6 DBMS (PostgreSQL)

Create a database in PostgreSQL

To create a database in PostgreSQL **create database** statement is used

syntax :

```
postgresql=#create database database_name ;
```

e.g **Postgresql> create database college ;**

```
postgres=# CREATE DATABASE college;
CREATE DATABASE
postgres=#
```

To view databases :

To view database **\l** command is used.

```
Postgresql=#/l
```

```
postgres=# \l
                                  List of databases
   Name    |  Owner   | Encoding | Collate | Ctype |   Access privileges
-----------+----------+----------+---------+-------+-----------------------
 balbharti | postgres | UTF8     | en_IN   | en_IN |
 college   | postgres | UTF8     | en_IN   | en_IN |
 postgres  | postgres | UTF8     | en_IN   | en_IN |
 template0 | postgres | UTF8     | en_IN   | en_IN | =c/postgres          +
           |          |          |         |       | postgres=CTc/postgres
 template1 | postgres | UTF8     | en_IN   | en_IN | =c/postgres          +
           |          |          |         |       | postgres=CTc/postgres
(5 rows)
```

To connect database :

To connect database **\c** command is used.

```
postgresql=# \c database_name
```

e.g \c college;

```
postgres=# \c college;
You are now connected to database "college" as user "postgres".
college=#
```

To create table :

To create table in database **Create table** command is used

databasename = # create table table_name (fieldname Datatype, fieldname Datatype);

```
college=# CREATE TABLE XI (Roll_no integer, Student_name text);
CREATE TABLE
college=#
```

To insert data in table :

To insert data in a table insert into command is used.

databsename=# insert into table_name (field name)values(data1,'data1')

```
college=# INSERT INTO XI (Roll_no,Student_name) VALUES(101,'Sachin');
INSERT 0 1
college=#
```

To view inserted data :

To view inserted data select * from command is used.

database name=#select * from table_name.

```
college=# SELECT * FROM XI;
 roll_no | student_name
---------+--------------
     101 | Sachin
(1 row)
```

To update table:

To update table UPDATE command is used.

databasename=# update table_name SET column_name=Value WHERE Reference_Column_name=Value

```
college=# UPDATE XI SET Roll_no = '1001' WHERE Student_name = 'Sachin';
UPDATE 1
college=#
```

To add Primary Key:

To add primary key to already created table, we can use following command.

or we can create primary key during table creation.

ALTER TABLE table_name ADD PRIMARY KEY (column_name);

```
college=# ALTER TABLE XI ADD PRIMARY KEY (Roll_no);
ALTER TABLE
college=#
```

To add Foreign Key:

To add foreign key while creating table, we can use the following command or we can create foreign key during table creation.

ALTER TABLE table_name ADD FOREIGN KEY (current_column_name) REFERENCES refered_table_name (referedtable_primarycolumn_name);

One to One relationship

```
college=# CREATE TABLE Marks  (roll_no integer PRIMARY KEY, total_marks integer,result
text,record_no integer,FOREIGN KEY (roll_no)  REFERENCES XI(Roll_no));
CREATE TABLE
college=#
```

Lets see the result of both table 'XI' and 'Marks' with one-to-one relationship.

```
college=# SELECT XI.Roll_no,XI.student_name,Marks.total_marks,Marks.result FROM XI,Marks where
XI.Roll_no=Marks.roll_no;
 roll_no | student_name | total_marks | result
---------+--------------+-------------+--------
    1001 | Sachin       |         230 | PASS
(1 row)
```

Do you know ?

\c Connect to database

\l List all the databases

\dt List all the tables from database

\d To view structure of table.

To delete table :

To delete table, DROP command is used.

```
databasename=# DROP table_name;
```

```
postgres=# DROP TABLE Marks;
DROP TABLE
```

To delete database :

Drop command is used to delete database also.

```
postgresql=# drop database  database_name;
```

```
postgres=# DROP DATABASE college;
DROP DATABASE
```

Note : Before deleting the current database you have to connect to another database eg. postgreSqL

Skill Set 6 - PostgreSQL

SOP 1 : Create a database, using postgreSQL named hospital.

- In this database, create a table of patients with the following fields Patient_ID, Patients_Name, Address, Room_number and Doctor's_name.
- Give appropriate data type for each field.

Patient_ID	Patient_name	Address	Room_number	Doctor's_name

SOP 2 : Create a database using postgreSQL named School-master.

- In this database create a table of students with the following fields student_ID, student_name, Address, Phone_number, Date_of_Birth.
- Give appropriate data type for each field. Enter at least 5 records.

SOP 3 : Given the list of fields : EmpId, EmpName, EmpDepartment, SalaryId, SalaryAmount, Bonus in the tables Employee and Salary respectively. Define primary key, foreign key and segregate for above fields into employee and salary table. Also create one-to-one relationship between Employee and Salary Table.

APPENDIX

Steps For Installing Linux OS

Steps For Installing Libre Office

Steps For Installing PostgreSQL

Steps For Installing GNUKhata

Step For Installing Linux OS

Installing GNU/Linux (Ubuntu) – An Important Skill for Digital Literacy

We will now install Ubuntu 18.04. Installation skill is often required in everyday life as your computer sometimes gets formatted or your hard disk may crash. We will learn three different methods of creating an installer. Students are required to learn all of them.

1. Creating Installation DVD of GNU/Linux

GNU/Linux distribution comes as an ISO image file. An ISO image file is an image of a CD or DVD which is stored as a usual binary file on disk. From the respective Linux distributions website, download the installation ISO file (Image). We will download Ubuntu 18.04 desktop 64 bit ISO image from Ubuntu official website www.ubuntu.com.

The easiest way to make an installation DVD is to Right Click on the iso file from your file manager. Most probably your current OS would have image burning feature built-in. If it shows burn image options menu then you can insert blank DVD in the DVD drive and burn the image straight away.

If you are using an old operating system, you might have to use separate image burning software. Few free and open source DVD burners are Infra Recorder, cdrtfe, DVD Flick, DVDStyler, Burn and also many more are available. Install one of these softwares and burn the Installation DVD.

You can also create a GNU/Linux Installation USB disk as given in the following paragraph which is the most preferred method.

Creating GNU/Linux Live USB Installer (Recommended Method)

Burning DVD from ISO is perhaps the simplest way to create GNU/Linux installer but there are certain disadvantages of this method. DVD has a short shelf life. If the disk has even a small read error it becomes useless. Active GNU/Linux distributions are updated regularly. Every few months, new improved versions keep coming with new features and security updates. Hence your installer DVD will become obsolete in a few months. Also, read/write speed of DVD is far less than USB. Hence it will take a long time to install. On the other hand, USB is much faster if you want to run GNU/Linux live session without installation. The Read Only DVD is wasted in case of any error during the writing process. But USB disk can be formatted and reused once the installation is finished. Thus USB can reduce e-waste to some extent.

Creating Live installation USB is also easy. Let us learn this skill now. We assume that you have Ubuntu 18.04 ISO file stored in your disk. The method is the same for all other distributions. You can very well install them with this method.

There are a many free and open source tools that can be used to create such USB installer disk. We will show here two such tools namely **Rufus** and **Etcher**. We will also show how to use one of the advance **disk duplicator** tool **dd**. Do try other tools, if you like, and compare them with the tools given here.

1. **Rufus :** Rufus (Pronounced as ROO-Fuss) has General Public License (GPL). It means that you are free to distribute and even modify Rufus software to suit your needs. The source code is available in public repositories.

The advantage of Rufus is that it is very small in size (about 1 mb). Also Rufus is a portable software. It means that you can Rufus from the executable file without installing it. So go and download Rufus from its website. Plug the usb disk (at least 4 GB). Start Rufus by double-clicking on the downloaded file. In the device menu, you can see your USB name. In boot selection menu select the downloaded ISO file. Most of the other entries will be filled automatically once you load the iso file. Accept these defaults and click on the start button. You may be asked permission to download system file syslinux. Click okay. In a newer version, this dialog may not appear.

Next, you will be shown hybrid image dialog. Leave defaults and click on okay. In rare cases, if the hybrid image method does not work, you have the option of dd image method. We will also learn this method separately in the last section.

Finally, you will be warned that all the data on the disk will be destroyed. If you have not already taken the backup of the data on the disk, you can cancel the process and copy the data from the disk to a safe place. Otherwise, the press continues to start the process. It will take about 3 to 8 minutes depending upon the read/write speed of your USB disk. The indicator will tell you the progress status. Once the process is over the ready message will appear. You can now close the application and eject your USB disk. Using this Live USB, you can install Ubuntu 18.04 LTS on any desktop or laptop.

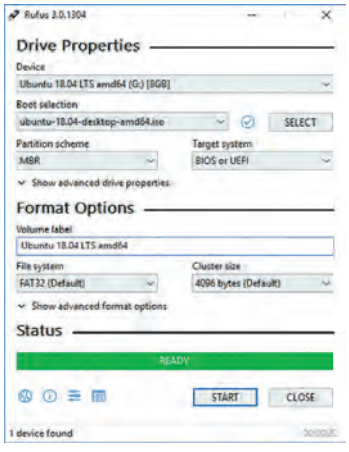


Fig. 1 : Refus USB creator

2. **Etcher :** Etcher is a cross-platform free and open source utility distributed under Apache license. Etcher is very easy to use. To download etcher. first, plug in your USB drive. Then start Etcher.

Now there are only three natural steps needed to make boot-able pen drive :

1) Select Image **2)** Select Drive **3)** Flash

In the first step select downloaded iso image from the disk. In the next step, select this as your target USB drive (if it is not selected by default).

In the last step, select flash to start the process. Once the process is over your USB disk is ready as Linux Installer.

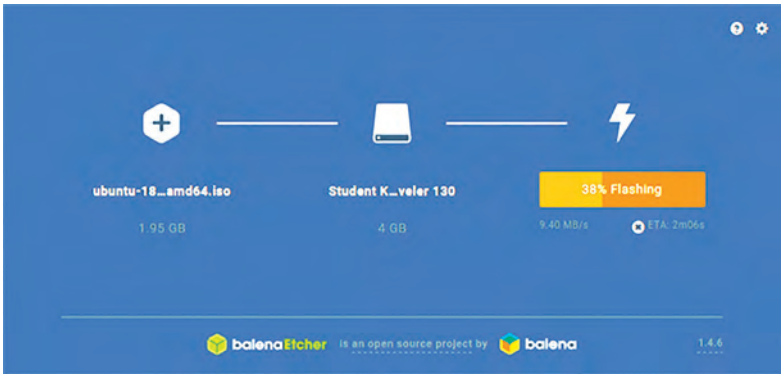


Fig. 2 : Etcher USB creator

3. **dd Command (Quick Advanced Method) :** Our last utility "dd command" is an advanced method which is applicable only for GNU/Linux distributions. This method is useful if you have already installed Linux on one of the machines and you would like to create USB installer. The advantage of dd command is that it is a one-line command. With just one line, the USB installer is created. Moreover, the command is always available in all GNU/Linux distribution. dd Stands for Data Duplicator. It is an internal command for all GNU/Linux distributions.

Please use dd command with care, preferably under the guidance of your teacher or you may accidentally format the hard disk of your computer.

Step 1 : First, go to the terminal by using terminal menu or press **Ctrl + Alt +T**. (The shortcut may be different). Plug in your USB disk.

Step 2 : Find out the drive letter by giving the **$lsblk** command.

Most probably sda will be the letter for hard disk and sdb will be your USB drive letter. Confirm again by carefully examining the output. Ignore the partition letters, if any, like sda1, sda2, sdb1 etc. The volume label will confirm your drive letter and also the size. It will be little less than 4 GB for a 4 GB disk. (3.7 G in the adjacent picture).

Step 3 : Once you confirm the drive letter you can go and give the dd command. It is assumed that you have kept the ISO image in the default home folder where the terminal is opened by default.

Step 4 : Make USB boot-able using dd command

$sudo dd bs=4M if= "Ubuntu 18.04.iso" of=/dev/sdb status=progress

Enter the Admin password when asked. The terminal will show process indicator in percentage (as shown in fig 3).

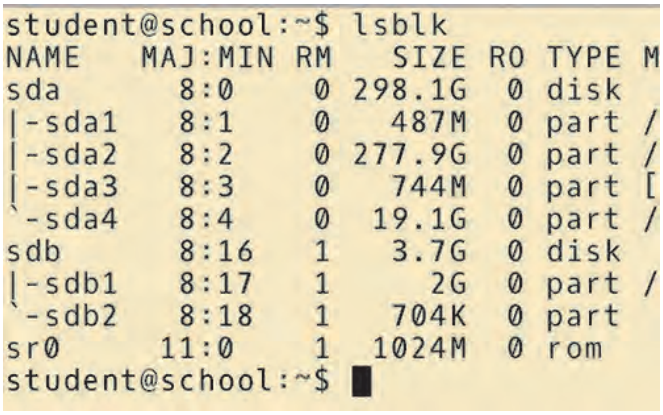


Fig. 3 : Output of 'ISblk' command

Step 5 : Once this process is over, do not be in a hurry to take out USB. You must flush the output buffer by the command

$sync :

That's it. Wait for sync to finish. Your USB GNU/Linux installer is ready.

Installing GNU/Linux (Ubuntu)

The first step before installing Ubuntu is taking a backup. Copy all the important file to an external hard drive. Make sure to not miss any files. Installing GNU/Linux involves formatting your hard drive. This means all the data on the hard drive will be deleted. You can copy the files back once you have installed GNU/Linux.

Once the backup is done, remove your backup drive, and insert your Installation USB/DVD that you created in the previous section. Now restart your computer. In order to start the installation, you need to access the boot menu/BIOS/UEFI. This is different on every computer. Steps for various vendors are given below.

Generally, you can press the [DEL] key, [F2] key, [F10] key, or the [F12] key while the computer is turning on. This has to be done right after you press the power button. Look up for the correct method to do this for your computer.

You should now be on a blue background menu. Use the keyboard to navigate. You need to make sure of the following things :

- Secure Boot is disabled
- Boot Mode is Legacy/BIOS and not UEFI
- Your installation DVD/USB has the highest boot priority.

Once that is done, choose the save and reboot option. You should now be in the Ubuntu Installer (as shown in fig. 4). Choose "Try before installing" using the keyboard and press Enter.

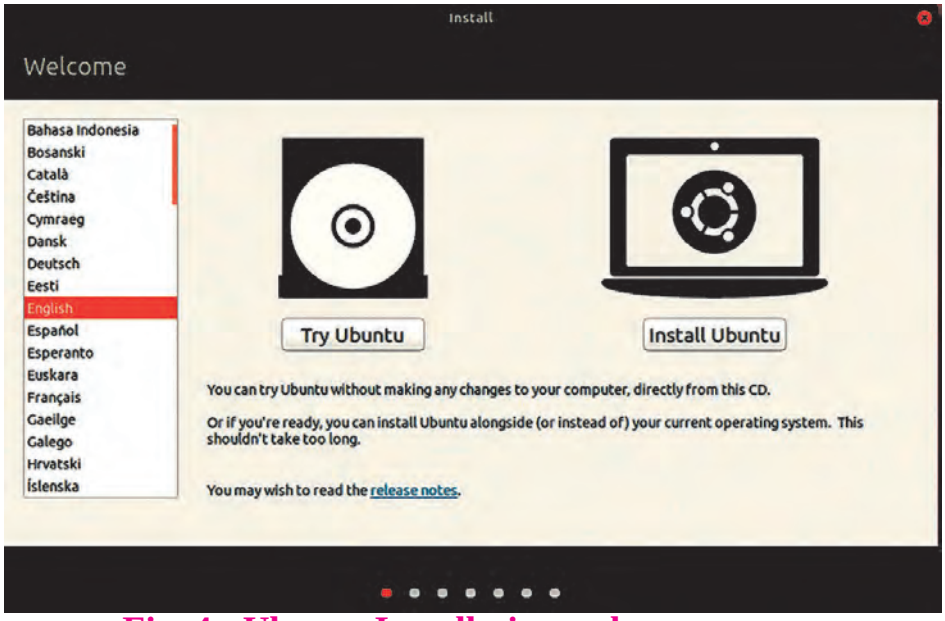


Fig. 4 : Ubuntu Installation welcome screen

Once your desktop loads, you can explore the system. To start the installation, double-click on the "Install Ubuntu 18.04" icon on the desktop.

It will ask what language and keyboard layout you have (as shown in Fig. 5). Keep those as default. You can choose "English – India" if you want the (Rupee) symbol, among other things.

Next, it will ask if you want to connect to WiFi. Click on "I don't want to connect to WiFi right now." If you connect to WiFi you can choose to download updates from the internet while installing, but that significantly increases the installation time. Click on next.

The next menu is "Updates and other software" (as shown in Fig. 5). Check the "Install third party software" box. This will allow you to view movie DVDs, etc. Uncheck the "Download updates while installing Ubuntu". You can install updates after you have installed Ubuntu.

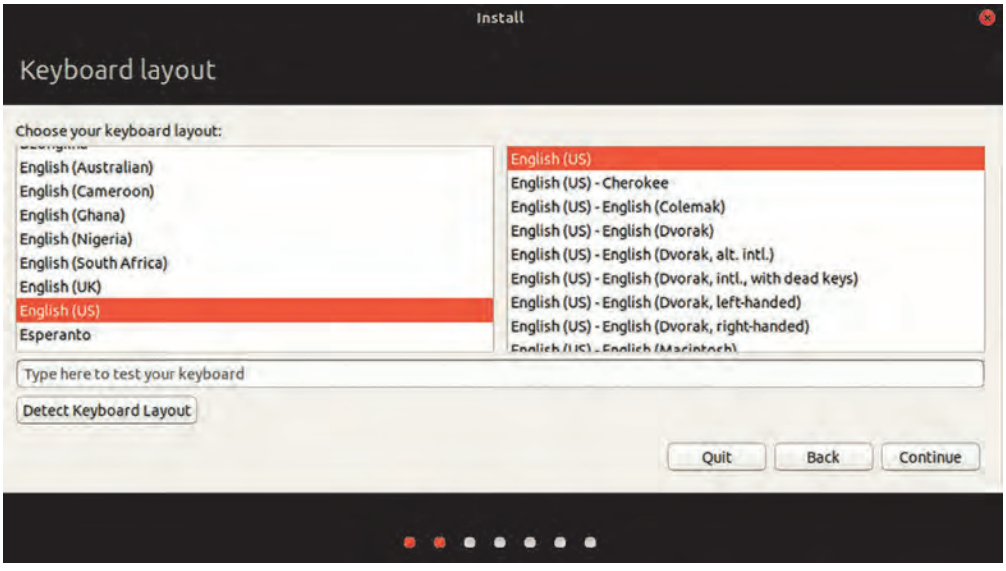


Fig. 5 : Ubuntu Installation Keyboard layout selection

Also, choose “Normal installation”. This will take more space, but includes a large amount of software. Again, click on next.

Now, click “Erase disk and install Ubuntu” and click on “Install now” (as shown in fig. 7).

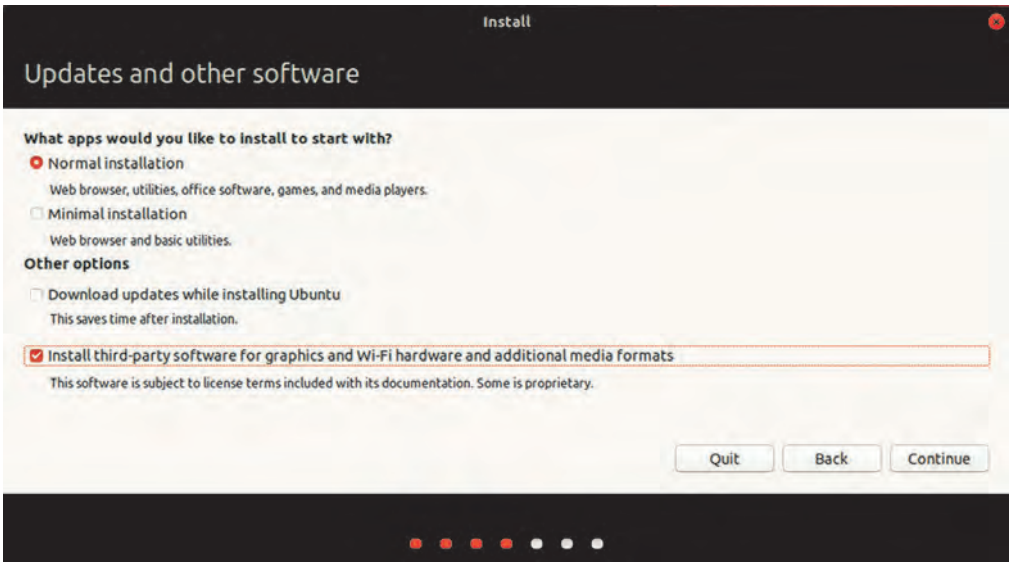


Fig. 6 : Ubuntu Installation Updates

Ubuntu will give you a Summary of the changes it is going to make. Click on “Write change the disk” to confirm (as shown in fig. 8).

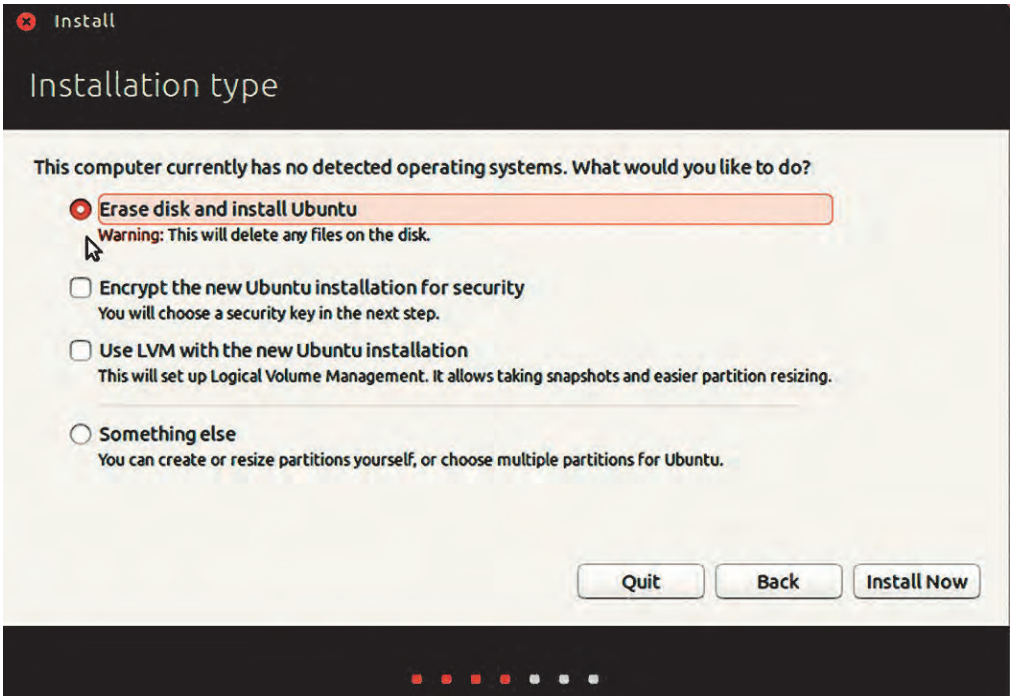


Fig. 7 : Ubuntu Installation Types

Before installing, Ubuntu will ask for your user information. First is your time-zone. In India, the IST (Indian Standard Time) is used. The (as shown in fig. 9) city for IST is Kolkata.

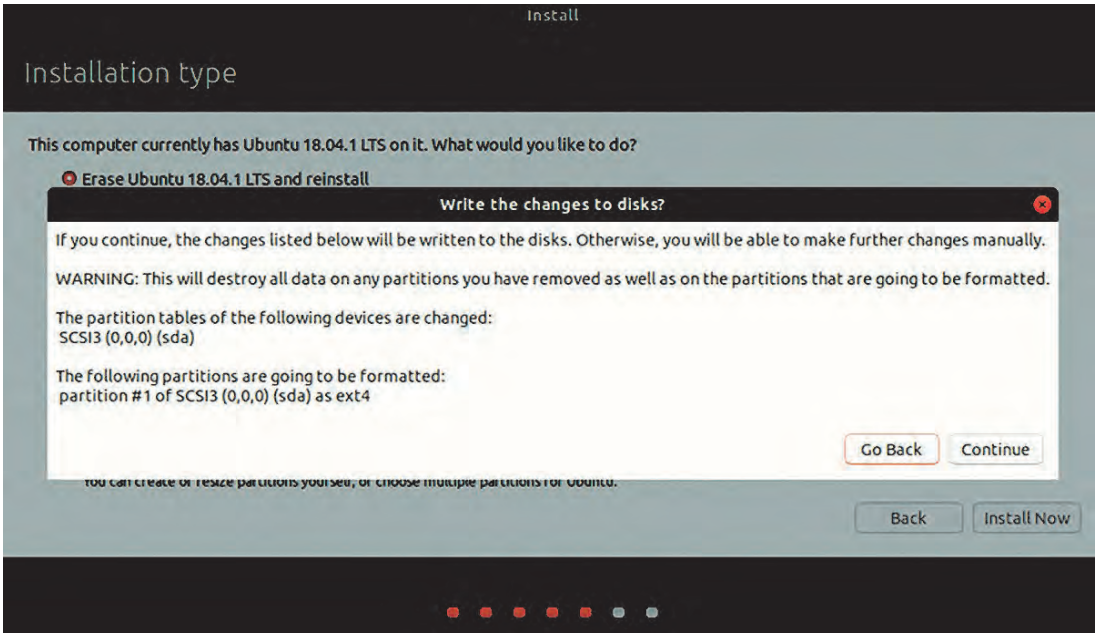
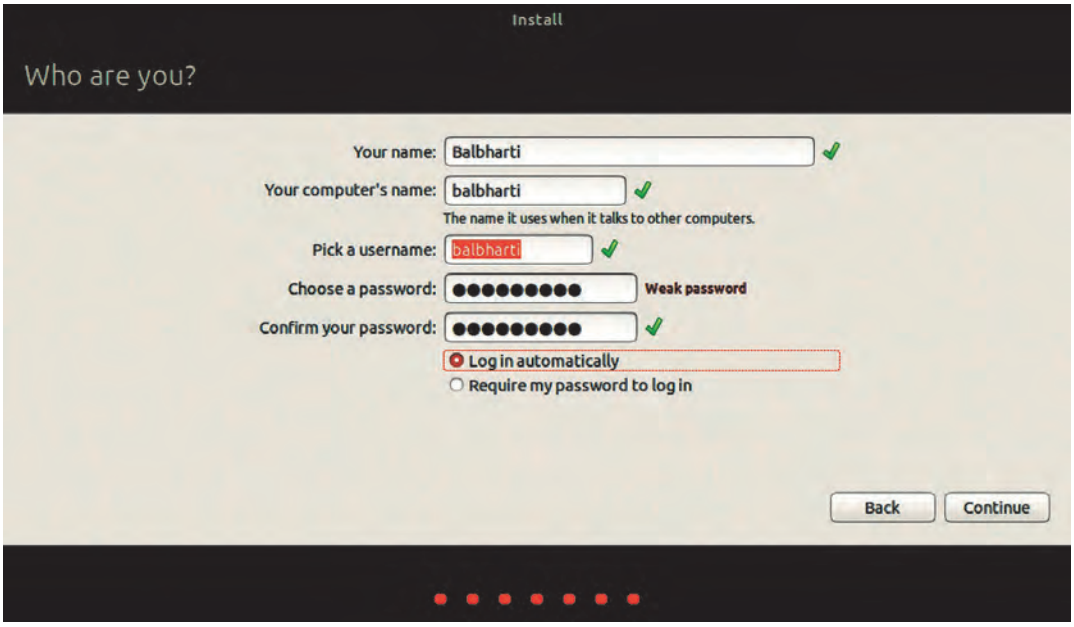


Fig. 8 : Ubuntu Disk Partition confirmation screen

Choose that and click on next, then input your Name, Computer name, Username, and Password. And finally, click on “Install now.” (as shown in fig. 10)

Fig. 9 : Ubuntu Timezone setting screen

The installation will take 30 min to 1hour.



(as shown in fig. 11)

Fig. 10 : Ubuntu user profile creation

After its done, Ubuntu will ask you if you want to restart your computer. Click on "Restart now", and remove the DVD/USB when it will you to do so. You should now have Ubuntu installed on your computer.

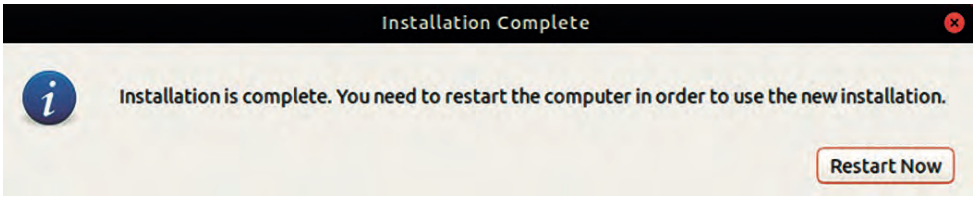


Fig. 11 : Ubuntu installation complete screen

◆◆◆