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TY-IT Roll No. 70

## Assignment 2

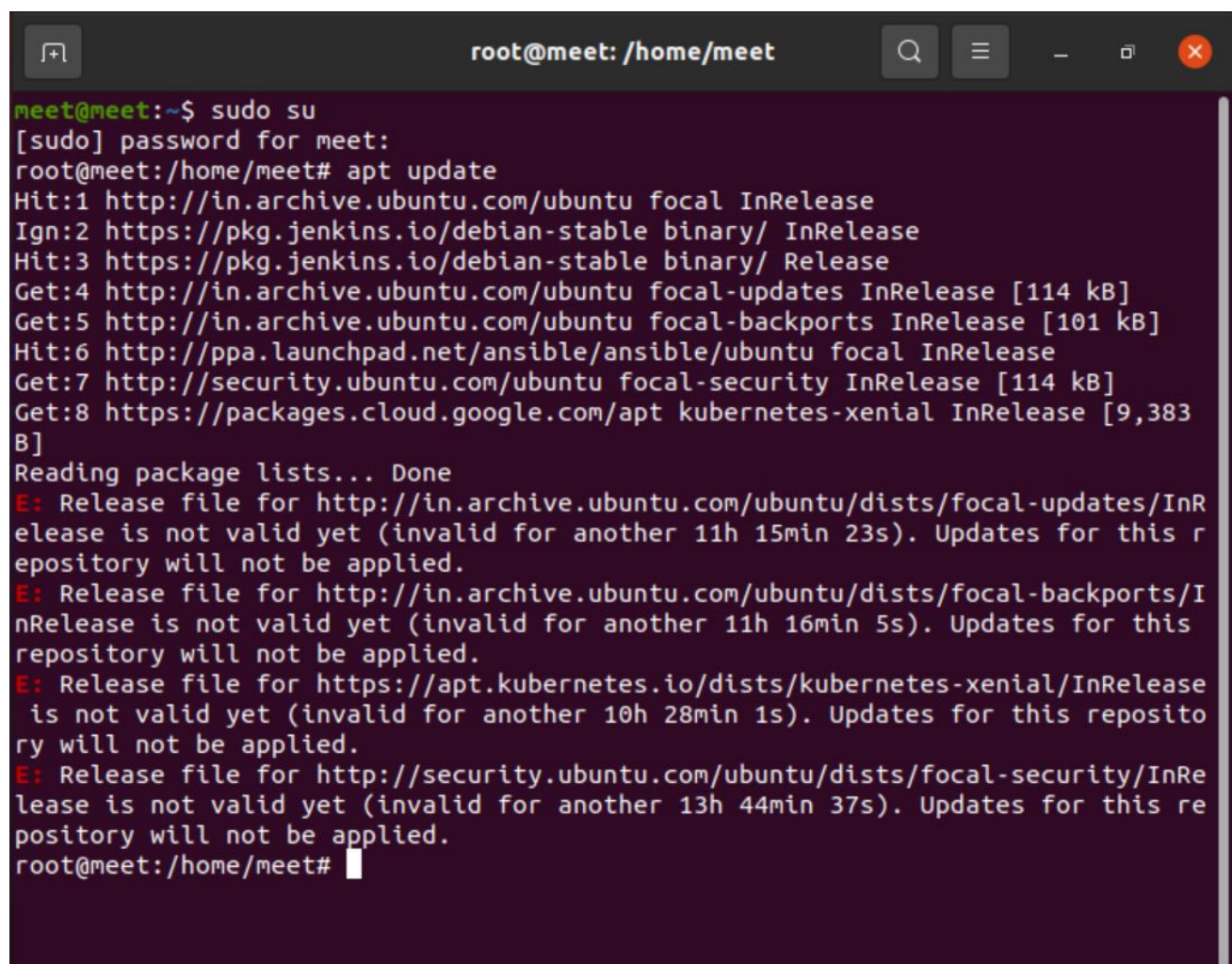
Host an application on Apache Tomcat Server using Jenkins pipeline.

### Steps and Outputs:

Step 1: Run the following for installation of Tomcat Server:

sudo apt update

sudo apt-cache search tomcat

A terminal window with a dark purple background and white text. The window title bar shows 'root@meet: /home/meet'. The terminal output shows the user 'meet' running 'sudo su' to become root. Then, 'apt update' is run, which lists several repositories and their update statuses. It shows that some repositories are not yet valid for updates. The output is as follows:

```
meet@meet:~$ sudo su
[sudo] password for meet:
root@meet:/home/meet# apt update
Hit:1 http://in.archive.ubuntu.com/ubuntu focal InRelease
Ign:2 https://pkg.jenkins.io/debian-stable binary/ InRelease
Hit:3 https://pkg.jenkins.io/debian-stable binary/ Release
Get:4 http://in.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu focal-backports InRelease [101 kB]
Hit:6 http://ppa.launchpad.net/ansible/ansible/ubuntu focal InRelease
Get:7 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:8 https://packages.cloud.google.com/apt kubernetes-xenial InRelease [9,383 B]
Reading package lists... Done
E: Release file for http://in.archive.ubuntu.com/ubuntu/dists/focal-updates/InRelease is not valid yet (invalid for another 11h 15min 23s). Updates for this repository will not be applied.
E: Release file for http://in.archive.ubuntu.com/ubuntu/dists/focal-backports/InRelease is not valid yet (invalid for another 11h 16min 5s). Updates for this repository will not be applied.
E: Release file for https://apt.kubernetes.io/dists/kubernetes-xenial/InRelease is not valid yet (invalid for another 10h 28min 1s). Updates for this repository will not be applied.
E: Release file for http://security.ubuntu.com/ubuntu/dists/focal-security/InRelease is not valid yet (invalid for another 13h 44min 37s). Updates for this repository will not be applied.
root@meet:/home/meet#
```

sudo apt install tomcat9 tomcat9-admin

```
root@meet: /home/meet
root@meet:/home/meet# sudo apt install tomcat9 tomcat9-admin
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi
  libgstreamer-plugins-bad1.0-0 libllvm11 libva-wayland2
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  libeclipse-jdt-core-java libtcnative-1 libtomcat9-java tomcat9-common
Suggested packages:
  tomcat9-docs tomcat9-examples tomcat9-user
The following NEW packages will be installed:
  libeclipse-jdt-core-java libtcnative-1 libtomcat9-java tomcat9
  tomcat9-admin tomcat9-common
0 upgraded, 6 newly installed, 0 to remove and 0 not upgraded.
Need to get 12.3 MB of archives.
After this operation, 14.8 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libeclipse-jdt-core-java all 3.18.0+eclipse4.12-1 [6,271 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu focal-updates/universe amd64 libtomcat9-java all 9.0.31-1ubuntu0.1 [5,838 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu focal-updates/universe amd64 tomcat9-common all 9.0.31-1ubuntu0.1 [59.8 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu focal-updates/universe amd64 tomcat9 all 9.0.31-1ubuntu0.1 [36.4 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu focal-updates/universe amd64 tomcat9-admin all 9.0.31-1ubuntu0.1 [24.6 kB]
```

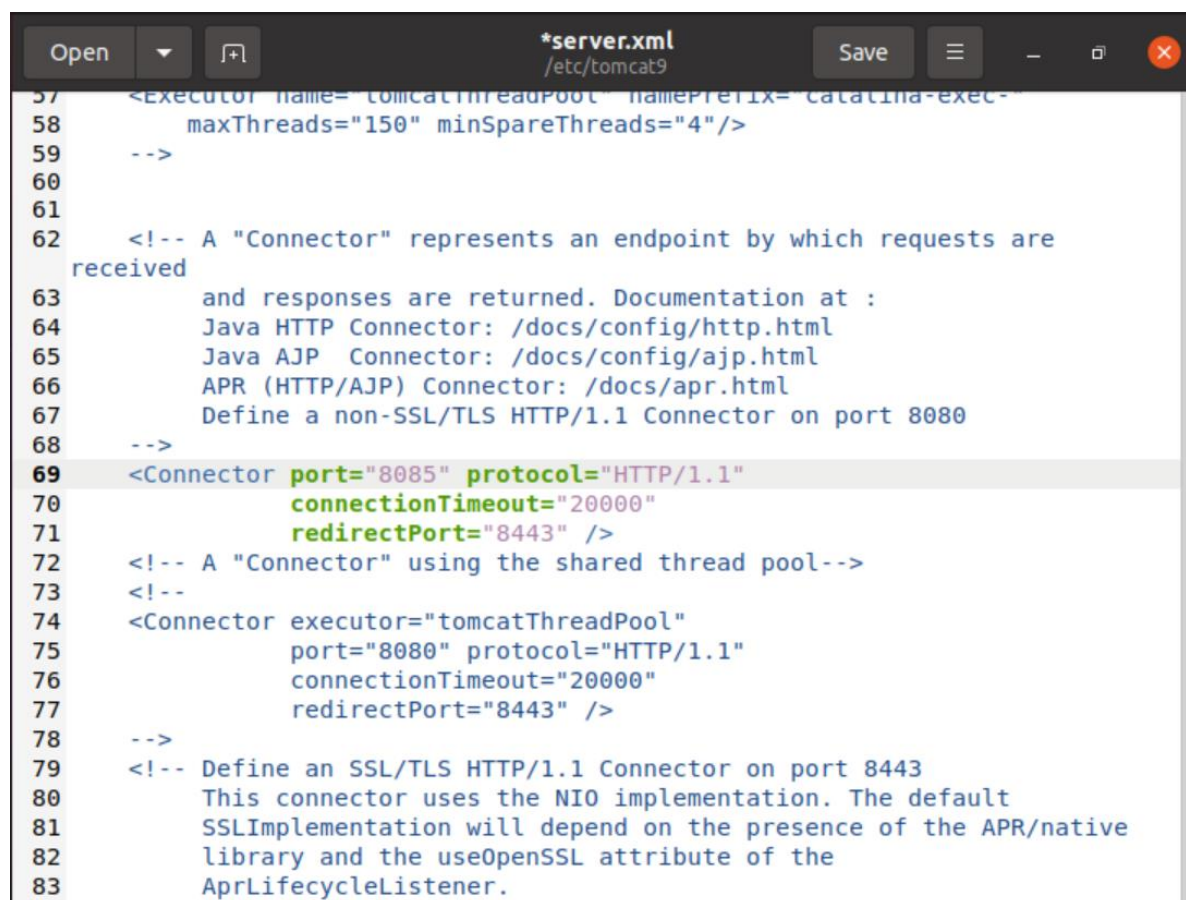
sudo systemctl enable tomcat9

```
root@meet: /etc/tomcat9
root@meet:/home/meet# systemctl enable tomcat9
root@meet:/home/meet# cd /etc/tomcat9/server.xml
bash: cd: /etc/tomcat9/server.xml: Not a directory
root@meet:/home/meet# cd..
cd..: command not found
root@meet:/home/meet# cd ..
root@meet:/home# cd ..
root@meet:/# cd ..
root@meet:/# ls
bin      dev      lib      libx32  mnt      root     snap     sys      var
boot    etc      lib32    lost+found  opt      run      srv      tmp
cdrom   home    lib64    media    proc     sbin     swapfile usr
root@meet:/# cd etc
root@meet:/etc# cd tomcat9
root@meet:/etc/tomcat9# sudo gedit server.xml
```



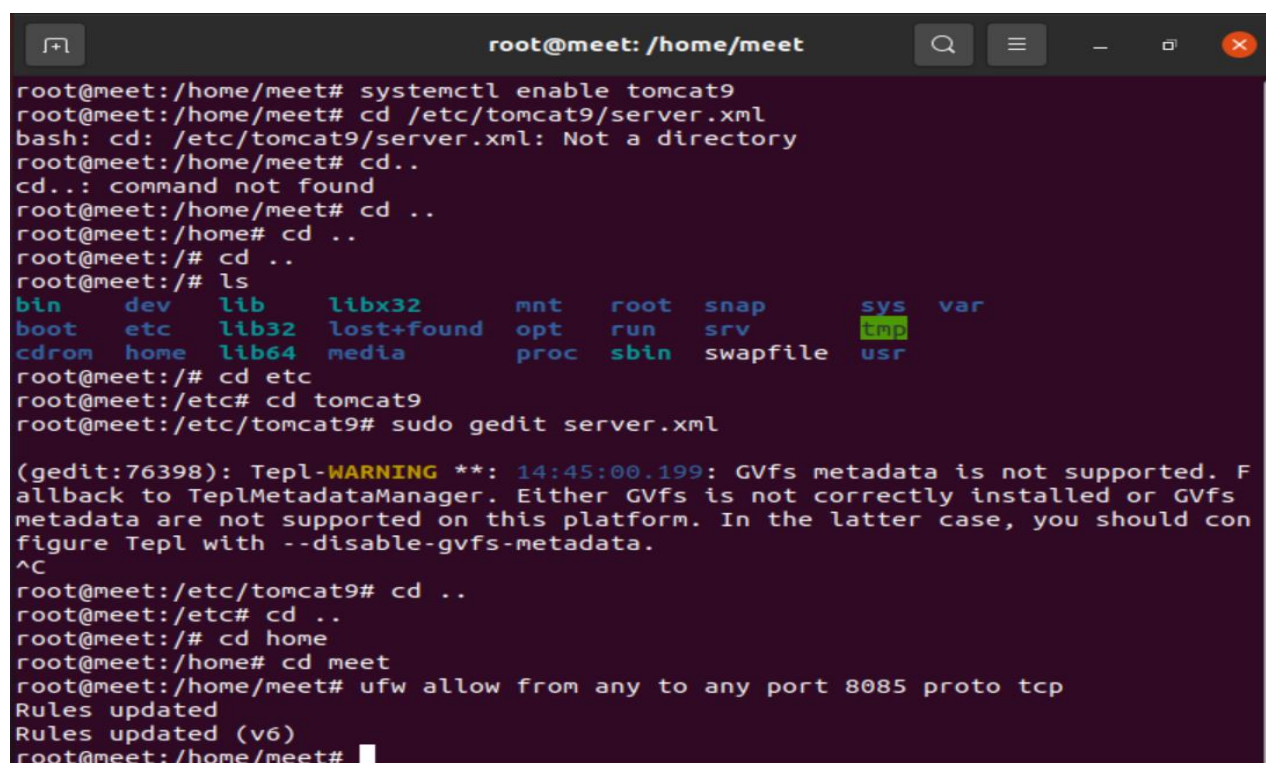
Step 2: Go to /etc/tomcat9 and edit server.xml:

Set the port to 8085 as we are using 8080 for Jenkins:



```
57 <Executor name="tomcatThreadPool" namePrefix="catalina-exec-"
58     maxThreads="150" minSpareThreads="4"/>
59 -->
60
61
62 <!-- A "Connector" represents an endpoint by which requests are
received
63     and responses are returned. Documentation at :
64     Java HTTP Connector: /docs/config/http.html
65     Java AJP  Connector: /docs/config/ajp.html
66     APR (HTTP/AJP) Connector: /docs/apr.html
67     Define a non-SSL/TLS HTTP/1.1 Connector on port 8080
68 -->
69 <Connector port="8085" protocol="HTTP/1.1"
70     connectionTimeout="20000"
71     redirectPort="8443" />
72 <!-- A "Connector" using the shared thread pool-->
73 <!--
74 <Connector executor="tomcatThreadPool"
75     port="8080" protocol="HTTP/1.1"
76     connectionTimeout="20000"
77     redirectPort="8443" />
78 -->
79 <!-- Define an SSL/TLS HTTP/1.1 Connector on port 8443
80     This connector uses the NIO implementation. The default
81     SSLImplementation will depend on the presence of the APR/native
82     library and the useOpenSSL attribute of the
83     AprLifecycleListener.
```

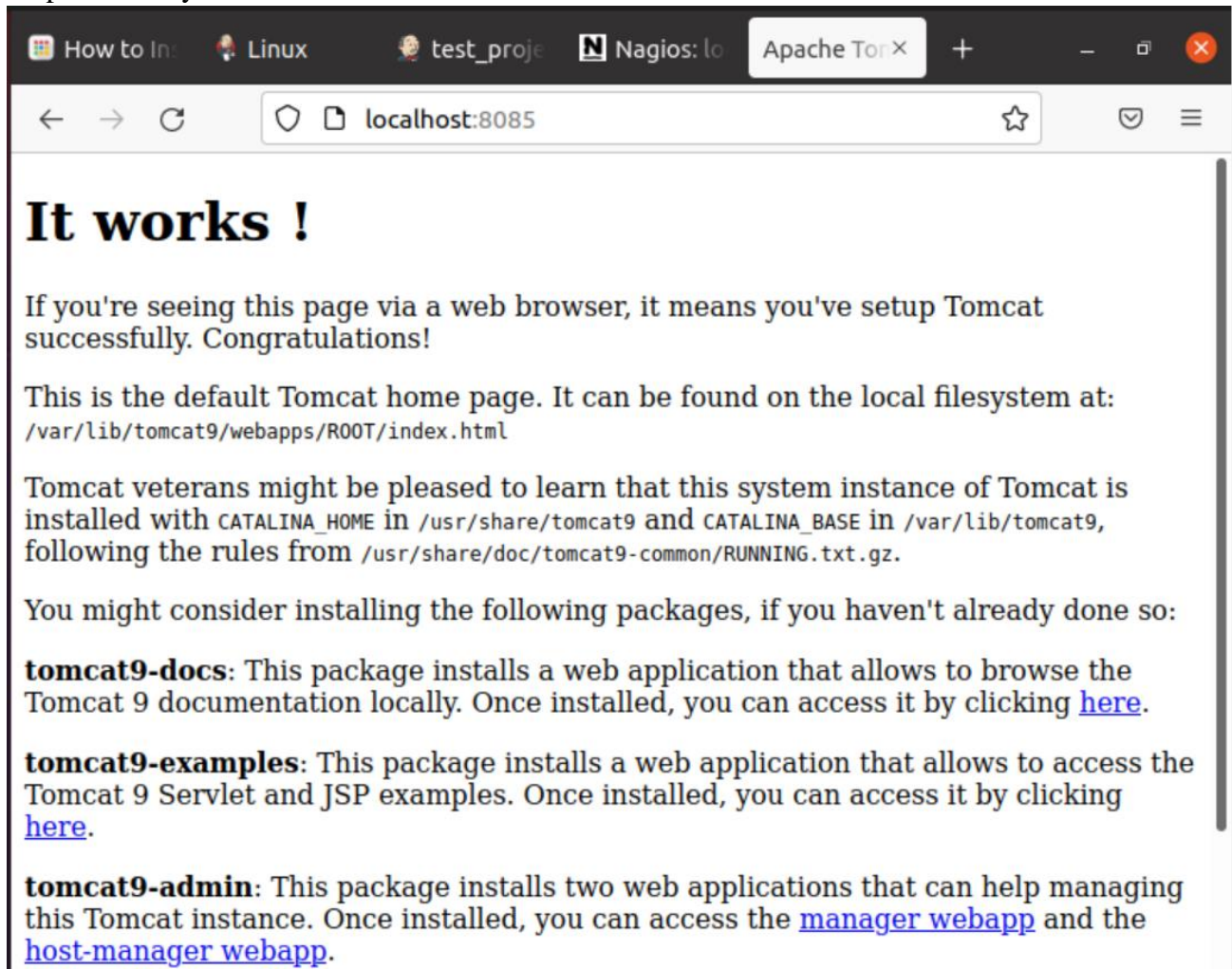
Step 3: Run sudo ufw allow from any to any port 8085 proto tcp.



```
root@meet:/home/meet# systemctl enable tomcat9
root@meet:/home/meet# cd /etc/tomcat9/server.xml
bash: cd: /etc/tomcat9/server.xml: Not a directory
root@meet:/home/meet# cd..
cd..: command not found
root@meet:/home/meet# cd ..
root@meet:/home# cd ..
root@meet:/# cd ..
root@meet:/# ls
bin    dev    lib    libx32  mnt    root  snap    sys    var
boot  etc    lib32  lost+found  opt    run    srv      tmp
cdrom  home  lib64  media   proc   sbin  swapfile  usr
root@meet:/# cd etc
root@meet:/etc# cd tomcat9
root@meet:/etc/tomcat9# sudo gedit server.xml

(gedit:76398): Tepl-WARNING **: 14:45:00.199: GVfs metadata is not supported. F
allback to TeplMetadataManager. Either GVfs is not correctly installed or GVfs
metadata are not supported on this platform. In the latter case, you should con
figure Tepl with --disable-gvfs-metadata.
^C
root@meet:/etc/tomcat9# cd ..
root@meet:/etc# cd ..
root@meet:/# cd home
root@meet:/home# cd meet
root@meet:/home/meet# ufw allow from any to any port 8085 proto tcp
Rules updated
Rules updated (v6)
root@meet:/home/meet#
```

Step 4: Sudo systemctl start tomcat9



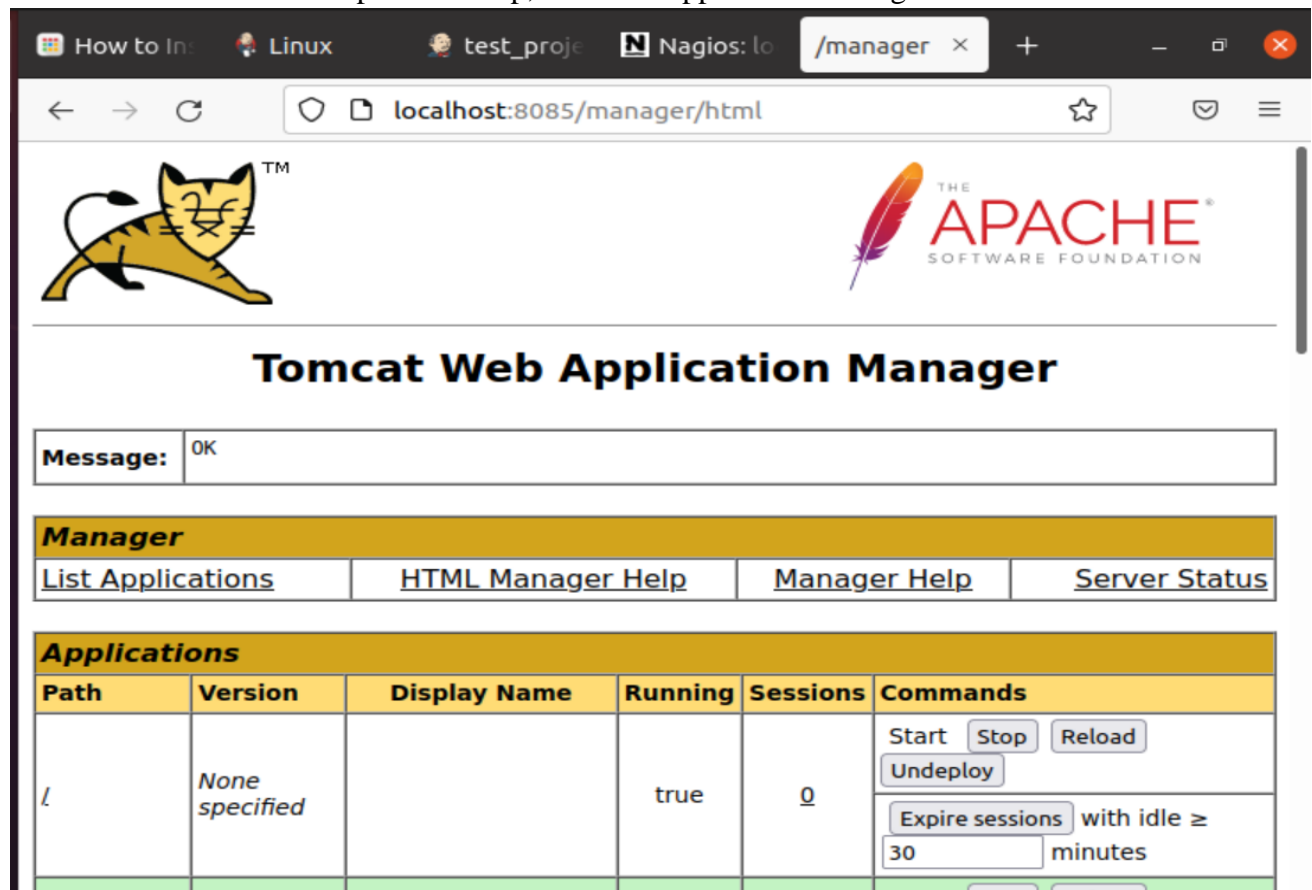
Step 5: Now edit the tomcat-users.xml in /etc/tomcat folder:



Step 6: Now run `sudo systemctl restart tomcat9`

And go to: `localhost/8085/manager/html`

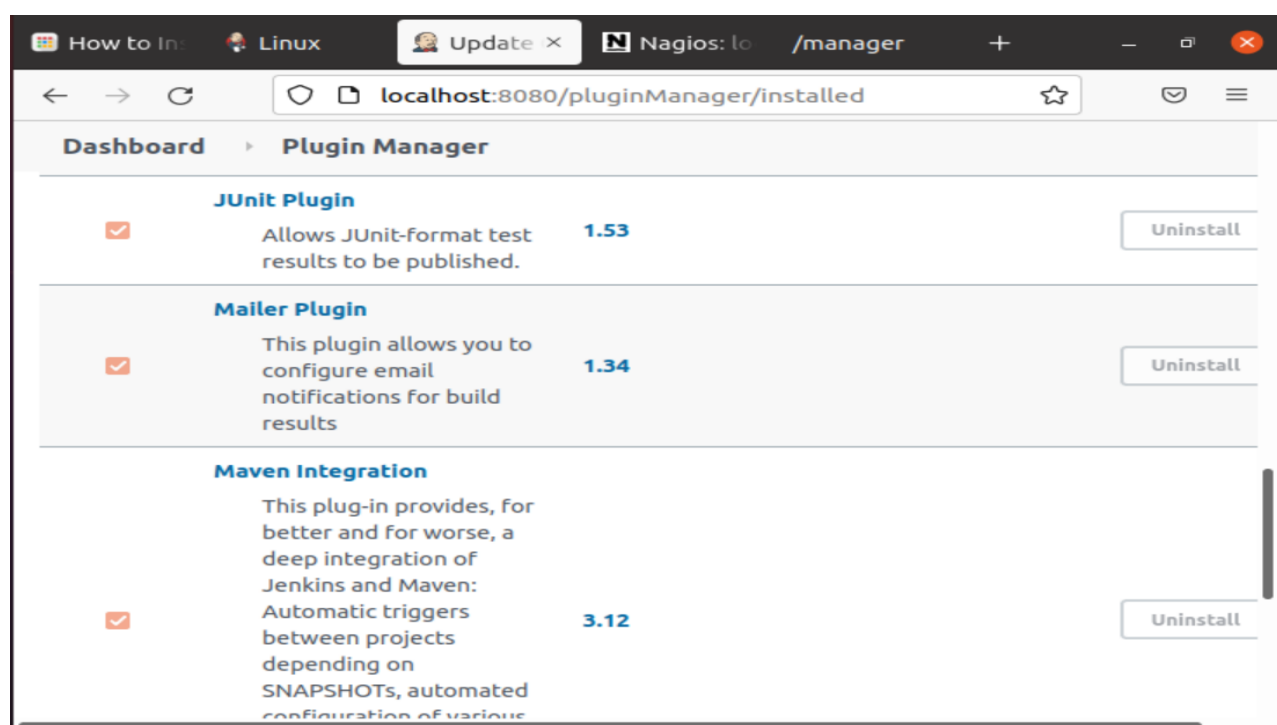
Enter the credentials set in previous step, and then Application Manager can be seen:



The screenshot shows the Tomcat Web Application Manager interface in a web browser. The browser's address bar shows `localhost:8085/manager/html`. The page features the Tomcat logo (a yellow cat) and the Apache Software Foundation logo. Below the logos, the title "Tomcat Web Application Manager" is displayed. A message box shows "Message: OK". A navigation bar includes links for "List Applications", "HTML Manager Help", "Manager Help", and "Server Status". The main section, titled "Applications", contains a table with columns: Path, Version, Display Name, Running, Sessions, and Commands. The table has one row with the following data: Path is `/`, Version is *None specified*, Display Name is empty, Running is `true`, Sessions is `0`, and the Commands column contains buttons for "Start", "Stop", "Reload", "Undeploy", and a text input for "Expire sessions with idle ≥ 30 minutes".

Path	Version	Display Name	Running	Sessions	Commands
<code>/</code>	<i>None specified</i>		<code>true</code>	<code>0</code>	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes

Step 7: Go to Jenkins Dashboard > Manage Jenkins > Manage Plugins and search for the plugins: "Deploy to Container", "Maven Integration", "JUnit" and install them.

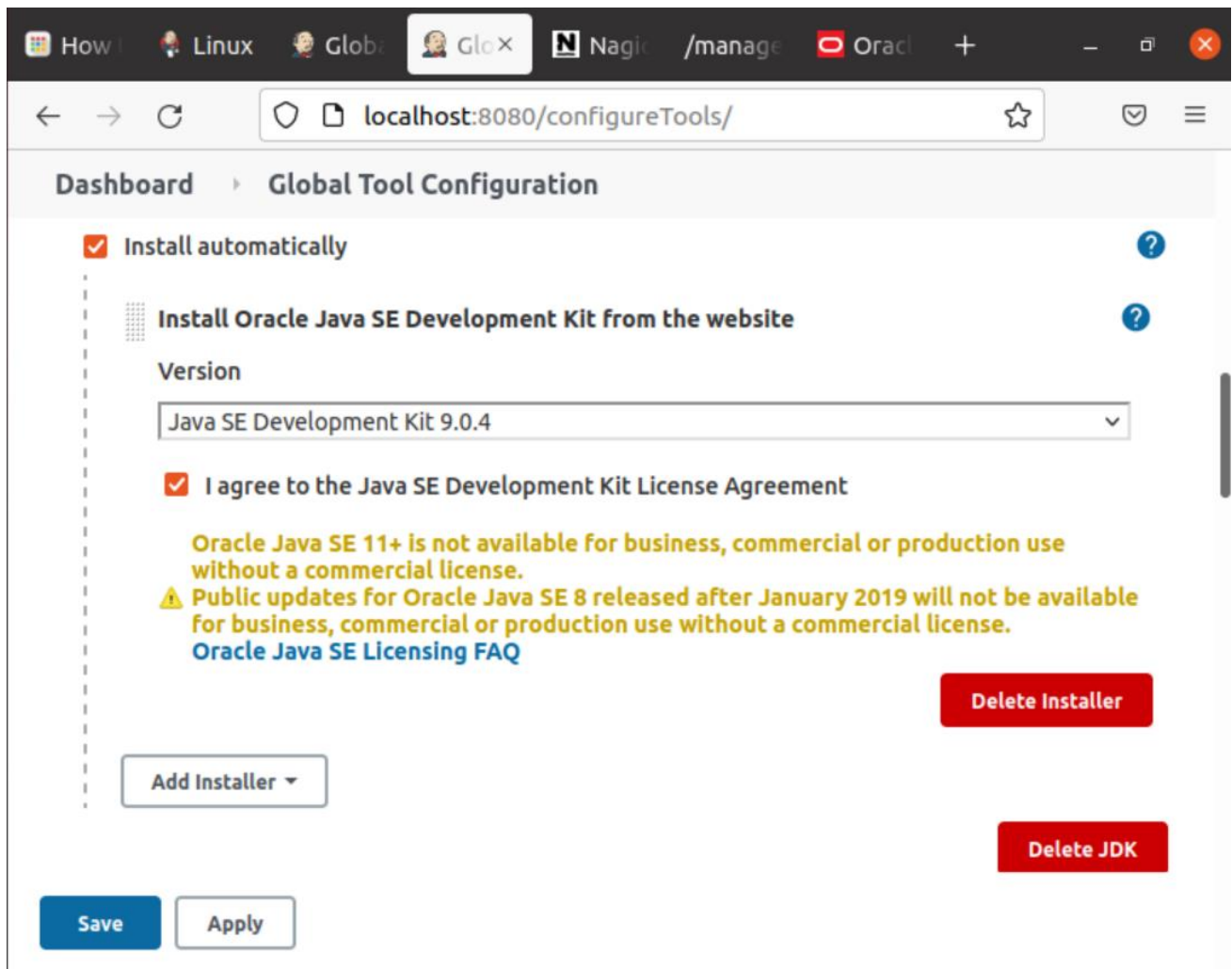


The screenshot shows the Jenkins Plugin Manager interface. The browser's address bar shows `localhost:8080/pluginManager/installed`. The page title is "Dashboard > Plugin Manager". It lists three installed plugins, each with a checkmark icon, a description, a version number, and an "Uninstall" button. The plugins are: JUnit Plugin (version 1.53, description: "Allows JUnit-format test results to be published."), Mailer Plugin (version 1.34, description: "This plugin allows you to configure email notifications for build results"), and Maven Integration (version 3.12, description: "This plug-in provides, for better and for worse, a deep integration of Jenkins and Maven: Automatic triggers between projects depending on SNAPSHOTS, automated configuration of various...").

Plugin Name	Description	Version	Action
JUnit Plugin	Allows JUnit-format test results to be published.	1.53	Uninstall
Mailer Plugin	This plugin allows you to configure email notifications for build results	1.34	Uninstall
Maven Integration	This plug-in provides, for better and for worse, a deep integration of Jenkins and Maven: Automatic triggers between projects depending on SNAPSHOTS, automated configuration of various...	3.12	Uninstall

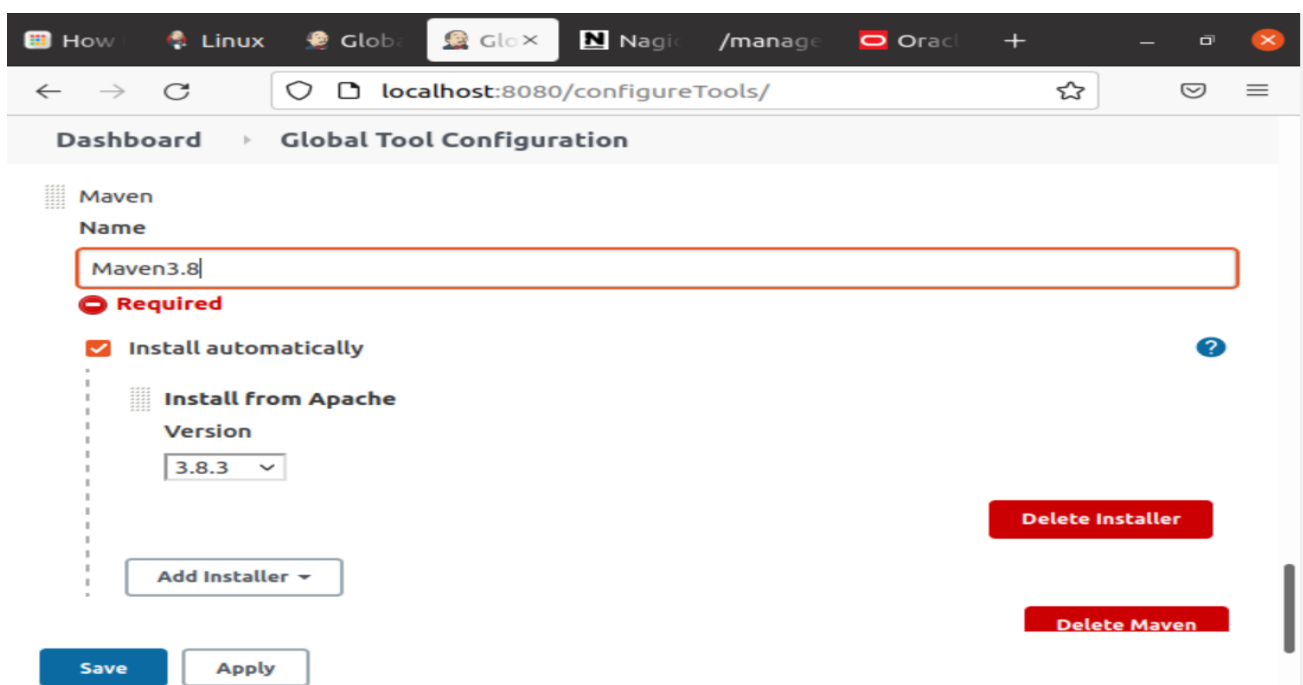


Step 8.1: From the Dashboard, go to the Configure System > Global Tool Configuration and click on add JDK and enter the name as JDK9 and check the License Agreement:



The screenshot shows a web browser window with the URL `localhost:8080/configureTools/`. The page title is "Global Tool Configuration". Under the "Install automatically" section, there is a checkbox labeled "Install Oracle Java SE Development Kit from the website" which is checked. Below this, a "Version" dropdown menu is set to "Java SE Development Kit 9.0.4". A checkbox labeled "I agree to the Java SE Development Kit License Agreement" is also checked. Below the checkbox, there is a warning message: "Oracle Java SE 11+ is not available for business, commercial or production use without a commercial license. Public updates for Oracle Java SE 8 released after January 2019 will not be available for business, commercial or production use without a commercial license. Oracle Java SE Licensing FAQ". At the bottom of the configuration area, there are buttons for "Save", "Apply", "Add Installer", "Delete Installer", and "Delete JDK".

Step 8.2: Similarly, add Maven with name as Maven3.8:



The screenshot shows the same web browser window, but now the "Maven" section is active. The "Name" field is set to "Maven3.8". A red "Required" label is visible. Below this, the "Install automatically" checkbox is checked. Under the "Install from Apache" section, the "Version" dropdown menu is set to "3.8.3". At the bottom of the configuration area, there are buttons for "Save", "Apply", "Add Installer", "Delete Installer", and "Delete Maven".

Step 9: Git clone an example java application and pushing it to the branch:

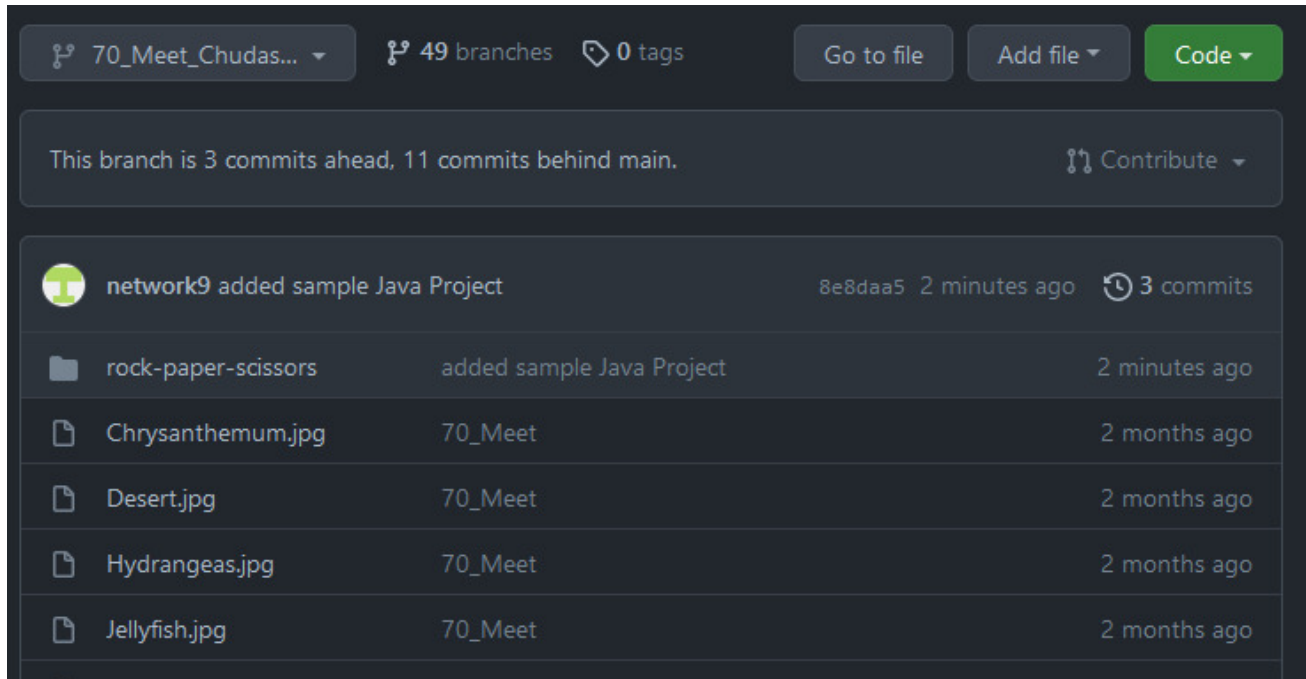
```
meet@meet: ~/Documents/temp
meet@meet:~/Documents/temp$ sudo git clone -b patch-1 https://github.com/camerommcnz/rock-paper-scissors.git
[sudo] password for meet:
Cloning into 'rock-paper-scissors'...
remote: Enumerating objects: 964, done.
remote: Counting objects: 100% (112/112), done.
remote: Compressing objects: 100% (78/78), done.
remote: Total 964 (delta 29), reused 90 (delta 13), pack-reused 852
Receiving objects: 100% (964/964), 29.13 MiB | 7.39 MiB/s, done.
Resolving deltas: 100% (205/205), done.
meet@meet:~/Documents/temp$
```

```
MINGW64:/c/Users/ASUS/Desktop/Website
create mode 100644 rock-paper-scissors/src/main/webapp/index.jsp
create mode 100644 rock-paper-scissors/src/test/java/com/mcnz/rps/GameSummaryTest.java
create mode 100644 rock-paper-scissors/src/test/java/com/mcnz/rps/ScoreTest.java
create mode 100644 rock-paper-scissors/sweet-day.html
create mode 100644 rock-paper-scissors/test_file.txt
create mode 100644 rock-paper-scissors/tidbits.sh
create mode 100644 rock-paper-scissors/training-day.html

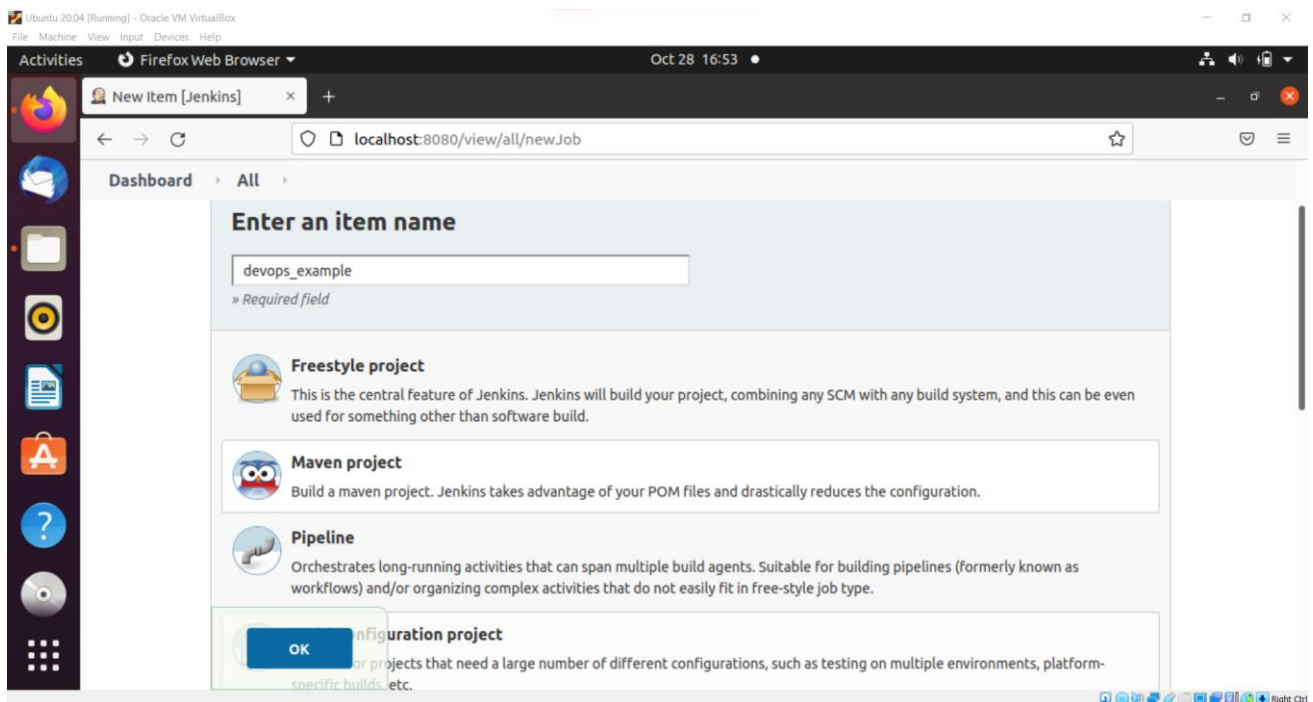
ASUS@LAPTOP-94M4QOBN MINGW64 ~/Desktop/Website (70_Meet_Chudasama)
$ git push origin 70_Meet_Chudasama
Enumerating objects: 40, done.
Counting objects: 100% (40/40), done.
Delta compression using up to 8 threads
Compressing objects: 100% (28/28), done.
Writing objects: 100% (39/39), 2.28 MiB | 1.39 MiB/s, done.
Total 39 (delta 3), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (3/3), completed with 1 local object.
To https://github.com/psawant27/teit.git
 4cd0080..8e8daa5 70_Meet_Chudasama -> 70_Meet_Chudasama

ASUS@LAPTOP-94M4QOBN MINGW64 ~/Desktop/Website (70_Meet_Chudasama)
$
```

Added under tomcat-deploy-example:

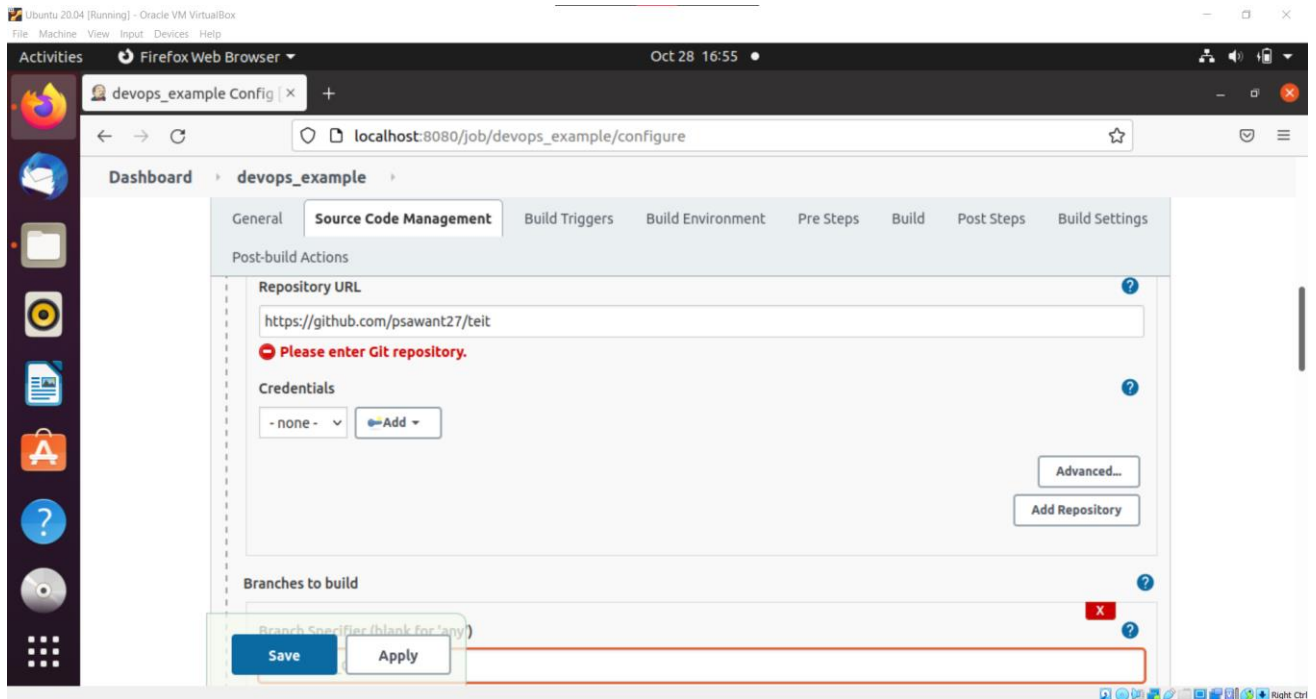


Step 10: Create a new Maven project:

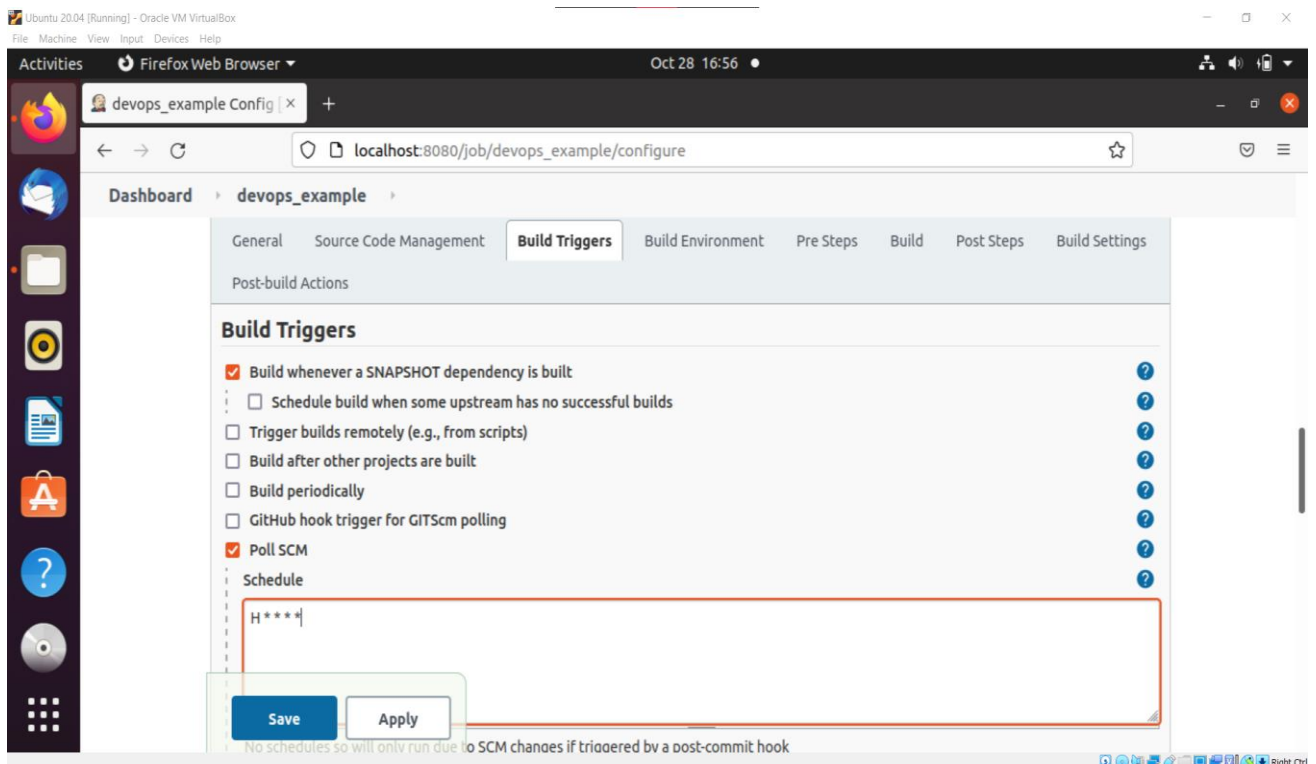




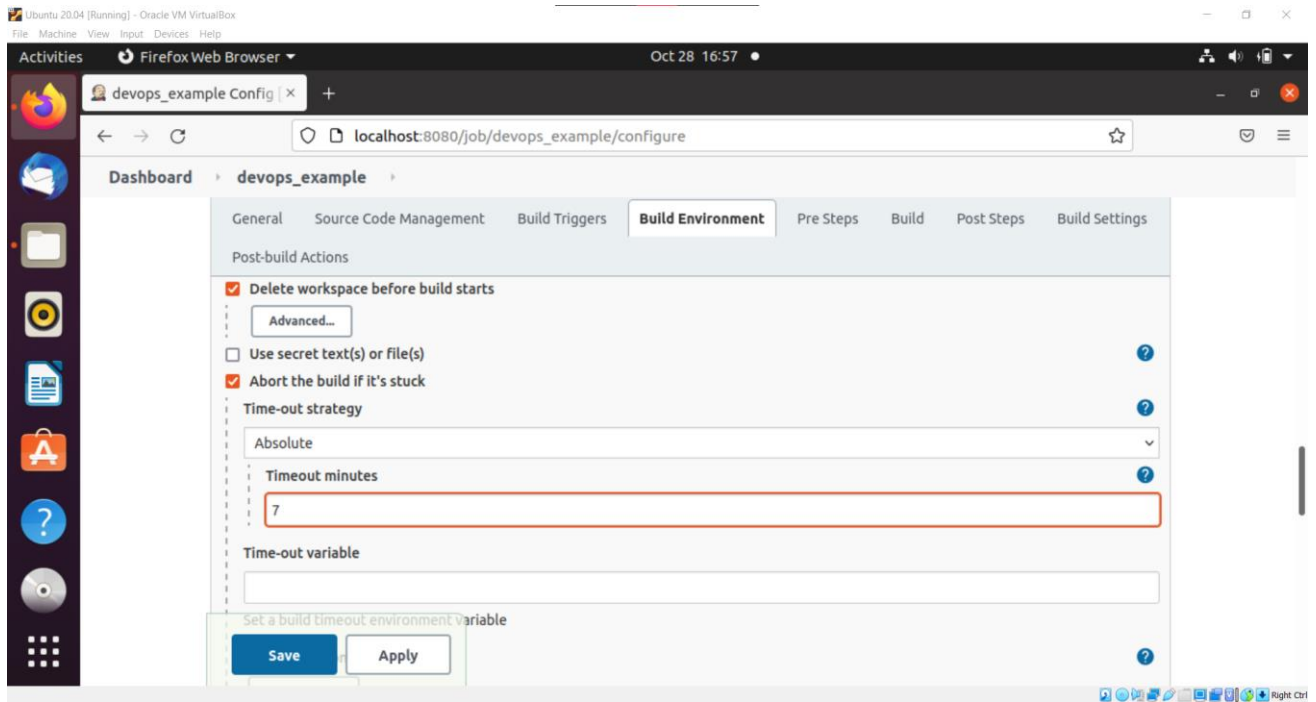
## Step 11: Add Git repository and branch in source code management:



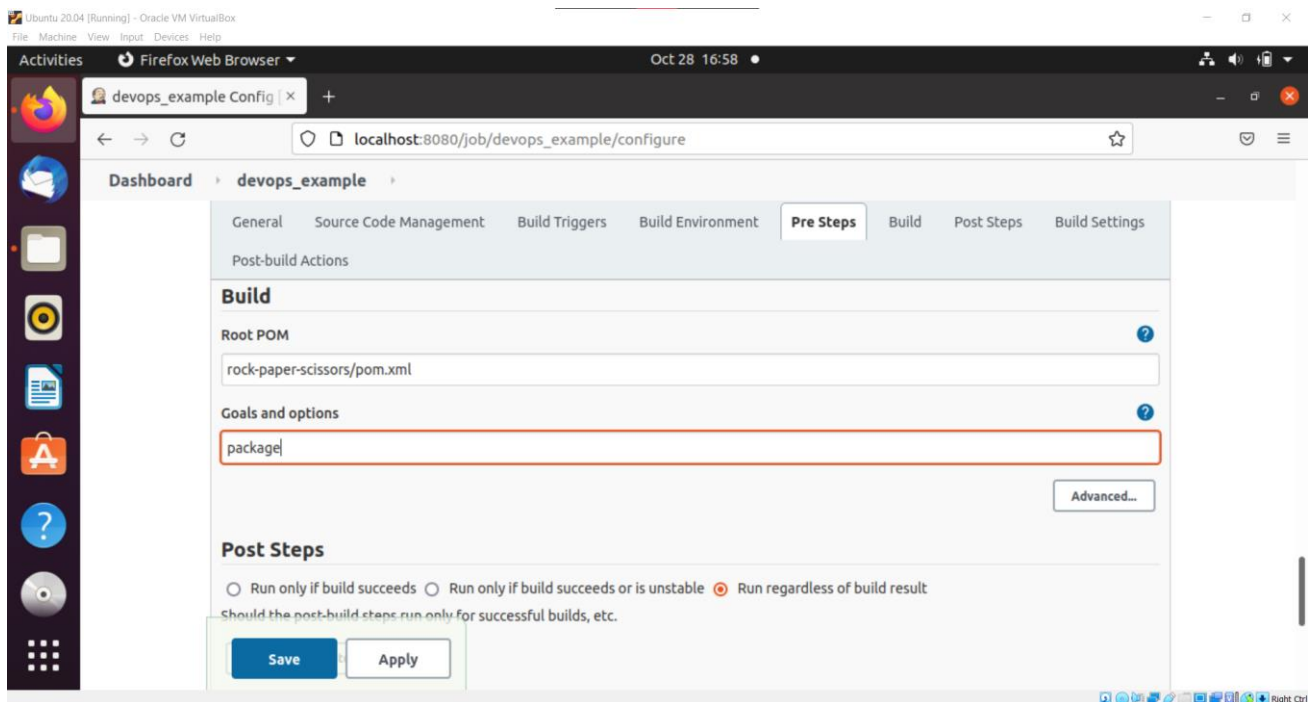
## Step 12: Add Poll SCM in Build Triggers:



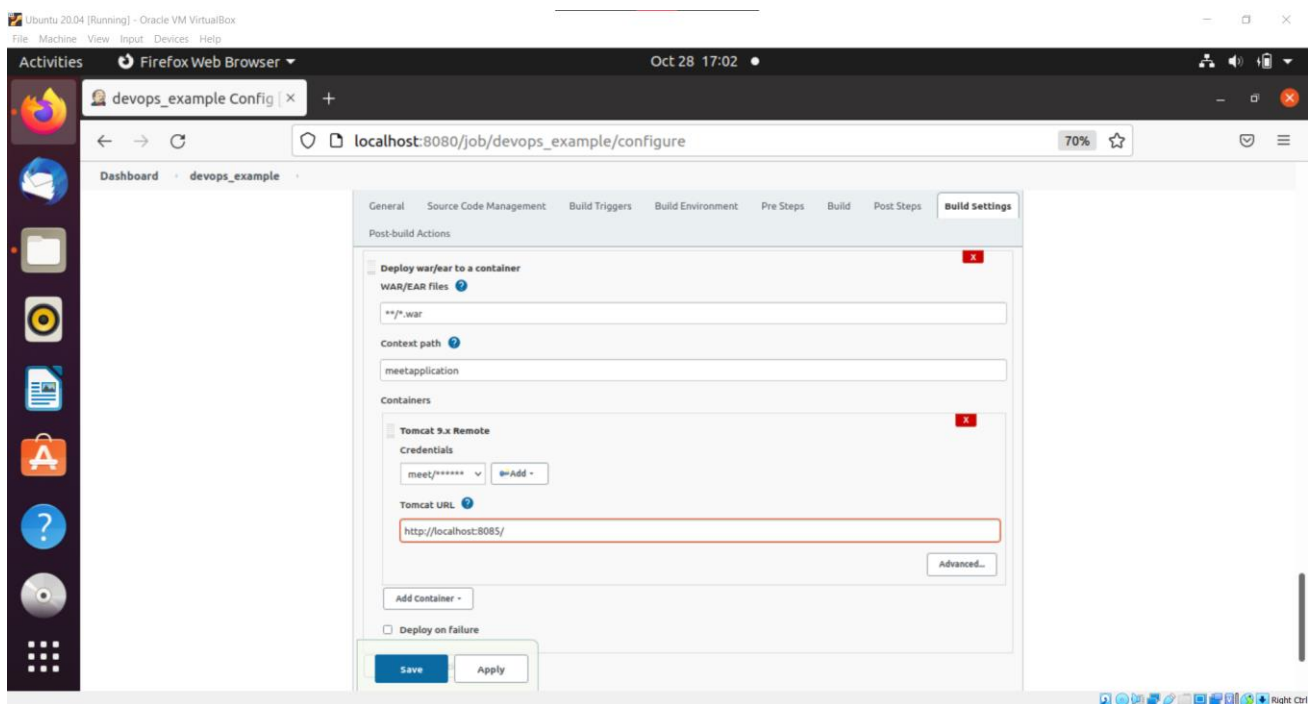
### Step 13: Set build environment settings:



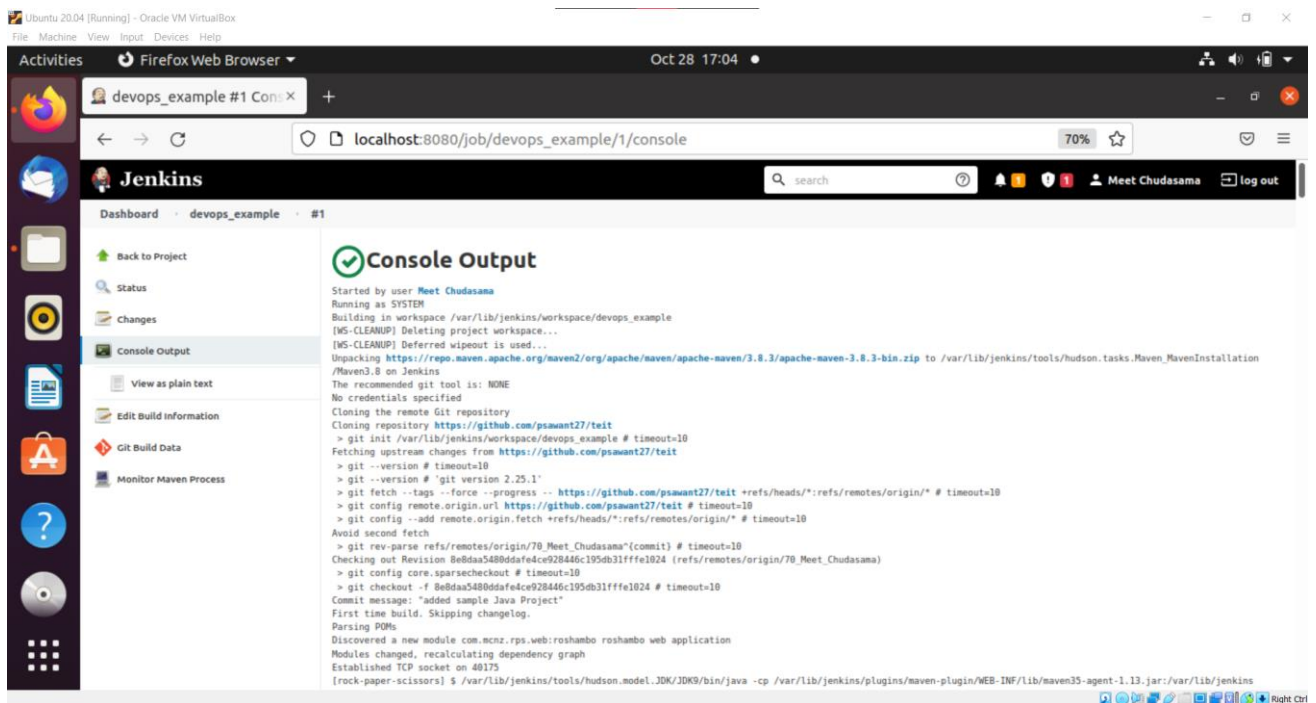
### Step 14: Set path to pom.xml and build goals to “package”



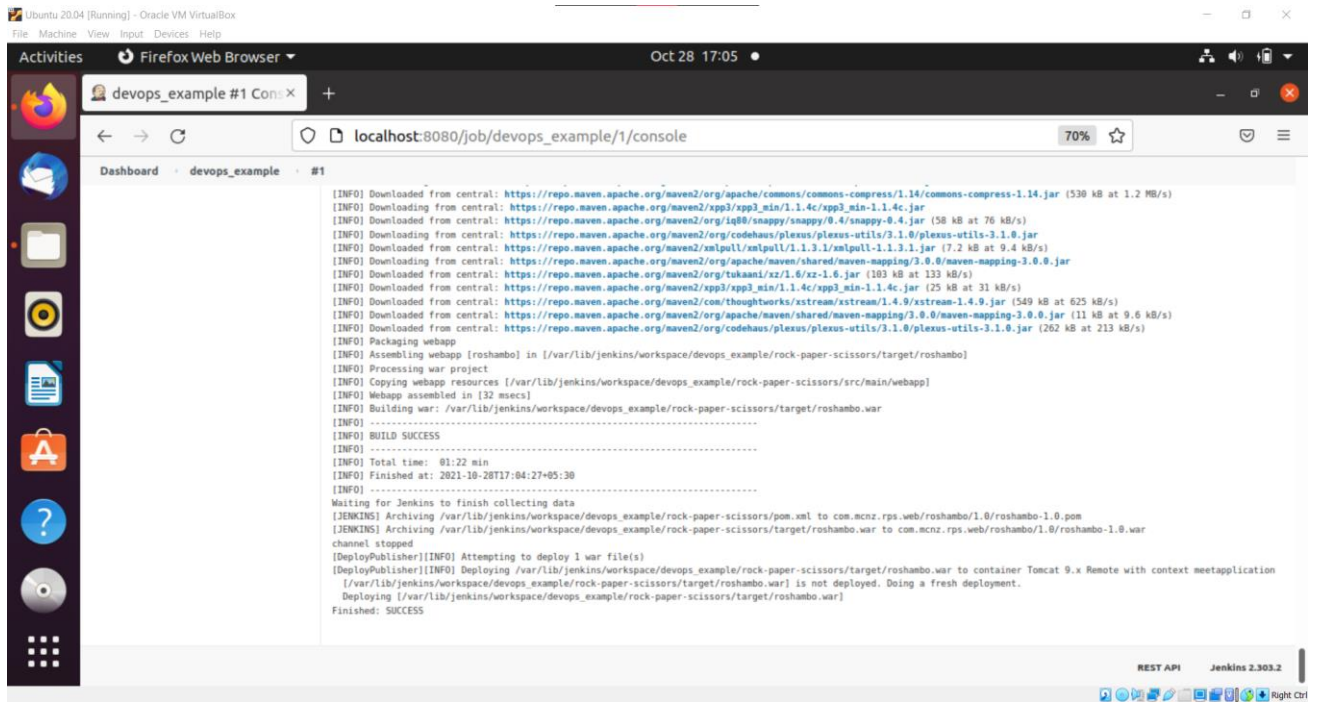
Step 15: Set post build actions and enter credentials set in tomcat-users.xml in Step 5 and finally Apply and Save:



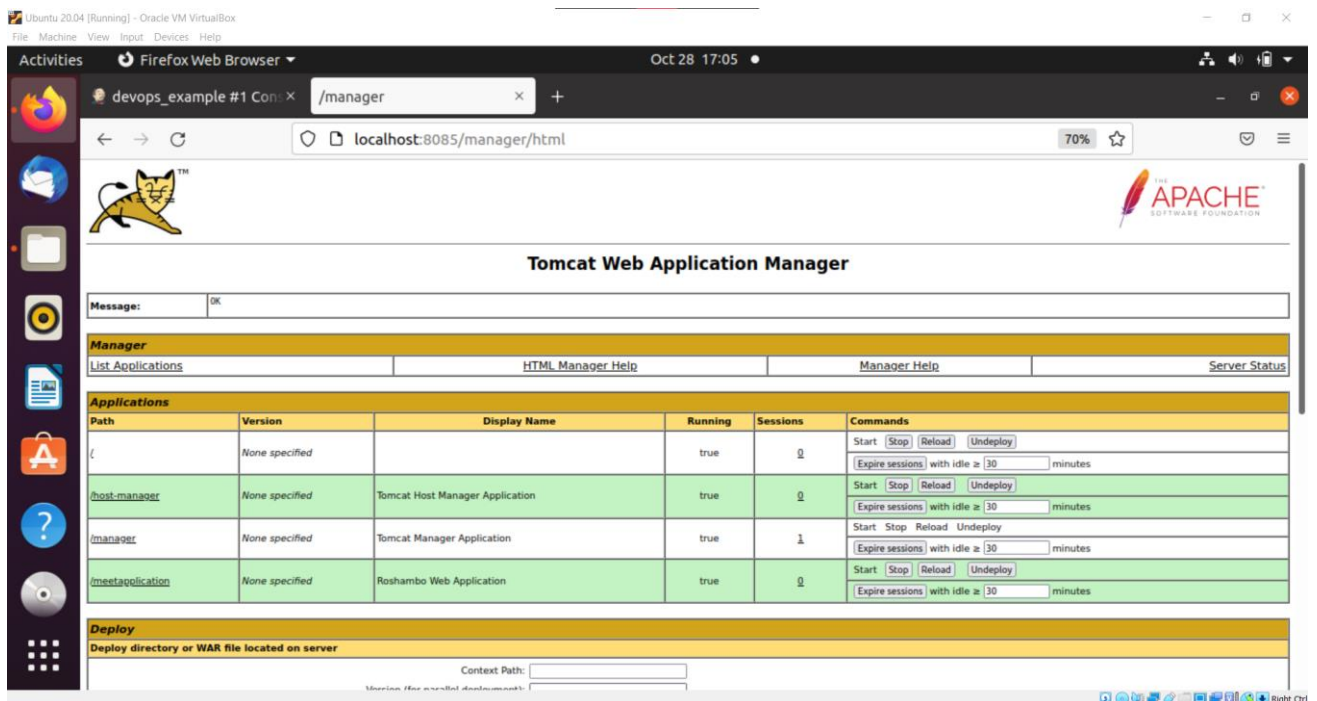
Step 16: On Running the Build, following console output can be seen:



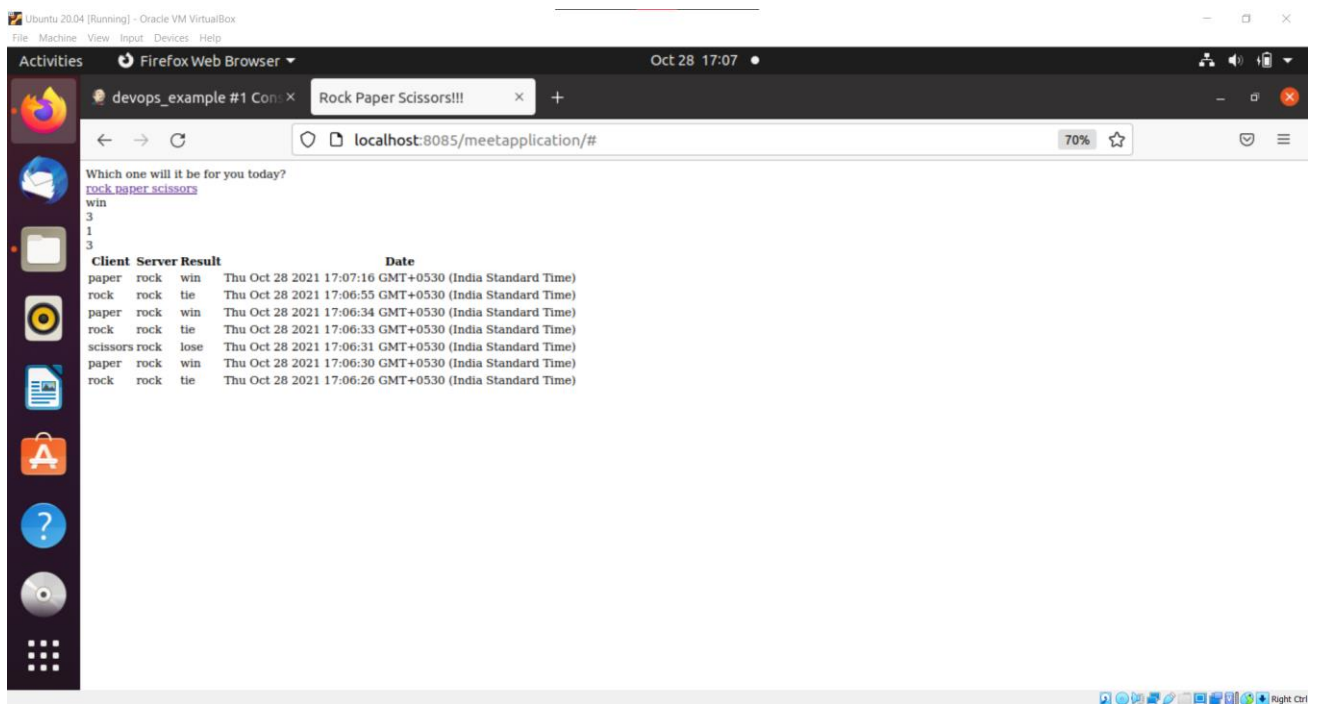
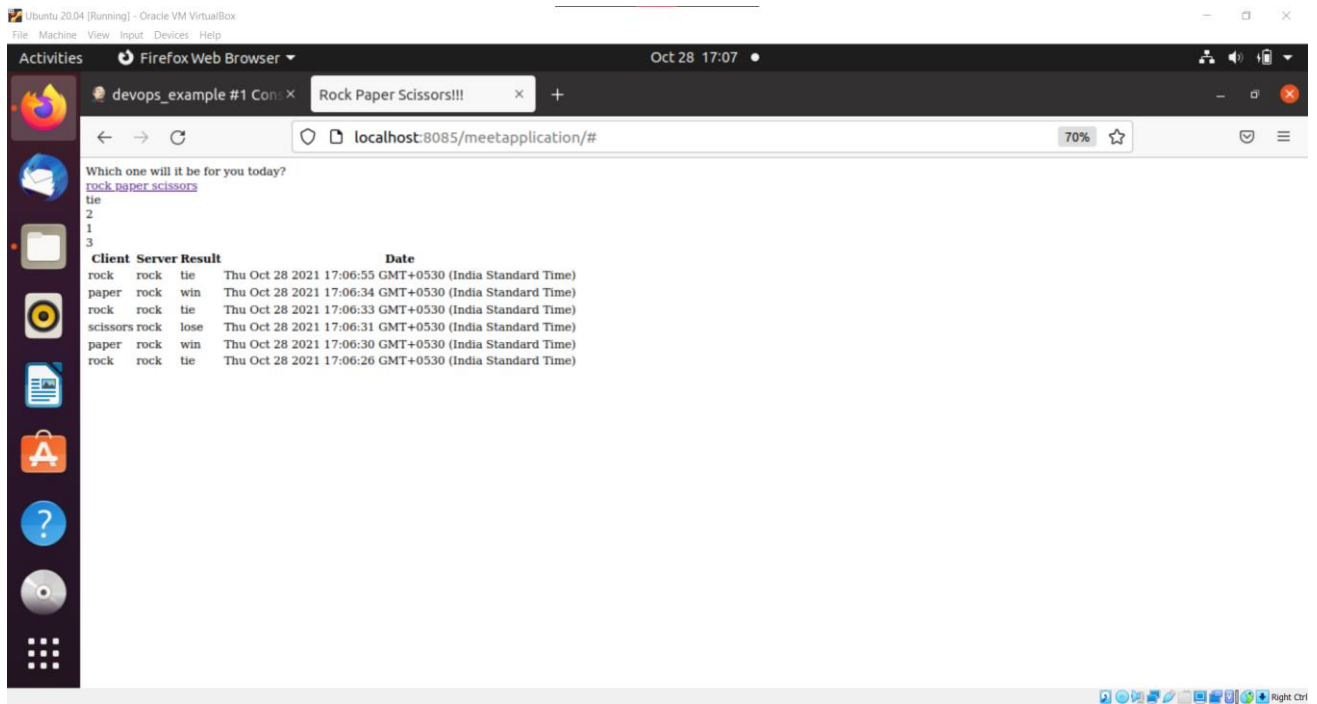


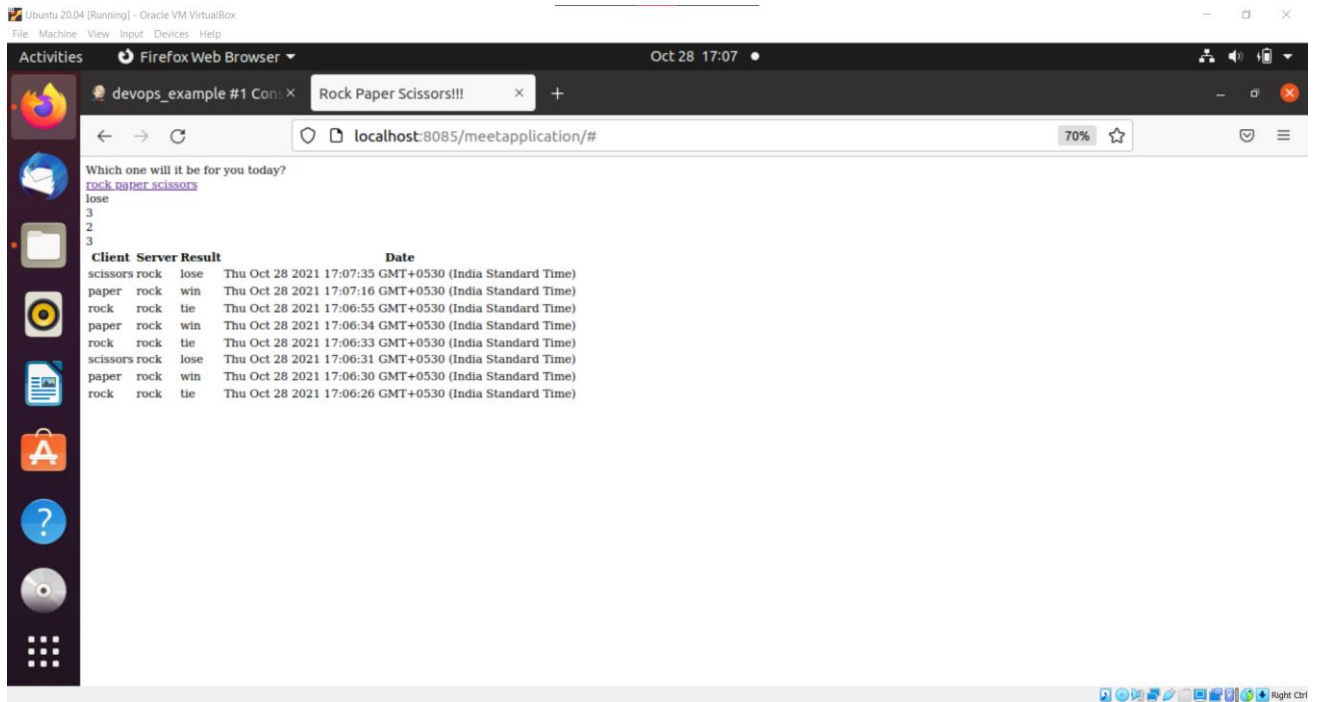


Step 16: Go to localhost:8085/manager/html and Our web application can be seen running under path /harshittomcat as specified earlier:



Step 17: on selecting meetapplication, we can see that the Rock Paper Scissors app is successfully running on localhost:8085/meetapplication:





## Conclusion:

We have implemented the complete procedure of installation and configuration of Apache Tomcat, created a Maven project and successfully deployed the application to the Tomcat server.