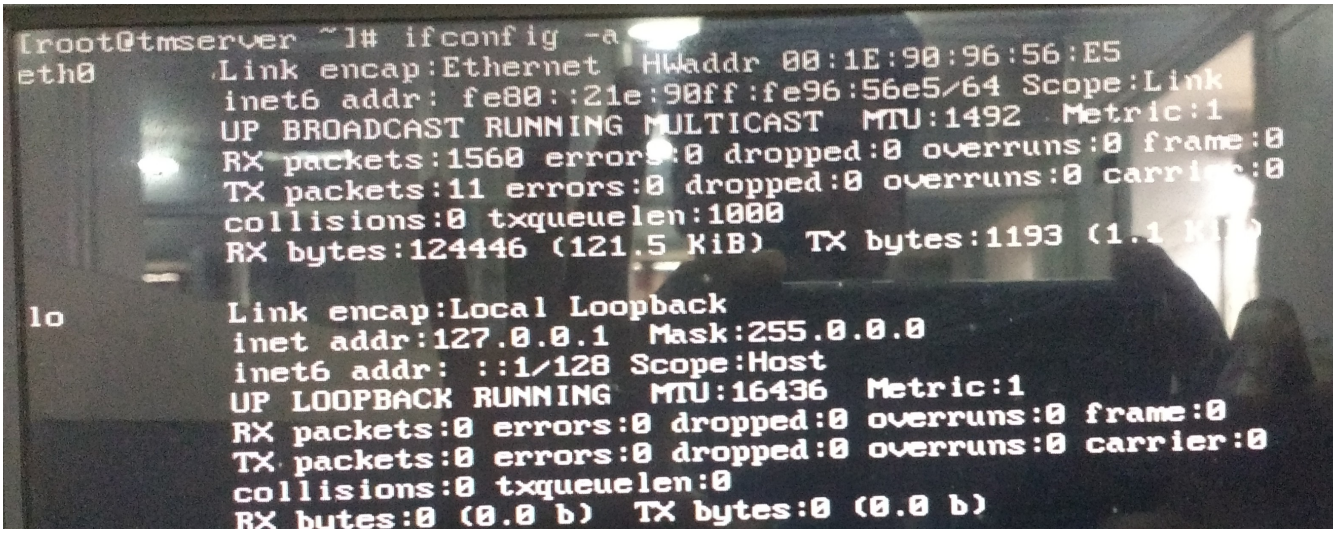
Now let us learn some things step by step (I am assuming that you have logged in as root user)

to the view the value of $PATH environment variable
echo $PATH
To view current directory
pwd
To change / create / remove directory
cd / mkdir / rmdir
To view the contents of a file
cat filename
to view the current user
whoami
to view hostname
hostname
to list the contents of the working folder
ls
to get details
ls -l
(Note : learn how to get list of specific file/files, or get recursive list)
to clear console
tput clear
or
clear

Networking

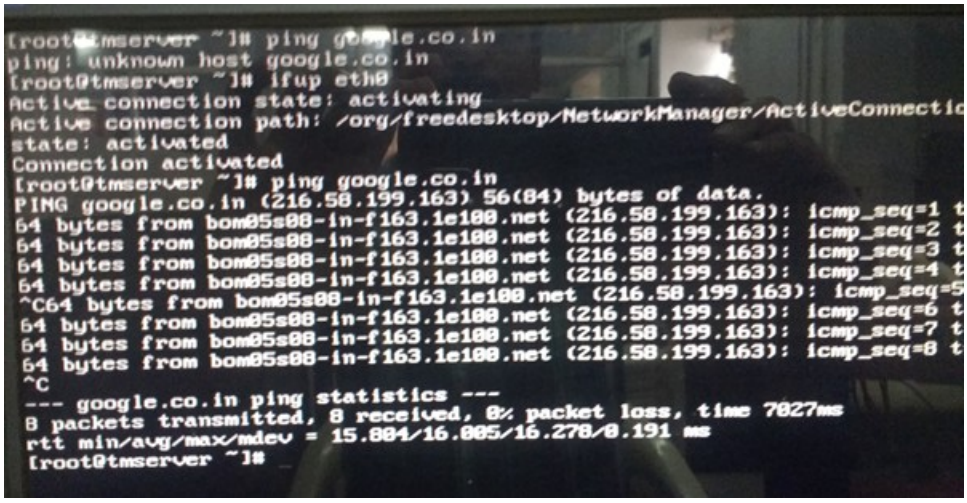
Plugin the network cable
to view network settings
ifconfig -a
Since I have not configured anything yet, I got the following output



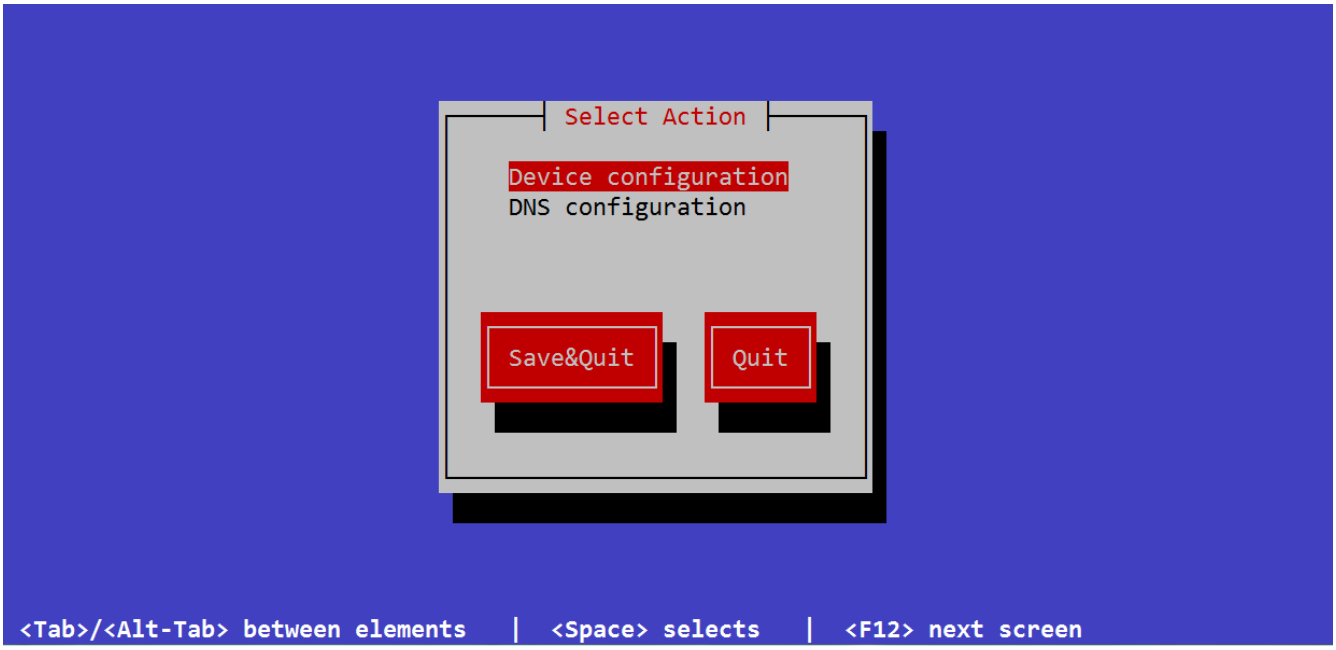
to check if internet connection is available type
ping google.co.in
I got the message : Unknown host because eth0 has not been activated

Now to activate the network interface type
ifup eth0

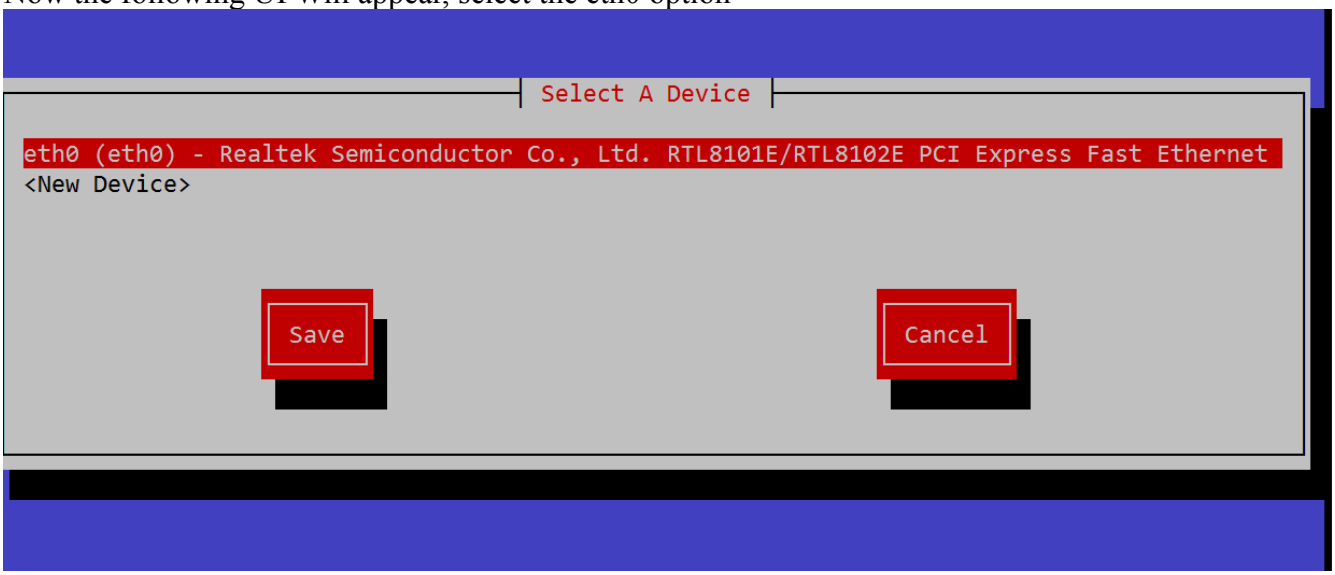
then again
ping google.co.in



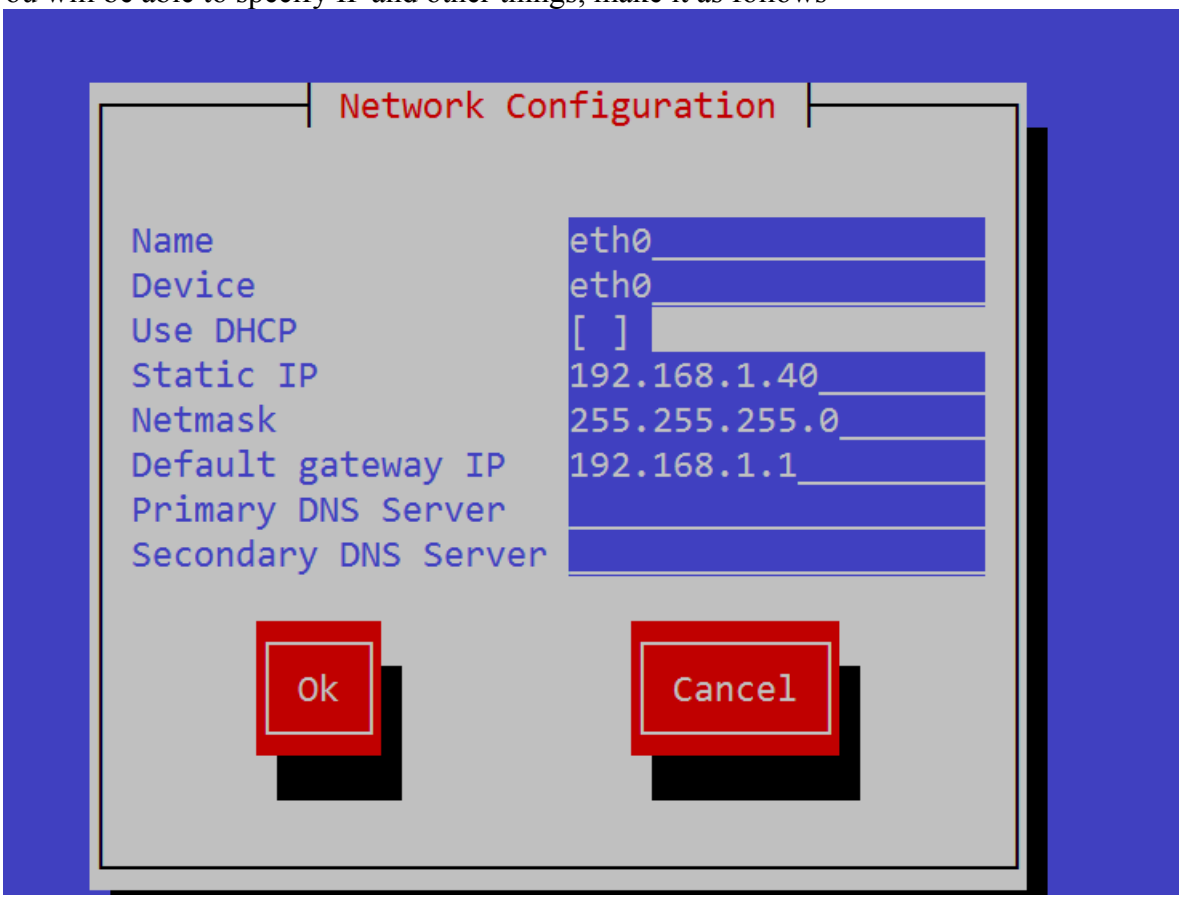
Now let us configure the IP, if you wish to connect the LINUX System with other users
type system-config-network, and you should see the following, select the Device Configuration option by selecting it and pressing the enter key



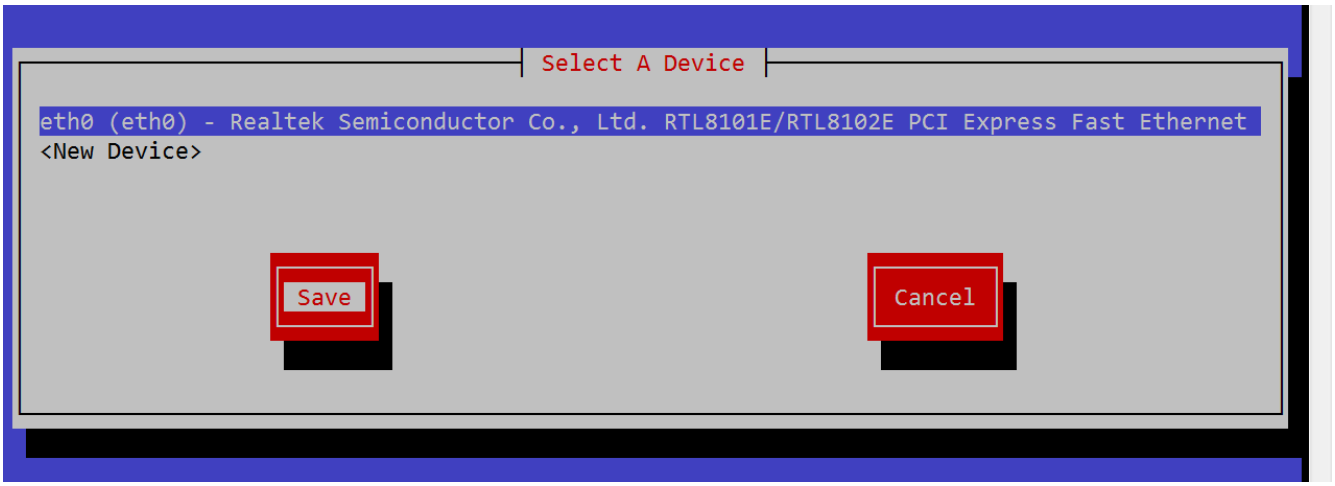
Now the following UI Will appear, select the eth0 option



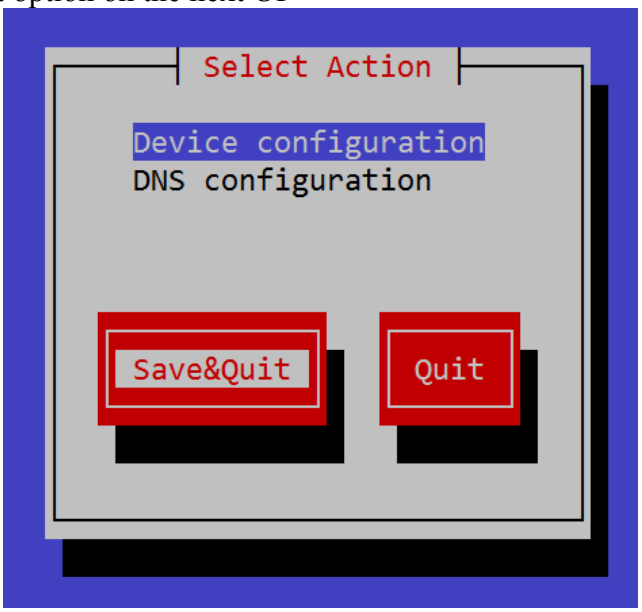
The following ui will appear, move to the [*] option and press space bar, the star will be erased and then you will be able to specify IP and other things, make it as follows



Note you can change 192.168.1.40 (the 40 part as it suits you), then select the ok option, then select the save option on the next ui



Then select the save & quit option on the next UI

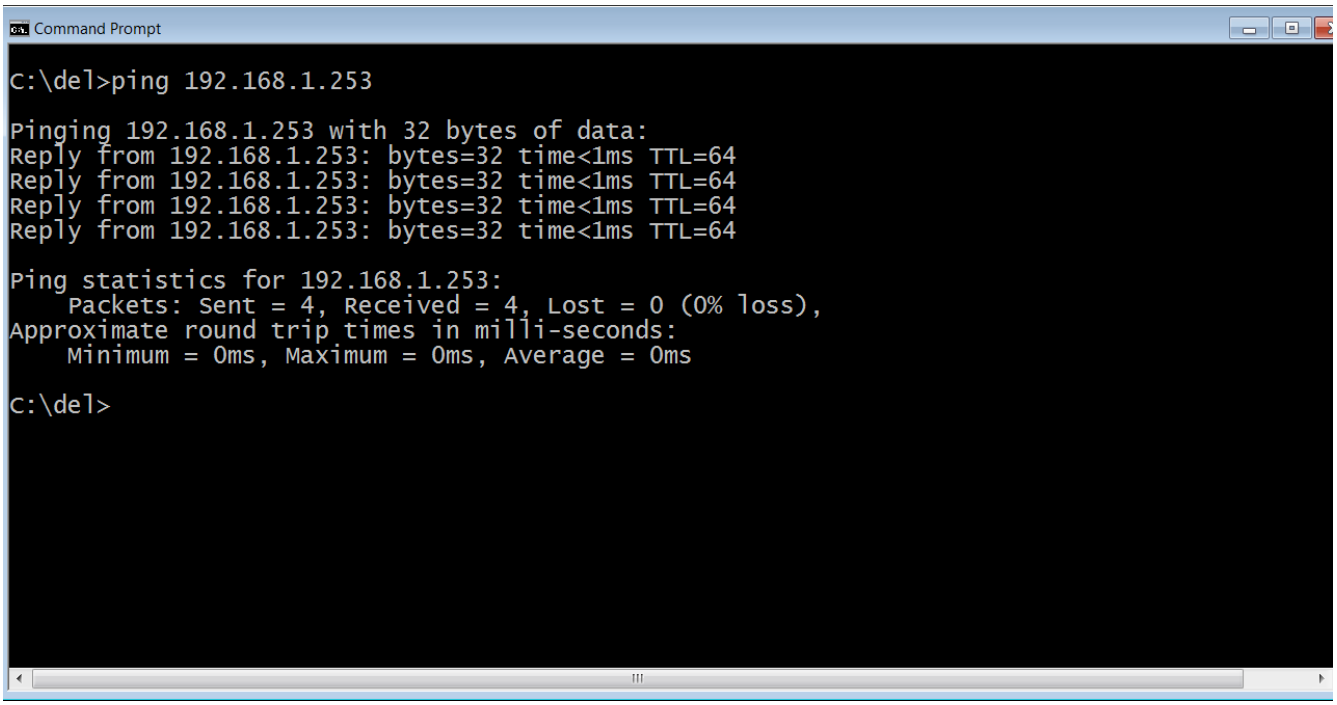


Thats it, we just configured the IP, now deactivate the network and activate it using
ifdown eth0
ifup eth0
Then again see the output of
ifconfig -a
you should see that the IP has been set.
Now ping google.co.in to verify that internet access is available. Now everytime we start the system, we want that the nework card eth0 should be activated on boot for that edit the file
/etc/sysconfig/network-scripts/ifcfg-eth0
and change the line from ONBOOT=no to ONBOOT=yes
Reboot the system using shutdown -r now
and then verify that the eth0 is up using the following
cat /sys/class/net/eth0/operstate

Skip the process and jump to page 7, if you don't have other Windows PC. Now let us check the connectivity with the PC that has LINUX from some other machine. I am doing it from Windows PC,

Note : On my Linux Server I have set the IP to 192.168.1.253 hence I will be using it, I had asked you to set 192.168.1.40 so you use that.

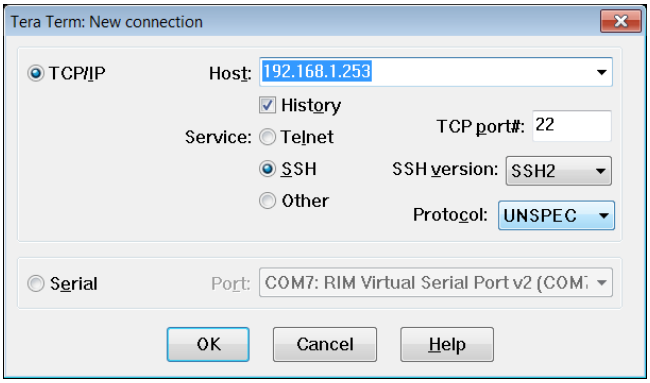
The following is the screen shot from my windows PC



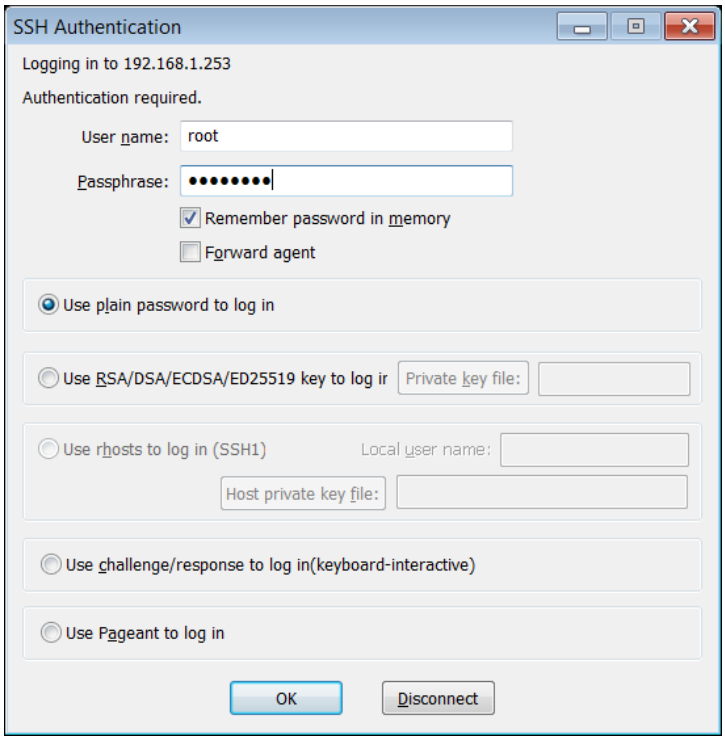
Now lets go for remote login from Windows Machine.

Download tera term from https://en.osdn.jp/projects/ttssh2/releases/

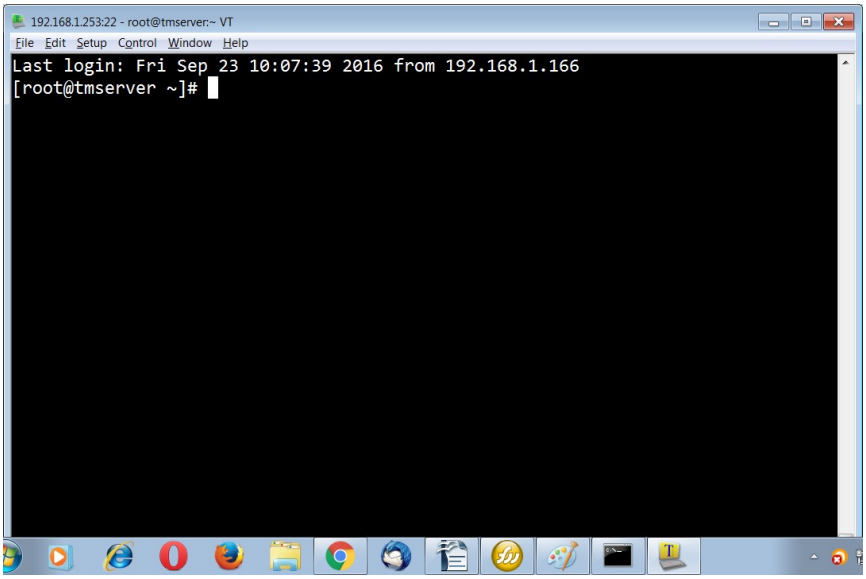
Download the windows executable and install it.
Run tera term, provide the TCP/IP and set the service as SSH and other things as show below and click ok



Provide the username and password and click OK



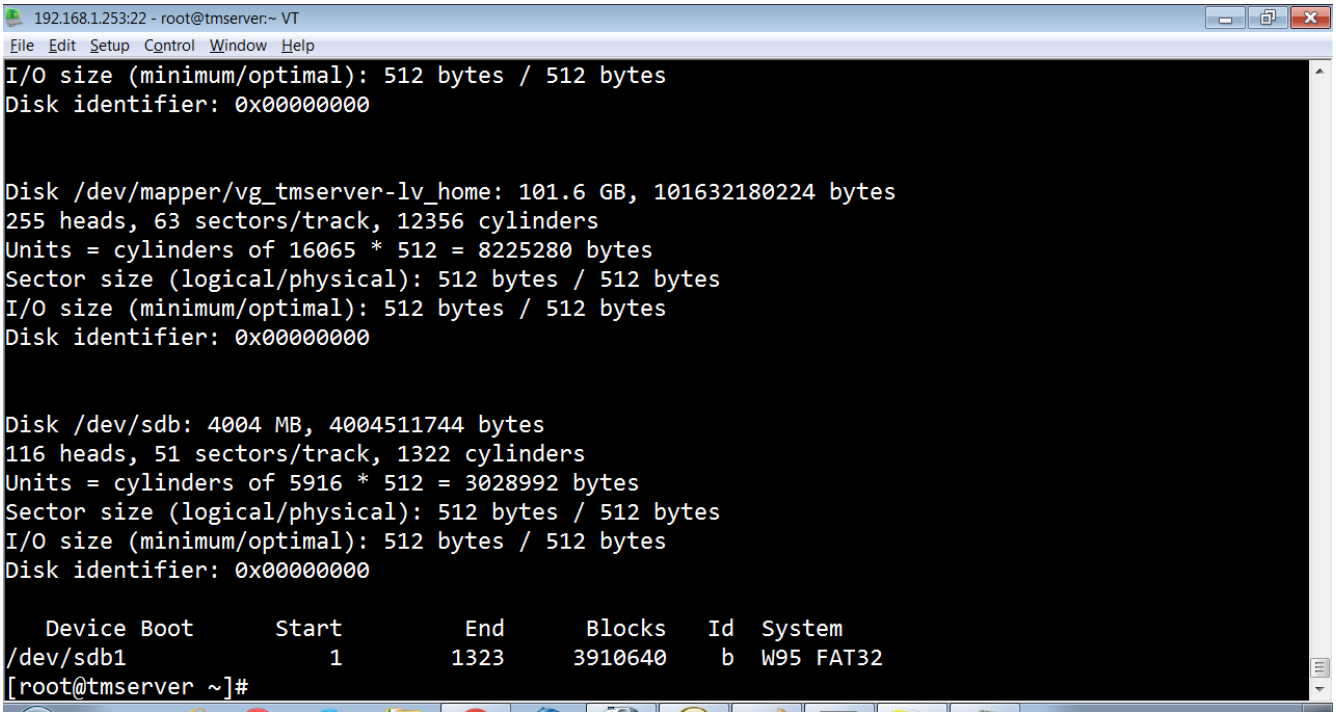
Now you will see the console as follows



Select the setup option from top, change font and then again select the setup option from top and select save setup, you will be asked to save the file, don't change anything and save it.

How to mount pen drive and copy contents from it or to it.

Plugin the pen drive. If you see some output
[sdb] assuming.....
just hit enter key.
Now the pen drive is connected but not yet mounted.
First of all let us find the device name, for that type
fdisk -l
You will see something like this



Notice /dev/sdb1 at the end, that is the identifier for our pen drive. Now let us mount it. For that we will create a folder, for that type
mkdir /mnt/sdb1

To mount the device against it, type the following

mount /dev/sdb1 /mnt/sdb1

If there is no problem, we are done, to check, type
ls /mnt/sdb1, and you will see the contents of the pen drive

to copy (use cp source target) command as discussed in the classroom session

To unmount type,
umount /dev/sdb1

Note : replace /dev/sdb1 with the device name that fdisk -l told you.

Updating Java 1.7 to Java 1.8 (Login as root)
Check your existing version of java using (javac -version) and (java -version)

```
[root@tmserver ~]# java  -version
java version "1.7.0_45"
OpenJDK Runtime Environment (rhel-2.4.3.3.el6-x86_64 u45-b15)
OpenJDK 64-Bit Server VM (build 24.45-b08, mixed mode)
[root@tmserver ~]# javac   -version
javac 1.7.0_45
[root@tmserver ~]#
```

First of find out the architecture of the installed system. For that
type
arch
If the output contains the number 64 means you have 64 bit architecture.

JDK Download option 1

Download your installation using the following

For 64 bi
First of all move to /opt folder by typing
cd /opt
Now type the following

For 64 bit

wget --no-cookies --no-check-certificate --header "Cookie: gpw_e24=http%3A%2F%2Fwww.oracle.com%2F; oraclelicense=accept-securebackup-cookie" "http://download.oracle.com/otn-pub/java/jdk/8u101-b13/jdk-8u101-linux-x64.tar.gz"

for 32 bit

wget --no-cookies --no-check-certificate --header "Cookie: gpw_e24=http%3A%2F%2Fwww.oracle.com%2F; oraclelicense=accept-securebackup-cookie" "http://download.oracle.com/otn-pub/java/jdk/8u101-b13/jdk-8u101-linux-i586.tar.gz"

You can copy paste the above and hit enter. It will take time to download,

JDK Download option 2

you can copy the downloaded gz file from your friends PC to USB and USB to /opt folder of your PC.

JDK Download option 3

Or in GUI mode using, the browser download the gz file from

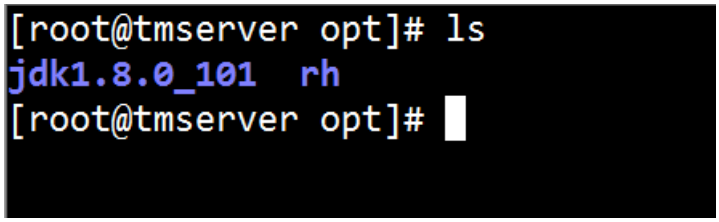
http://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html
against linux 86 or 64 (as per your architecture and save / copy it to /opt folder.

Whatever technique you might have adapted, I am assuming that now the /opt folder has the gz file.

Now type (ls -l) command to view the contents of the folder and you should see the gz file that we downloaded/copied from pen drive.

Now type
tar xzf nameofthezipfile

Note : type tar xzf (then press j and tab, the rest will appear automatically) and press enter
now see the contents of the folder, and you should see the jdk folder, if you want you can remove the zip file using the rm command. My /opt folder now contains



Note : we have got nothing to do with the rh folder.
Now move into the jdk folder using cd command and verify using pwd after moving in
Then let us use the alternative command to install java

alternatives --install /usr/bin/java java /opt/jdk1.8.0_101/bin/java 2

then

alternatives --config java

A menu will appear, type the number against the option that says jdk 1.8. Following is what happened at my end.

```
[root@tmserver jdk1.8.0_101]# alternatives --install /usr/bin/java  java  /opt/j
dk1.8.0_101/bin/java  2
[root@tmserver jdk1.8.0_101]# alternatives   --config  java

There are 3 programs which provide 'java'.

  Selection    Command
-----------------------------------------------
*  1           /usr/lib/jvm/jre-1.7.0-openjdk.x86_64/bin/java
   2           /usr/lib/jvm/jre-1.6.0-openjdk.x86_64/bin/java
 + 3           /opt/jdk1.8.0_101/bin/java

Enter to keep the current selection[+], or type selection number: 3
[root@tmserver jdk1.8.0_101]#
```

Now again check the java and javac versions, and you will see that java version is updated by javac version has not been updated

```
[root@tmserver jdk1.8.0_101]# java -version
java version "1.8.0_101"
Java(TM) SE Runtime Environment (build 1.8.0_101-b13)
Java HotSpot(TM) 64-Bit Server VM (build 25.101-b13, mixed mode)
[root@tmserver jdk1.8.0_101]# javac  -version
javac 1.7.0_45
[root@tmserver jdk1.8.0_101]#
```

Now let us set the path to jdk1.8 using the alternatives command

alternatives --install /usr/bin/jar jar /opt/jdk1.8.0_101/bin/jar 2
alternatives --install /usr/bin/javac javac /opt/jdk1.8.0_101/bin/javac 2
alternatives --set jar /opt/jdk1.8.0_101/bin/jar
alternatives --set javac /opt/jdk1.8.0_101/bin/javac

Now again check the versions, now this is what I get at my end

```
[root@tmserver jdk1.8.0_101]# java -version
java version "1.8.0_101"
Java(TM) SE Runtime Environment (build 1.8.0_101-b13)
Java HotSpot(TM) 64-Bit Server VM (build 25.101-b13, mixed mode)
[root@tmserver jdk1.8.0_101]# javac -version
javac 1.8.0_101
[root@tmserver jdk1.8.0_101]#
```

Now just type cd and hit enter, you will be taken to your home folder
Now use the vi editor and add the following 3 lines to file /etc/environment
Note : environment file might be empty, so just add the following lines to it

export JAVA_HOME=/opt/jdk1.8.0_101
export JRE_HOME=/opt/jdk1.8.0_101/jre
PATH=$PATH:/opt/jdk1.8.0_101/bin:/opt/jdk1.8.0_101/jre/bin
export PATH

add the same four lines to **.bashrc** file that lies on your home directory (/root) for root login
and also add the four lines to **.bashrc** file in /home/student folder
Note : name of the file is **.bashrc** (dot followed by bashrc)
Now reboot the system (shutdown -r now)

---

check the versions again
also check the values of environment variable $JAVA_HOME and $JRE_HOME using the echo command

Setting up MYSQL,

First of all edit the /etc/hosts file and add the following at the end of it, be careful

127.0.0.1 localhost.localdomain

then
type

/etc/init.d/mysqld start

Since we have not yet set the password for root, type the following (This we will done one time only)
Note : Keep the NEWPASSWORD as your surname (keep it simple)

mysqladmin -u root password NEWPASSWORD

To change the password later on you can do the following

mysqladmin -u root -p password NEWPASSWORD

you will be asked for password, give the existing one, if it is correct newone will be set

Now let us connect to mysql using the mysql client
type mysql -uroot -p
you will be asked for password, type whatever is your root password.

If everything is ok, you will see the mysql> prompt, type quit to get out of it.

Now let us configure (mysql) to start at boot, so we won't have to start it everytime.
Type the following
/sbin/chkconfig --add mysqld
/sbin/chkconfig mysqld on

Now restart the system and login and
type
mysql -uroot -p

provide the password and you will see that the mysql prompt appears, which means that we don't have to start the mysql server again and again on every boot.

Now let us create a new database named as tmdb, for that type
create database tmdb;
to list all databases, type
show databases;
and you will see the list of databases available.

Now let us create a user named as student with password as student and grant all rights of the tmdb to the student.

Type the following

CREATE USER 'student'@'localhost' IDENTIFIED BY 'student';
again type
CREATE USER 'student'@'tmserver' IDENTIFIED BY 'student';

Note : replace tmserver with your servername

the username is student and the password is also student

to display list of all users, type

select user,host from mysql,user;

Now let us give the rights of tmdb to user student. For that type
GRANT ALL ON tmdb.* TO student

now quit from mysql using quit command
Again login to mysql using
mysql -ustudent -p

when asked for password, provide the password as student and you should see the mysql prompt
to select database, type
use tmdb
Create a table using the following
create table student
(roll_number int primary key,
name char(50) not null,
gender char(1));

To get list of tables type,
show tables

Now let us download mysql.jar
Login as root
create folder /ourlib using mkdir /ourlib
move to /ourlib using cd /ourlib
now type
wget "http://tm-certificates.com/mysql.jar"

check the size after downloading using ls -l
the size should be 676693, if it is not that, again use
wget "http://tm-certificates.com/mysql.jar"
or download it in GUI mode using the browser and save it to /ourlib

Now logout from root and login as student
I am assuming that in /home/student you must have created a folder named as javaeg, if not do so.
Then move into the folder and create the following java file using vi editor

jdbc1.java

```
import java.sql.*;
class jdbc1
{
public static void main(String data[])
{
int rollNumber=Integer.parseInt(data[0]);
String name=data[1];
String gender=data[2];
try
{
Class.forName("com.mysql.jdbc.Driver");
Connection c=DriverManager.getConnection("jdbc:mysql://localhost:3306/tmdb","student","student");
PreparedStatement p;
p=c.prepareStatement("insert into student values(?,?,?)");
p.setInt(1,rollNumber);
p.setString(2,name);
p.setString(3,gender);
p.executeUpdate();
p.close();
c.close();
"jdbc1.java" 27L, 581C                                    1,1           Top
import java.sql.*;
class jdbc1
{
public static void main(String data[])
{
int rollNumber=Integer.parseInt(data[0]);
String name=data[1];
String gender=data[2];
try
{
Class.forName("com.mysql.jdbc.Driver");
Connection c=DriverManager.getConnection("jdbc:mysql://localhost:3306/tmdb","student","student");
PreparedStatement p;
p=c.prepareStatement("insert into student values(?,?,?)");
p.setInt(1,rollNumber);
p.setString(2,name);
p.setString(3,gender);
p.executeUpdate();
p.close();
c.close();
System.out.println(“Student added”);
```

```
}catch(Exception e)
{
System.out.println(e);
}
}
}
```

Compile the above code using
javac jdbc1.java
For execution type

java -classpath /ourlib/mysql.jar:. jdbc1 101 sameer M

Note : before dot, : has been used and not ; as we do it in windows environment
You should see the message Student added.

Now login into mysql using
mysql -ustudent -p
provide password (student) and mysql prompt will appear
Now type
select * from student

Thats it, you should see the record we inserted. Rest do everything that we did in Windows Environment. You have backup of everything in pen drive. You know how to mount it and use the cp command to copy the contents.
You can switch to GUI mode using starx for applications where we used Swing.

Configure PostGRE SQL
Login as root

type

service postgresql initdb

then wait for some time , ok message will appear and then #prompt appears, type

service postgresql start

Again ok message should appear

Now we will configure postgresql to start on boot, for that type

chkconfig postgresql on

Now let us login into postgresql and change the password for the default user postgres

type the following

sudo -u postgres psql postgres

The prompt (postgres=#) will appear, now you type

alter user postgres password 'yoursurname';

Now we will create a user named as student with rights to create database and create user, we will also set the password to student, for that type

create user student createdb createuser password 'student';

Now we will create a database named as tmdb and will make the user (student) as its owner
create database tmdb owner student;

Now quit from psql by typing
\q

Now we are back to LINUX Shell

Now we need to configure the postgresql in such a way that it allows every linux user to login into the postgresql, for that

move to
/var/lib/pgsql/data
folder, this folder contains a file named as pg_hba.conf, you need to edit this file using vi editor and at the end of the file make changes as show below,
See where (trust and md5) is written, earlier it was (ident), so make the changes and save the file

```
# TYPE  DATABASE    USER        CIDR-ADDRESS          METHOD

# "local" is for Unix domain socket connections only
local   all         all                               trust
# IPv4 local connections:
host    all         all         127.0.0.1/32          md5
# IPv6 local connections:
host    all         all         ::1/128               md5
~
~
~
~
```

After saving the file, restart the postgresql service by typing

service postgresql restart

Now exit from the root user and login as student

Then type
psql -U student **--password** tmdb

Note : Before password I have given dash 2 times.
You will be asked for password, provide student as password and you should see the

tmdb=# prompt
type the following sql to create table

create table student(roll_number int primary key,name char(50),gender char(1));

type \q to quit from psql

Now logout and login as root
Move to /ourlib folder

download the postgresql.jar from tm-certificates.com using

wget "http://tm-certificates.com/postgresql.jar"

Now logout and login as student
move to your javaeg folder and edit the jdbc1.java file and change the driver class name and connection string as shown below

```
Class.forName("org.postgresql.Driver");
Connection
c=DriverManager.getConnection("jdbc:postgresql://localhost:5432/tmdb","student","student");
```

now compile the code using javac jdbc1.java

Now run using
java -classpath /ourlib/postgresql.jar:. jdbc1 101 sameer M

Now before . I have used a : (colon) not semicolon

Now login to postgresql using

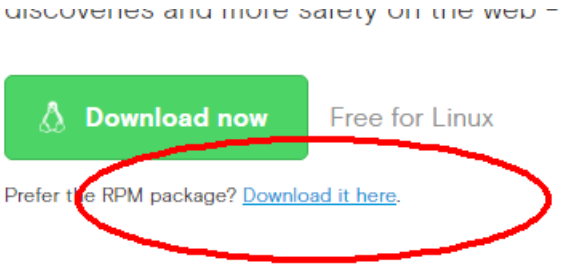
psql -U student --password tmdb
provide password when asked for and when the psql prompt appears, type
select * from student

Now practice as much as you can.

Now let us download and configure oracle express on RED Hat Linux 6
First of all go to GUI mode using starx command

Start the browser and and download opera for Red Hat (RPM Version)
Be careful,
For that visit opera.com

From the top menu select Computer Browsers
Then from the menu below the top menu select Linux
Then below the Download Button, you should see Prefer the RPM Package ? Click the link that is beside it.



And when asked for save it in Documents or Downloads folder.
After the download is complete, from the top menu on desktop, select places then (documents or download) folder, wherever you downloaded it and double click the RPM package and install it.

Now under the applications → internet → you should get Opera shortcut, drag and drop it to the desktop.

Now when you will run it, you will be asked to update, don't update.

Now let us add our servername to /etc/hosts file, for that edit the /etc/hosts and make it as follows

```
127.0.0.1   localhost localhost.localdomain localhost4 localhost4.localdomain4
::1         localhost localhost.localdomain localhost6 localhost6.localdomain6 tmserver
127.0.0.1   localhost.localdomain
192.168.1.253 tmserver
```

Note : replace tmserver with your hostname and 192.168.1.253 with that IP that you have set
Now visit oracle.com

Create an account using the Register link at the top.
login and go to downloads, databases section and select
Oracle Database Express Edition 11g Release 2 for LINUX X64 (Note : only X64 bit version is available). If your PC is 32 bit, then can't do anything.

Download it and save it to the downloads folder whose path is /root/Downloads

My download folder has this file after download

```
-rw-r--r--. 1 root root 315891481 Sep 24 13:21 oracle-xe-11.2.0-1.0.x86_64.rpm.zip
```

Now unzip the file using the following command

unzip oracle-xe-11.2.0-1.0.x86_64.rpm.zip

it will take a little time, then see the directory listing and you will see a folder named as Disk1
move into that directory using
cd Disk1/
and see the contents, you should see the following

```
[root@tmserver Disk1]# ls -l
total 309892
-rw-rw-r--. 1 root root 317320273 Aug 29  2011 oracle-xe-11.2.0-1.0.x86_64.rpm
drwxr-xr-x. 2 root root      4096 Aug 29  2011 response
drwxrwxr-x. 2 root root      4096 Aug 29  2011 upgrade
[root@tmserver Disk1]#
```

Now to install type the following

rpm -i oracle-xe-11.2.0-1.0.x86_64.rpm

You should see the following output

```
[root@tmserver Disk1]# rpm -i oracle-xe-11.2.0-1.0.x86_64.rpm
Executing post-install steps...

You must run '/etc/init.d/oracle-xe configure' as the root user to configure the database.

[root@tmserver Disk1]#
```

now move to /etc/init.d folder using

cd /etc/init.d

to see if oracle-xe exists, type

ll oracle-xe

Note : I have typed L two times in lower case.

Now be careful
To start configuration type
sh oracle-xe configure

You will be asked for Oracle Application Express Port number , just press enter, don't type anything, default will be 8080

Now you will be asked port for database listener, just press enter, don't type anything, default will be 1521

Now you will be asked password for database accounts and same will be used for SYS and SYSTEM accounts, specify your surname, (keep it simple), provide it twice,

Next question will be that do you want to start oracle database server on boot, press enter, don' type anything, default is (y)

Now wait for some time, Listener service will start, database will be created
Then it will be configured, after some time you should see the following

```
This will configure on-boot properties of Oracle Database 11g Express
Edition.  The following questions will determine whether the database should
be starting upon system boot, the ports it will use, and the passwords that
will be used for database accounts.  Press <Enter> to accept the defaults.
Ctrl-C will abort.

Specify the HTTP port that will be used for Oracle Application Express [8080]:

Specify a port that will be used for the database listener [1521]:

Specify a password to be used for database accounts.  Note that the same
password will be used for SYS and SYSTEM.  Oracle recommends the use of
different passwords for each database account.  This can be done after
initial configuration:
Confirm the password:

Do you want Oracle Database 11g Express Edition to be started on boot (y/n) [y]:

Starting Oracle Net Listener...Done
Configuring database...Done
Starting Oracle Database 11g Express Edition instance...Done
Installation completed successfully.
[root@tmserver init.d]#
```

Now to test if oracle listener is working as a service type the following
service oracle-xe status

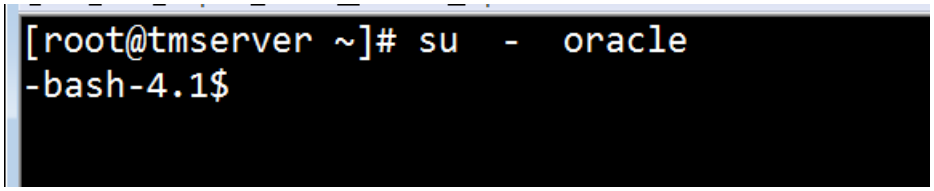
and you should see the output that states that Instance “XE” Status ready
To stay on the safe side restart OS and again type service oracle-xe status to check if it starts on boot.

Now we will change the user to oracle and perform some more things

type

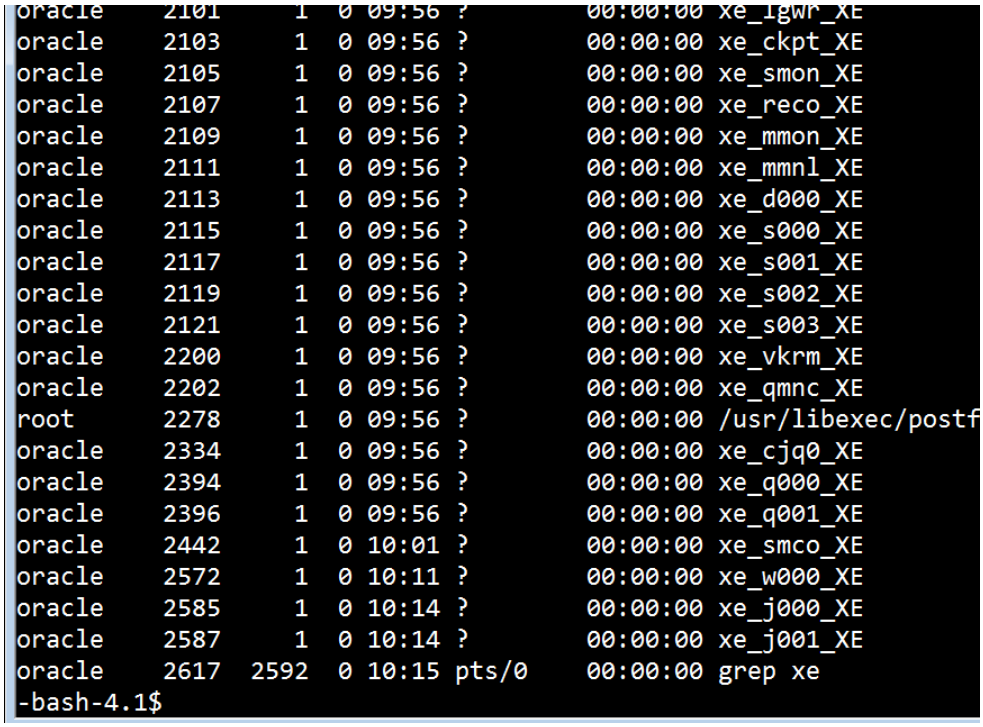
su - oracle

you will get the following prompt



Now type
ps -ef | grep xe

and you will see lot of lines with oracle at the beginning, something as follows



Now we will try to login using sql plus
first of check your working directory, it must by /u01/app/oracle
Now see the contents of the working directory using the ll command.
You should see the following

```
-bash-4.1$ pwd
/u01/app/oracle
-bash-4.1$ ll
total 24
drwxr-x---. 4 oracle dba  4096 Sep 26 08:16 admin
drwxrwxr-x. 4 oracle dba  4096 Sep 26 08:16 diag
drwxr-x---. 3 oracle dba  4096 Sep 26 07:46 fast_recovery_area
drwxr-x---. 3 oracle dba  4096 Sep 26 08:16 oradata
drwxr-xr-x. 3 oracle dba  4096 Sep 26 07:46 oradiag_oracle
drwxr-xr-x. 3 root   root 4096 Sep 24 18:44 product
-bash-4.1$
```

Now move to product/11.2.0/xe/bin
and type
./sqlplus /nolog
you will get an error message as shown below

```
-bash-4.1$ pwd
/u01/app/oracle
-bash-4.1$ cd product/11.2.0/xe/bin
-bash-4.1$ ./sqlplus /nolog
Error 6 initializing SQL*Plus
SP2-0667: Message file sp1<lang>.msb not found
SP2-0750: You may need to set ORACLE_HOME to your Oracle software directory
-bash-4.1$
```

Now type the following two lines
export ORACLE_HOME=/u01/app/oracle/product/11.2.0/xe
export ORACLE_BASE=/u01/app/oracle
Now type ./sqlplus /nolog
you should see SQL> prompt

Now let us connect to server
type
connect /as sysdba
and you will get to see the error as service name is incorrectly specified, type quit to exit from SQL
now type
export ORACLE_SID=XE

Now again type
./sqlplus /nolog
then
connect /as sysdba
now you should be connected
now type
describe v$instance and you should see some output as follows

```
-bash-4.1$ export ORACLE_SID=XE
-bash-4.1$ ./sqlplus /nolog

SQL*Plus: Release 11.2.0.2.0 Production on Mon Sep 26 10:33:28 2016

Copyright (c) 1982, 2011, Oracle.  All rights reserved.

SQL> connect /as sysdba
Connected.
SQL>
```

```
Connected.
SQL> describe v$instance
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 INSTANCE_NUMBER                                    NUMBER
 INSTANCE_NAME                                      VARCHAR2(16)
 HOST_NAME                                          VARCHAR2(64)
 VERSION                                            VARCHAR2(17)
 STARTUP_TIME                                       DATE
 STATUS                                             VARCHAR2(12)
 PARALLEL                                           VARCHAR2(3)
 THREAD#                                            NUMBER
 ARCHIVER                                           VARCHAR2(7)
 LOG_SWITCH_WAIT                                    VARCHAR2(15)
 LOGINS                                             VARCHAR2(10)
 SHUTDOWN_PENDING                                   VARCHAR2(3)
 DATABASE_STATUS                                    VARCHAR2(17)
 INSTANCE_ROLE                                      VARCHAR2(18)
 ACTIVE_STATE                                       VARCHAR2(9)
 BLOCKED                                            VARCHAR2(3)
 EDITION                                            VARCHAR2(7)
```

Just for fun sake type
select 100+200 from dual;
Now you can type exit or quit to get out of SQL, then type exit to get out of the oracle login.

Now we need to login from student account into ORACLE using sqlplus

for that we will do things manually, then set the environment variables in .bashrc and /etc/environment.
First of all do everything manually and test it, after logging,
What I did is exported 3 environment variables, the started sqlplus and typed
connect
when asked for username I provided : system
and password, that I gave (my surname) while configuring oracle
I got connected, then I quit, this is sufficient to test
The screen shot is given below

```
[student@tmserver ~]$ export ORACLE_HOME=/u01/app/oracle/product/11.2.0/xe
[student@tmserver ~]$ export ORACLE_BASE=/u01/app/oracle
[student@tmserver ~]$ export ORACLE_SID=XE
[student@tmserver ~]$ /u01/app/oracle/product/11.2.0/xe/bin/sqlplus /nolog

SQL*Plus: Release 11.2.0.2.0 Production on Mon Sep 26 11:05:36 2016

Copyright (c) 1982, 2011, Oracle.  All rights reserved.

SQL> connect
Enter user-name: system
Enter password:
Connected.
SQL> describe v$instance
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 INSTANCE_NUMBER                                    NUMBER
 INSTANCE_NAME                                      VARCHAR2(16)
 HOST_NAME                                          VARCHAR2(64)
 VERSION                                            VARCHAR2(17)
```

Now let us set it in environment and .bashrc files
exit from student account and login as root
Since some of you are having problems, I am pasting the UI of my /etc/environment file and /home/student/.bashrc file and /etc/profile file
make then as follows, (I have made some changes)

File : /etc/environment

```
[root@tmserver ~]# whoami
root
[root@tmserver ~]# cat /etc/environment
PATH=$PATH:/opt/jdk1.8.0_101/bin:/opt/jdk1.8.0_101/jre/bin
export JAVA_HOME=/opt/jdk1.8.0_101
export JRE_HOME=/opt/jdk1.8.0_101/jre
export ORACLE_HOME=/u01/app/oracle/product/11.2.0/xe
export ORACLE_BASE=/u01/app/oracle
export ORACLE_SID=XE
PATH=$PATH:/u01/app/oracle/product/11.2.0/xe/bin
export PATH

[root@tmserver ~]#
```

Add whatever appears in the above screenshot to

File : /root/.bashrc
File : /etc/profile
File : /home/student/.bashrc

Note : append the setting to the above file from line PATH= to
export PATH, if you are unable to understand then copy paste the following.

```
PATH=$PATH:/opt/jdk1.8.0_101/bin:/opt/jdk1.8.0_101/jre/bin
export JAVA_HOME=/opt/jdk1.8.0_101
export JRE_HOME=/opt/jdk1.8.0_101/jre
export ORACLE_HOME=/u01/app/oracle/product/11.2.0/xe
export ORACLE_BASE=/u01/app/oracle
export ORACLE_SID=XE
PATH=$PATH:/u01/app/oracle/product/11.2.0/xe/bin
export PATH
```

Now restart the machine and login as root and type
echo $PATH and you should see the path of oracle in it
Do the same for student login

Now just type sqlplus and you should be asked for username and password, provide system and yourpassword and you will be connected.

You should be able to do this from both the logins (root as well as student)

Now let us create a new useraccount named as student with password as student
connect to Oracle using sqlplus as logging as system account.
Type the following at SQL prompt, after successful connectivity

create user student identified by student
then grant all rights to the new user by typing

```
grant CREATE SESSION, ALTER SESSION, CREATE DATABASE LINK, -
  CREATE MATERIALIZED VIEW, CREATE PROCEDURE, CREATE PUBLIC SYNONYM, -
  CREATE ROLE, CREATE SEQUENCE, CREATE SYNONYM, CREATE TABLE, -
  CREATE TRIGGER, CREATE TYPE, CREATE VIEW, UNLIMITED TABLESPACE -
  to student;
```

See the following UI

```
Enter user-name: system
Enter password:

Connected to:
Oracle Database 11g Express Edition Release 11.2.0.2.0 - 64bit Production

SQL> create user student identified by student;

User created.

SQL> grant CREATE SESSION, ALTER SESSION, CREATE DATABASE LINK, -
>   CREATE MATERIALIZED VIEW, CREATE PROCEDURE, CREATE PUBLIC SYNONYM, -
>   CREATE ROLE, CREATE SEQUENCE, CREATE SYNONYM, CREATE TABLE, -
>   CREATE TRIGGER, CREATE TYPE, CREATE VIEW, UNLIMITED TABLESPACE -
>   to student;

Grant succeeded.
```

Now exit from SQL Plus and again connect to oracle using sqlplus, but this time using the student account. Then create the student table as shown below.
Note : while running sqlplus you can provide the username as command line argument.

```
[student@tmserver ~]$ sqlplus student

SQL*Plus: Release 11.2.0.2.0 Production on Mon Sep 26 12:00:55 2016

Copyright (c) 1982, 2011, Oracle.  All rights reserved.

Enter password:

Connected to:
Oracle Database 11g Express Edition Release 11.2.0.2.0 - 64bit Production

SQL> create table student
  2  (roll_number int primary key,
  3  name char(20) not null,
  4  gender char(1)
  5  );

Table created.

SQL>
```

Now exit from sql plus.
Now exit from student account and login as root
now move to /ourlib folder using cd/ourlib
now download the oracle.jar from my site, using

wget "http://tm-certificates.com/oracle.jar"

```
[root@tmserver ourlib]# wget "http://tm-certificates.com/oracle.jar"
--2016-09-26 12:14:35--  http://tm-certificates.com/oracle.jar
Resolving tm-certificates.com... 184.168.193.46
Connecting to tm-certificates.com|184.168.193.46|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 2739670 (2.6M) [application/java-archive]
Saving to: "oracle.jar"

100%[======================================================>] 2,739,670   82.6K/s   in 30s

2016-09-26 12:15:06 (87.8 KB/s) - "oracle.jar" saved [2739670/2739670]

[root@tmserver ourlib]#
```

Now exit from root account and login as student

Now move to javaeg1 folder and make changes to jdbc1.java (the connectivity part) as follows

Class.forName("oracle.jdbc.OracleDriver");
Connection
c=DriverManager.getConnection("jdbc:oracle:thin:@localhost:1521:XE","student","student");

to compile type javac jdbc1.java
to execute type
java -classpath /ourlib/oracle.jar jdbc1 101 sameer M
And you should get the message as student added. Now login to oracle using sqlplus with student account and type select * from student, and you should get to see the record that we added.

```
[student@tmserver javaeg]$ javac jdbc1.java
[student@tmserver javaeg]$ java -classpath /ourlib/oracle.jar:.  jdbc1  101 sameer M
Student added
[student@tmserver javaeg]$ sqlplus student

SQL*Plus: Release 11.2.0.2.0 Production on Mon Sep 26 12:18:46 2016

Copyright (c) 1982, 2011, Oracle.  All rights reserved.

Enter password:

Connected to:
Oracle Database 11g Express Edition Release 11.2.0.2.0 - 64bit Production

SQL> select * from student;

ROLL_NUMBER NAME                 G
----------- -------------------- -
        101 sameer               M
```

Thats it : Now we have MySQL, Postgre SQL and Oracle, working for us and we are able to connect to them using their respective clients and java code.

Next step will be to setup MongoDB – NoSQL Database.