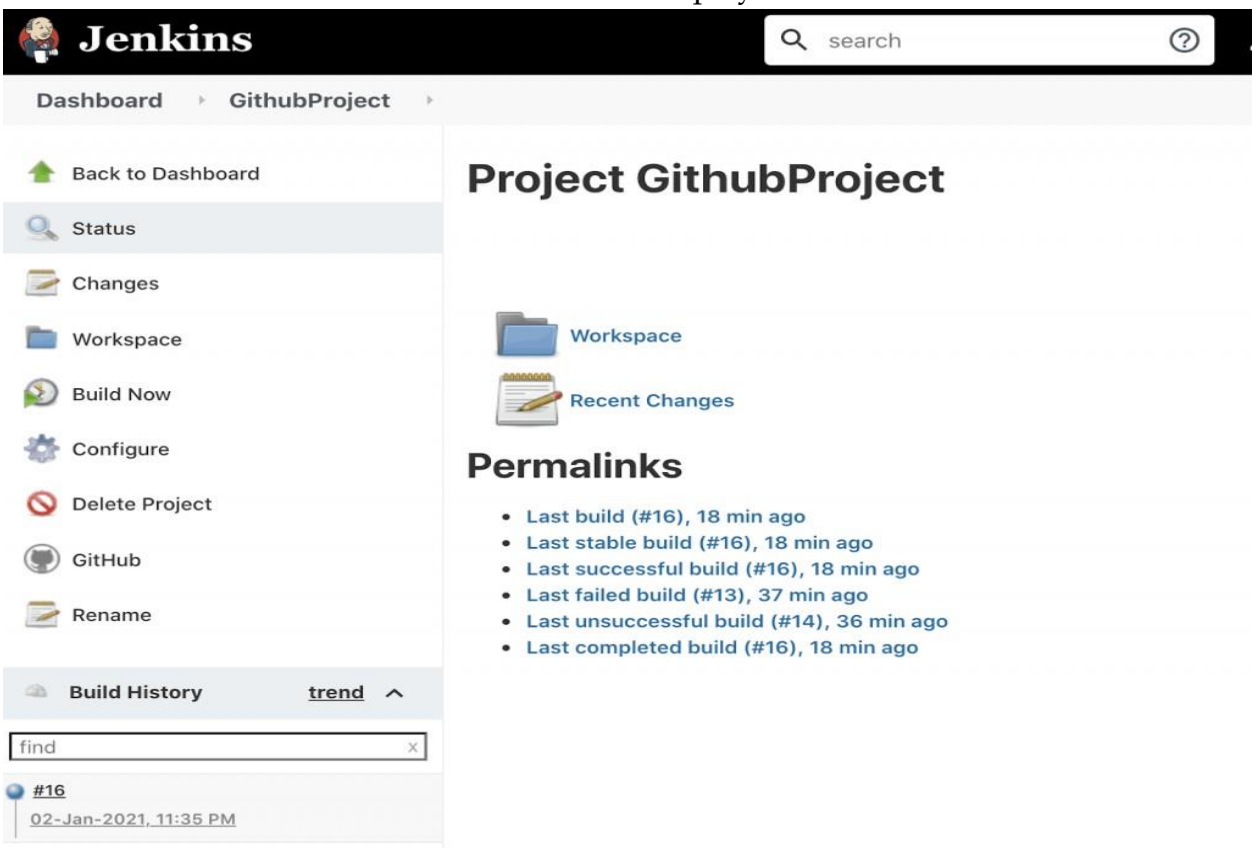
cleancompiletest packagewar

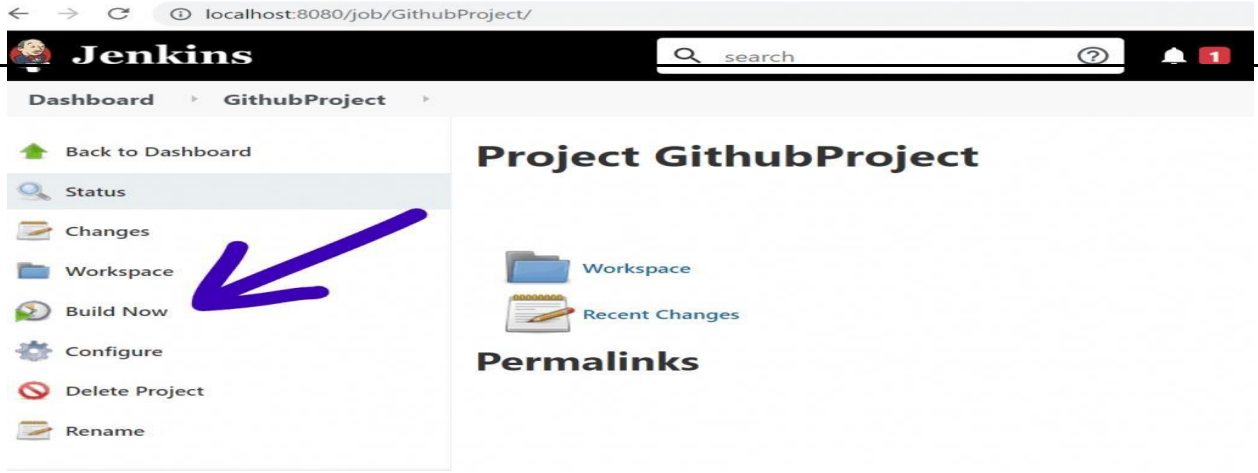


Click onthe"**Apply**"buttonand thenclick onthe"**Save**"button.

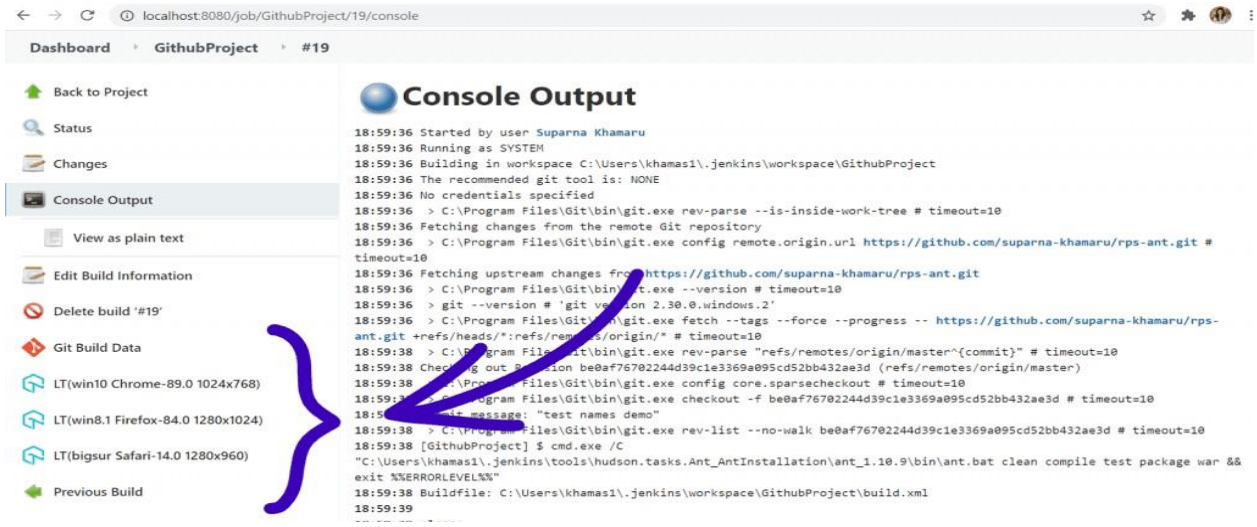



OncethenewJenkinsconfigurationsaresuccessfullysaved,theuser shallbenavigatedbacktothe Project dashboard screen, where the user now clicks on the "**Build Now**" menu on the left-handsideofthe displayeddashboardscreen.

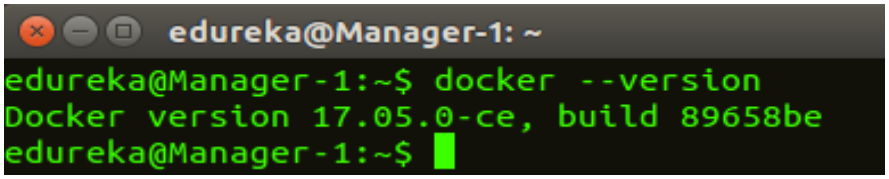
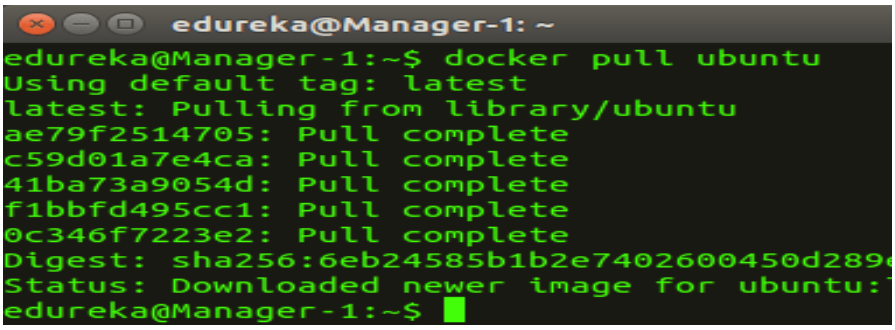
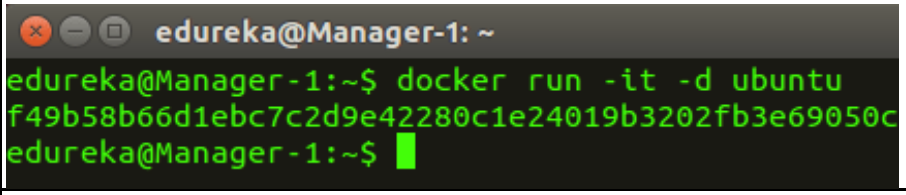
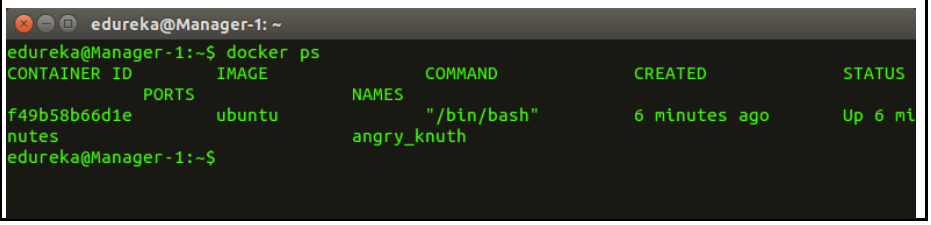


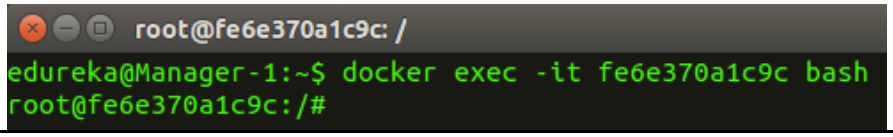
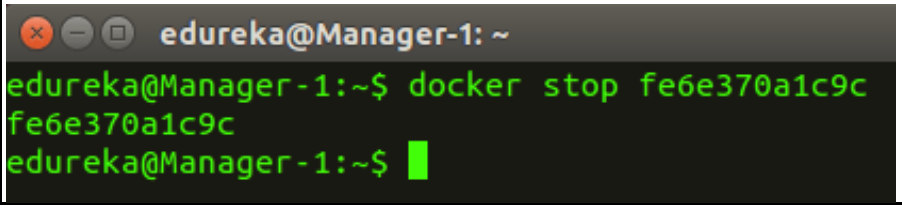


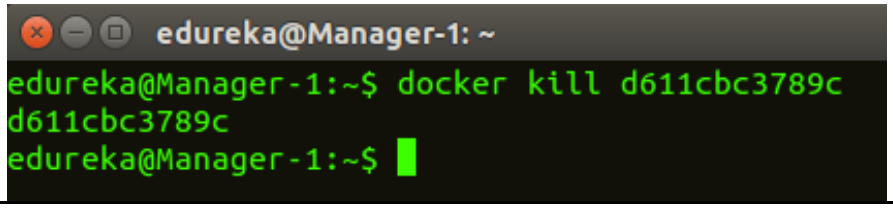

Clickonthe"**BuildNow**"buttonandallowthescheduledbuildtocomplete.

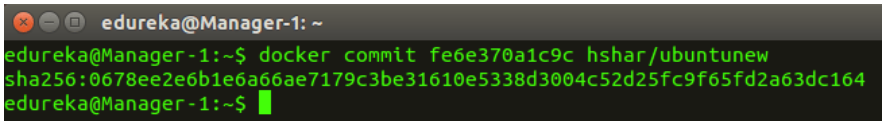
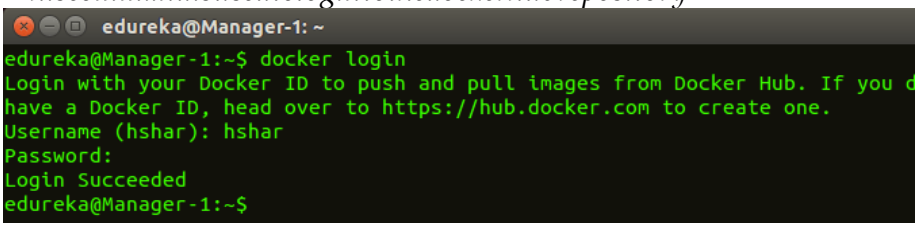
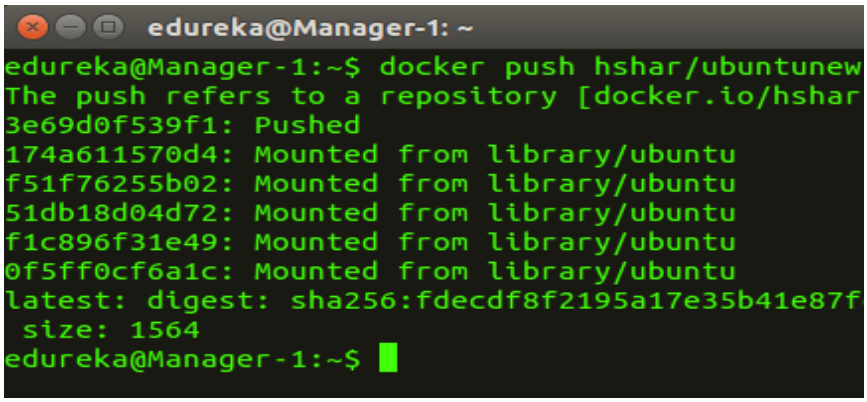


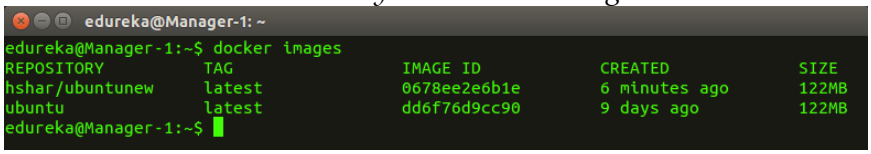
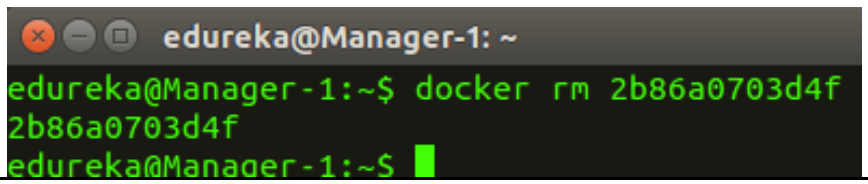
**Lab06:**
**ExploreDockercommandsforcontentmanagement.**

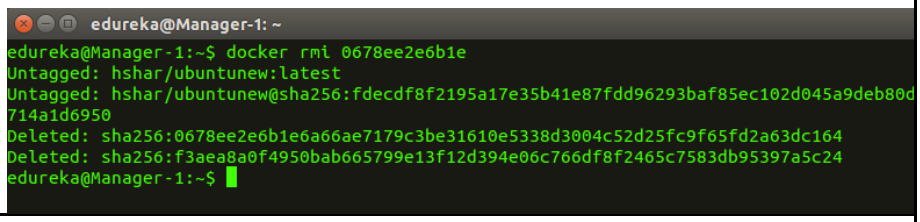
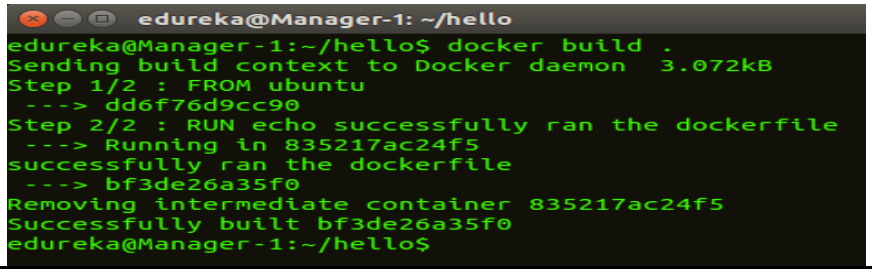
| | |
|---|---|
| **docker–version** | *Thiscommandisusedtogetthecurrentlyinstalled versionofdocker*<br>  |
| **dockerpull** | ***Usage:dockerpull<imagename>***<br>*This command is used to pull images from the* ***dockerrepository****(hub.docker.com)*<br>  |
| **dockerrun** | ***Usage:dockerrun-it-d<imagename>***<br>*Thiscommandisusedtocreateacontainerfromanimage*<br>  |
| **dockerps** | *Thiscommandisusedtolisttherunningcontainers*<br>  |

| | |
|---|---|
| **dockerps -a** | *Thiscommandisusedtoshowalltherunningandexitedcontainers*<br>  |
| **dockerexec** | ***Usage:dockerexec-it<containerid>bash***<br>*Thiscommandisusedtoaccesstherunningcontainer*<br>  |
| **dockerstop** | ***Usage:dockerstop<containerid>***<br>*Thiscommandstopsarunningcontainer*<br>  |

| | |
|---|---|
| **dockerkill** | ***Usage:dockerkill<containerid>***<br>*This command kills the container by stopping its execution immediately.The difference between 'docker kill' and 'docker stop' is that 'docker stop'gives the container time to shutdown gracefully, in situations when it istakingtoomuchtimeforgettingthecontainertostop,onecanopttokill it*<br>  |

| | |
|---|---|
| **dockercommit** | ***Usage:dockercommit<conatainerid><username/imagename>***<br>*Thiscommandcreatesanewimageofaneditedcontaineronthelocalsystem*<br>  |
| **dockerlogin** | *Thiscommandisusedtologintothedockerhubrepository*<br>  |
| **dockerpush** | ***Usage:dockerpush<username/imagename>***<br>*Thiscommandisusedtopushanimagetothedockerhubrepository*<br>  |

| | |
|---|---|
| **dockerimages** | *Thiscommandlistsallthelocally storeddockerimages*<br>  |
| **dockerrm** | ***Usage:dockerrm<containerid>***<br>*Thiscommandisusedtodeleteastoppedcontainer*<br>  |

| | |
|---|---|
| **dockerrmi** | ***Usage:dockerrmi<image-id>***<br>*Thiscommandisusedtodeleteanimagefromlocalstorage*<br>  |
| **dockerbuild** | ***Usage:dockerbuild<pathto dockerfile>***<br>*Thiscommandisusedtobuildanimagefromaspecifieddockerfile*<br>  |

**CleanUpCommands**

| Command | Explanation |
|---|---|
| dockerimageprune | Clearsanunusedimage |
| dockerimageprune-a | Clearsallimagesthatare notbeingused bycontainers |
| dockersystemprune | Removesallstoppedcontainers,allnetworksnot used by containers, all dangling images,andallbuildcache |
| docker imagermimage | Removesanimage |
| dockerrmcontainer | Removesarunningcontainer |
| dockerkill$(dockerps-q) | Stopsallrunningcontainers |
| dockerswarmleave | Leavesaswarm |
| dockerstackrmstackname | Removesaswarm |

| | |
|---|---|
| dockervolumerm$(dockervolumels -fdangling=**true**-q) | Removesalldanglingvolumes |
| dockerrm$(dockerps-a-q) | Removesallstoppedcontainers |
| dockerkill$(dockerps-q) | Stopsallrunningcontainers |

**ContainerInteractionCommands**

| **Command** | **Explanation** |
|---|---|
| dockerstartcontainer | Startsanewcontainer |
| dockerstopcontainer | Stopsacontainer |
| dockerpausecontainer | Pausesacontainer |
| dockerunpausecontainer | Unpausesacontainer |
| dockerrestartcontainer | Restartsacontainer |
| dockerwaitcontainer | Blocksacontainer |
| dockerexportcontainer | Exportscontainercontentsto atar archive |
| docker attachcontainer | Attachestoarunningcontainer |
| dockerwaitcontainer | Waitsuntilthecontaineristerminatedandshowstheexitcode |
| docker commit -m “commitmessage”-a“author”containerusername/image_name:tag | Savesarunningcontainerasanimage |
| dockerlogs-ftcontainer | Followscontainerlogs |
| dockerexec-ticontainerscript.sh | Runsacommandinacontainer |

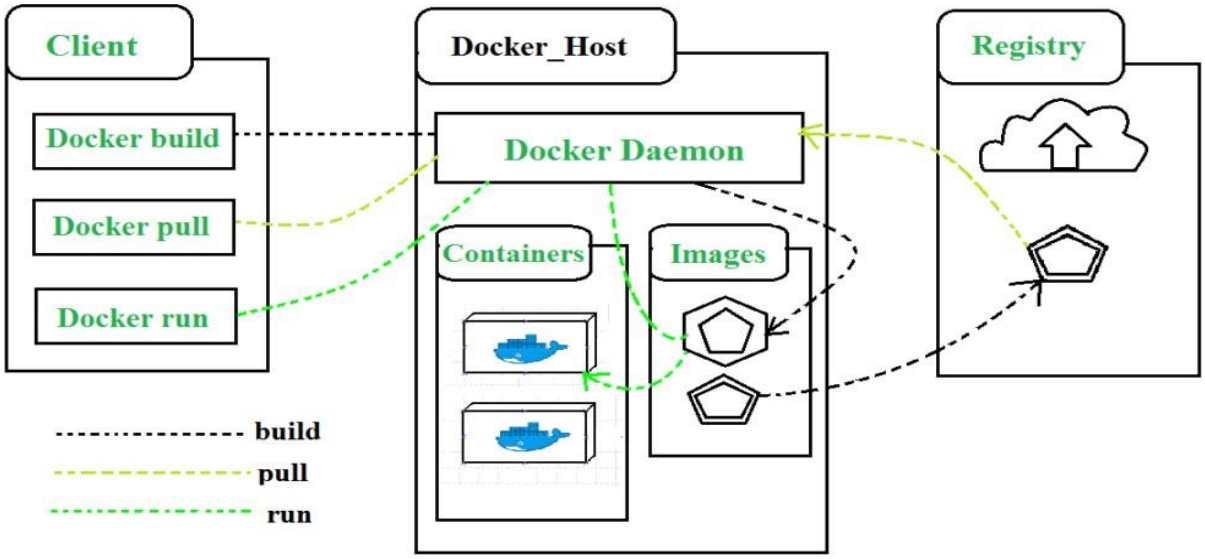
| | |
|---|---|
| dockercommitcontainer image | Createsanewimagefromacontainer |
| dockercreateimage | Createsanewcontainerfromanimage |

**Lab07:**

**DevelopasimplecontainerizedapplicationusingDocker.**

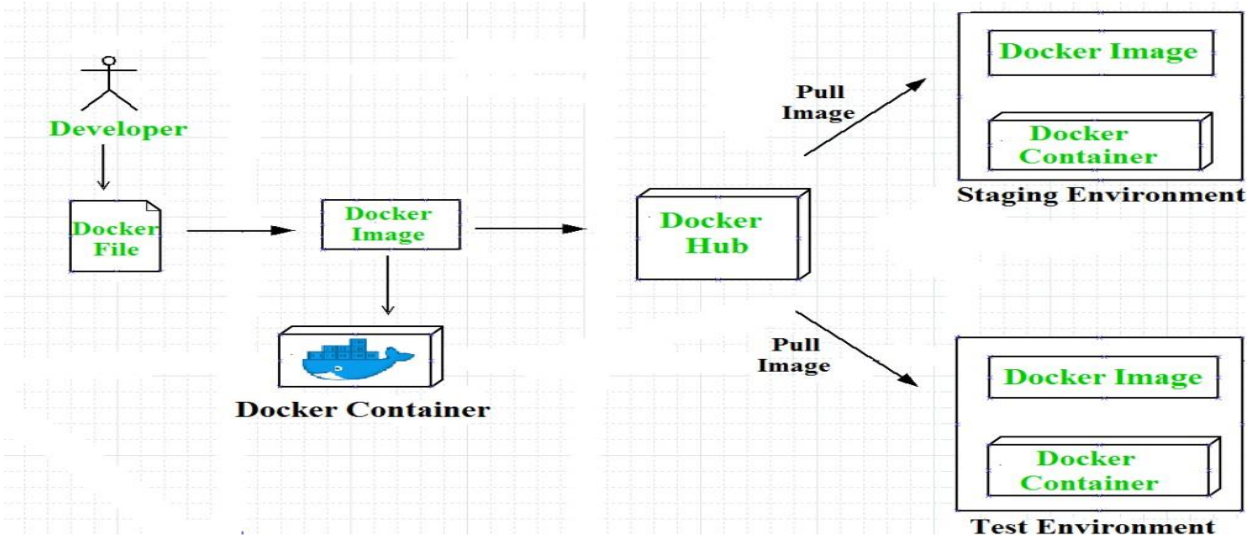
**DockerArchitecture**

DockerarchitectureconsistsofDocker client,Docker DaemonrunningonDockerHost, andDockerHubrepository.




**ComponentsofDocker**

ThemaincomponentsofDockerinclude–Dockerclientsandservers, Dockerimages,Dockerfile,DockerRegistries,andDockercontainers.




FirstcreateaJavaScriptfilewithasinglelineofcode.Itis justaprintstatementontheconsole.

```
//justa printstatementonconsole
```

```
console.log('HelloDocker!');
```

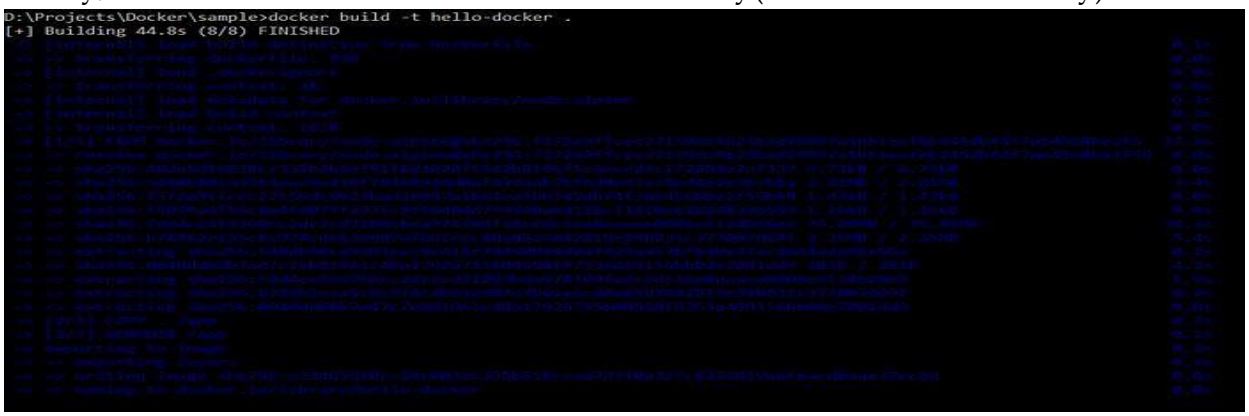
Creating the Dockerfile is start with the base image. This base image has a bunch of files. So, wetakethosefilesand add additionalcustomizationtothem.Iused Nodeimagewhich buildsontopofthe Linuximage.Youcanfindanyofficialimagesfromthedockerhub.

```
FROM
node:alpine
        COPY./app
        WORKDIR
        /app
        CMDnodeapp.j
        s
```

FROM—Definethebaseimage
COPY— Copyfilesfromthecurrentdirectoryto /appdirectoryintheimageWORKDIR—Setthe currentworkingdirectoryintheimage
CMD—
Writethecommandthatshouldbeexecuted(Here,Iexecutethenodecommand)Then we need to execute a command as below. It will build the Docker package for ourapplication.

```
dockerbuild-thello-docker.
```

The-tisatagtoidentifytheimage. Then,thehello-dockerisaspecificnamethatcanbeusedtoaccessit.
Finally,thiscommandmentionstheDockerfiledirectory(.meanscurrentdirectory).




Then,I canseealltheimagesonmycomputer withthiscommand.

```
D:\Projects\Docker\sample>docker images
REPOSITORY              TAG       IMAGE ID       CREATED              SIZE
hello-docker            latest    e33465df0cc2   About a minute ago   113MB
docker/getting-started  latest    3ba8f2ff0727   2 months ago         27.9MB
```

```
dockerimages
```

Now,wecanrunthisimageonanycomputerthatrunningDocker.Let'srunitwiththis command.

dockerrunhello-docker

```
D:\Projects\Docker\sample>docker run hello-docker
Hello Docker!
```

**Lab08:**

**IntegrateKubernetesandDocker.**

**WhatisKubernetes?**

*Kubernetes* isanopen-sourceorchestrationtoolthatallowsyoutorunandmanageyourcontainer-based workloads. KubernetesK8s was Developed by google and was later donated tothe Cloud Native Computing Foundation. Kubernetes helps you manage hundreds and thousandsof containerizedapplicationsin differentdeployable environments beitphysical machines,virtualmachines,cloudorevenhybridenvironments!

**HowDoesKubernetesWork?**

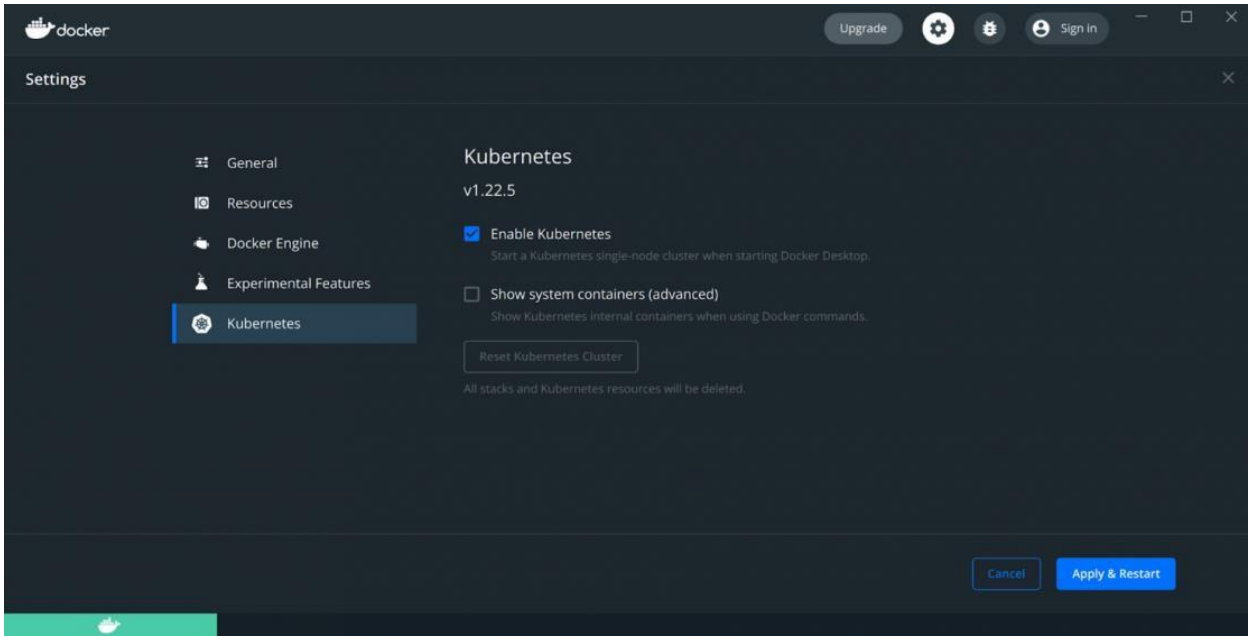
Kubernetes was made to solve the problems of the Monolith approach of application deploymentused to face. This is where the Microservice type of approach comes into the picture. To get toknow why Microservice is the business as of today, have a look at Monolithic vs Microservices.Kubernetesandthe Microserviceapproachhasmade the livesofsomanytech-giantseasier!

**HowDoesKubernetesWorkwithDocker?**

You'd have figured it by now that Docker helps to "create" containers whereas K8s enables youto "manage" them at runtime. Docker is used in packing and hip your application. In the sameway, K8s empowers you to deploy and scale your application. Kubernetes comes into the pictureonly when there are more containers that need to be managed. While the big tech-giants are in hrace to adapt to Kubernetes, small startups preferably wouldn't be needing K8s for managingtheir applications. But, as the companies grow, their infrastructure needs will rise; hence, thenumber of containers will increase,which can be difficulttomanage. Voila! this is whereKubernetescomesin.

**Kubernetessetup**

KubernetescanbeenabledfromtheKubernetes settingspanelasshownbelow.




## DockerfiletoCreateaHelloWorldContainerImage

A manifest, called a Dockerfile, describes how the image and its parts are to run in a containerdeployed on a host. To make the relationship between the Dockerfile and the image concrete,here'sanexample ofa Dockerfile thatcreatesa "HelloWorld" appfromscratch:

```
FROM
scratchCOPY
hello
```

When yougivethisDockerfiletoalocalinstanceofDockerbyusingthedockerbuild command, itcreatesacontainerimagewiththe"HelloWorld"appinstalledinit.

**CreatingaKubernetesDeploymentforHelloWorld**

Nextyouneedtodefineadeploymentmanifest,commonlydonewithaYAMLorJSONfile,totell

```
# Hello World Deployment
YAMLapiVersion:apps/v1
kind:
Deploymentmetada
ta:
  name:
helloworldspec:
  selector:
       matchLabels:
       app:
  helloworldtemplate:
       metadata:
       labels:
       app:
       helloworldspec:
       containers:
       -name:helloworldimage:
       boskey/helloworldresourc
       es:
       limits:
             memory:
```

Kubernetesshow torun "HelloWorld"basedonthe containerimage:
TodeploytheapplicationonaKubernetescluster,youcansubmitaYAMLfileusingakubectl commandsimilartothe following.
kubectlapply-fhttps://yourdomain.ext/application/helloworld.yaml--record

**CreatingaKubernetesService**

ThecontainerisnowdeployedtoKubernetesbutthereisnowaytocommunicatewithit,thenextst ep isto turnthe deploymentinto a Servicebyestablishing communication.

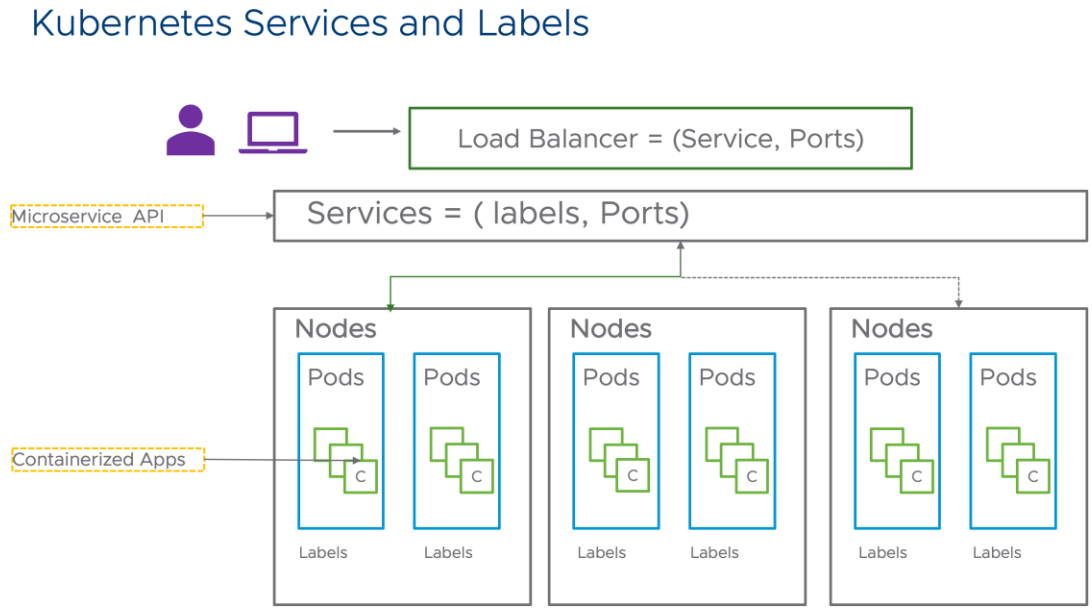
InKubernetes,aServiceisanabstractionwhichdefinesalogicalsetofpodsandapolicybywhichto accessthem.Thisguidedemonstratesabasicmethod ofprovidingservicestopods.

**ApplicationLabelsandServices**

**Labels**

AveryinterestingaspectofKubernetesisthewayKubernetescombinestheuseofLabelsandServ icestocreatetremendous possibilities.

AttheheartofKubernetesisapod.Apodcontainsrunninginstancesofoneormorecontainers.Wh enapodisdeployedinKubernetes,apartfromotherspecifications,thepodcanbeassigned labels. Ideally a pod is given a label identifying which part of the overall application the podbelongs to. For example, if the pod being deployed is for the application "frontend" and within"frontend"thepodisrunningcodeforlogin,upondeploymentitcanbelabeled[app=fr ontend,label=login]. Other podsdeployedaspartofthistier canbegiventhesamelabel.




**Services**

| ServiceType | Dependson | WhatitDoes | Traffic TypeHandled |
|---|---|---|---|
| **ClusterIP** | ClusterNetwork | UsestheClusterNetwork toMAPpodIP/port | Internal to theCluster |
| **NodePort** | ClusterIP | Uses a port on Kubernetes Node + creates a mapping of Nodeporttothe ClusterIP | External |
| **Load BalancerPort** | ClusterIP/Node | CreatesanExternalLoadBalancer thatmapsto eitheraCluster IP/NodePort | External |

ServicesenableKubernetestoroutetraffictopods.PodsinKubernetesaredeployedon Anoverlaynetwork.PodsacrossKubernetesnodescannotaccesseachothernorcananyexternal/ingress traffic access pods unless a Service type resource is defined. A service is routedto the correct

app using a label. So when a service gets created with label login,the service willsend traffic to pods that contain the login app based on the label match. Services are needed forboth East-West communication, when two pods from different apps need to talk to each other,and for North-South communication, when external traffic ( outside of the Kubernetes cluster)needs to talk to a pod. Kubernetes has different service types to address both scenarios. Somecommonservices arelistedbelow:

**HelloWorldservicedefinition**

A corresponding service definition for the earlier “Hello World” deployment manifest is shownbelow. Notice line 5 onward. With the selector as "app: hello world" the service will forwardtraffic comingtoport80ontheclusternetworktopodsthatmatchthislabel.

```
apiVersion:
v1kind:
Servicemetadat
a:
  name:
helloworldspec:
  selector:
      app:
  helloworldports:
  -port:80
```

**Lab09:**

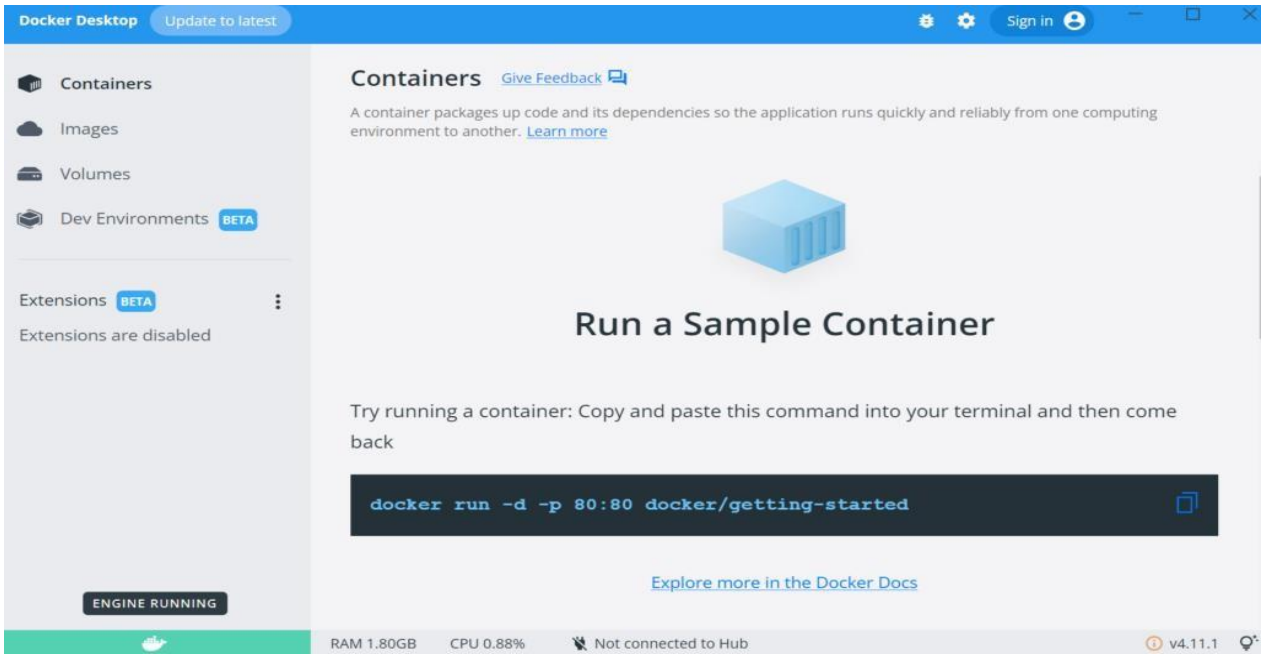
**Automatetheprocessofrunningcontainerizedapplicationdevelopedinexercise7using Kubernetes.**

TogetaKubernetesCluster upandrunning, wewillusethefollowingtools:

- DockerEngine:Forcreating,building,anddeployingapplicationimages.
- ADocker HubAccountfordeployingDocker imagestotheDocker Hubregistry.
- Minikube: Minikube is Kubernetes tool. It allows you to run Kubernetes locally on yourcomputer.Itrunsasasingle-nodeKubernetesclusterwithinyourlocalcomputer,makingiteasytodeploytheKubernetes app.
- Kubectl: Kubectl is a Kubernetes command-line (CLI) tool. It allows you to runcommandsrelatedto deploying,inspecting,and managingclusterresourcesagainstKubernetes.
- Node.jsruntime:For creatingaNode.jsapp.

Itisessentialtoensuretheabovetoolsareinstalledtoolsandcorrectlyconfiguredonyourcomputer beforeDeployingyour containertotheKubernetescluster using Docker.
YoucancheckifNode.jsiscorrectlyinstalledusingthefollowingcommand:To checkifDockerisinstalled correctly,runthe following:

```
docker
version#clien
t
# version
#server Docker Desktop
```




OnceyouhaveinstalledMinikubeonyourcomputer,runthefollowingcommandtogetitup,and runningwithinyourinstalledDockerEngine:

minikubestart

```
* docker "minikube" container is missing, will recreate.
* Creating docker container (CPUs=2, Memory=2200MB) ...
* Preparing Kubernetes v1.24.3 on Docker 20.10.17 ...
  - Generating certificates and keys ...
  - Booting up control plane ...
  - Configuring RBAC rules ...
* Verifying Kubernetes components...
! Executing "docker container inspect minikube --format={{.State.Status}}"
took an unusually long time: 4.3711286s
  - Using image gcr.io/k8s-minikube/storage-provisioner:v5
* Restarting the docker service may improve performance.
  - Using image kubernetesui/metrics-scraper:v1.0.8
  - Using image kubernetesui/dashboard:v2.6.0
* Enabled addons: default-storageclass, storage-provisioner, dashboard
* Done! kubectl is now configured to use "minikube" cluster and "default" n
amespace by default
```

Once youhavethePATHready,runthefollowingcommandtocheckifyoursetKubectlisreadytoexecuteKubernetes commands:

kubectlcluster-info

```
C:\Users\kim>kubectl cluster-info
Kubernetes control plane is running at https://127.0.0.1:8547
CoreDNS is running at https://127.0.0.1:8547/api/v1/namespaces/kube-system
/services/kube-dns:dns/proxy

To further debug and diagnose cluster problems, use 'kubectl cluster-info
dump'.
```

Kubernetesallowsyoutomanagelargeapplications.Likewise,Dockercandeploythisapplication to a Kubernetes cluster seamlessly. For this guide, we will just create a simpleNode.jsapp todemonstratehowyoucangetyourapplicationrunning onaKubernetescluster.

If you have an application reader, you can skip this step and use the application alongside thisguide.

First,navigatetoyourprojectdirectoryand

initializeNode.jsusingthefollowingcommand:npminit-y

Just like any application, you go ahead and add dependencies/libraries to run your application. Inthis case, we create a minimal Node.js app. Therefore, we will use the Express library to create asimple Node.js server.InstallExpress asfollows:

npminstallexpress

Thencreateanindex.js fileandcreatetheserveras

follows:constexpress =

require('express');constapp=express();
constport=
3000;app.get('/',(req,re
s)=>{
res.send('Hello Kubernetes!!!');
});
app.listen(port,()=>{
console.log(`Serverstartedonport${port}`);
});

Thentesttheapplicationbyrunning thefollowing:
node index.js

Finally,openhttp://localhost:3000onthebrowsertotesttheapplication:


To get the application ready, we will firstwrite a few commands that will instruct Docker tobuildanimageforthis specificapplication.
Note:Eachapplication Dockerfilediffers.Therefore,alwaysensureyouhavetherightDockerfile for running your application. In this example, we will write the Dockerfile as follows:Insidetheprojectdirectory,createaDockerfilefileandaddthefollowingDocker commands.

```
# pull the Node.js from the Docker
registryFROMnode:18-alpine3.15
#setdefaultdirsothatsubsequentcommandsexecutein/src/appdirWORK
DIR/src/app
# copy dependencies
filesCOPY
package.json./COPYpa
ckage-lock.json.
#willexecutenpminstall
in/src/appbecauseofWORKDIRRUN npminstall
#copyapplicationfiles(index.js)
COPY././
# Port t expose the application on
DockerEXPOSE 3000
#Thecommandforrunningtheapplication
CMD["node","index.js"]
```

OnceyouhavetheDockerfileready,let's diveinandruntheapplicationusingDocker.Herewewill:

- Buildtheapplicationimage
- Allowsustotestiftheapplicationiscorrectlyrunningon Docker.
- Buildaglobalregistryimagefor Docker Hub

Let'snowdiveinandlearnhowtobuildthecontainerimageusingthe Dockerfilewehavecreated.

First, let's build the image and test it locally. Inside your Dockerfile root directory, run thefollowingcommand:

dockerbuild-tnode-app.

```
C:\Users\kim>kubectl cluster-info
Kubernetes control plane is running at https://127.0.0.1:8547
CoreDNS is running at https://127.0.0.1:8547/api/v1/namespaces/kube-system
/services/kube-dns:dns/proxy

To further debug and diagnose cluster problems, use 'kubectl cluster-info
dump'.
```

Nowrunacontainerfromthisimageandseethatit worksasexpected:dockerrun-it-p3000:3000node-app Ifyouopenhttp://localhost:3000,youshouldbeservedthesameapplicationwerunlocally. However,thistimetheapplicationwill beloadedfromaDockercontainer.

Hello Kubernetes!!!

To deploy this application to Kubernetes, we first need to push the image to a Docker Hubregistry.Todo so,loginto yourDockerHubaccountusing aterminalbyrunning:

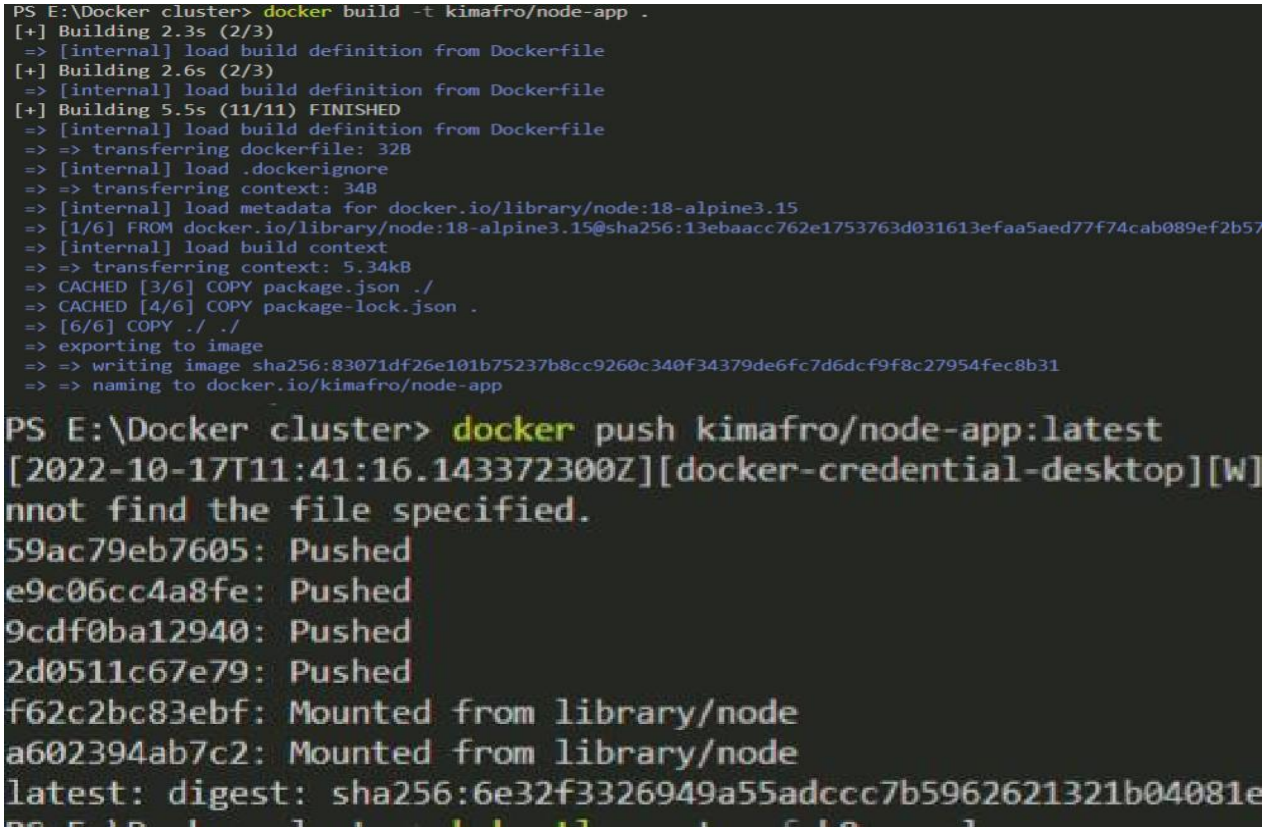
**dockerlogin**

Provide your correct Docker Hub username and password.Proceedandbuildanimageusing yourusernameasfollows:

**dockerbuild-t<EnteryourDockerHub username>/node-app**

Here, ensureyouhavethecorrectusernameaddedtotheabovecommand. Thiswillformtheimagename ofyourapplication.Forexample:

**dockerbuild-t kimafro/node-app**

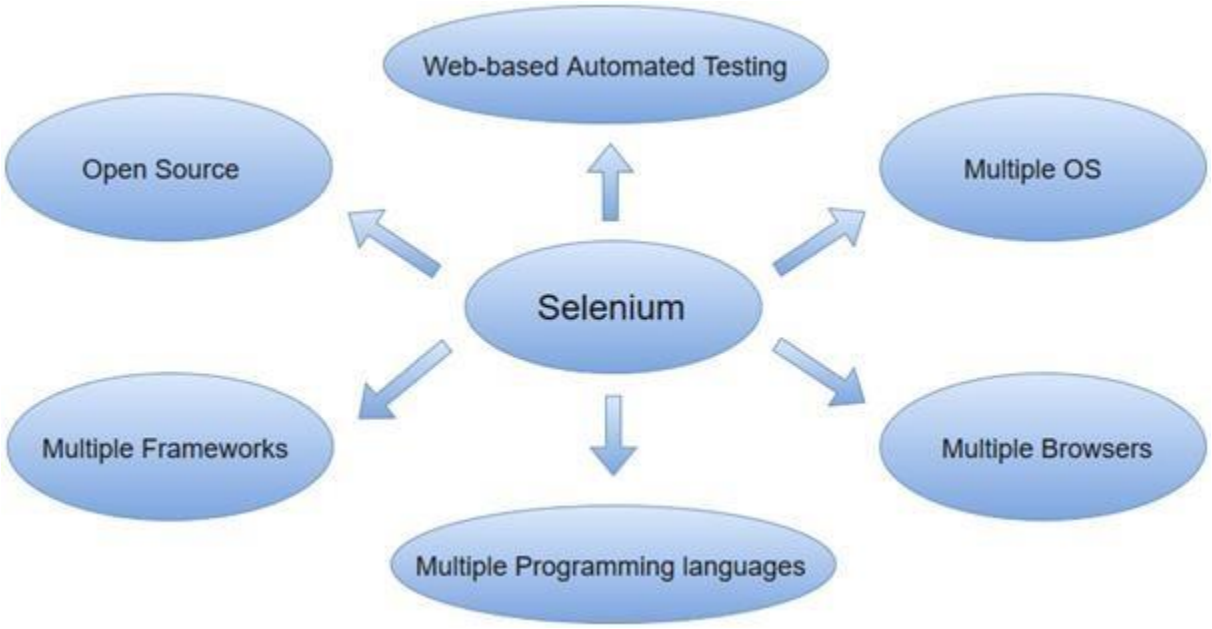

PS E:\Docker cluster> docker build -t kimafro/node-app .
[+] Building 2.3s (2/3)
=> [internal] load build definition from Dockerfile
[+] Building 2.6s (2/3)
=> [internal] load build definition from Dockerfile
[+] Building 5.5s (11/11) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 32B
=> [internal] load .dockerignore
=> => transferring context: 34B
=> [internal] load metadata for docker.io/library/node:18-alpine3.15
=> [1/6] FROM docker.io/library/node:18-alpine3.15@sha256:13ebaacc762e1753763d031613efaa5aed77f74cab089ef2b57
=> [internal] load build context
=> => transferring context: 5.34kB
=> CACHED [3/6] COPY package.json ./
=> CACHED [4/6] COPY package-lock.json .
=> [6/6] COPY ./ ./
=> exporting to image
=> => writing image sha256:83071df26e101b75237b8cc9260c340f34379de6fc7d6dcf9f8c27954fec8b31
=> => naming to docker.io/kimafro/node-app
PS E:\Docker cluster> docker push kimafro/node-app:latest
[2022-10-17T11:41:16.143372300Z][docker-credential-desktop][W]
nnot find the file specified.
59ac79eb7605: Pushed
e9c06cc4a8fe: Pushed
9cdf0ba12940: Pushed
2d0511c67e79: Pushed
f62c2bc83ebf: Mounted from library/node
a602394ab7c2: Mounted from library/node
latest: digest: sha256:6e32f3326949a55adccc7b5962621321b04081e

**Lab10:**

**InstallandExploreSeleniumforautomatedtesting.**

Selenium is one of the most widely used open source Web UI (User Interface) automation testingsuite.It was originally developed by Jason Huggins in 2004 as an internal tool at Thought Works.Seleniumsupportsautomationacrossdifferent browsers,platformsandprogramming languages.

Selenium supports a variety of programminglanguages through the use of drivers specific toeachlanguage.Languagessupportedby SeleniumincludeC#,Java,Perl,PHP,Python andRuby.Currently, Selenium Web driver is most popular with Java and C#. Selenium test scriptscan be coded in any of the supported programming languages and can be run directly in mostmodern web browsers.Browserssupported by Selenium includeInternetExplorer,MozillaFirefox,GoogleChromeandSafari.




**SeleniumFeatures**

- SeleniumisanopensourceandportableWebtestingFramework.
- Selenium IDE provides a playback and record feature for authoring tests without the needtolearnatestscriptinglanguage.
- It can be considered as the leading cloud-based testing platform which helps testers torecord their actions and export them as a reusable script with a simple-to-understand andeasy-to-use interface.
- Selenium supports various operating systems, browsers and programminglanguages.Followingis thelist:

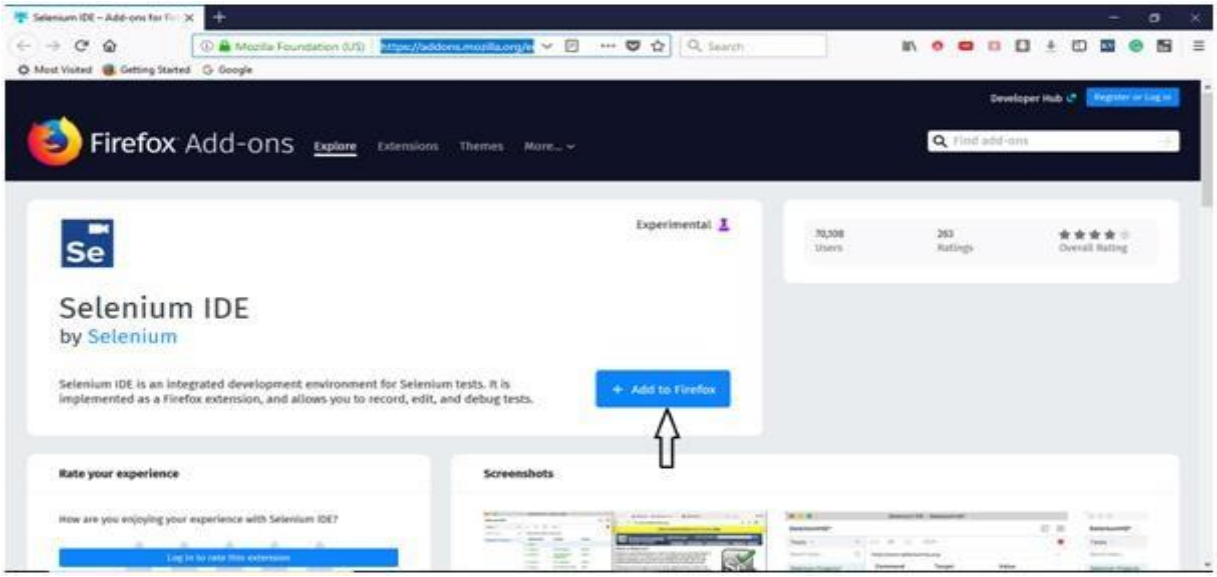
- ProgrammingLanguages:C#,Java,Python,PHP,Ruby,Perl,andJavaScript
- OperatingSystems:Android,iOS,Windows,Linux,Mac,Solaris.
- Browsers:GoogleChrome,Mozilla Firefox,InternetExplorer,Edge,Opera,Safari,etc.
- Italsosupportsparalleltestexecutionwhichreducestimeandincreasestheefficiencyof tests.
- SeleniumcanbeintegratedwithframeworkslikeAntandMavenforsourcecodecompil ation.
- Selenium can alsobeintegratedwith testingframeworkslikeTestNGforapplicationtestingandgeneratingreports.
- Seleniumrequiresfewerresourcesascomparedtoother automationtesttools.
- WebDriverAPIhasbeenindulgedinseleniumwhichisoneofthemostimportantmodif icationsdonetoselenium.
- Seleniumwebdriverdoesnotrequireserverinstallation,testscriptsinteractdirectlywi ththe browser.
- Seleniumcommandsarecategorizedintermsofdifferentclasseswhichmakeiteasierto understandandimplement.
- SeleniumRemoteControl(RC)inconjunctionwithWebDriverAPIisknownasSeleniu m2.0.Thisversionwasbuilttosupportthevibrantwebpagesand Ajax.

Selenium IDE is available only as Firefox and Chrome plug-in, we assume that you have alreadyinstalled Mozilla Firefox browser in your system. However, you can download the latest versionofFirefoxthroughtheirofficialwebsite providedunderthelinkgivenbelow.

https://www.mozilla.org/en-US/firefox/new/

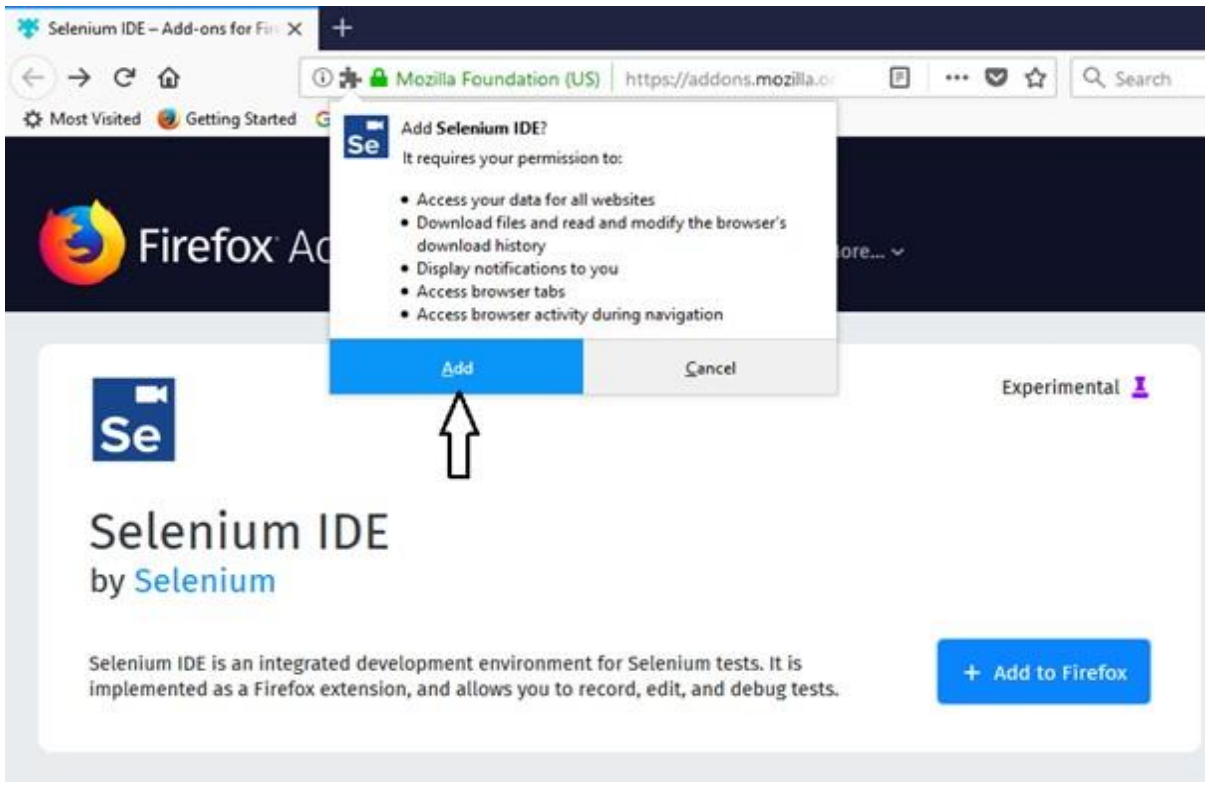
SeleniumIDE
DownloadandInstallLaunchMoz
illa Firefoxbrowser.
Open URLhttps://addons.mozilla.org/en-us/firefox/addon/selenium-
ide/Itwillredirectyoutotheofficialadd-onpageofFirefox.

Clickon"AddtoFirefox"button.



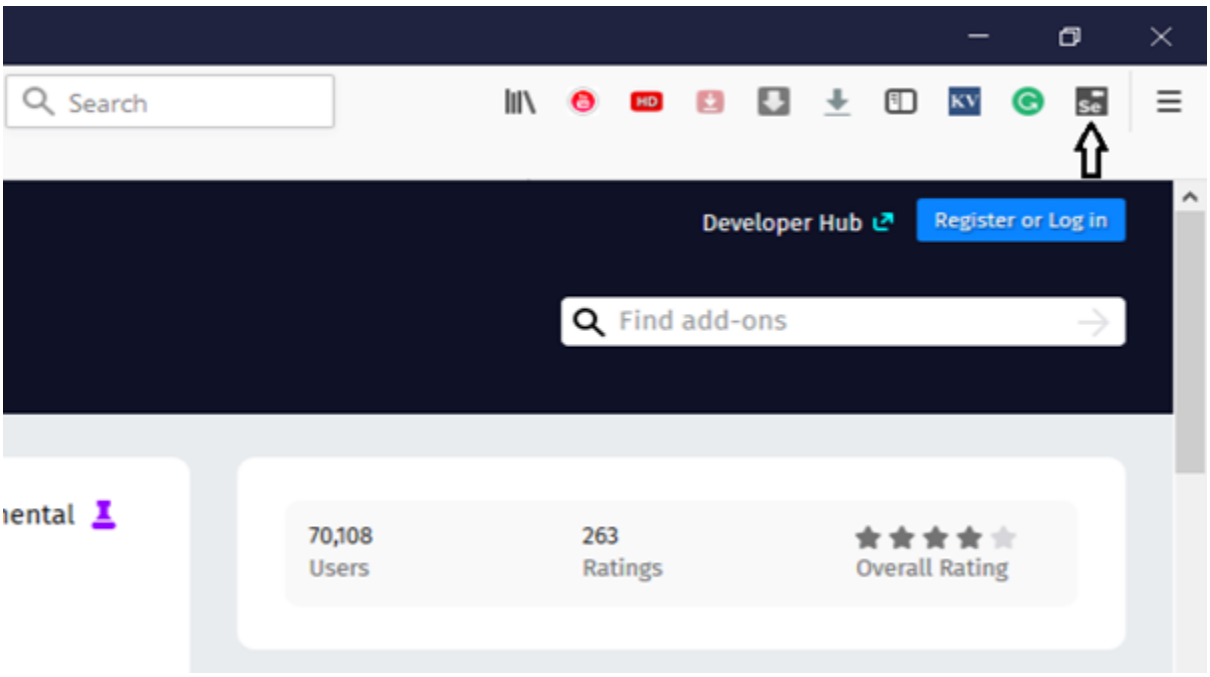

Apop-updialogboxwillbeappearedaskingyoutoaddSeleniumIDEasextensiontoyourFirefoxbrowser.

Clickon"Add"button.

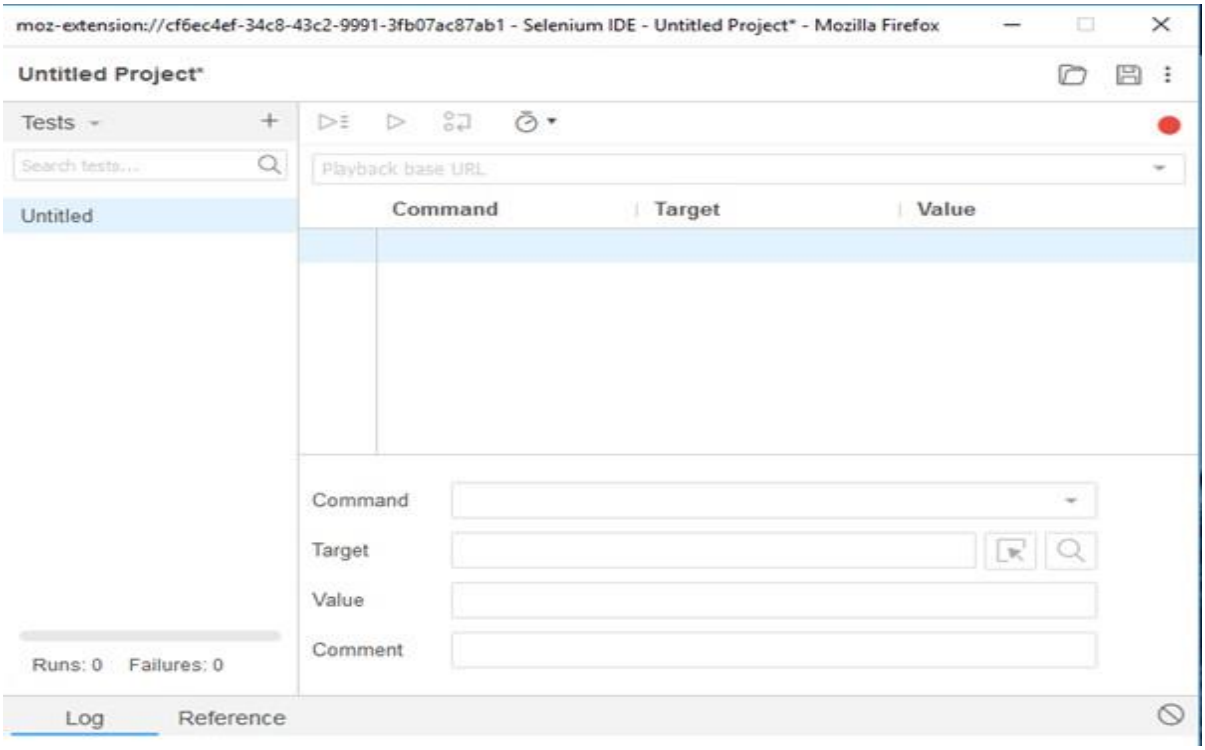


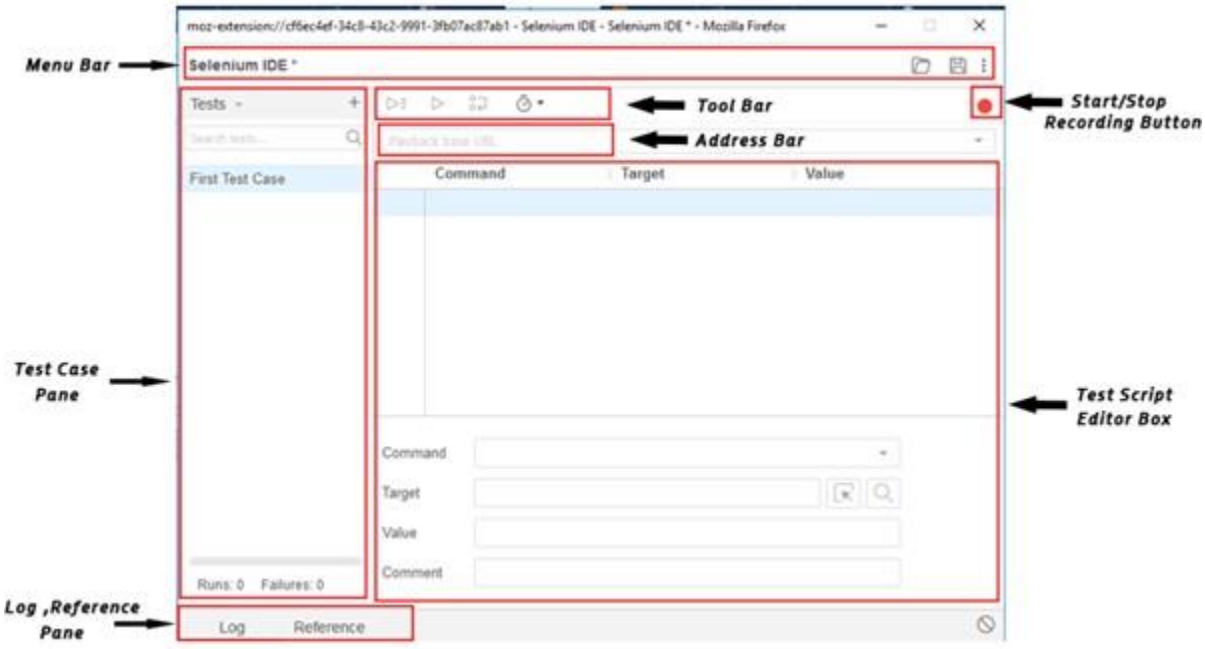

RestartyouFirefoxbrowser.

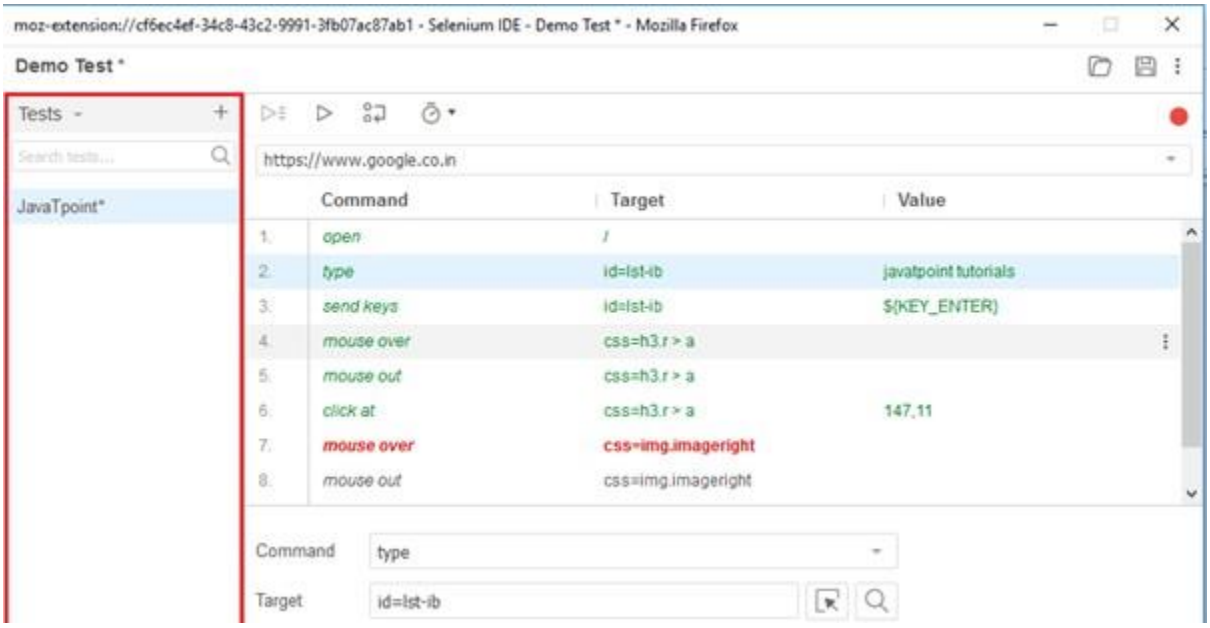
Gotothetoprightcorneronyour Firefoxbrowser andlookfortheSeleniumIDE icon.




ClickonthaticontolaunchSeleniumIDE.


moz-extension://cf6ec4ef-34c8-43c2-9991-3fb07ac87ab1 - Selenium IDE - Untitled Project* - Mozilla Firefox
Untitled Project*
Tests
Search tests...
Untitled
Playback base URL
Command
Target
Value
Command
Target
Value
Comment
Runs: 0
Failures: 0
Log
Reference


Menu Bar
Selenium IDE *
Tool Bar
Start/Stop Recording Button
Address Bar
Tests
First Test Case
Command
Target
Value
Test Case Pane
Test Script Editor Box
Command
Target
Value
Comment
Runs: 0
Failures: 0
Log ,Reference Pane
Log
Reference

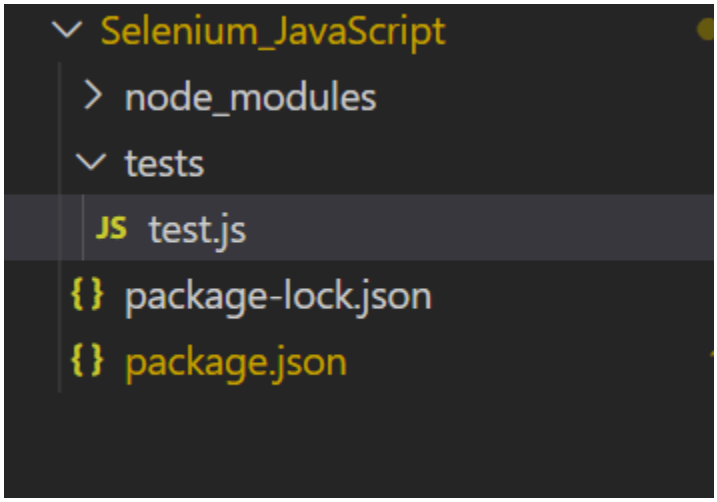

moz-extension://cf6ec4ef-34c8-43c2-9991-3fb07ac87ab1 - Selenium IDE - Demo Test * - Mozilla Firefox
Demo Test *
Tests
JavaTpoint*
https://www.google.co.in
Command
Target
Value
1. open /
2. type id=lst-ib javatpoint tutorials
3. send keys id=lst-ib ${KEY_ENTER}
4. mouse over css=h3.r > a
5. mouse out css=h3.r > a
6. click at css=h3.r > a 147,11
7. mouse over css=img.imageright
8. mouse out css=img.imageright
Command type
Target id=lst-ib

**Lab11:**

**WriteasimpleprograminJavaScriptandperformtestingusingSelenium.**

Step1:Createafoldernamed“tests”intheprojectroot.Insidethisfolder,wecreateour firsttestfilenamed“test.js”.

Shownbelowisthefolder structure:




Step2:Insidetest.js, pullalltherequiredfunctions fromnode_modules*const {By,Key,Builder} = require("selenium-webdriver");require("chromedriver");*

**Step3:**Createafunctionexample(),whichwillbecontainingyourtestscript.Feelfreetoprovide anyfunctionnameofyourchoice.

```
asyncfunctionexample(){
}
```

**Step 4:** Inside the function, let us write our test script using Selenium and JavaScript.

```
asyncfunctionexample(){

    varsearchString="AutomationtestingwithSeleniumandJavaScript";

    //Towaitforbrowsertobuildandlaunchproperly
    letdriver=awaitnewBuilder().forBrowser("chrome").build();

     //Tofetchhttp://google.comfromthebrowser withour
     code.awaitdriver.get("http://google.com");

     //TosendasearchquerybypassingthevalueinsearchString.
     awaitdriver.findElement(By.name("q")).sendKeys(searchString,Key.RETURN);

     //Verify the page title and
```

```
    print
    itvartitle=awaitdriver.getTitle
    ();console.log('Titleis:',title);

    //Itisalwaysasafepracticetoquitthebrowserafterexecutio
    nawaitdriver.quit();
}
```

**Step5:**Nowsimplyaddthefunctioncall.

Hereishowtheoverallimplementationlookslike:

```
const{By,Key,Builder}=require("seleniu
m-webdriver");
require("chromedriver")

;asyncfunctionexample(

){

    varsearchString="AutomationtestingwithSelenium";

    //Towaitforbrowsertobuildandlaunchproperly
    letdriver=awaitnewBuilder().forBrowser("chrome").build();

    //Tofetchhttp://google.comfromthebrowser withour
    code.awaitdriver.get("http://google.com");

    //TosendasearchquerybypassingthevalueinsearchString.
    awaitdriver.findElement(By.name("q")).sendKeys(searchString,Key.RETURN);

    //Verify the page title and
    print
    itvartitle=awaitdriver.getTitle
    ();console.log('Titleis:',title);

    //Itisalwaysasafepracticetoquitthebrowserafterexecutio
    nawaitdriver.quit();

}
example()
```

**Step6:**Timeforsomeaction…let'srunthecodebygivingthefollowingcommandontheterminal:

```
nodetest.js
```

AninstanceofChromebrowserisinstantiatedandthenecessarySeleniumWebDriveractions areperformedonthe WebElements.

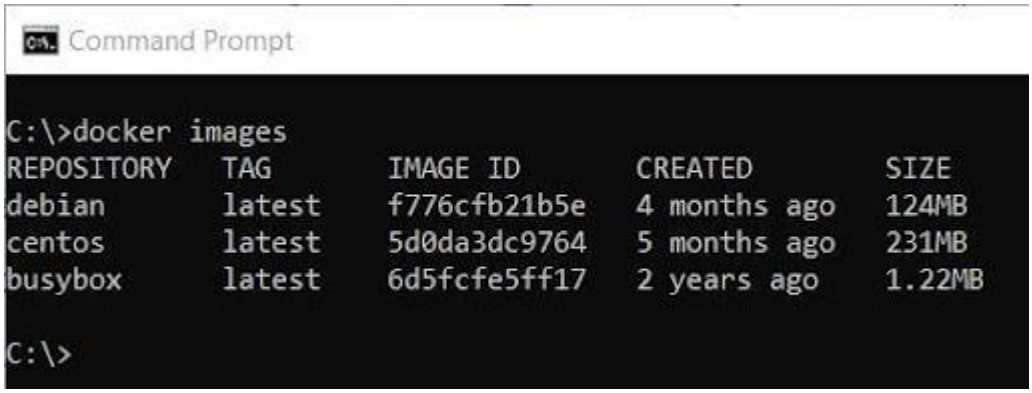
**Lab12:**

**Developtestcasesfortheabovecontainerizedapplicationusingselenium.**

**Step1:Pullthedockerimage**

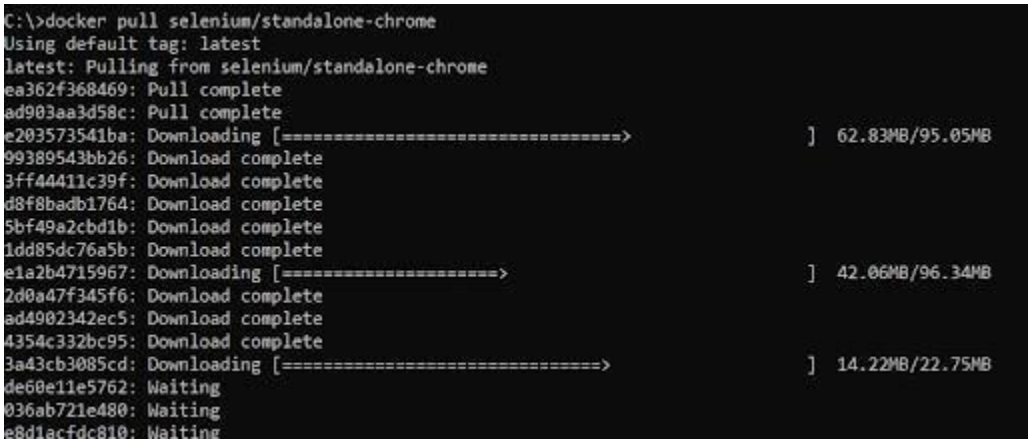
Togetalistofallthealreadyexistingimagesonthesystem,runthefollowingcommandinthecommandprompt:

```
dockerimages
```




Ifyoudonotalreadyhavetheseleniumstandalone-chromedockerimage,runthefollowingcommandtodownloadacopyoftheimageontothesystem.

```
dockerpullselenium/standalone-chrome
```




Uponrerunningthecommanddockerimages,selenium/standalone-chromeimageappearsinthelist.


Step2:RunningtheSeleniumWebdriverDockercontainer

Uponpullingtheselenium/standalone-

chromeimageontothesystem,startthecontainerbyrunningthefollowingcommand:

```
dockerrun-d-p4444:4444-v/dev/shm:/dev/shmselenium/standalone-chrome
```

```
C:\Users\bshrikanth>docker run -d -p 4444:4444  selenium/standalone-chrome
837f375519d620fb2f53f70ded60eaabf87756e5819757a736df1aca62fe1bf4
```

StartingDockerContainer
Thecommand,whenrun,willreturntheContainerID.

Openthebrowserandnavigatetohttp://localhost:4444/.ItreflectsSeleniumGridUI,asshown below.


Step3:Creatingasampletestfile
Seleniumsupportstestswrittenindifferentlanguagesofwhich JavaandPythonaremostpopularlyused.Inthis example,usingPythontocreate SeleniumTest.

```
fromseleniumimportwebdriver
```

Toopenfileinchromebrowser,Chromedriverisnecessary.Therefore,initializingChromeOptions to declare any connection and driver options necessary while instantiating abrowserinstance.

```
options =

webdriver.ChromeOptions()options.add_argument('

--ignore-ssl-errors=yes')
```

CreatinganinstanceoftheRemotewebdriverandpassingtheseleniumendpointandchromeoptionsdefinedintheprevious step.

```
driver =

webdriver.Remote(command_executor='http://localhost

:4444/wd/hub',options=options

)
```

avigatetotheBrowserStackwebsiteandclickontheGetStartedfor Freebutton.Inducingwaittime betweenthe twoactions allowsviewingtheexecutionoftests.

```
driver.get("https://www.browserstack.com/")

driver.find_element_by_link_text("Getstartedfree").click()
```

seleniumDockerTest.py

```
from selenium import

webdriverimporttime



print("Test Execution

Started")options=

webdriver.ChromeOptions()

options.add_argument('--ignore-ssl-

errors=yes')options.add_argument('--ignore-

certificate-errors')driver =

webdriver.Remote(command_executor='http://localhost

:4444/wd/hub',options=options

)

#maximize the window

sizedriver.maximize_windo

w()time.sleep(10)

#navigate to

browserstack.comdriver.get("https://www.bro

wserstack.com/")time.sleep(10)
```

```
driver.find_element_by_link_text("Getstartedfree").click()time.sleep(10)

#close the

browserdriver.clos

e()driver.quit()

print("TestExecutionSuccessfullyCompleted!")
```

Step4:Executing the test case PythontestcasefilecanberunusingeitheranIDEorcommandprompt.Torunitfromthecommand prompt,opena commandpromptandrunthefollowingcommand:

```
python<filename>
```