

C.C PRACTICAL NO. 1

AIM: To study cloud architecture and cloud computing model.

THEORY/NOTES:

Cloud computing enables companies to consume compute resources as a utility -- just like electricity -- rather than having to build and maintain computing infrastructures in-house. Cloud computing promises several attractive benefits for businesses and end users.

Three of the main **benefits of cloud computing** include:

- ✓ **Self-service provisioning:** End users can spin up computing resources for almost any type of workload on-demand.
- ✓ **Elasticity:** Companies can scale up as computing needs increase and then scale down again as demands decreases.
- ✓ **Pay per use:** Computing resources are measured at a granular level, allowing users to pay only for the resources and workloads they use.

Four types of Deployment models: (Public , Private, Hybrid or Community Cloud)

Private cloud services are delivered from a business' data center to internal users. This model offers versatility and convenience, while preserving management, control and security. Internal customers may or may not be billed for services through IT chargeback.

In the **Public cloud model**, a third-party provider delivers the cloud service over the Internet. Public cloud services are sold on-demand, typically by the minute or the hour. Customers only pay for the CPU cycles, storage or bandwidth they consume. Leading public cloud providers include Amazon Web Services (AWS), Microsoft Azure, IBM/SoftLayer and Google Compute Engine.

Hybrid cloud or heterogeneous clouds, is a combination of public cloud services and on-premises private cloud – with orchestration and automation between the two.

Communityclouds. The cloud is characterized by a multi-administrative domain involving different deployment models (public, private, and hybrid), and it is specifically designed to address the needs of a specific industry.

Three types of Service models: (IaaS, PaaS, SaaS)

IT people talk about three different kinds of cloud computing, where different services are being provided for you. Note that there's a certain amount of vagueness about how these things are defined and some overlap between them.

- ✓ **Infrastructure as a Service (IaaS)** means you're buying access to raw computing hardware over the Net, such as servers or storage. Since you buy what you need and pay-as-you-go, this is often referred to as utility computing. Ordinary web hosting is a simple example of IaaS: you pay a monthly subscription or a per-megabyte/gigabyte fee to have a hosting company serve up files for your website from their servers.
- ✓ **Software as a Service (SaaS)** means you use a complete application running on someone else's system. Web-based email and Google Documents are perhaps the best-known examples. Zoho is another well-known SaaS provider offering a variety of office applications online.

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- ✓ **Platform as a Service (PaaS)** means you develop applications using Web-based tools, so they run on systems software and hardware provided by another company. So, for example, you might develop your own ecommerce website but have the whole thing, including the shopping cart, checkout, and payment mechanism running on a merchant's server. Force.com (from salesforce.com) and the Google App Engine are examples of PaaS.

Advantages:

Cloud computing has some interesting characteristics that bring benefits to both cloud serviceconsumers (CSCs) and cloud service providers (CSPs). These characteristics are:

- No up-front commitments
- On-demand access
- Nice pricing
- Simplified application acceleration and scalability
- Efficient resource allocation
- Energy efficiency
- Seamless creation and use of third-party services

Disadvantages

Instead of purchasing computers and software, cloud computing means you buy services, so one-off, upfront capital costs become ongoing operating costs instead. That might work out much more expensive in the long-term.

If you're using software as a service (for example, writing a report using an online word processor or sending emails through webmail), you need a reliable, high-speed, broadband Internet connection functioning the whole time you're working.

If you're buying in services, you can buy only what people are providing, so you may be restricted to off-the-peg solutions rather than ones that precisely meet your needs. Not only that, but you're completely at the mercy of your suppliers if they suddenly decide to stop supporting a product you've come to depend on. Instead of using "generative" systems (ones that can be added to and extended in exciting ways the developers never envisaged), you're effectively using "dumb terminals" whose uses are severely limited by the supplier.

CONCLUSION:

Cloud computing enables a convenient and on-demand network access to a wide range of resources. The different services and also the deployment models allow flexible service provider interaction with minimal human intervention. It saves costs but also can lead to risk issues and suspension of resources when in huge quantity.

C.C PRACTICAL NO. 2

Aim :- Installation and Configuration of virtualization using KVM.

OBJECTIVES: Understand the concepts of virtualization.Understand KVM architecture and its configuration.

HARDWARE / SOFTWARE REQUIRED:Ubuntu operating system open source software KVM internet

THEORY:

Virtualization is software that separates physical infrastructures to create various dedicated resources. It is the fundamental technology that powers cloud computing. The technology behind virtualization is known as a virtual machine monitor (VMM) or virtual manager, which separates compute environments from the actual physical infrastructure. There are three areas of IT where virtualization is making head roads, network virtualization, storage virtualization and server virtualization.

- ✓ Network virtualization is a method of combining the available resources in a network by splitting up the available bandwidth into channels, each of which is independent from the others, and each of which can be assigned (or reassigned) to a particular server or device in real time.
- ✓ Storage virtualization is the pooling of physical storage from multiple network storage devices into what appears to be a single storage device that is managed from a central console. Storage virtualization is commonly used in storage area networks (SANs).
- ✓ Server virtualization is the masking of server resources (including the number and identity of individual physical servers, processors, and operating systems) from server users.

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Command :- sudo apt-get update

```
yash@yash-VirtualBox:~$ sudo apt-get update
[sudo] password for yash:
Hit:1 http://in.archive.ubuntu.com/ubuntu bionic InRelease
Get:2 http://in.archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu bionic-backports InRelease [74.6 kB]
Get:4 http://security.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 Packages [2,439 kB]
Get:6 http://security.ubuntu.com/ubuntu bionic-security/main amd64 Packages [2,092 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu bionic-updates/main i386 Packages [1,426 kB]
Get:8 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 DEP-11 Meta
data [297 kB]
Get:9 http://in.archive.ubuntu.com/ubuntu bionic-updates/universe i386 Packages
[1,600 kB]
Get:10 http://security.ubuntu.com/ubuntu bionic-security/main i386 Packages [1,120 kB]
Get:11 http://in.archive.ubuntu.com/ubuntu bionic-updates/universe amd64 Packag
es [1,790 kB]
Get:12 http://in.archive.ubuntu.com/ubuntu bionic-updates/universe amd64 DEP-11
Metadata [301 kB]
Get:13 http://in.archive.ubuntu.com/ubuntu bionic-updates/multiverse amd64 DEP-
11 Metadata [2,464 B]
Get:14 http://in.archive.ubuntu.com/ubuntu bionic-backports/universe amd64 DEP-
11 Metadata [9,276 B]
Get:15 http://security.ubuntu.com/ubuntu bionic-security/main amd64 DEP-11 Meta
data [55.1 kB]
Get:16 http://security.ubuntu.com/ubuntu bionic-security/universe amd64 Package
```

Command :- sudo grep -c "svm\|vmx" /proc/cpuinfo

```
yash@yash-VirtualBox:~$ sudo grep -c "svm\|vmx" /proc/cpuinfo
0
```

Command :- sudo apt-get install qemu-kvm libvirt-bin bridge-utils virt-manager

```
yash@yash-VirtualBox:~$ sudo apt-get install qemu-kvm libvirt-bin bridge-utils
virt-manager
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  augeas-lenses cpu-checker dmeventd ebtables gir1.2-appindicator3-0.1
  gir1.2-gtk-vnc-2.0 gir1.2-libosinfo-1.0 gir1.2-libvirt-glib-1.0
  gir1.2-spiceclientglib-2.0 gir1.2-spiceclientgtk-3.0 ibverbs-providers
  ipxe-qemu ipxe-qemu-256k-compat-efi-roms libaio1 libaugeas0 libcaca0
  libdevmapper-event1.02.1 libfdt1 libgovirt-common libgovirt2
  libgtk-vnc-2.0-0 libgvnc-1.0-0 libibverbs1 libiscsi7 liblvm2app2.2
  liblvm2cmd2.02 libnetcf1 libnl-route-3-200 libosinfo-1.0-0 libphodav-2.0-0
  libphodav-2.0-common libpython-stdlib libpython2.7 libpython2.7-minimal
  libpython2.7-stdlib librados2 librbd1 librdmacm1 libreadline5
  libSDL1.2debian libspice-client-glib-2.0-8 libspice-client-gtk-3.0-5
  libspice-server1 libusbredirhost1 libusbredirparser1 libvirt-clients
  libvirt-daemon libvirt-daemon-driver-storage-rbd libvirt-daemon-system
  libvirt-glib-1.0-0 libvirt0 libxen-4.9 libxenstore3.0 libxml2-utils lvm2
  msr-tools osinfo-db python python-asn1crypto python-cairo python-certifi
  python-cffi-backend python-chardet python-cryptography python-dbus
  python-enum34 python-gi python-gi-cairo python-idna python-ipaddr
  python-ipaddress python-libvirt python-libxml2 python-minimal
```

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Command :- sudo adduser xash

```
yash@yash-VirtualBox:~$ sudo adduser xash
Adding user `xash' ...
Adding new group `xash' (1001) ...
Adding new user `xash' (1001) with group `xash' ...
Creating home directory `/home/xash' ...
Copying files from `/etc/skel' ...
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
Changing the user information for xash
Enter the new value, or press ENTER for the default
      Full Name []: xash
      Room Number []: 1
      Work Phone []: 123456789
      Home Phone []: 123456789
      Other []: 123456789
Is the information correct? [Y/n] y
yash@yash-VirtualBox:~$
```

Command :- sudo adduser xash libvirt

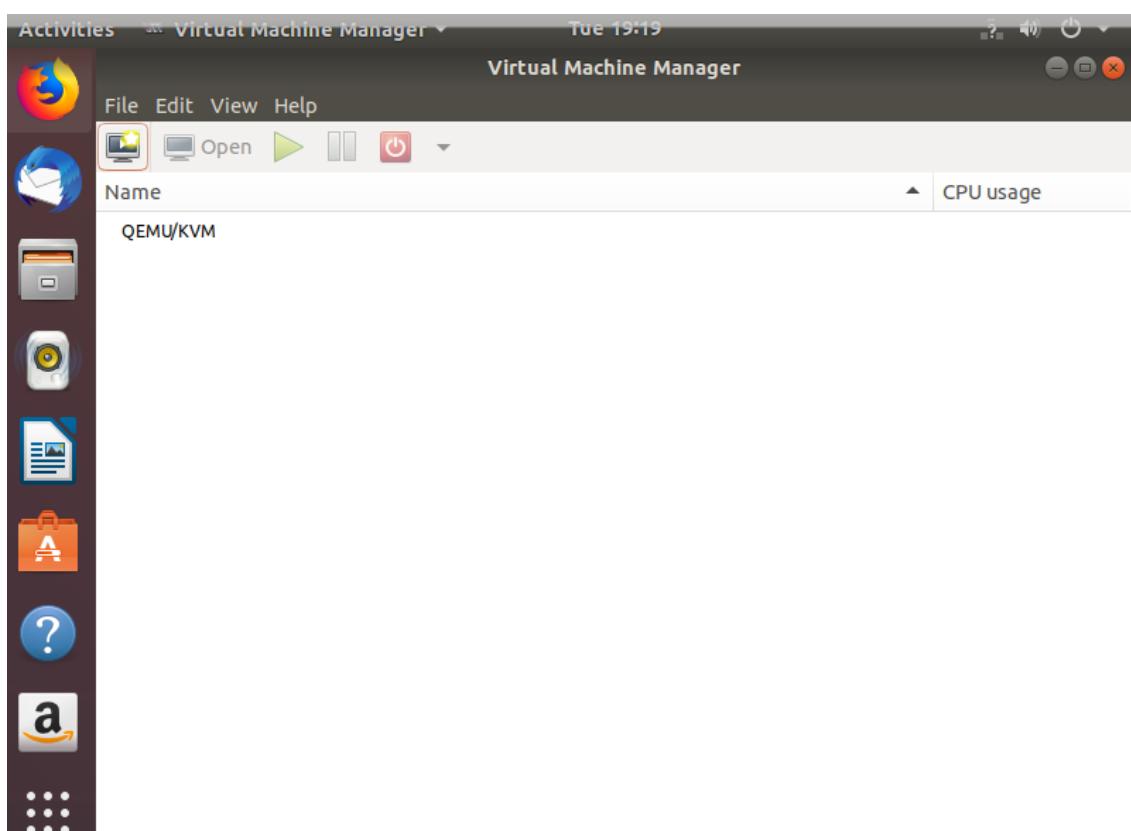
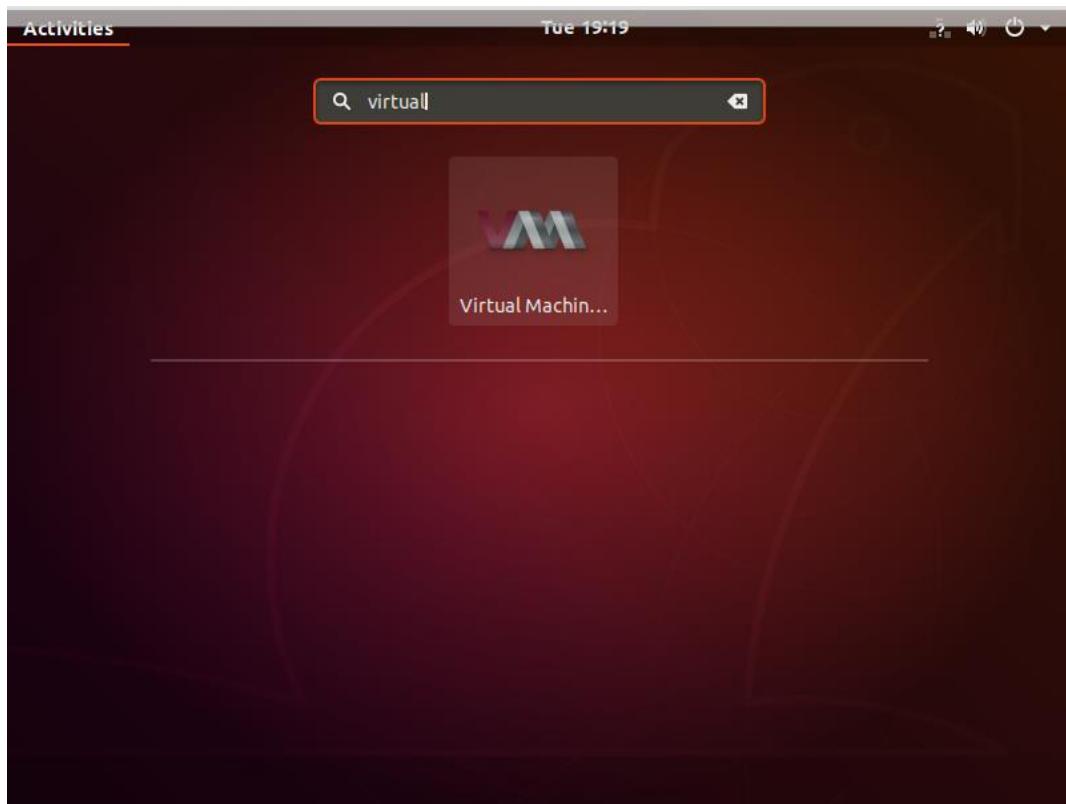
```
yash@yash-VirtualBox:~$ sudo adduser xash libvirt
Adding user `xash' to group `libvirt' ...
Adding user xash to group libvirt
Done.
yash@yash-VirtualBox:~$
```

You will see the username we entered has been created successfully



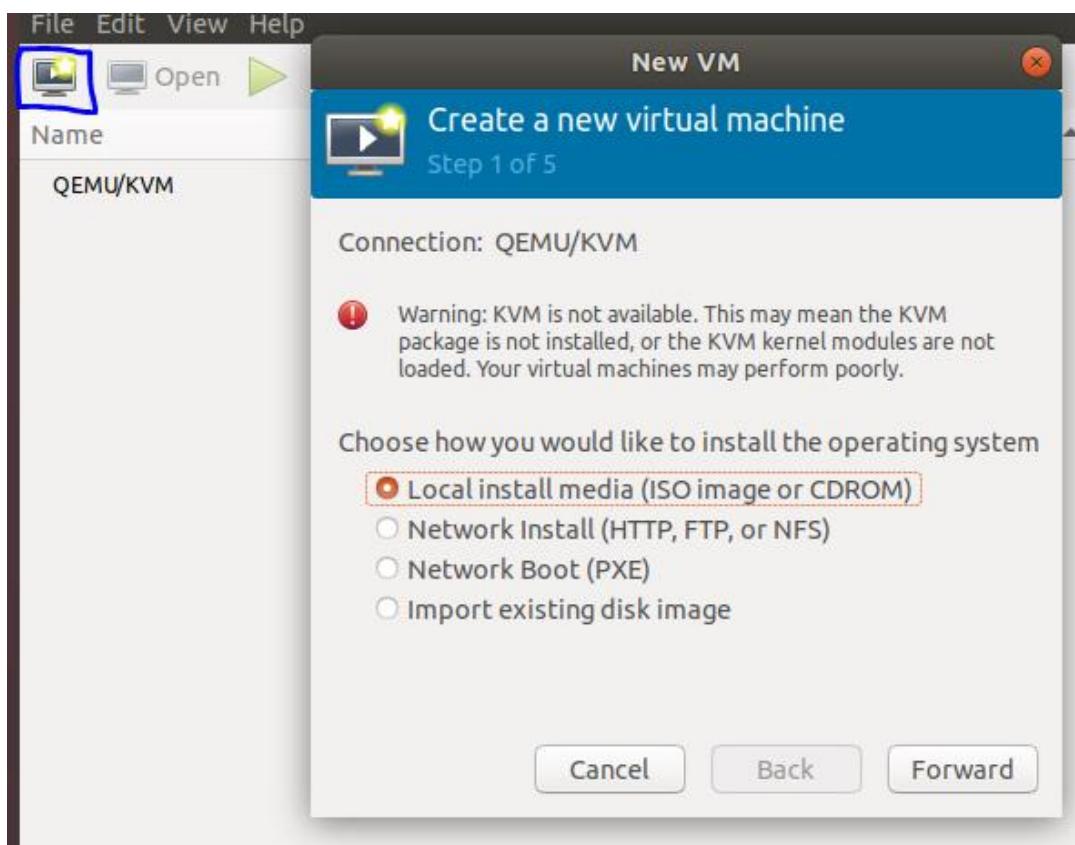
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Open Virtual Machine



C.C PRACTICAL NO. 2

Create a new virtual Machine

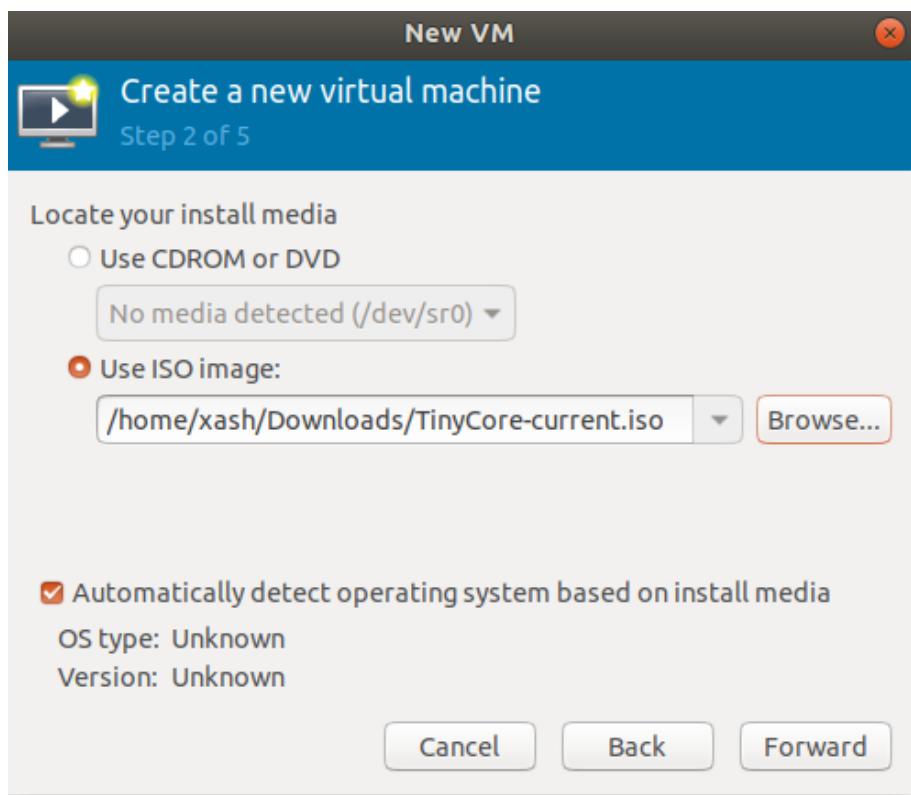


Download TinyCoreOS ISO file from the website (TinyCore OS)

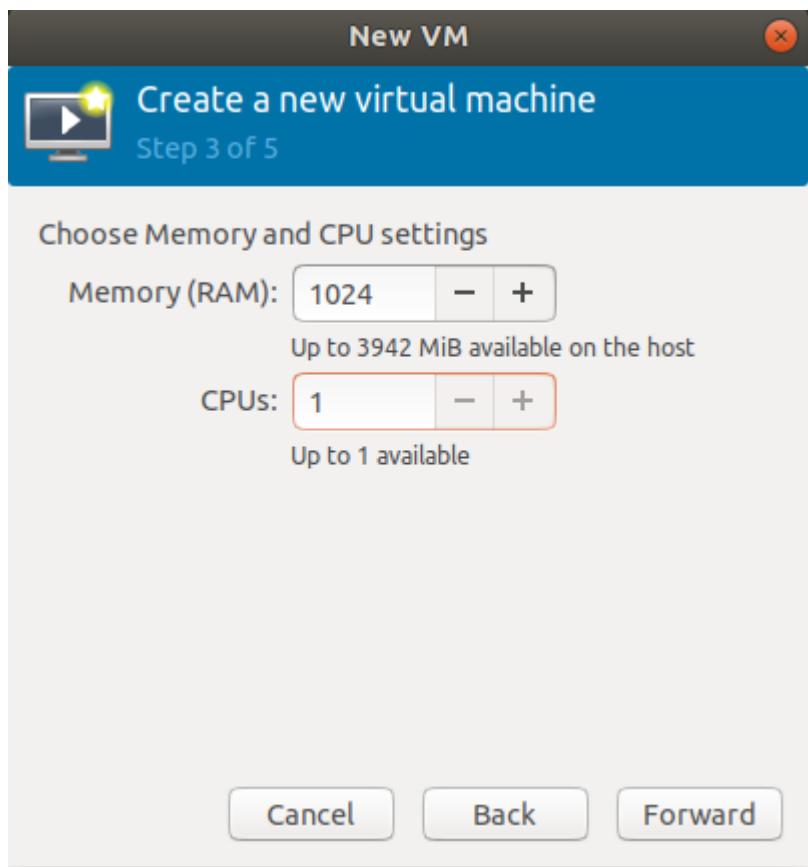
The screenshot shows a Firefox browser window with the address bar showing "tinycorelinux.net/downloads.h". The page title is "Downloads Tiny Core Linux - Mozilla Firefox". The main content area displays the "Core" logo and a navigation menu with links like Welcome, Intro, Screen Shots, Installation, Core Concepts, Book, FAQ, Forums, Downloads, Wiki, About Us, RepoBr. Below the menu, a text block says: "The Core Project, as suggested by our name, is not a turnkey desktop distribution. Instead we deliver just the core Linux from which quite easy to add what you want. We offer 3 different x86 "cores" to get you started: Core, TinyCore, and our installation image, CorePlus." It then lists three options: "Core (16 MB)", "TinyCore (21 MB)", and "CorePlus (163 MB)". The "Core" option is described as providing a command line interface for experienced users. The "TinyCore" option is described as recommended for new users with a wired network connection. The "CorePlus" option is described as an installation image for new users with access to a wireless network or non-US keyboard layout. At the bottom, there's a section titled "The Core x86 Project Version 13.0" with two columns: "Base System" and "Extensions". The "Base System" column includes links to Core x86 Release Files, Release Notes, Release Candidates, and Other Ports (x86-64, dCore, & Raspberry Pi). The "Extensions" column includes links to Browse TCZs, Recently Updated TCZs, Browse Our Git Repository, and View Download HOWTO. A footer at the bottom says "Archive of last base releases: 1 x 2 x 3 x 4 x 5 x 6 x 7 x 8 x 9 x 10 x 11 x 12 x".

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Browse the iso File we Downloaded and attach it !!

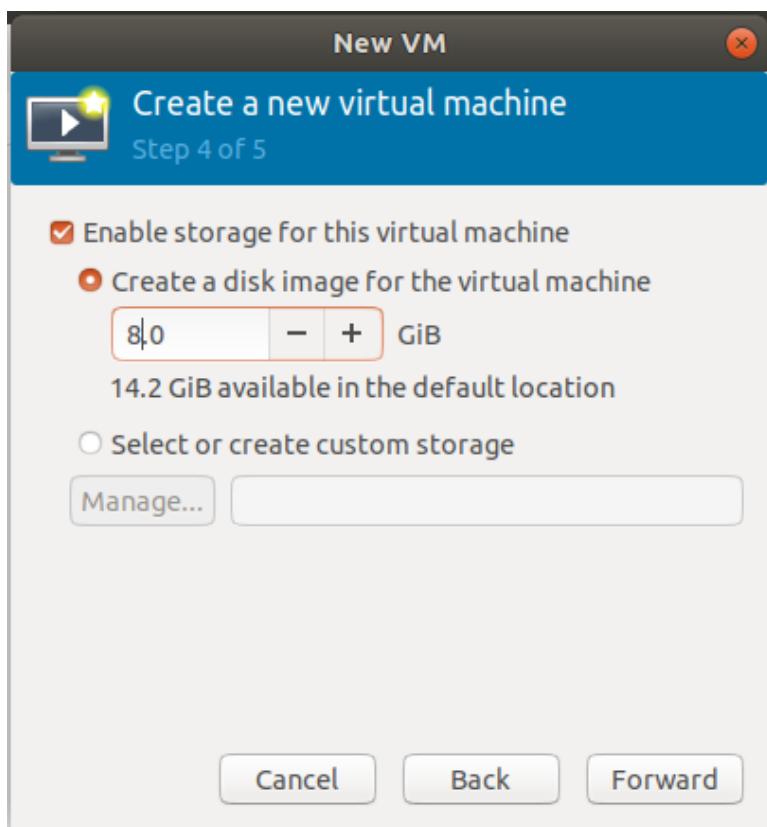


Keep it Default !!!!

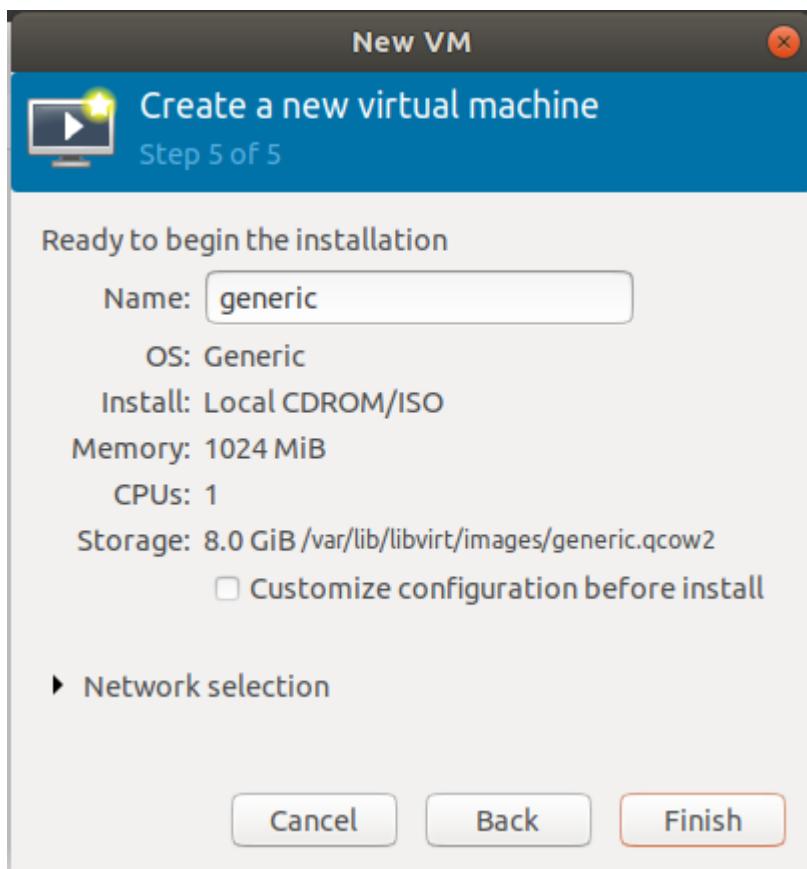


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Increase or Decrease the size of disk if you want.

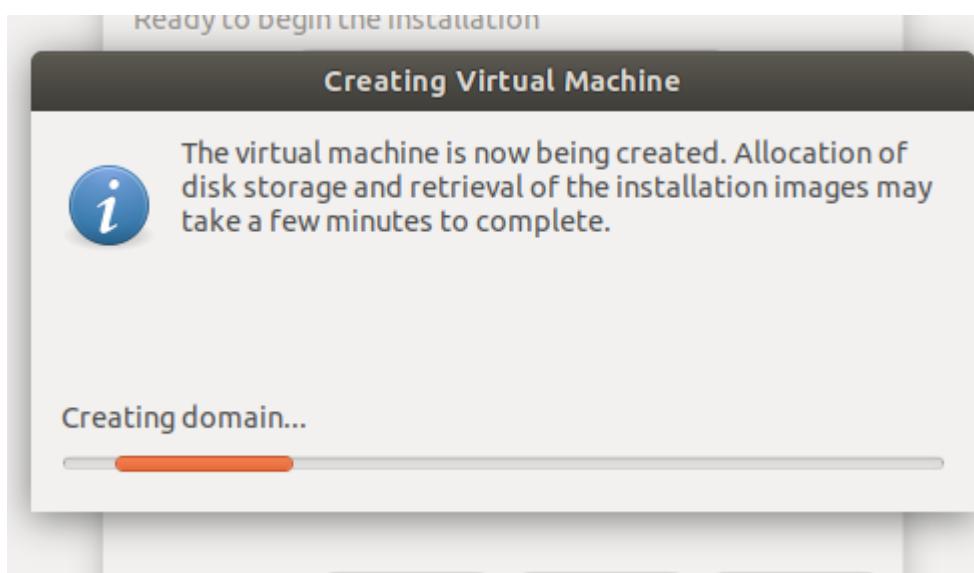


Click On Finish :-

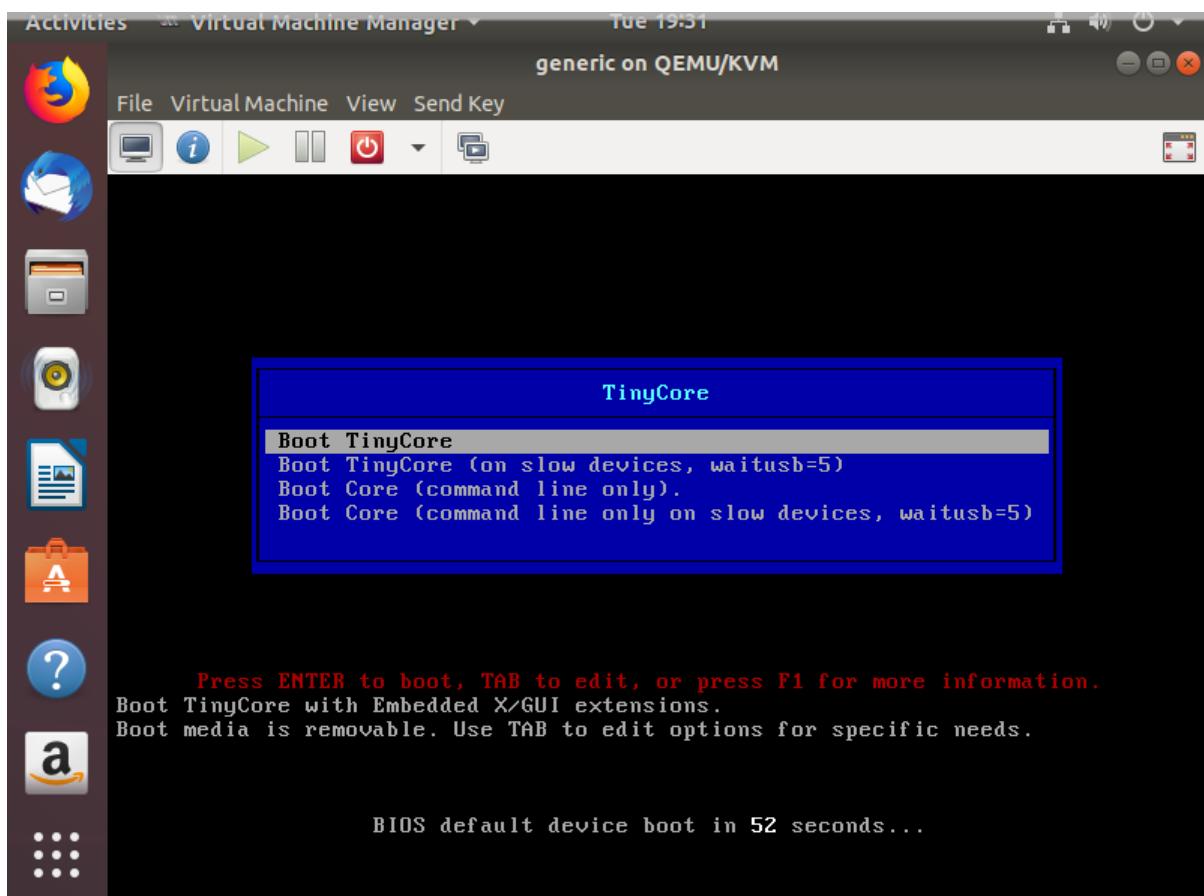


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It will start creating virtual machine :-

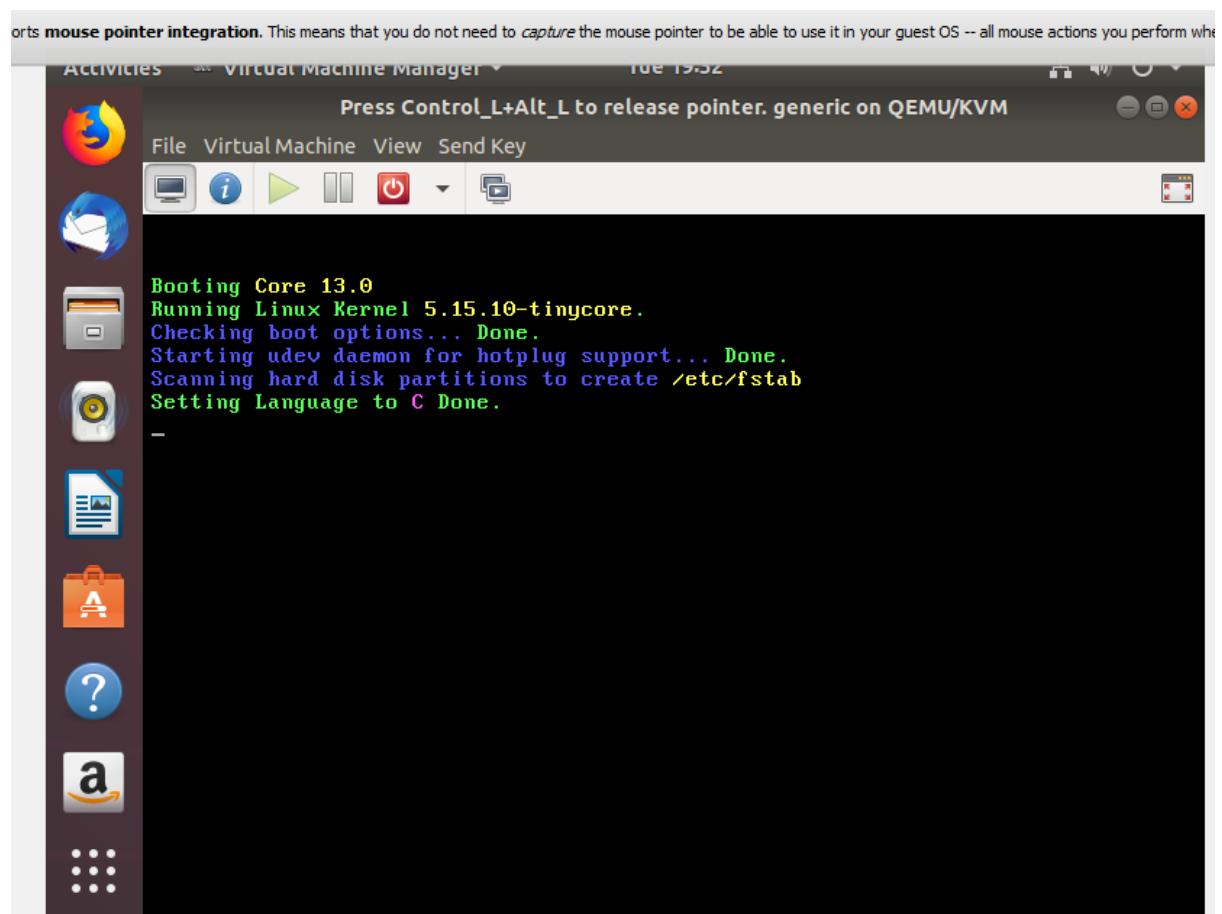
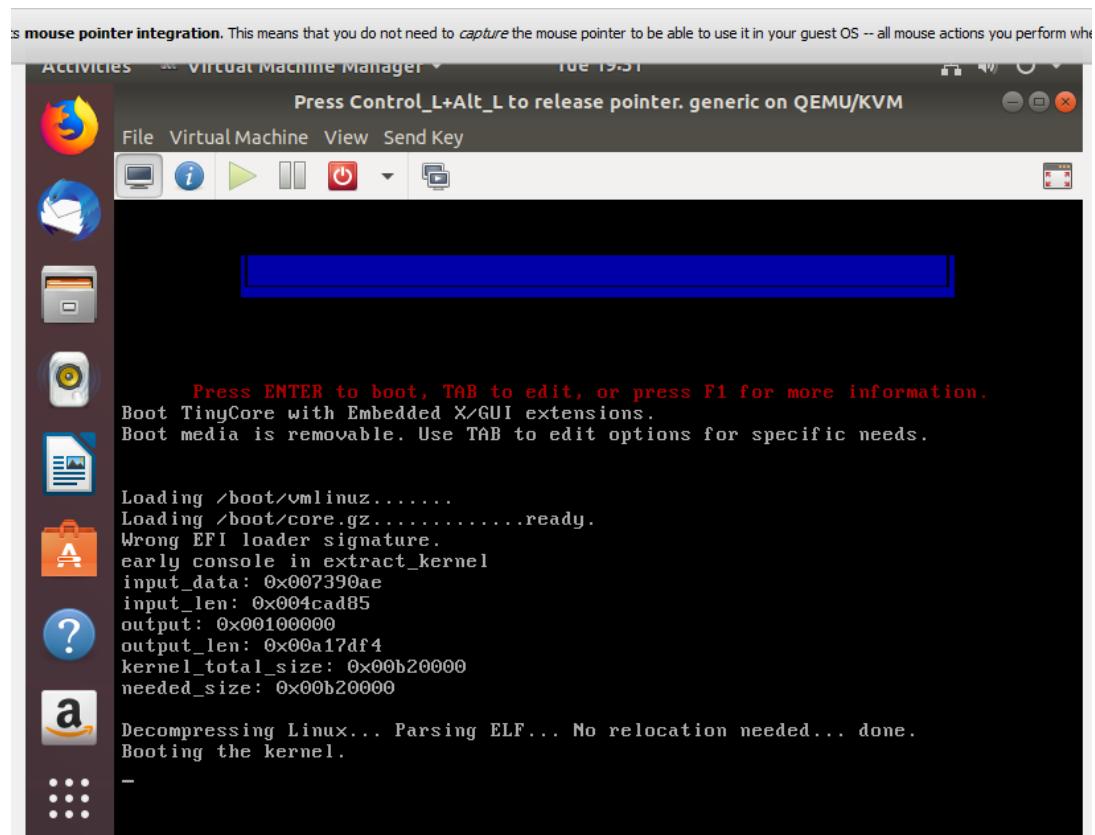


Select Boot TinyCore from the option :-



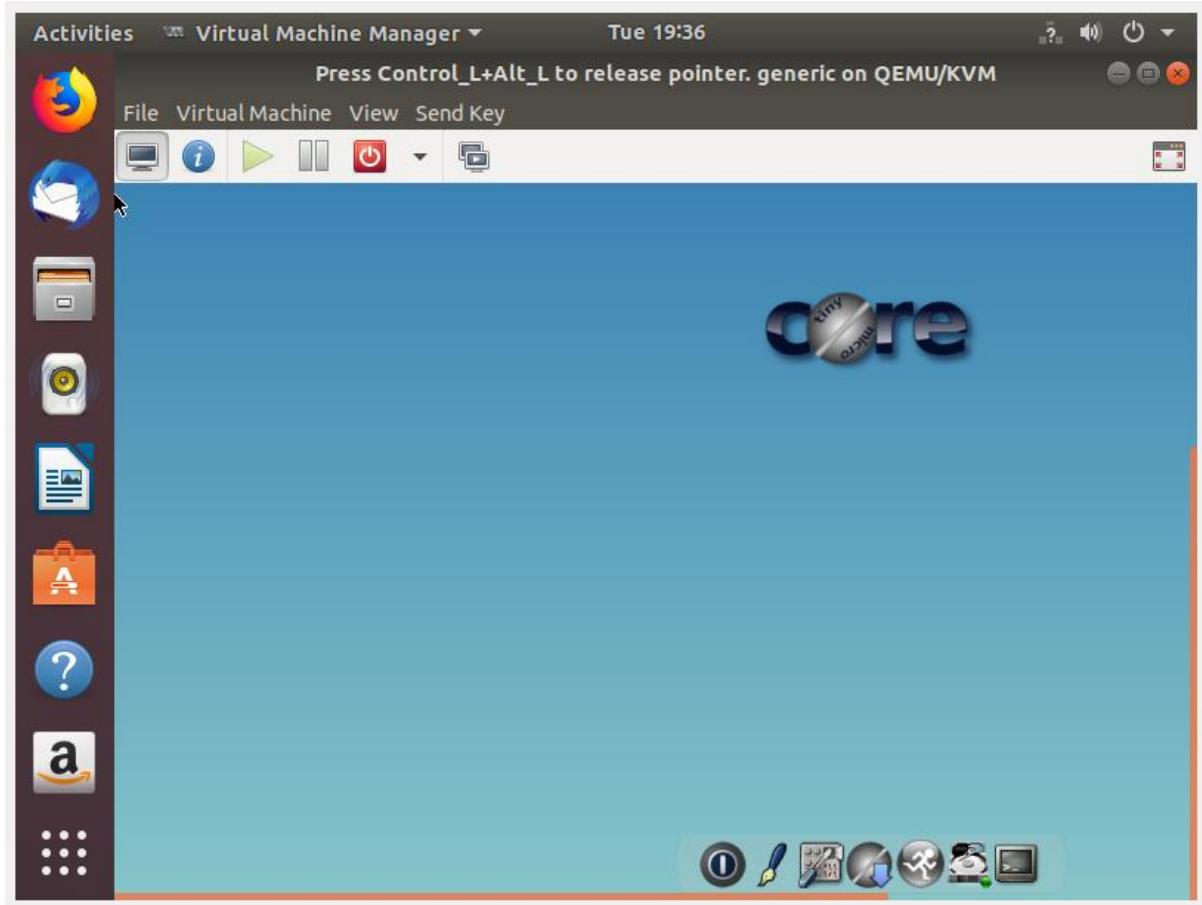
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Booting of OS starts in Virtual Machine, Just Sit back and relax !!

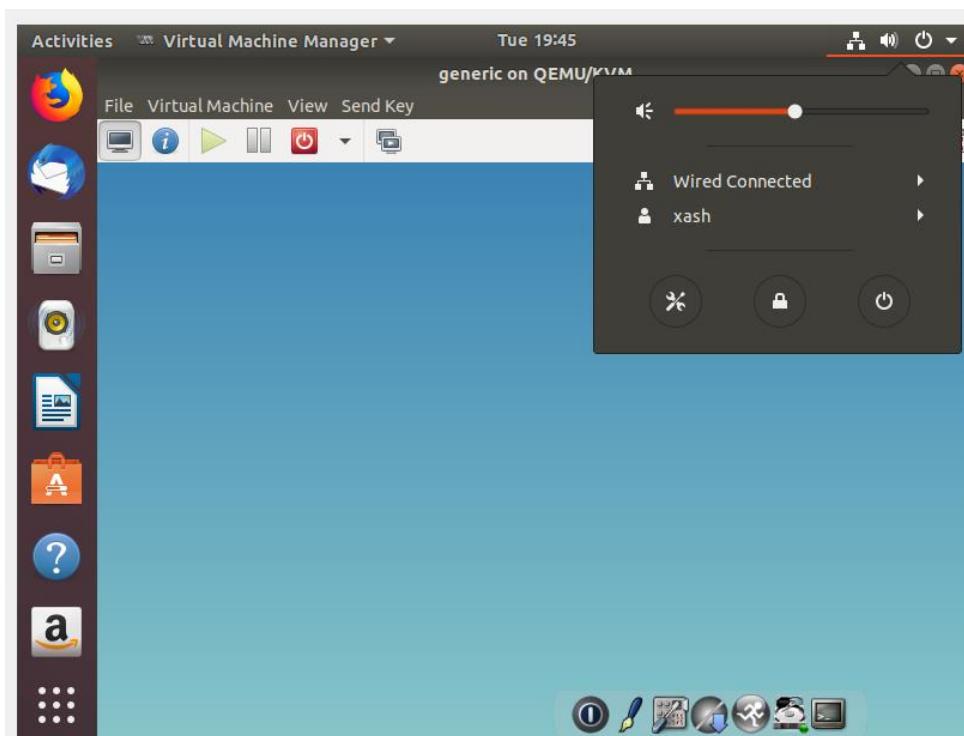


C.C PRACTICAL NO. 2

The Virtual Machine Starts in Virtual Machine Manager :-



And we have successfully created A Virtual Machine with Tiny Core Pure OS



C.C PRACTICAL NO. 3

Aim :- Study and implementation of Infrastructure as a Service

THEORY:

OpenStack is a free and open-source software platform for cloud computing, mostly deployed as infrastructure-as-a-service, whereby virtual servers and other resources are made available to customers.

Written in: Python

License: Apache License 2.0

Stable release: Rocky (2018.08.30) / 30 August 2018; 5 months ago

Initial release date: 21 October 2010

OpenStack Components :-

Compute (Nova)

OpenStack Compute is a cloud computing fabric controller, which manages pools of computer resources and work with virtualization technologies, bare metals, and high-performance computing configurations. Nova's architecture provides flexibility to design the cloud with no proprietary software or hardware requirements and also delivers the ability to integrate the legacy systems and third-party products.

Nova can be deployed using hypervisor technologies such as KVM, VMware, LXC, XenServer, etc. It is used to manage numerous virtual machines and other instances that handle various computing tasks.

Image Service (Glance):

OpenStack image service offers discovering, registering, and restoring virtual machine images. Glance has client-server architecture and delivers a user REST API, which allows querying of virtual machine image metadata and also retrieval of the actual image. While deploying new virtual machine instances, Glance uses the stored images as templates.

OpenStack Glance supports Raw, VirtualBox (VDI), VMWare (VMDK, OVF), Hyper-V (VHD), and Qemu/KVM (qcow2) virtual machine images.

Object Storage (Swift):

OpenStack Swift creates redundant, scalable data storage to store petabytes of accessible data. The stored data can be leveraged, retrieved and updated. It has a distributed architecture, providing greater redundancy, scalability, and performance, with no central point of control. Swift is a profoundly available, shared, eventually consistent object store. It helps organizations to store lots of data safely, cheaply and efficiently. Swift ensures data replication and distribution over various devices, which makes it ideal for cost-effective, scale-out storage.

Dashboard (Horizon)

Horizon is the authorized implementation of OpenStack's Dashboard, which is the only graphical interface to automate cloud-based resources. **Identity Service (Keystone)**

Keystone provides a central list of users, mapped against all the OpenStack services, which they can access. It integrates with existing backend services such as LDAP (Lightweight Directory Access Protocol) while acting as a common authentication system across the cloud computing system.

Keystone supports various forms of authentication like standard username & password

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Networking (Neutron):

Neutron provides networking capability like managing networks and IP addresses for OpenStack. It ensures that the network is not a limiting factor in a cloud deployment and offers users with self-service ability over network configurations. OpenStack networking allows users to create their own networks and connect devices and servers to one or more networks. Developers can use SDN technology to support great levels of multi-tenancy and massive scale.

Block Storage (Cinder)

OpenStack Cinder delivers determined block-level storage devices for application with OpenStack compute instances. A cloud user can manage their storage needs by integrating block storage volumes with Dashboard and Nova.

Cinder can use storage platforms such as Linux server, EMC (ScaleIO, VMAX, and VNX), Ceph, Coraid, CloudByte, IBM, Hitachi data systems, SAN volume controller, etc. It is appropriate for expandable file systems and database storage. **Telemetry (Ceilometer)**

Ceilometer delivers a single point of contact for billing systems obtaining all of the measurements to authorize customer billing across all OpenStack core components. By monitoring notifications from existing services, developers can collect the data and may configure the type of data to meet their operating requirements.

Orchestration (Heat)

Heat is a service to orchestrate multiple composite cloud applications through both the CloudFormation-compatible Query API and OpenStack-native REST API, using the AWS CloudFormation template format.

C.C PRACTICAL NO. 3

Give all the commands as we give in the images below as it is

```
yash@yash-VirtualBox:~$ sudo apt-get update
[sudo] password for yash:
Hit:1 http://in.archive.ubuntu.com/ubuntu bionic InRelease
Hit:2 http://in.archive.ubuntu.com/ubuntu bionic-updates InRelease
Hit:3 http://in.archive.ubuntu.com/ubuntu bionic-backports InRelease
Get:4 http://security.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]
Fetched 88.7 kB in 5s (16.5 kB/s)
Reading package lists... Done
```

```
yash@yash-VirtualBox:~$ sudo apt-get install sudo -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages will be upgraded:
  sudo
1 upgraded, 0 newly installed, 0 to remove and 490 not upgraded.
Need to get 428 kB of archives.
After this operation, 0 B of additional disk space will be used.
Get:1 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 sudo amd64
1.8.21p2-3ubuntu1.4 [428 kB]
Fetched 428 kB in 3s (136 kB/s)
(Reading database ... 129509 files and directories currently installed.)
Preparing to unpack .../sudo_1.8.21p2-3ubuntu1.4_amd64.deb ...
Unpacking sudo (1.8.21p2-3ubuntu1.4) over (1.8.21p2-3ubuntu1) ...
Setting up sudo (1.8.21p2-3ubuntu1.4) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
```

```
yash@yash-VirtualBox:~$ lsb_release -d
Description:    Ubuntu 18.04.3 LTS
```

```
yash@yash-VirtualBox:~$ free -m
              total        used        free      shared  buff/cache   available
Mem:          3942         1021        1983          12         937       2688
Swap:           953            0         953
```

```
yash@yash-VirtualBox:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
udev            2.0G   0    2.0G  0% /dev
tmpfs           395M  1.6M  393M  1% /run
/dev/sda1        20G  5.6G  14G  30% /
tmpfs           2.0G   0    2.0G  0% /dev/shm
tmpfs           5.0M  4.0K  5.0M  1% /run/lock
tmpfs           2.0G   0    2.0G  0% /sys/fs/cgroup
/dev/loop0       15M   15M    0  100% /snap/gnome-characters/296
/dev/loop1       43M   43M    0  100% /snap/gtk-common-themes/1313
/dev/loop2       1.0M  1.0M    0  100% /snap/gnome-logs/61
/dev/loop4       3.8M  3.8M    0  100% /snap/gnome-system-monitor/100
/dev/loop5      150M  150M    0  100% /snap/gnome-3-28-1804/67
/dev/loop3       89M   89M    0  100% /snap/core/7270
/dev/loop6       4.2M  4.2M    0  100% /snap/gnome-calculator/406
/dev/loop7       55M   55M    0  100% /snap/core18/1066
tmpfs           395M  28K  395M  1% /run/user/121
tmpfs           395M  32K  395M  1% /run/user/1000
yash@yash-VirtualBox:~$ █
```

C.C PRACTICAL NO. 3

```
yash@yash-VirtualBox:~$ sudo useradd -s /bin/bash -d /opt/stack -m stack
```

```
yash@yash-VirtualBox:~$ sudo su  
[sudo] password for yash:  
root@yash-VirtualBox:/home/yash# echo "stack ALL=(ALL) NOPASSWD: ALL" >> /etc/sudoers  
root@yash-VirtualBox:/home/yash#
```

```
yash@yash-VirtualBox:~$ sudo su stack && cd ~  
[sudo] password for yash:
```

```
stack@yash-VirtualBox:/home/yash$ sudo apt-get install git -y || sudo yum install -y git  
Reading package lists... Done  
Building dependency tree  
Reading state information... Done  
The following additional packages will be installed:  
  git-man liberror-perl  
Suggested packages:  
  git-daemon-run | git-daemon-sysvinit git-doc git-el git-email git-gui gitk  
  gitweb git-cvs git-mediawiki git-svn  
The following NEW packages will be installed:  
  git git-man liberror-perl  
0 upgraded, 3 newly installed, 0 to remove and 490 not upgraded.  
Need to get 4,750 kB of archives.  
After this operation, 34.0 MB of additional disk space will be used.  
Get:1 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 liberror-perl all 0.17025-1 [22.8 kB]  
Get:2 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 git-man all 1:2.17.1-1ubuntu0.9 [803 kB]  
Get:3 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 git amd64 1:2.17.1-1ubuntu0.9 [3,923 kB]  
Fetched 4,750 kB in 3s (1,385 kB/s)  
Selecting previously unselected package liberror-perl.  
(Reading database ... 129509 files and directories currently installed.)  
Preparing to unpack .../liberror-perl_0.17025-1_all.deb ...  
Unpacking liberror-perl (0.17025-1) ...  
Selecting previously unselected package git-man.
```

```
stack@yash-VirtualBox:/home/yash$ git clone https://git.openstack.org/openstack-dev/devstack  
fatal: could not create work tree dir 'devstack': Permission denied  
stack@yash-VirtualBox:/home/yash$
```

After we encounter fatal error we have to enter some commands as shown in below image

```
yash@yash-VirtualBox:~$ sudo useradd -s /bin/bash -d /opt/stack -m stack  
[sudo] password for yash:  
useradd: user 'stack' already exists  
yash@yash-VirtualBox:~$ echo "stack ALL=(ALL) NOPASSWD: ALL" | sudo tee /etc/sudoers.d/stack  
stack ALL=(ALL) NOPASSWD: ALL  
yash@yash-VirtualBox:~$ sudo su - stack  
stack@yash-VirtualBox:~$
```

C.C PRACTICAL NO. 3

Clone Git for Devstack

```
stack@yash-VirtualBox:~$ git clone https://git.openstack.org/openstack-dev/devstack
Cloning into 'devstack'...
fatal: unable to access 'https://git.openstack.org/openstack-dev/devstack/': se
rver certificate verification failed. CAfile: /etc/ssl/certs/ca-certificates.cr
l CRLfile: none
```

Again we are encountering fatal error for certificates for this we need to execute some more commands :-

```
stack@yash-VirtualBox:~$ sudo apt-get install apt-transport-https ca-certificat
es -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  apt-transport-https
The following packages will be upgraded:
  ca-certificates
1 upgraded, 1 newly installed, 0 to remove and 489 not upgraded.
Need to get 150 kB of archives.
After this operation, 140 kB of additional disk space will be used.
Get:1 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 ca-certific
ates all 20210119~18.04.2 [145 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu bionic-updates/universe amd64 apt-tra
nsport-https all 1.6.14 [4,348 B]
Fetched 150 kB in 17s (8,887 B/s)
Preconfiguring packages ...
(Reading database ... 130416 files and directories currently installed.)
Preparing to unpack .../ca-certificates_20210119~18.04.2_all.deb ...
Unpacking ca-certificates (20210119~18.04.2) over (20180409) ...
Selecting previously unselected package apt-transport-https.
Preparing to unpack .../apt-transport-https_1.6.14_all.deb ...
Unpacking apt-transport-https (1.6.14) ...
```

```
stack@yash-VirtualBox:~$ sudo update-ca-certificates
Updating certificates in /etc/ssl/certs...
0 added, 0 removed; done.
Running hooks in /etc/ca-certificates/update.d...
done.
```

After this try cloning git again for Dev stack it will Work :-

```
stack@yash-VirtualBox:~$ git clone https://git.openstack.org/openstack-dev/devstack
Cloning into 'devstack'...
warning: redirecting to https://opendev.org/openstack/devstack/
remote: Enumerating objects: 28016, done.
remote: Counting objects: 100% (28016/28016), done.
remote: Compressing objects: 100% (9362/9362), done.
remote: Total 48426 (delta 27350), reused 18654 (delta 18654), pack-reused 2041
0
Receiving objects: 100% (48426/48426), 10.37 MiB | 785.00 KiB/s, done.
Resolving deltas: 100% (34037/34037), done.
stack@yash-VirtualBox:~$ █
```

Git Clone of Devstack gets downloaded here successfully.

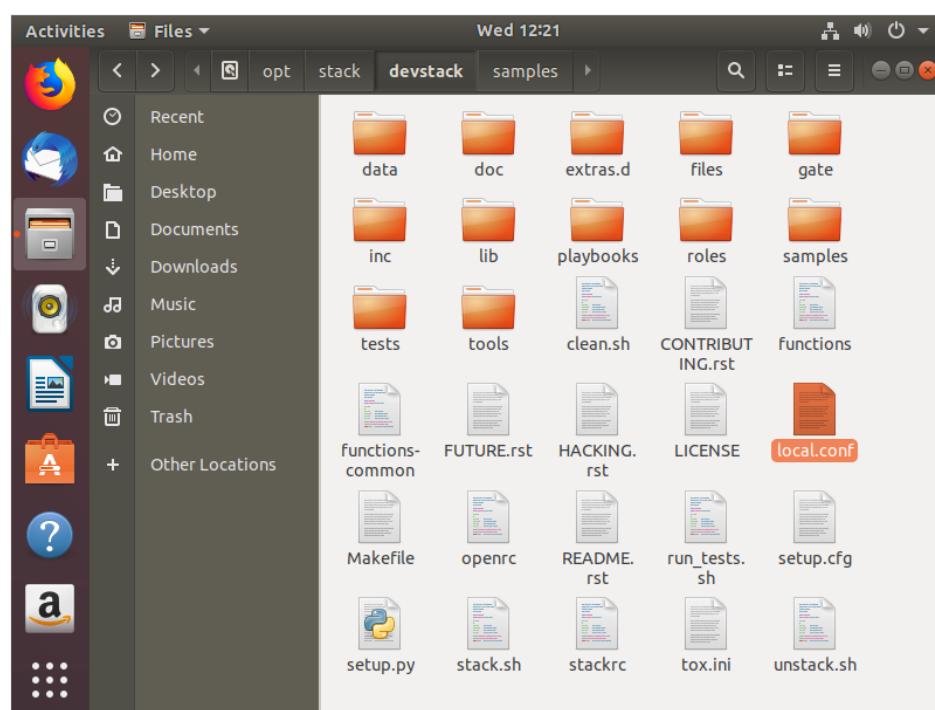
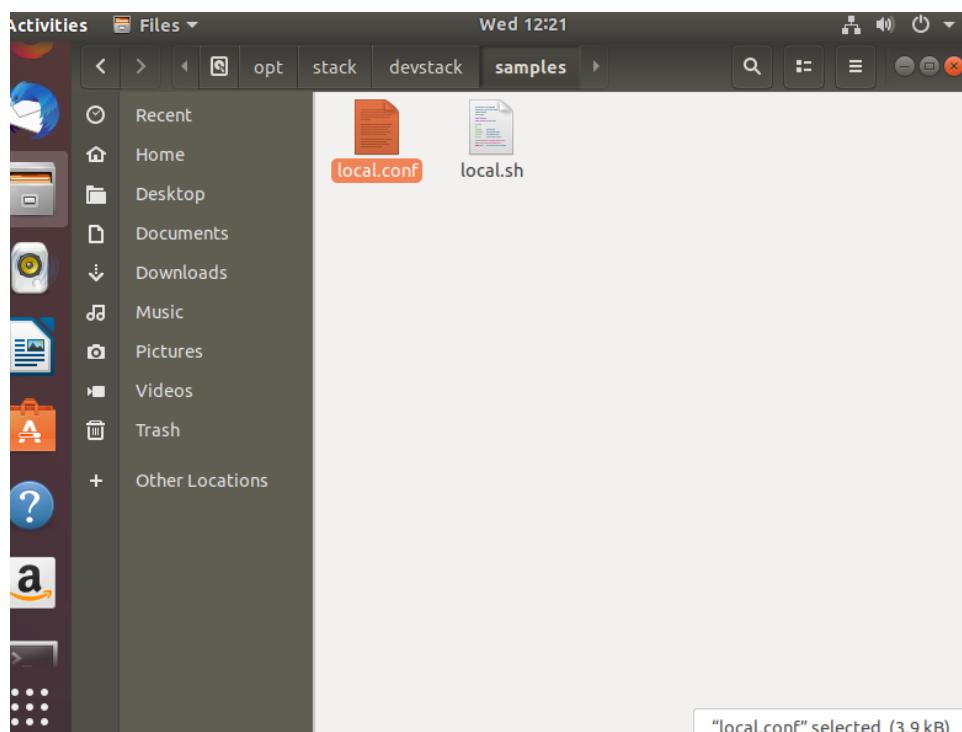
C.C PRACTICAL NO. 3

Now we need to change permissions of the devstack folder because we have to change local.conf file. For that we need to give command

```
yash@yash-VirtualBox:~$ sudo chmod -R a+rwx /opt/stack/devstack  
[sudo] password for yash:  
yash@yash-VirtualBox:~$
```

Now Go to /opt/stack/devstack folder

Copy local.conf file from samples to the root folder of devstack



C.C PRACTICAL NO. 3

Change the content in the file



```
[[local|localrc]]
HOST_IP=10.0.2.15
ADMIN_PASSWORD=secret
DATABASE_PASSWORD=$ADMIN_PASSWORD
RABBIT_PASSWORD=$ADMIN_PASSWORD
SERVICE_PASSWORD=$ADMIN_PASSWORD
```

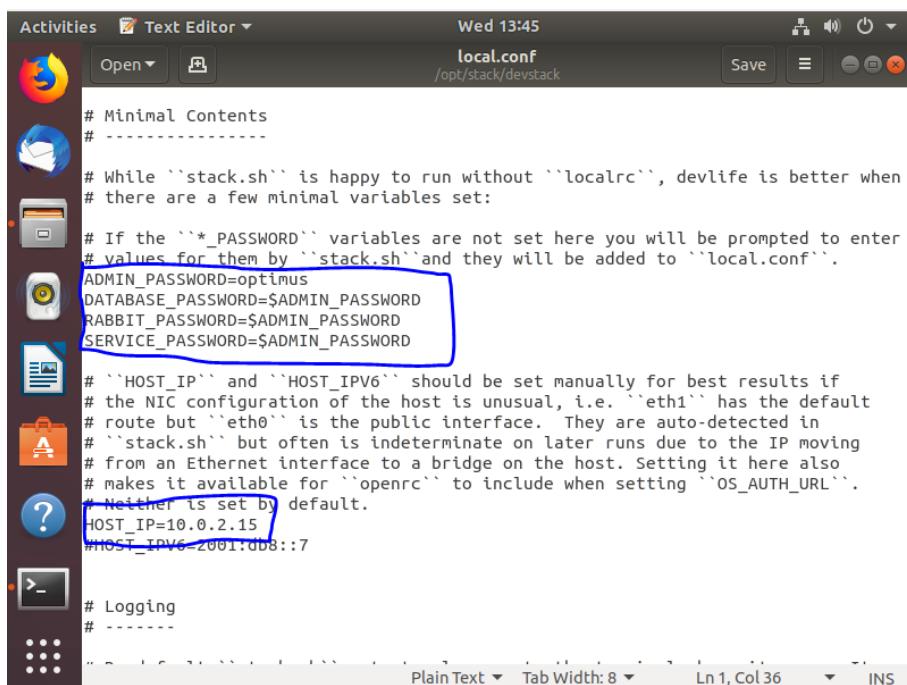
Now go to terminal and start devstack and give some commands and Hit Enter

```
yash@yash-VirtualBox:~$ sudo su - stack
stack@yash-VirtualBox:~$ cd devstack
stack@yash-VirtualBox:~/devstack$ ./stack.sh
```

We encounter this error message after this

```
[Call Trace]
./stack.sh:235:die
[ERROR] ./stack.sh:235 If you wish to run this script anyway run with FORCE=yes
/opt/stack/devstack/functions-common: line 310: /opt/stack/logs/error.log: No such file or directory
stack@yash-VirtualBox:~/devstack$ ./stack.sh FORCE=YES
[...]
```

To encounter error don't delete all the content from local.conf just edit what you want to edit and remaining keep all the same as original file and then again gave ./stack.sh command, it will work.



```
# Minimal Contents
# -----
#
# While ``stack.sh`` is happy to run without ``localrc``, devlife is better when
# there are a few minimal variables set:
#
# If the ``*_PASSWORD`` variables are not set here you will be prompted to enter
# values for them by ``stack.sh`` and they will be added to ``local.conf``.
ADMIN_PASSWORD=optimus
DATABASE_PASSWORD=$ADMIN_PASSWORD
RABBIT_PASSWORD=$ADMIN_PASSWORD
SERVICE_PASSWORD=$ADMIN_PASSWORD

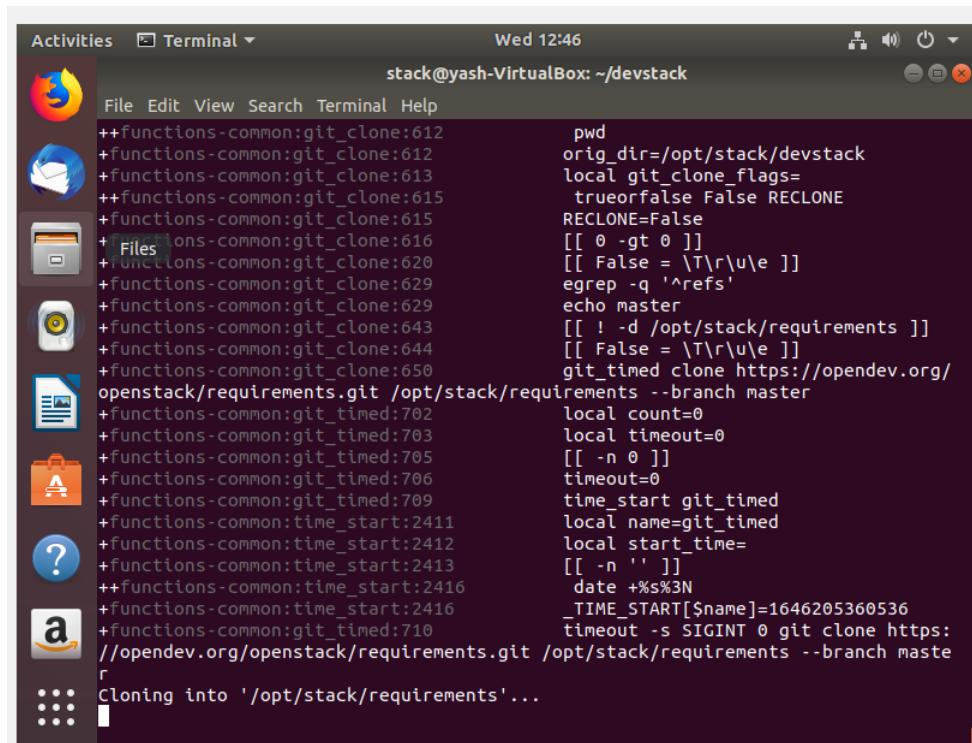
# ``HOST_IP`` and ``HOST_IPV6`` should be set manually for best results if
# the NIC configuration of the host is unusual, i.e. ``eth1`` has the default
# route but ``eth0`` is the public interface. They are auto-detected in
# ``stack.sh`` but often is indeterminate on later runs due to the IP moving
# from an Ethernet interface to a bridge on the host. Setting it here also
# makes it available for ``openrc`` to include when setting ``OS_AUTH_URL``.
# Neither is set by default.
HOST_IP=10.0.2.15
HOST_IPV6=::1:008::7

# Logging
# -----
```

C.C PRACTICAL NO. 3

Give this commands again in terminal

```
Processing triggers for libc-bin (2.27-3ubuntu1) ...
yash@yash-VirtualBox:~$ sudo su - stack
stack@yash-VirtualBox:~$ cd devstack
stack@yash-VirtualBox:~/devstack$ FORCE=yes ./stack.sh
+ unset GREP_OPTIONS
+ unset LANG
+ unset LANGUAGE
```



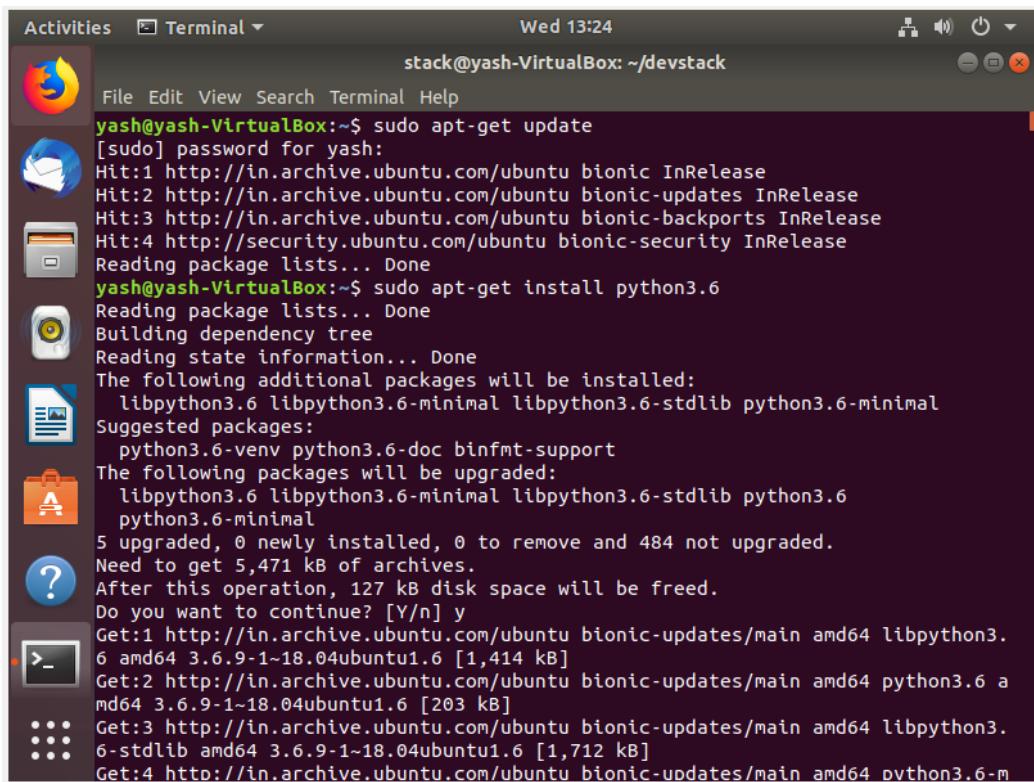
```
File Edit View Search Terminal Help
++functions-common:git_clone:612      pwd
+functions-common:git_clone:612      orig_dir=/opt/stack/devstack
+functions-common:git_clone:613      local git_clone_flags=
+functions-common:git_clone:615      truefalse False RECLONE
RECLONE=False
[[ 0 -gt 0 ]]
[[ False = \T\r\u\e ]]
egrep -q '^refs'
echo master
[[ ! -d /opt/stack/requirements ]]
[[ False = \T\r\u\e ]]
git_timed clone https://opendev.org/
openstack/requirements.git /opt/stack/requirements --branch master
functions-common:git_timed:702      local count=0
functions-common:git_timed:703      local timeout=0
functions-common:git_timed:705      [[ -n 0 ]]
functions-common:git_timed:706      timeout=0
functions-common:git_timed:709      time_start git_timed
functions-common:time_start:2411    local name=git_timed
functions-common:time_start:2412    local start_time=
functions-common:time_start:2413    [[ -n '' ]]
functions-common:time_start:2416    date +%s%3N
functions-common:time_start:2416    _TIME_START[$name]=1646205360536
functions-common:git_timed:710      timeout -s SIGINT 0 git clone https:
//opendev.org/openstack/requirements.git /opt/stack/requirements --branch maste
r
Cloning into '/opt/stack/requirements'...
```

But again we encounter other problem !!!!!!

```
./stack.sh:exit_trap:547          [[ -z /opt/stack/logs ]]
                                /usr/bin/python3.6 /opt/stack/devsta
ck/tools/worlddump.py -d /opt/stack/logs
Traceback (most recent call last):
  File "/opt/stack/devstack/tools/worlddump.py", line 22, in <module>
    from distutils import spawn
ImportError: cannot import name 'spawn'
stack@yash-VirtualBox:~/devstack$ ^C
stack@yash-VirtualBox:~/devstack$
```

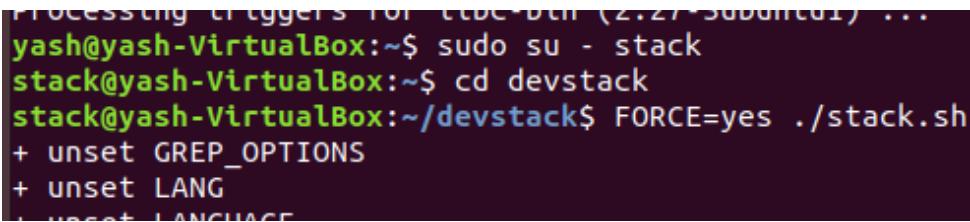
C.C PRACTICAL NO. 3

To encounter the above problem you need to download python 3 version (any version above 3)

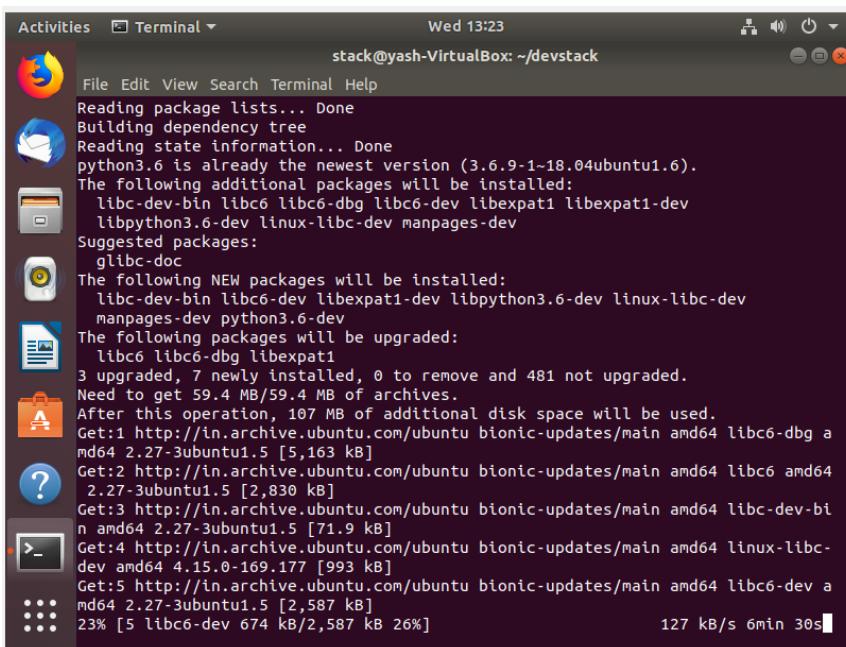


```
Activities Terminal Wed 13:24
stack@yash-VirtualBox: ~/devstack
File Edit View Search Terminal Help
yash@yash-VirtualBox:~$ sudo apt-get update
[sudo] password for yash:
Hit:1 http://in.archive.ubuntu.com/ubuntu bionic InRelease
Hit:2 http://in.archive.ubuntu.com/ubuntu bionic-updates InRelease
Hit:3 http://in.archive.ubuntu.com/ubuntu bionic-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu bionic-security InRelease
Reading package lists... Done
yash@yash-VirtualBox:~$ sudo apt-get install python3.6
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libpython3.6 libpython3.6-minimal libpython3.6-stdlib python3.6-minimal
Suggested packages:
  python3.6-venv python3.6-doc binfmt-support
The following packages will be upgraded:
  libpython3.6 libpython3.6-minimal libpython3.6-stdlib python3.6
  python3.6-minimal
5 upgraded, 0 newly installed, 0 to remove and 484 not upgraded.
Need to get 5,471 kB of archives.
After this operation, 127 kB disk space will be freed.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libpython3.6 amd64 3.6.9-1~18.04ubuntu1.6 [1,414 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 python3.6 amd64 3.6.9-1~18.04ubuntu1.6 [203 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libpython3.6-stdlib amd64 3.6.9-1~18.04ubuntu1.6 [1,712 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 python3.6-m
```

And then again give ./stack.sh command



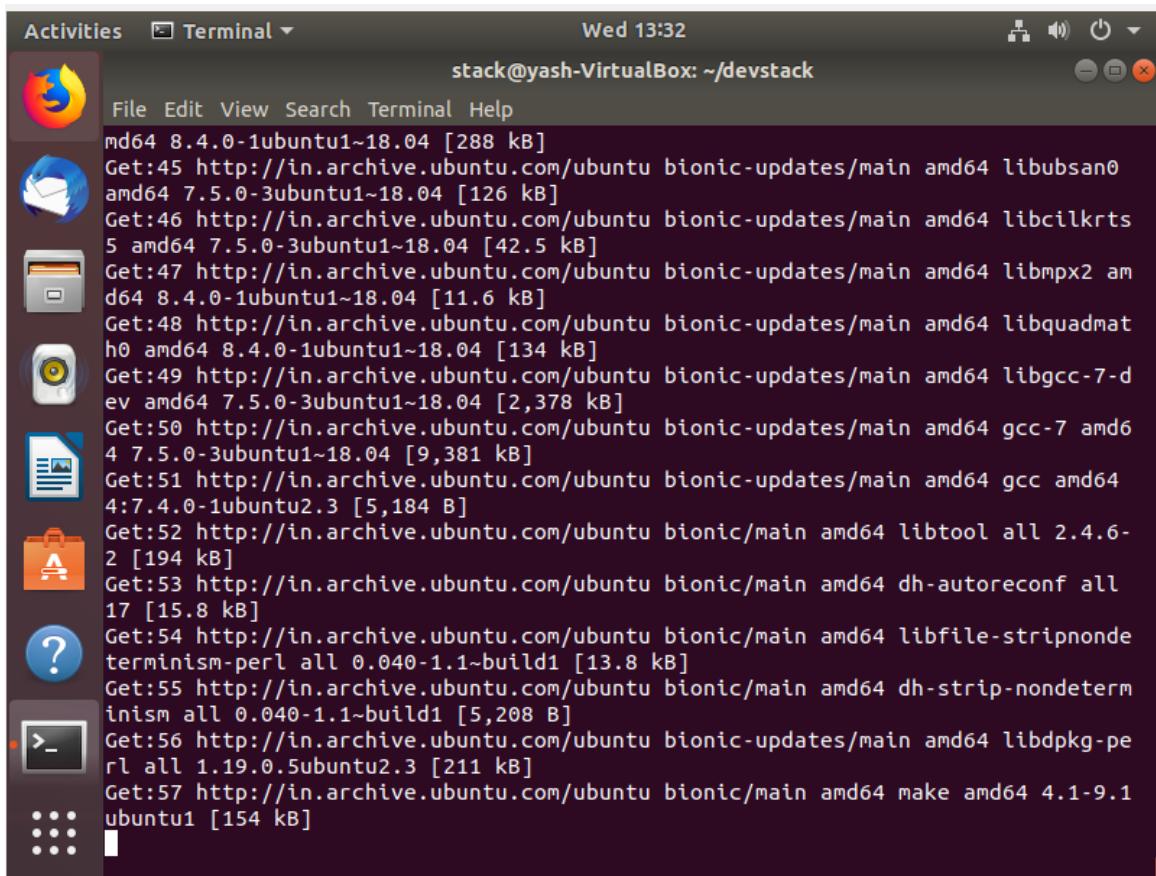
```
Processing triggers for libc-bin (2.27-3ubuntu1) ...
yash@yash-VirtualBox:~$ sudo su - stack
stack@yash-VirtualBox:~/devstack
stack@yash-VirtualBox:~/devstack$ FORCE=yes ./stack.sh
+ unset GREP_OPTIONS
+ unset LANG
+ unset LANGUAGE
```



```
Activities Terminal Wed 13:23
stack@yash-VirtualBox: ~/devstack
File Edit View Search Terminal Help
Reading package lists... Done
Building dependency tree
Reading state information... Done
python3.6 is already the newest version (3.6.9-1~18.04ubuntu1.6).
The following additional packages will be installed:
  libc-dev-bin libc6 libc6-dbg libc6-dev libexpat1 libexpat1-dev
  libpython3.6-dev linux-libc-dev manpages-dev
Suggested packages:
  glibc-doc
The following NEW packages will be installed:
  libc-dev-bin libc6-dev libexpat1-dev libpython3.6-dev linux-libc-dev
  manpages-dev python3.6-dev
The following packages will be upgraded:
  libc6 libc6-dbg libexpat1
3 upgraded, 7 newly installed, 0 to remove and 481 not upgraded.
Need to get 59.4 MB/59.4 MB of archives.
After this operation, 107 MB of additional disk space will be used.
Get:1 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libc6-dbg a
md64 2.27-3ubuntu1.5 [5,163 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libc6 amd64
2.27-3ubuntu1.5 [2,830 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libc-dev-bi
n amd64 2.27-3ubuntu1.5 [71.9 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 linux-libc-
dev amd64 4.15.0-169.177 [993 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libc6-dev a
md64 2.27-3ubuntu1.5 [2,587 kB]
23% [5 libc6-dev 674 kB/2,587 kB 26%]
```

C.C PRACTICAL NO. 3

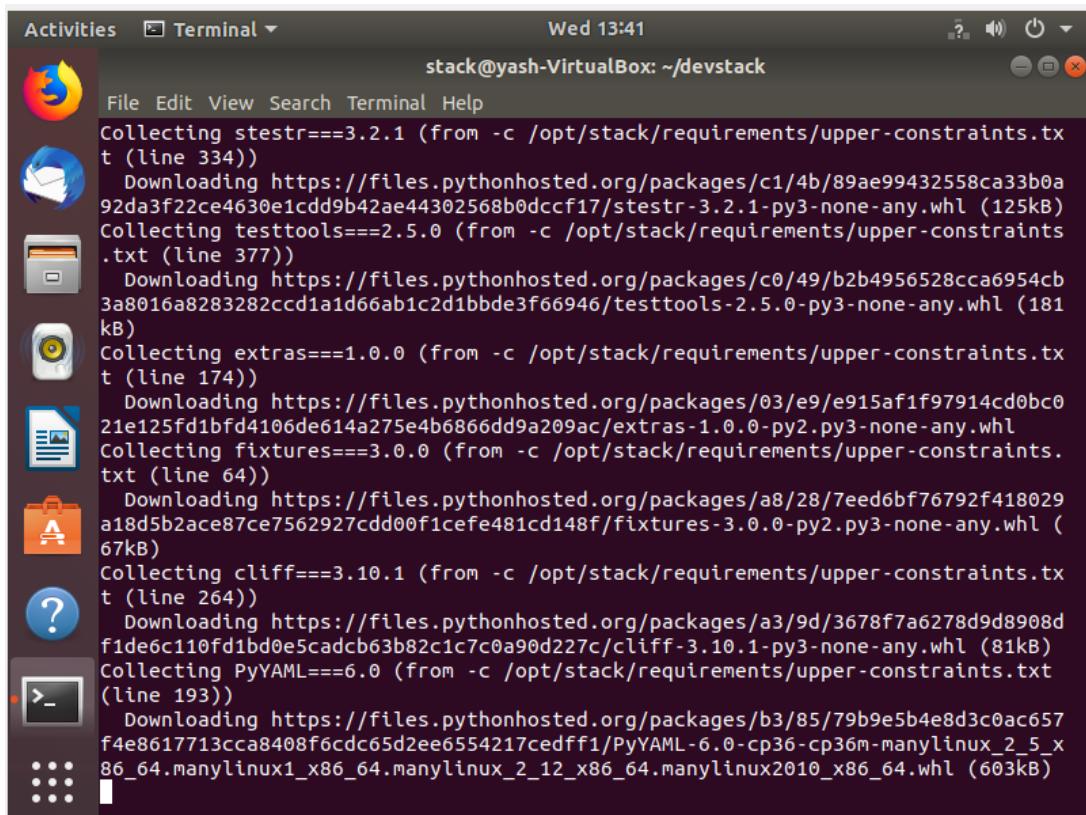
It will take upto 20-25 minutes to process



A screenshot of a Linux desktop environment, likely Ubuntu, showing a terminal window titled "stack@yash-VirtualBox: ~/devstack". The terminal is displaying a series of "Get:" commands, which are part of a package download process. The output includes file names, URLs, and sizes. The desktop interface features a dock with various icons like a browser, file manager, and terminal.

```
File Edit View Search Terminal Help
md64 8.4.0-1ubuntu1~18.04 [288 kB]
Get:45 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libubsan0
amd64 7.5.0-3ubuntu1~18.04 [126 kB]
Get:46 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libcilkrt
5 amd64 7.5.0-3ubuntu1~18.04 [42.5 kB]
Get:47 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libmpx2 am
d64 8.4.0-1ubuntu1~18.04 [11.6 kB]
Get:48 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libquadmat
h0 amd64 8.4.0-1ubuntu1~18.04 [134 kB]
Get:49 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libgcc-7-d
ev amd64 7.5.0-3ubuntu1~18.04 [2,378 kB]
Get:50 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 gcc-7 amd6
4 7.5.0-3ubuntu1~18.04 [9,381 kB]
Get:51 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 gcc amd64
4:7.4.0-1ubuntu2.3 [5,184 B]
Get:52 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 libtool all 2.4.6-
2 [194 kB]
Get:53 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 dh-autoreconf all
17 [15.8 kB]
Get:54 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 libfile-stripnode
terminism-perl all 0.040-1.1~build1 [13.8 kB]
Get:55 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 dh-strip-nondeterm
inism all 0.040-1.1~build1 [5,208 B]
Get:56 http://in.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libdpkg-pe
rl all 1.19.0.5ubuntu2.3 [211 kB]
Get:57 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 make amd64 4.1-9.1
ubuntu1 [154 kB]
```

Wait for some more time let it download all the requirements

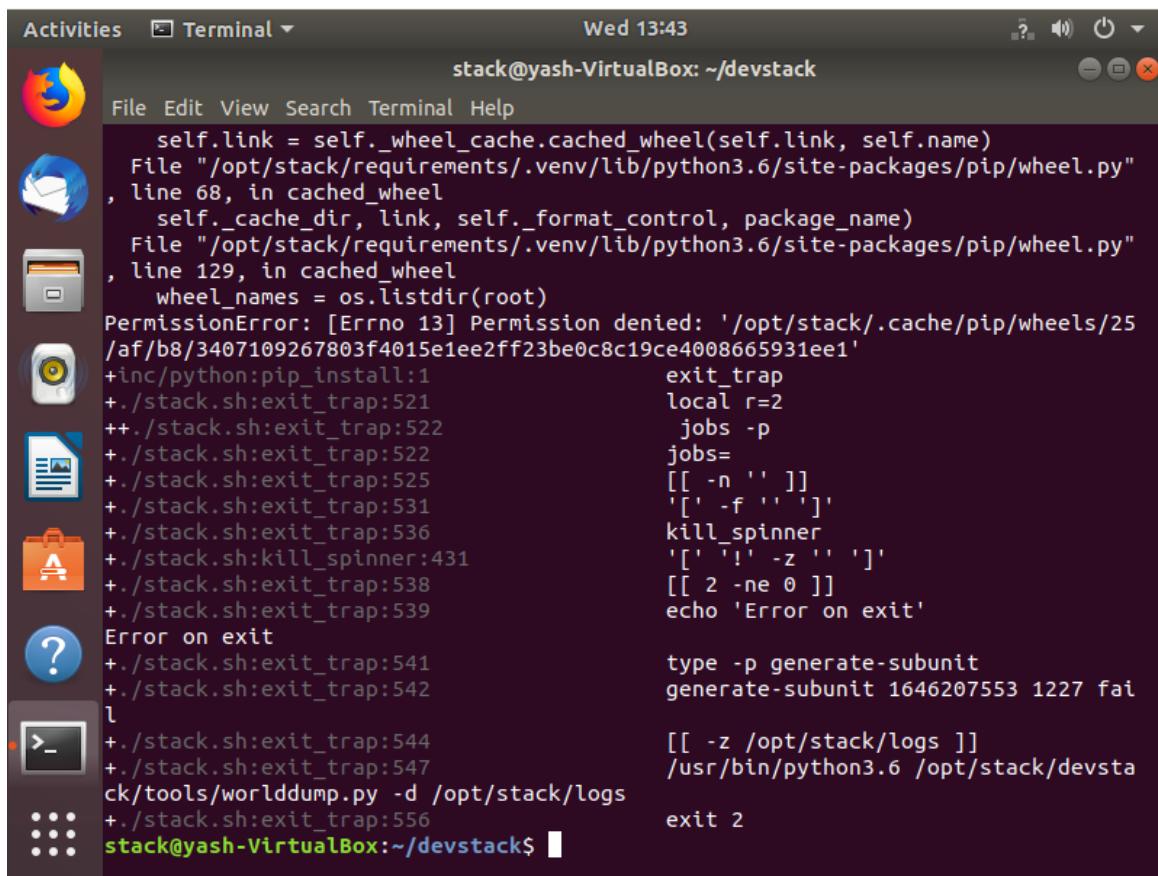


A screenshot of a Linux desktop environment, likely Ubuntu, showing a terminal window titled "stack@yash-VirtualBox: ~/devstack". The terminal is displaying a series of "Collecting" and "Downloading" commands, which are part of a package requirement collection process. The output includes URLs and file names. The desktop interface features a dock with various icons like a browser, file manager, and terminal.

```
File Edit View Search Terminal Help
Collecting stestr==3.2.1 (from -c /opt/stack/requirements/upper-constraints.tx
t (line 334))
  Downloading https://files.pythonhosted.org/packages/c1/4b/89ae99432558ca33b0a
92da3f22ce4630e1cd9b42ae44302568b0dccf17/stestr-3.2.1-py3-none-any.whl (125kB)
Collecting testtools==2.5.0 (from -c /opt/stack/requirements/upper-constraints.
txt (line 377))
  Downloading https://files.pythonhosted.org/packages/c0/49/b2b4956528cca6954cb
3a8016a828328cccd1a1d6ab1c2d1bbde3f66946/testtools-2.5.0-py3-none-any.whl (181
kB)
Collecting extras==1.0.0 (from -c /opt/stack/requirements/upper-constraints.tx
t (line 174))
  Downloading https://files.pythonhosted.org/packages/03/e9/e915af1f97914cd0bc0
21e125fd1bfd4106de614a275e4b686dd9a209ac/extras-1.0.0-py2.py3-none-any.whl
Collecting fixtures==3.0.0 (from -c /opt/stack/requirements/upper-constraints.
txt (line 64))
  Downloading https://files.pythonhosted.org/packages/a8/28/7eed6bf76792f418029
a18d5b2ace87ce7562927cdd00f1cefe481cd148f/fixtures-3.0.0-py2.py3-none-any.whl (
67kB)
Collecting cliff==3.10.1 (from -c /opt/stack/requirements/upper-constraints.tx
t (line 264))
  Downloading https://files.pythonhosted.org/packages/a3/9d/3678f7a6278d9d8908d
f1de6c110fd1bd0e5cadcb63b82c1c7c0a90d227c/cliff-3.10.1-py3-none-any.whl (81kB)
Collecting PyYAML==6.0 (from -c /opt/stack/requirements/upper-constraints.txt
(line 193))
  Downloading https://files.pythonhosted.org/packages/b3/85/79b9e5b4e8d3c0ac657
f4e8617713cca8408f6cdc65d2ee6554217cedff1/PyYAML-6.0-cp36-cp36m-manylinux_2_5_x
86_64.manylinux1_x86_64.manylinux_2_12_x86_64.manylinux2010_x86_64.whl (603kB)
```

C.C PRACTICAL NO. 3

And we have encountered a new error for permissions denied.



A screenshot of a Linux desktop environment (Ubuntu) showing a terminal window. The terminal title is "stack@yash-VirtualBox: ~/devstack". The window contains a stack trace from a Python script, likely pip, which failed due to permission denied errors. The trace shows multiple levels of function calls, including "stack.sh:exit_trap" and "stack.sh:kill_spinner", leading back to the original command "stack.sh". The error message "Permission denied" appears at several points in the trace, indicating insufficient privileges for file operations like reading or writing to the "/opt/stack/.cache/pip/wheels" directory.

```
self.link = self._wheel_cache.cached_wheel(self.link, self.name)
  File "/opt/stack/requirements/.venv/lib/python3.6/site-packages/pip/wheel.py"
, line 68, in cached_wheel
    self._cache_dir, link, self._format_control, package_name)
  File "/opt/stack/requirements/.venv/lib/python3.6/site-packages/pip/wheel.py"
, line 129, in cached_wheel
    wheel_names = os.listdir(root)
PermissionError: [Errno 13] Permission denied: '/opt/stack/.cache/pip/wheels/25
/af/b8/3407109267803f4015e1ee2ff23be0c8c19ce4008665931ee1'
+inc/python:pip_install:1          exit_trap
+./stack.sh:exit_trap:521           local r=2
++./stack.sh:exit_trap:522         jobs -p
+./stack.sh:exit_trap:522         jobs=
[[ -n '' ]]
[' -f '' '' ]
kill_spinner
[' !' -z '' '' ]
[[ 2 -ne 0 ]]
echo 'Error on exit'

type -p generate-subunit
generate-subunit 1646207553 1227 fai
[[ -z /opt/stack/logs ]]
/usr/bin/python3.6 /opt/stack/devsta
exit 2
stack@yash-VirtualBox:~/devstack$
```

Change the permissions of the stack folder and run the stack commands again

```
yash@yash-VirtualBox:~$ sudo chmod -r a+rwx /opt/stack
[sudo] password for yash:
chmod: cannot access 'a+rwx': No such file or directory
yash@yash-VirtualBox:~$ sudo chmod -R a+rwx /opt/stack
yash@yash-VirtualBox:~$ sudo su - stack
stack@yash-VirtualBox:~$ cd devstack
stack@yash-VirtualBox:~/devstack$ FORCE=yes ./stack.sh
+ unset GREP_OPTIONS
+ unset LANG
```

Encountered new issue for the Grpcio still running

```
Using cached https://files.pythonhosted.org/packages/4e/e4/bcaf6978c0811fbba48
0acc9bd6e024b53390a61d153fa0be4f20a6c80d94/tenacity-6.3.1-py2.py3-none-any.whl
Building wheels for collected packages: grpcio, etcd3
  Running setup.py bdist_wheel for grpcio: started
  Running setup.py bdist_wheel for grpcio: still running...
  Running setup.py bdist_wheel for grpcio: still running...
```

C.C PRACTICAL NO. 4

Aim :- Study and implementation of Storage as a Service

HARDWARE / SOFTWARE REQUIRED:

Online mode: Google account → login into the google drive.

Offline mode: owncloud server.

THEORY:

Google Docs:

Google Docs (docs.google.com) is the most popular web-based word processor available today. Docs is actually a suite of applications that also includes Google Spreadsheets and Google Presentations; the Docs part of the Docs suite is the actual word processing application. When you log in to Google Docs with your Google account, you see the page. This is the home page for all the Docs applications (word processing, spreadsheets, and presentations); all your previously created documents are listed on this page. The leftmost pane helps you organize your documents. You can store files in folders, view documents by type (word processing document or spreadsheet), and display documents shared with specific people.

Collaborating on Databases:

A local database is one in which all the data is stored on an individual computer.

A networked database is one in which the data is stored on a computer or server connected to a network, and accessible by all computers connected to that network.

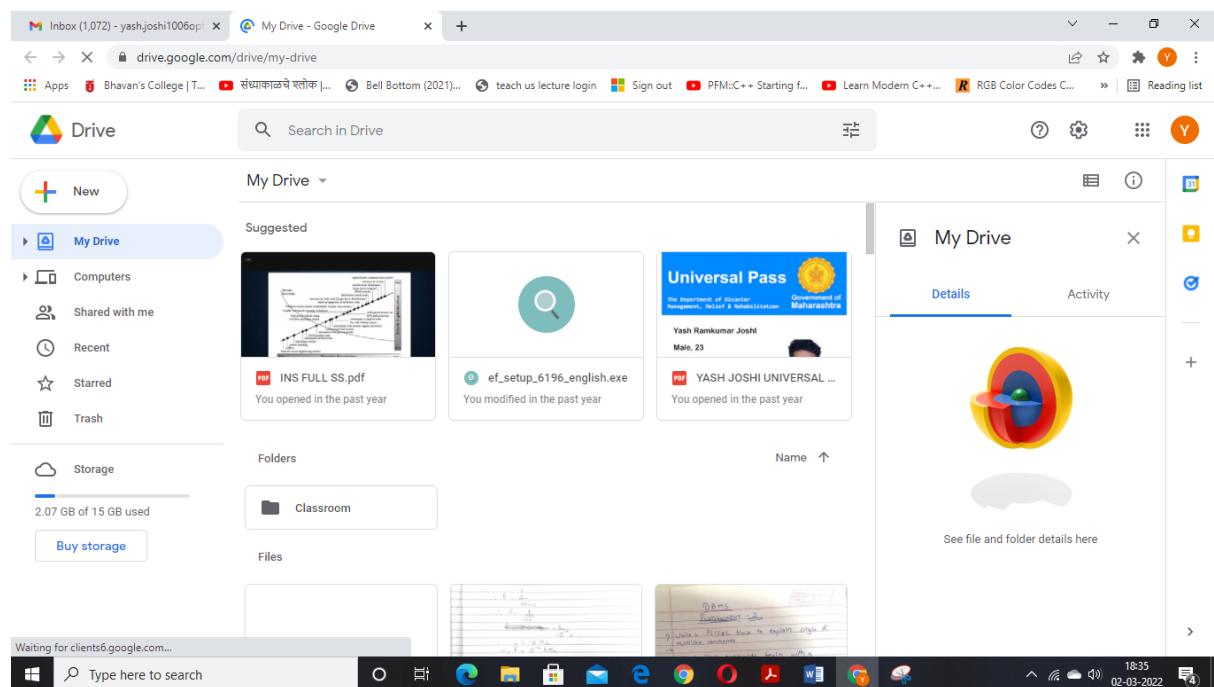
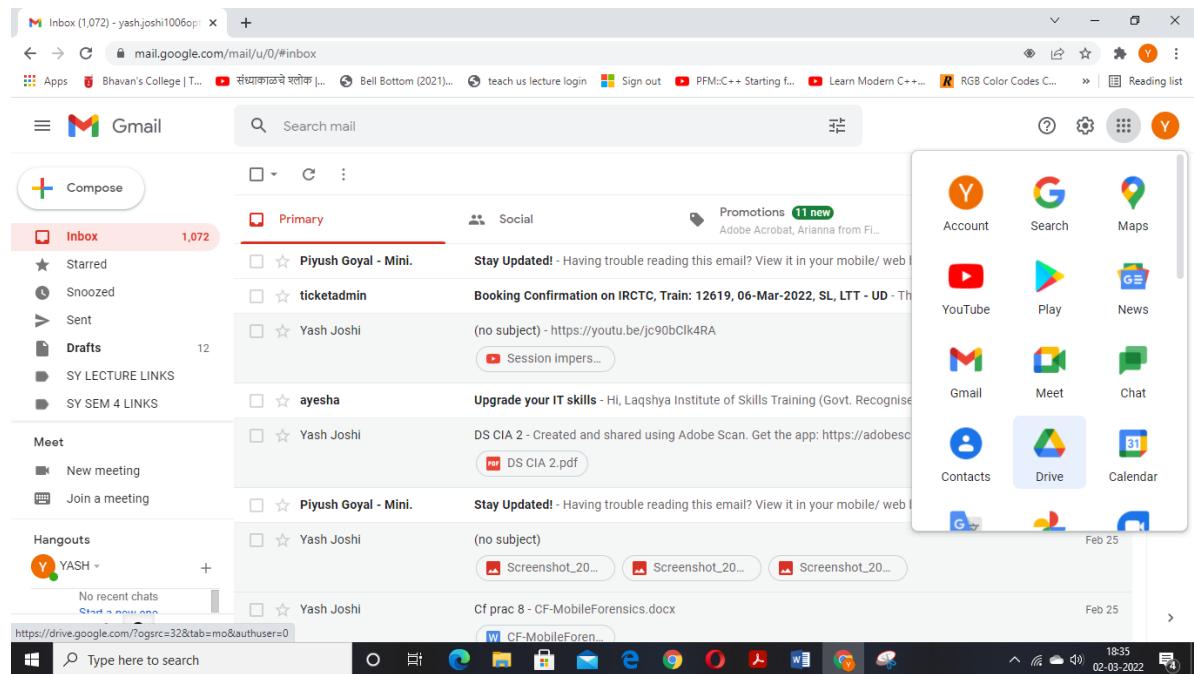
Finally, an online or web-based database stores data on a cloud of servers somewhere on the Internet, which is accessible by any authorized user with an Internet connection.

Eg: Cebase

Cebase (www.cebase.com) lets you create new database applications with a few clicks of your mouse; all you have to do is fill in a few forms and make a few choices from some pull-down lists. Data entry is via web forms, and then your data is displayed in a spreadsheet-like layout. You can then sort, filter, and group your data as you like. Sharing is accomplished by clicking the Share link at the top of any data page. You invite users to share your database via email, and then adjust their permissions after they've accepted your invitation.

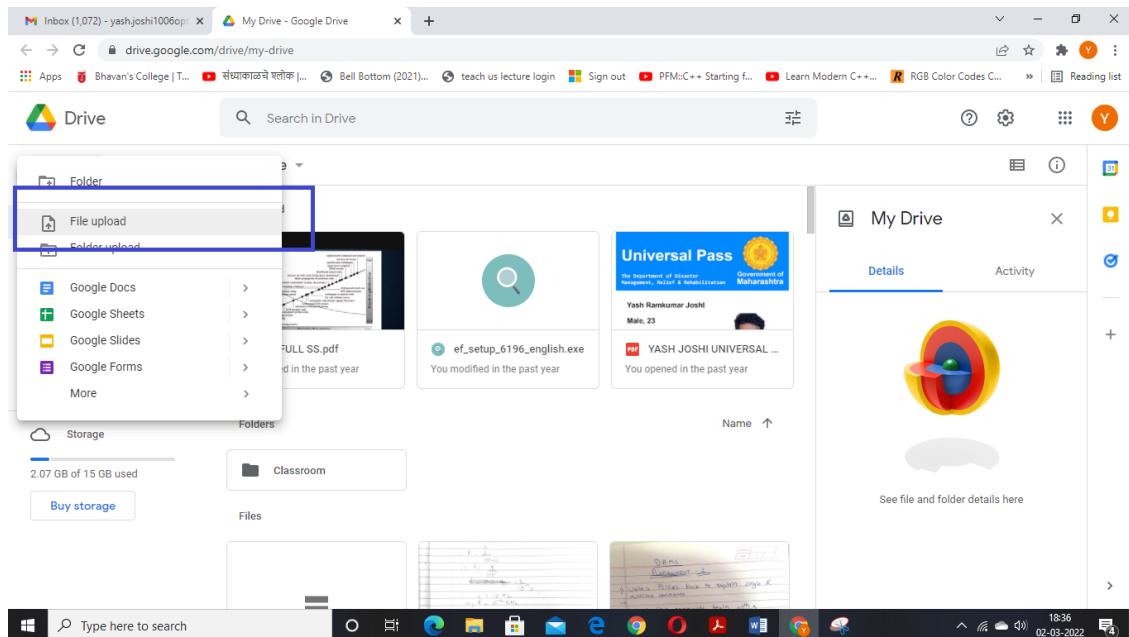
C.C PRACTICAL NO. 4

Step 1 :- Login to the Google Drive using You google account

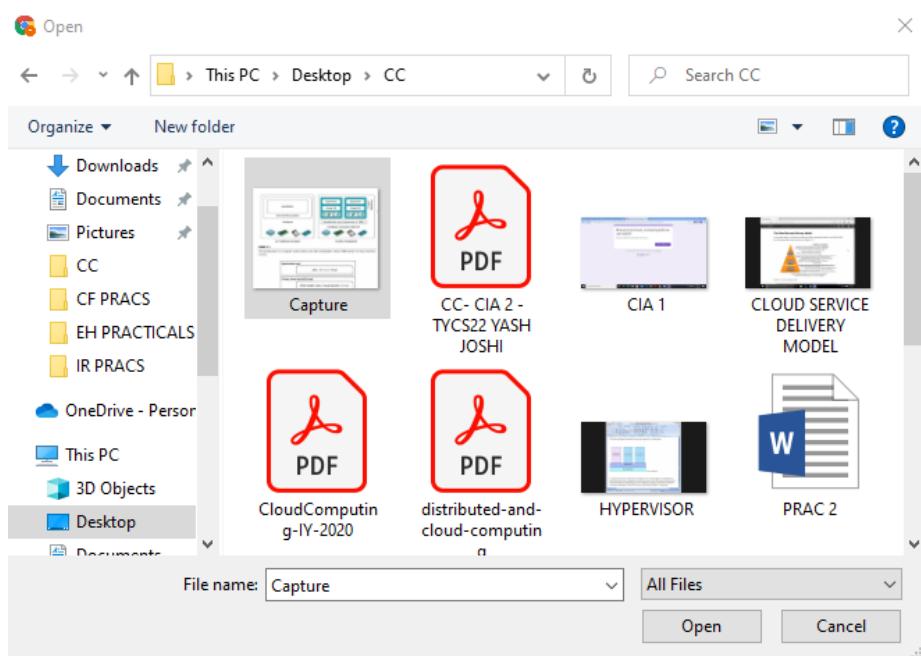


C.C PRACTICAL NO. 4

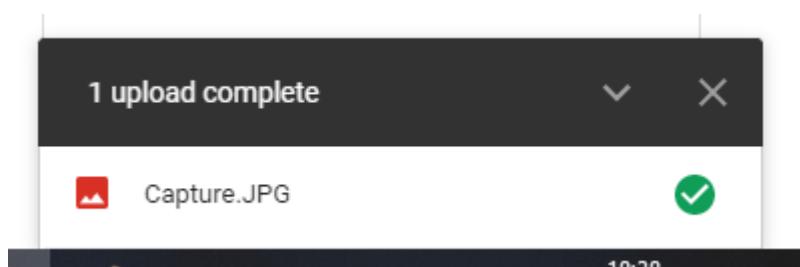
Step 2 :- Add Files to your drive



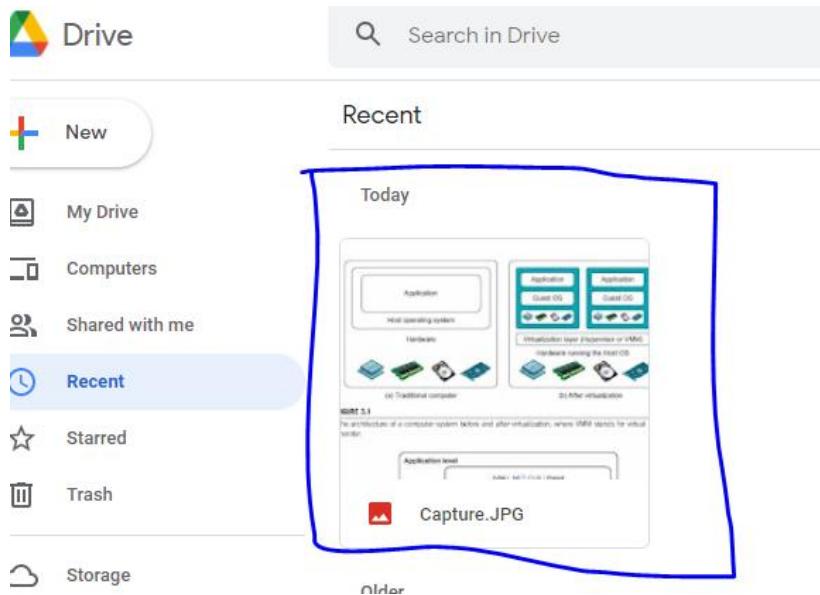
Browse the file you want to upload



And the File is uploaded to the Drive



C.C PRACTICAL NO. 4



And the files are stored on the cloud, You can access the google cloud anywhere and anytime. This is very efficient way to keep a backup of your files and even very convenient way for transportation of data.

C.C PRACTICAL NO. 5

AIM:To Study Cloud IdentityManagement (AWS)

OBJECTIVE: Secure your AWS account using IAM services

- ✓ To understand the security features of Cloud.
- ✓ To learn the technique of application security management and its complexity
- ✓ To understand the importance of cloud security management from application

point of view

Hardware / Software/Web reference Required: <https://www.aws.amazon.com>

THEORY:

Identity management is also known as identity and access management.

IAM refers to a framework of policies and technologies for ensuring that the proper people in

an enterprise have the appropriate access to technology resources.

Identity management can involve four basic functions:

1. The pure identity function: Creation, management and deletion of identities without regard to access or entitlements;
2. The user access (log-on) function: For example: a smart card and its associated data used by a customer to log on to a service or services (a traditional view);
3. The service function: A system that delivers personalized, role-based, online, on-demand, multimedia (content), presence-based services to users and their devices.
4. Identity Federation: A system that relies on federated identity to authenticate a user without knowing his or her password.

AWS Identity and Access Management (IAM) enables you to manage access to AWS services

and resources securely. Using IAM, you can create and manage AWS users and groups, and use

permissions to allow and deny their access to AWS resources. IAM is a feature of your AWS account offered at no additional charge.

C.C PRACTICAL NO. 5

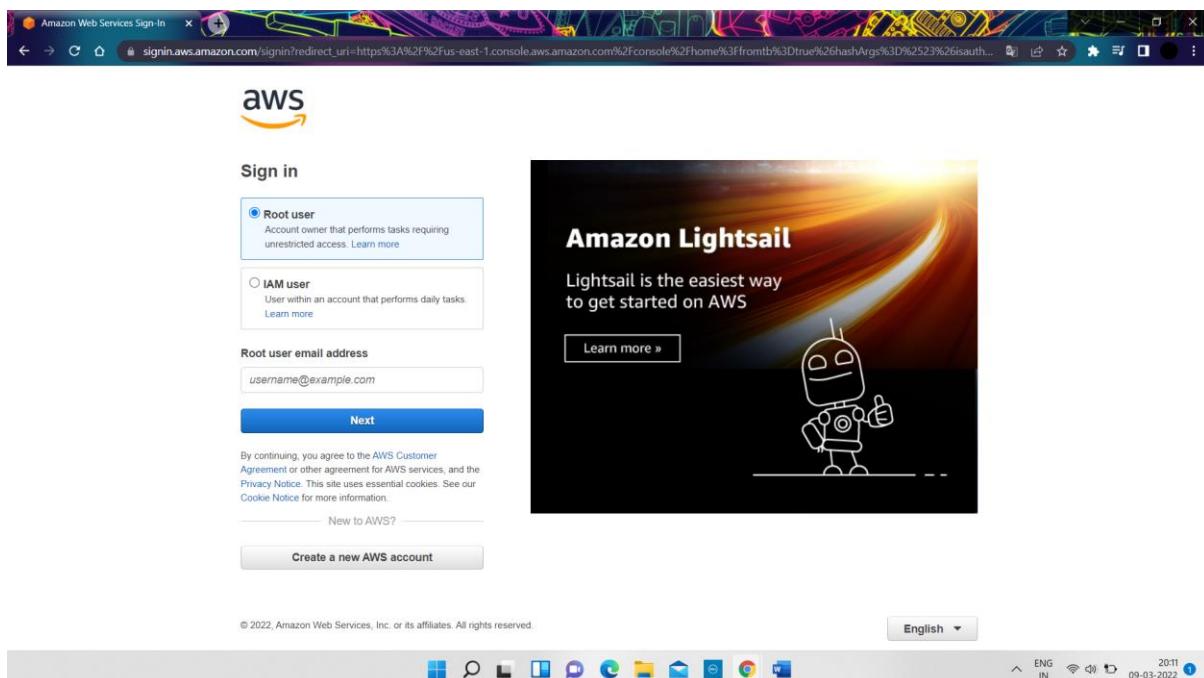
PROCEDURE:

Step 1: Go to <https://www.aws.amazon.com> ◆ click on “Create an AWS Account” ◆ Enter details in the required field ◆ click on “Continue”

Step 2 : Select the account type and complete the fields below ◆ click on “Create Account and continue” ◆ Sign out .

NOTE : Do not provide any credit card details on Payment Information .

Step 3: Click on “My Account” and go to “AWS Management Console” ◆ Sign In with your account as a root user.



Email id : mehtaashwin2021@gmail.com password : Bhavans@2022

Step 4 : After signing in , the AWS Management Console home page is displayed

Click on All Services ◆ On Security Identity and compliance click on IAM

C.C PRACTICAL NO. 5

The screenshot shows the AWS Management Console homepage. On the left, there's a sidebar titled "AWS services" with sections for "Recently visited services" and "All services". Below this is a "Build a solution" section with three cards: "Launch a virtual machine" (With EC2, 2-3 minutes), "Build a web app" (With Elastic Beanstalk, 6 minutes), and "Build using virtual servers" (With Lightsail, 1-2 minutes). To the right, there are promotional boxes for "New AWS Console Home", "Stay connected to your AWS resources on-the-go", and "Explore AWS". At the bottom, there are links for "Feedback", "English (US)", and "Cookie preferences". The status bar at the bottom right shows "ENG IN" and the date "09-03-2022".

This screenshot shows the AWS Management Console with the "All services" section expanded. Under "Compute", it lists EC2, Lightsail, Lambda, Batch, Elastic Beanstalk, Serverless Application Repository, AWS Outposts, EC2 Image Builder, and AWS App Runner. Under "Containers", it lists Elastic Container Registry, Elastic Container Service, Elastic Kubernetes Service, and Red Hat OpenShift Service on AWS. Under "Storage", it lists S3, EFS, FSx, S3 Glacier, and Storage Gateway. On the right side, the "IAM" service is selected, showing various sub-services like AWS Organizations, CloudWatch, AWS Auto Scaling, CloudFormation, CloudTrail, Config, OpsWorks, Service Catalog, Systems Manager, AWS AppConfig, Trusted Advisor, Control Tower, AWS License Manager, AWS Well-Architected Tool, Personal Health Dashboard, AWS Chatbot, Launch Wizard, AWS Compute Optimizer, Resource Groups & Tag Editor, Amazon Grafana, and Amazon Prometheus. There are also sections for "Security, Identity, & Compliance" (AWS IAM, Cognito, Secrets Manager, GuardDuty, Inspector, Amazon Macie, AWS Single Sign-On, Certificate Manager, Key Management Service, CloudHSM, Directory Service, WAF & Shield, AWS Firewall Manager, Artifact, Security Hub, Detective, AWS Signer, AWS Network Firewall, and AWS Audit Manager) and "Explore AWS" (Free AWS Training and Calling All Java and Python Developers).

Step 5 : click on Add User ♦ Set User Details ♦ Next : Permission

C.C PRACTICAL NO. 5

The image consists of three vertically stacked screenshots from the AWS IAM Management Console.

Screenshot 1: Shows the 'Users' page. A blue banner at the top says 'Introducing the new Users list experience'. The table lists one user: 'yash.joshi1006' with 'None' in all other columns. The sidebar shows navigation options like 'Dashboard', 'Access management', 'Users', 'Roles', 'Policies', etc.

Screenshot 2: Shows the 'Add users' step. It asks 'You can add multiple users at once with the same access type and permissions.' A 'User name*' field contains 'sonalivsavadia'. Below it, 'Select AWS access type' and 'Select AWS credential type*' sections are shown. Under 'Access key - Programmatic access', both checkboxes ('Access key ID' and 'Secret access key') are checked. Under 'Password - AWS Management Console access', the checkbox is checked. A 'Console password*' section shows a masked password and a 'Show password' link. A 'Require password reset' checkbox is unchecked. At the bottom are 'Cancel' and 'Next: Permissions' buttons.

Screenshot 3: Shows the 'Next: Permissions' step. It displays a large list of AWS services and actions, with checkboxes for selecting policies. The 'Administrator Access' and 'AmazonAPI' checkboxes are selected. At the bottom are 'Cancel' and 'Create User' buttons.

Step 6: Click on Attach existing policies directly and select Administrator Access and AmazonAPI

Gateway ♦ click on Next till 4th step ♦ Download the csv file wherein Access key ID and login URL of users is stored.

C.C PRACTICAL NO. 5

The screenshot shows the AWS IAM Management Console with the URL [us-east-1.console.aws.amazon.com/iam/home#/users\\$new?step=permissions&accessKey&login&userNames=sonalivisavadia&passwordType=manual&permissionType=policies](https://us-east-1.console.aws.amazon.com/iam/home#/users$new?step=permissions&accessKey&login&userNames=sonalivisavadia&passwordType=manual&permissionType=policies). The 'Attach existing policies directly' button is highlighted. Below it, a table lists 733 policies, with 'AdministratorAccess' and 'AmazonAPIGatewayAdministrator' selected. The table includes columns for Policy name, Type, and Used as.

Policy name	Type	Used as
AdministratorAccess	Job function	None
AdministratorAccess-Amplify	AWS managed	None
AdministratorAccess-AWSElasticBeanstalk	AWS managed	None
AlexaForBusinessDeviceSetup	AWS managed	None
AlexaForBusinessFullAccess	AWS managed	None
AlexaForBusinessGatewayExecution	AWS managed	None
AlexaForBusinessLifesizeDelegatedAccessPolicy	AWS managed	None
AlexaForBusinessPolyDelegatedAccessPolicy	AWS managed	None
AlexaForBusinessReadOnlyAccess	AWS managed	None
AmazonAPIGatewayAdministrator	AWS managed	None
AmazonAPIGatewayInvokeFullAccess	AWS managed	None

Feedback English (US) © 2022, Amazon Internet Services Private Ltd. or its affiliates. Privacy Terms Cookie preferences ENG IN 09-03-2022 20:29

The screenshot shows the 'Add user' review step. It displays the user details (User name: sonalivisavadia, AWS access type: Programmatic access and AWS Management Console access, Console password type: Custom, Require password reset: No, Permissions boundary: Permissions boundary is not set) and the attached policies (AdministratorAccess and AmazonAPIGatewayAdministrator). The 'Create user' button is visible at the bottom.

Add user Review User details Permissions summary Tags Cancel Previous Create user Feedback English (US) © 2022, Amazon Internet Services Private Ltd. or its affiliates. Privacy Terms Cookie preferences ENG IN 09-03-2022 20:30

C.C PRACTICAL NO. 5

The screenshot shows the AWS IAM Management Console interface. A success message box is displayed, stating: "Success: You successfully created the users shown below. You can view and download user security credentials. You can also email users instructions for signing in to the AWS Management Console. This is the last time these credentials will be available to download. However, you can create new credentials at any time." Below this, a table lists a single user named "sonalivisavadia". The table columns are "User", "Access key ID", "Secret access key", and "Email login instructions". The "Access key ID" column contains "AKIAUXBI3GZFYI7TM5NQ" with a "Show" link. The "Email login instructions" column contains a "Send email" link. A "Download .csv" button is located above the table.

Step 7: Now login as a user now

The screenshot shows the AWS sign-in page for the user "sonalivisavadia". The page includes fields for "Account ID (12 digits) or account alias" (set to "324355700299"), "IAM user name" (set to "sonalivisavadia"), and "Password" (set to "*****"). There is a "Remember this account" checkbox and a "Sign in" button. To the right of the sign-in form is an advertisement for "Amazon Lightsail" featuring a cartoon robot character. The bottom of the page includes links for "Terms of Use" and "Privacy Policy". The status bar at the bottom indicates the URL as "https://signin.aws.amazon.com/oauth?redirect_uri=https%3A%2F%2Fus-east-1.console.aws.amazon.com%2Fconsole%2Fhome%3Ffromt...".

C.C PRACTICAL NO. 5

The screenshot shows the AWS Management Console homepage. On the left, there's a sidebar titled "AWS services" with sections for "Recently visited services" (IAM) and "All services". Below this is a "Build a solution" section with three options: "Launch a virtual machine" (With EC2, 2-3 minutes), "Build a web app" (With Elastic Beanstalk, 6 minutes), and "Build using virtual servers" (With Lightsail, 1-2 minutes). To the right, there are promotional boxes for "New AWS Console Home", "Stay connected to your AWS resources on-the-go", and "Explore AWS". At the bottom, there are links for "Feedback", "English (US)", and "Cookie preferences". The status bar at the bottom right shows "ENG IN" and the date "09-03-2022".

The screenshot shows the IAM Management Console dashboard. On the left, a sidebar lists "Access management" (User groups, Users, Roles, Policies, Identity providers, Account settings), "Access reports" (Access analyzer, Archive rules, Analyzers, Settings, Credential report, Organization activity, Service control policies (SCPs)), and "What's new". The main area has a "IAM dashboard" header. It features a "Security recommendations" section with three items: "Add MFA for root user" (with a note about improving security for the account), "Add MFA for yourself" (with a note about improving security for the account), and "Your user, sonalivisavada, does not have any active access keys that have been unused for more than a year" (with a note about deactivating or deleting unused access keys). Below this is an "IAM resources" summary table:

User groups	Users	Roles	Policies	Identity providers
0	2	2	0	0

On the right, there are sections for "AWS Account" (Account ID: 324355700299, Account Alias: 324355700299 Create, Sign-in URL: https://324355700299.sigin.aws.amazon.com/console), "Quick Links" (My security credentials, Policy simulator), and "Tools" (Policy simulator). The status bar at the bottom right shows "ENG IN" and the date "09-03-2022".

C.C PRACTICAL NO. 6

AIM: To Study Cloud Security Management (AWS)

OBJECTIVE: Secure your AWS account using IAM services

- ✓ To understand the security features of Cloud.
- ✓ To learn the technique of application security management and its complexity
- ✓ To understand the importance of
- ✓ cloud security management from application point of view

HARDWARE / SOFTWARE REQUIRED: <https://www.aws.amazon.com>

THEORY:

Cloud computing security is the set of control-based technologies and policies designed to adhere to regulatory compliance rules and protect information, data applications and infrastructure associated with cloud computing use. Because of the cloud's very nature as a shared resource, identity management, privacy and access control are of concern.

Physical security:

Cloud service providers physically secure the IT hardware (servers, routers, cables etc.) against unauthorized access, interference, theft, fires, floods etc. and ensure that essential supplies (such as electricity) are sufficiently robust to minimize the possibility of disruption. This is normally achieved by serving cloud applications from 'world-class' (i.e. professionally specified, designed, constructed, managed, monitored and maintained) data centers.

Personnel security:

Various information security concerns relating to the IT and other professionals associated with cloud services are typically handled through pre-, para- and post-employment activities such as security screening potential recruits, security awareness and training programs, proactive security monitoring and supervision, disciplinary procedures and contractual obligations embedded in employment contracts, service level agreements, codes of conduct, policies etc.

C.C PRACTICAL NO. 6

Application security:

Cloud providers ensure that applications available as a service via the cloud (SaaS) are secure by specifying, designing, implementing, testing and maintaining appropriate application security measures in the production environment.

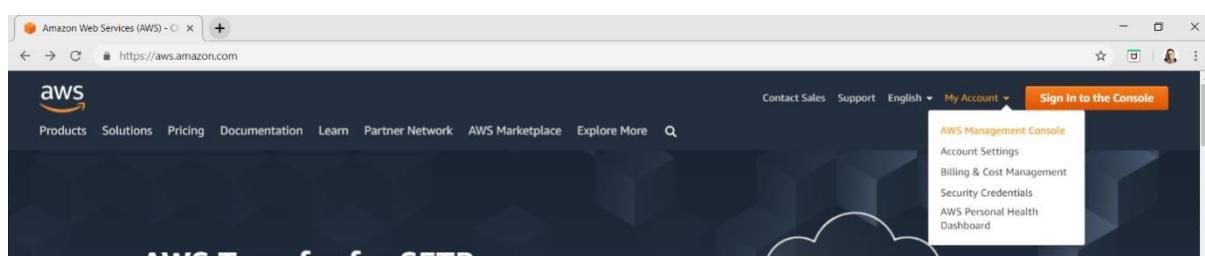
PROCEDURE:

Step 1: Go to <https://www.aws.amazon.com> click on “Create an AWS Account”

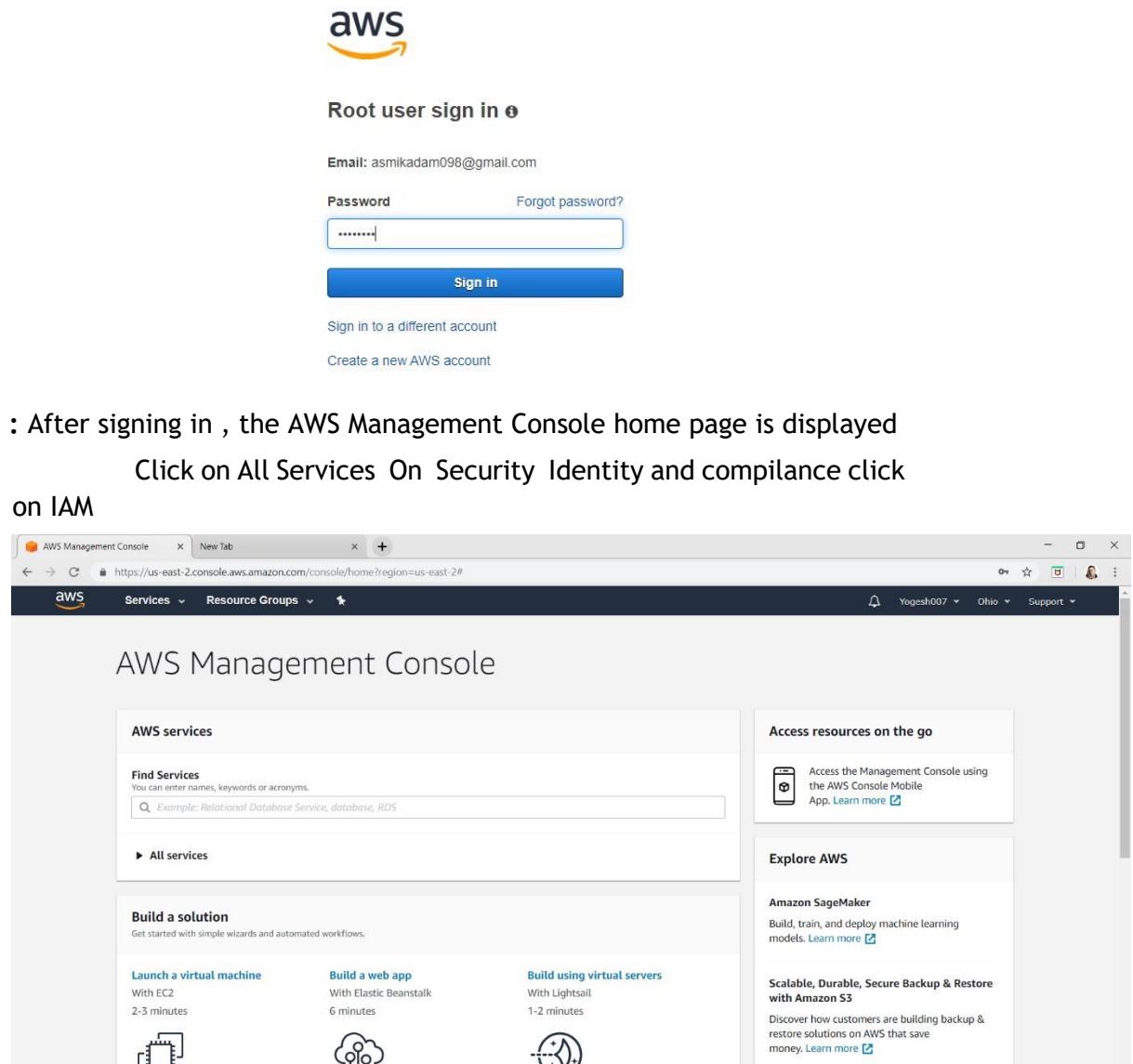
Enter details in the required field click on “Continue”

The screenshot shows the 'Create an AWS account' page. At the top, there's a message: 'AWS Accounts Include 12 Months of Free Tier Access' followed by a note about EC2, S3, and DynamoDB usage and a link to the free offer terms. Below this, there are four input fields: 'Email address' (filled with 'asmikadam098@gmail.com'), 'Password' (filled with '*****'), 'Confirm password' (filled with '*****'), and 'AWS account name' (filled with 'asmita'). A yellow 'Continue' button is at the bottom right of the form. Below the form, there's a link to 'Sign in to an existing AWS account'. At the very bottom, there's a small footer with copyright information and links to 'Privacy Policy' and 'Terms of Use'.

Step 3: Click on “My Account” and go to “AWS Management Console” Sign In with your account as a root user.



C.C PRACTICAL NO. 6



Step 5 : Complete all Security status steps

click on Delete your root access Manage Security Credentials Get Started with

IAM Users

C.C PRACTICAL NO. 6

The screenshot shows the AWS IAM Management Console home page. The left sidebar includes options like Dashboard, Groups, Users, Roles, Policies, Identity providers, Account settings, Credential report, and Encryption keys. The main area displays a "Welcome to Identity and Access Management" message, showing 0 users, 2 roles, and 0 identity providers. A "Security Status" section indicates "1 out of 5 complete" and lists several items with checkboxes, such as "Delete your root access keys" (which is checked) and "Activate MFA on your root account".

The screenshot shows the "Your Security Credentials" page. It provides instructions for managing AWS account credentials. Key points include using an email address for password recovery, enabling multi-factor authentication, and creating access keys. A prominent message at the top states: "You are accessing the security credentials page for your AWS account. The account credentials provide unlimited access to your AWS resources." Buttons for "Continue to Security Credentials" and "Get Started with IAM Users" are visible.

Step 6 : click on Add User

Set User Details

Next : Permission

The screenshot shows the "Users" page in the AWS IAM Management Console. The left sidebar has "Users" selected. The main area features a search bar and a table with columns for User name, Groups, Access key age, Password age, Last activity, and MFA. A message at the bottom states: "There are no IAM users. Learn more". Buttons for "Add user" and "Delete user" are located at the top of the user list.

C.C PRACTICAL NO. 6

The screenshot shows the 'Add user' review step in the AWS IAM Management Console. The user details section lists 'User names' as 'anjaliaraul and rasikapanchal', 'AWS access type' as 'Programmatic access and AWS Management Console access', 'Console password type' as 'Custom', 'Require password reset' as 'No', and 'Permissions boundary' as 'Permissions boundary is not set'. The 'Permissions summary' section indicates that policies from selected users will be copied: 'AdministratorAccess', 'IAMUserChangePassword', and 'AmazonAPIGatewayAdministrator'. There are no tags added. At the bottom, there are 'Cancel', 'Previous', and 'Create users' buttons.

Step 7: Click on Attach existing policies directly and select AdministratorAccess and

AmazonAPIGateway click on Next till 4th step Download the csv file wherein

Access key ID and login URL of users is stored

The screenshot shows the 'Set permissions' step in the AWS IAM Management Console. It features three options: 'Add users to group', 'Copy permissions from existing user', and 'Attach existing policies directly'. The 'Attach existing policies directly' option is selected. Below is a table of policies:

Policy name	Type	Used as	Description
AdministratorAccess	Job function	None	Provides full access to AWS services and...
AmazonAPIGatewa...	AWS managed	None	Provides full access to create/edit/delete...
AWSAppSyncAdmi...	AWS managed	None	Provides administrative access to the Ap...
AWSCloud9Adminis...	AWS managed	None	Provides administrator access to AWS Cl...

C.C PRACTICAL NO. 6

Add user

1 2 3 4 5

Review

Review your choices. After you create the users, you can view and download autogenerated passwords and access keys.

User details

User names	Irfan, Rakesh, and Rahul_M
AWS access type	Programmatic access and AWS Management Console access
Console password type	Custom
Require password reset	Yes
Permissions boundary	Permissions boundary is not set

Permissions summary

The following policies will be attached to the users shown above.

Type	Name
Managed policy	AdministratorAccess
Managed policy	AmazonAPIGatewayAdministrator
Managed policy	IAMUserChangePassword

Tags

No tags were added.

Cancel Previous Create users

Amazon Web Services (AWS) - IAM Management Console

console.aws.amazon.com/iam/home?region=us-east-2#/users?new?step=final&accessKeyLogin&userNames=anjilraul&userNames=rasikapanchal&passwordType=manual&permissionType=clone&doneUser=asmitakadam

Apps Inbox (4) - switching... New Tab

AWS Services Resource Groups

Add user

Success

You successfully created the users shown below. You can view and download user security credentials. You can also email users instructions for signing in to the AWS Management Console. This is the last time these credentials will be available to download. However, you can create new credentials at any time.

Users with AWS Management Console access can sign-in at: <https://495662379473.signin.aws.amazon.com/console>

Download .csv

User	Access key ID	Secret access key	Email login instructions
anjilraul	AKIAJXGZ6HWHDXZ73NSWR	***** Show	Send email
rasikapanchal	AKIAJXGZ6WHIQQNRV4FZ	***** Show	Send email

Feedback English (US)

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Show all Close

Step 8: Now login as a user now



Account ID or alias

495662379473

IAM user name

asmitakadam

Password

.....

Sign In

Sign-in using root account credentials

Forgot password?

C.C PRACTICAL NO. 6

Step 9: Go to My security credentials click on Create access key
Download secret access key .csv file

The screenshot shows the 'My security credentials' page in the AWS IAM console. On the left, there's a sidebar with links like Dashboard, Groups, Users, Roles, Policies, Identity providers, Account settings, Credential report, and Encryption keys. The main area has a heading 'My security credentials' with a back arrow. Below it is 'Account details' with fields: User name (Irfan), User ARN (arn:aws:iam::272214125374:user/Irfan), AWS account ID (272214125374), and Canonical user ID (f8663efe8d04b78acc61036dde10311261526b6cd4fa5220add3bd241297e415). There are tabs for 'AWS IAM credentials' (selected) and 'AWS CodeCommit credentials'. Under 'AWS IAM credentials', there's a section for 'Password for console access' with a 'Change password' button. Below that is 'Access keys for CLI, SDK, & API access' with a note about retrieving access keys. A 'Create access key' button is present. A table lists one access key: Access key ID (AKIAJQN443CPDDK5HHJA), Status (Active), Created (2019-03-11 10:24 UTC+0530), Last used (N/A), and Actions (Make inactive | Delete).

The screenshot shows a modal dialog titled 'Create access key' with a green success message: 'Your new access key is now available.' It also contains a note: 'This is the only time that the secret access key can be viewed or downloaded. You cannot recover it later. However, you can create new access keys at any time.' Below this, there's a 'Download .csv file' button. The modal includes fields for 'Access key ID' (AKIAKGZ6HWHI7WWEXM5C) and 'Secret access key' (Show secret access key). At the bottom right is a 'Close' button.

Step 10: Now to assign MFA, click on Assign MFA Device click on Virtual MFA Device click on Show QR Code and scan it via Google Authenticator app from your Mobile phone enter two MFA codes below. Our MFA is assigned

C.C PRACTICAL NO. 6

The screenshot shows the AWS IAM Management Console interface. The top navigation bar includes tabs for 'Services' (selected), 'Resource Groups', and 'Support'. The main content area displays a success message: 'Access keys successfully deleted'. Below this, there is a table of access keys:

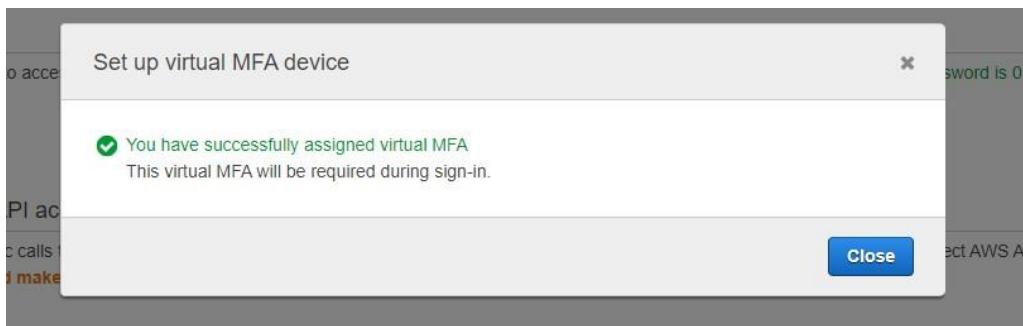
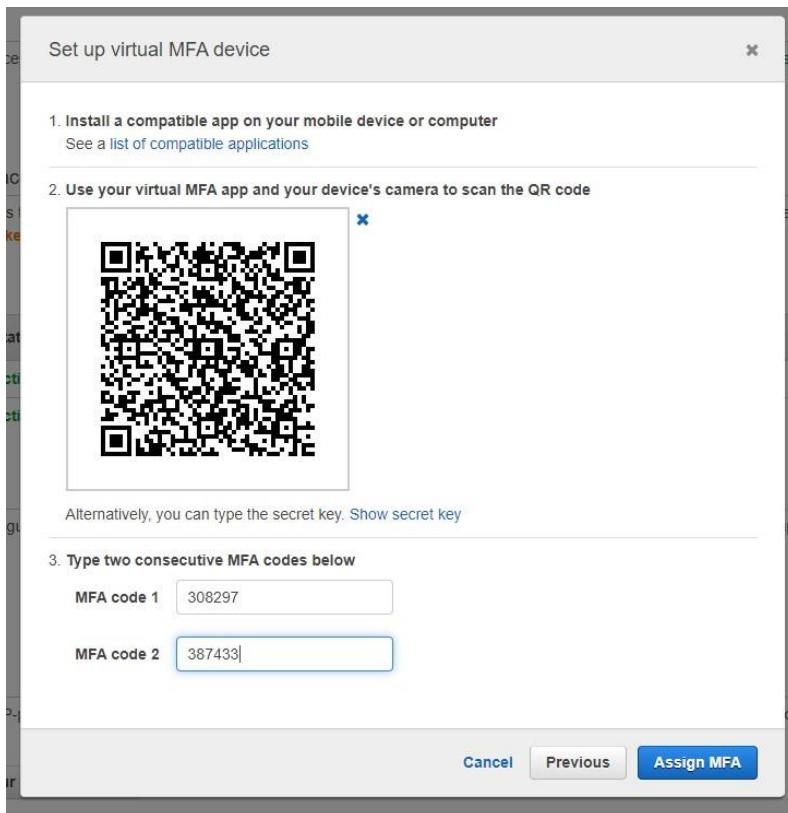
Access key ID	Status	Created	Last used	Actions
AKIAIVOQESLZXK4RZQNA	Active	2019-03-11 10:31 UTC+0530	N/A	Make inactive Delete
AKIAJQN443CPDDK6HHJA	Active	2019-03-11 10:24 UTC+0530	N/A	Make inactive Delete

Below the table, a section titled 'Multi-factor authentication (MFA)' provides instructions for increased security. It states: 'For increased security, we recommend configuring MFA to help protect your AWS resources. MFA requires users to type a unique authentication code from an approved authentication device when they sign in to AWS.' A link 'Learn more' is provided. There is a button 'Assign MFA device'.

The next section is 'X.509 certificate', which explains how to use X.509 certificates for secure SOAP-protocol requests. It includes links 'Create new certificate' and 'Upload your own certificate'.

A modal window titled 'Manage MFA device' is displayed, asking 'Choose the type of MFA device to assign:'. The 'Virtual MFA device' option is selected, with the sub-instruction: 'Authenticator app installed on your mobile device or computer'. Other options shown are 'U2F security key' (YubiKey or any other compliant U2F device) and 'Other hardware MFA device' (Gemalto token). A note at the bottom of the modal says: 'For more information about supported MFA devices, see [AWS Multi-Factor Authentication](#)'. The modal has 'Cancel' and 'Continue' buttons.

C.C PRACTICAL NO. 6



The screenshot shows the AWS IAM Policies page. The left sidebar shows 'Identity and Access Management (IAM)' with 'Policies' selected. The main area shows a table of policies. An 'Attach' button is highlighted in a dropdown menu above the table. The table columns are 'Policy', 'Type', 'Used as', and 'Description'. Policies listed include 'AccessAnalyzerServiceRolePolicy' (AWS managed, None, Allow Access Analyzer to analyze resource metadata), 'AdministratorAccess' (Job function, Permissions policy (3), Provides full access to AWS services and resources), 'AlexaForBusinessDeviceSetup' (AWS managed, None, Provide device setup access to AlexaForBusiness services), and 'AlexaForBusinessFullAccess' (AWS managed, None, Grants full access to AlexaForBusiness resources and access to related AWS Services).

Step 11: Now go to policies and click on AdministratorAccess and on policy action button click on attach.

C.C PRACTICAL NO. 6

Step 12: Go to users and open it

The screenshot shows the AWS IAM User Summary page for the user 'asmitakadam'. The left sidebar navigation includes 'Identity and Access Management (IAM)', 'Dashboard', 'Access management' (with 'Groups' and 'Users' selected), 'Roles', 'Policies', 'Identity providers', 'Account settings', 'Access reports' (with 'Access analyzer' and 'Analyzer details'), 'Credential report', 'Organization activity', and 'Service control policies (SCPs)'. A search bar for 'Search IAM' is also present. The main summary area displays the User ARN (arn:aws:iam::495662379473:user/asmitakadam), Path (/), and Creation time (2019-12-07 09:32 UTC+0530). Below this, tabs for 'Permissions', 'Groups', 'Tags', 'Security credentials', and 'Access Advisor' are shown, with 'Permissions' being active. Under 'Permissions', it lists 'Permissions policies (3 policies applied)' with three entries: 'AdministratorAccess' (AWS managed policy) and 'IAMUserChangePassword' (AWS managed policy), both attached directly. There is also a link to 'Show 1 more'. A 'Permissions boundary (not set)' section is also visible. On the right side, there are 'Delete user' and 'Edit user' buttons.

CONCLUSION: We have studied how to secure the cloud and its data. Amazon EWS provides the best security with its extended facilities and services like MFA+-device. It also gives you the ability to add your own permissions and policies for securing data more encrypted.

C.C PRACTICAL NO. 7

Aim :- Write a program for web feed.

THEORY:

RSS: Really Simple Syndication.

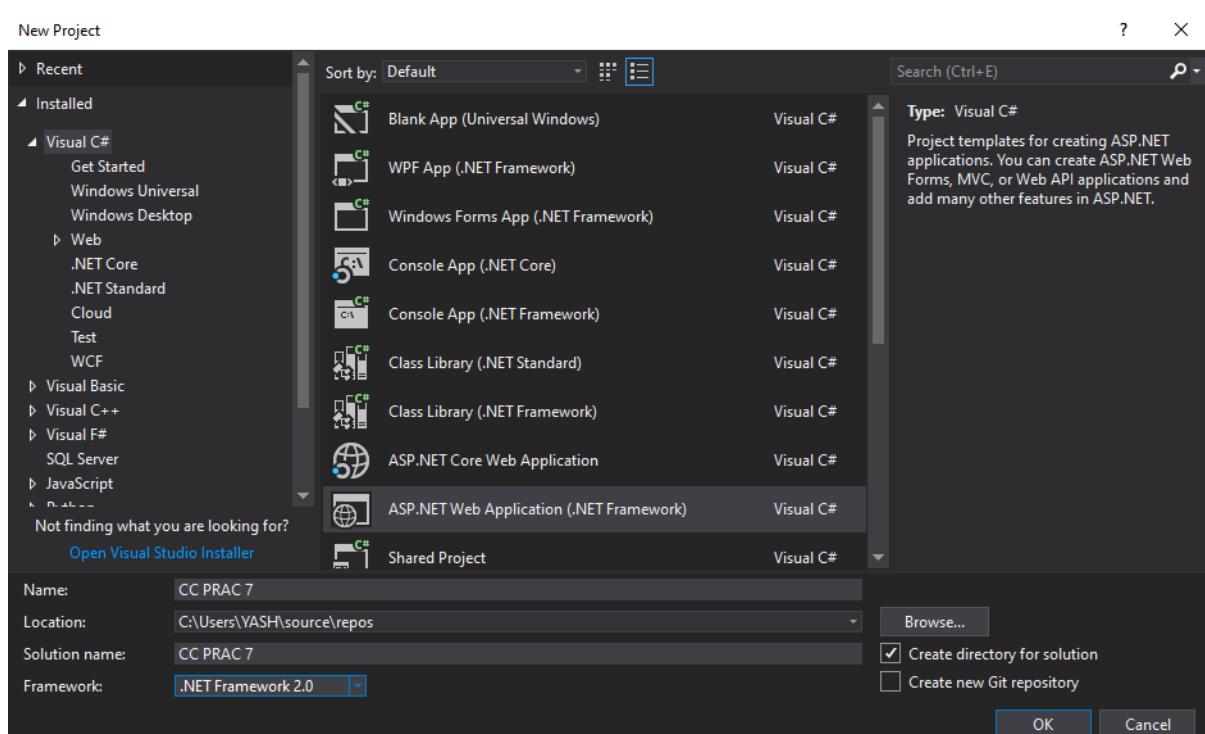
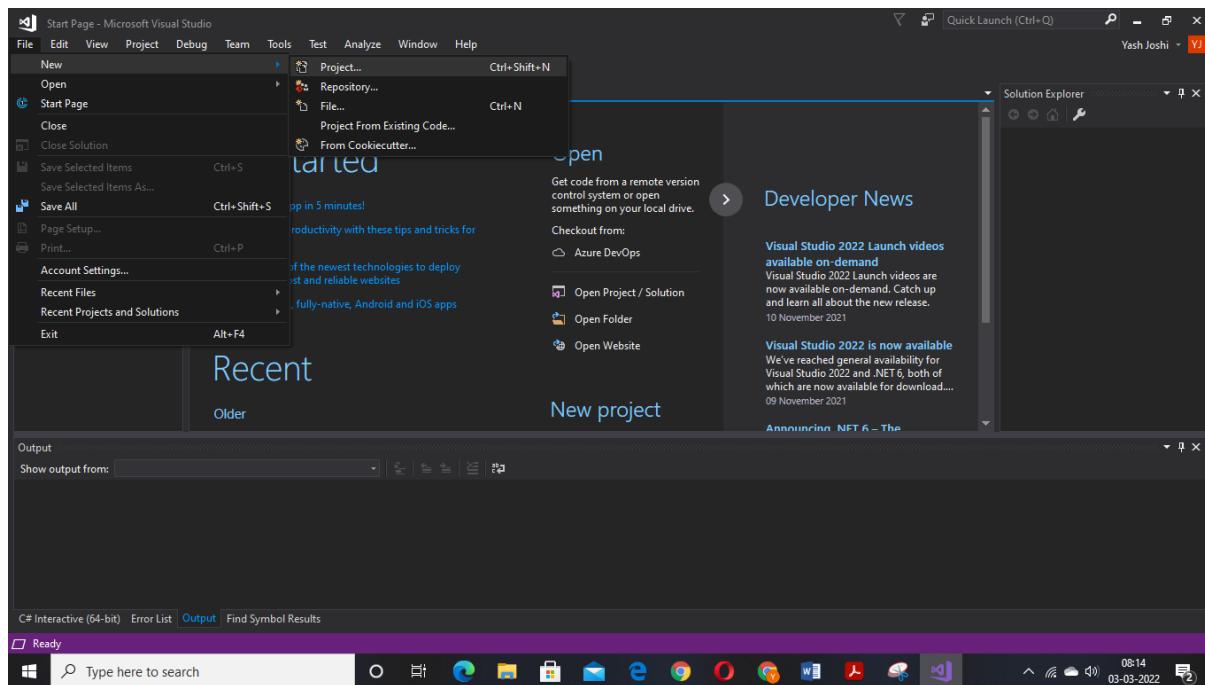
Concept: Web feed and RSS.

Objective: This lab is to understand the concept of form and control validation.

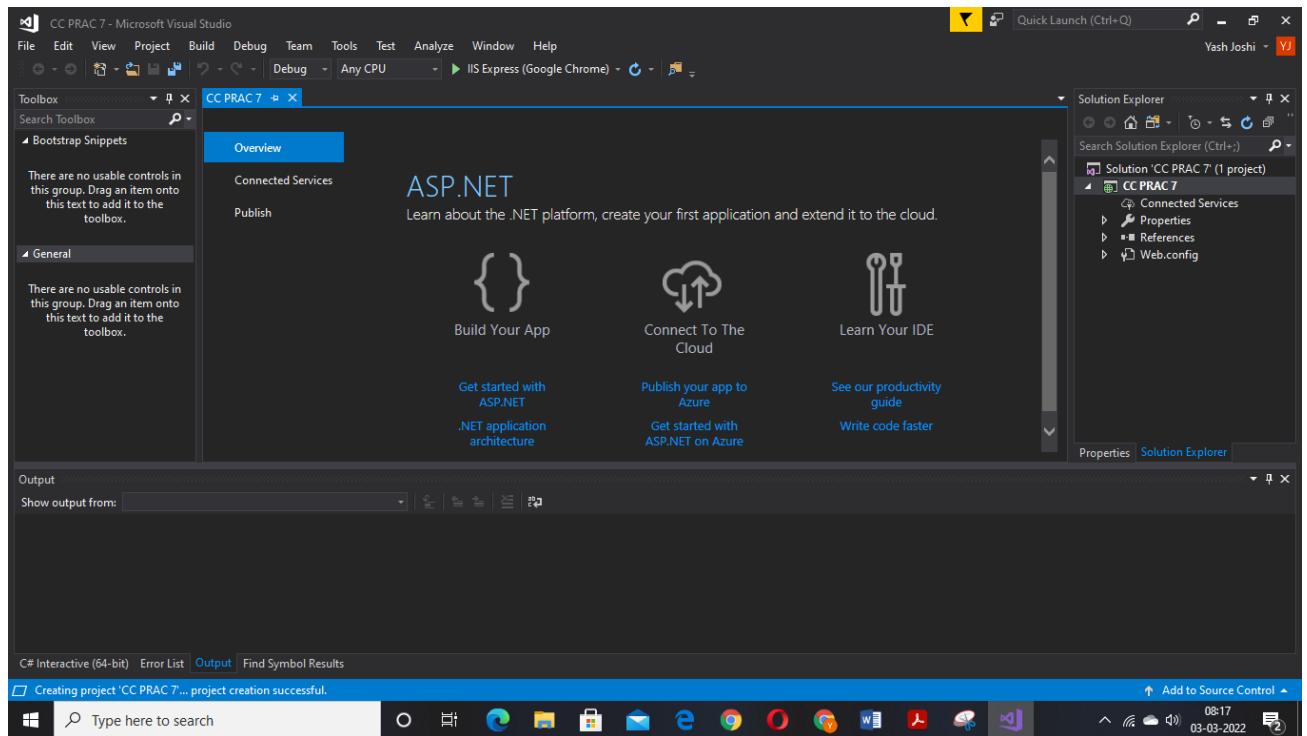
Scope: Write a program for web feed.

Software: XML / PHP, HTML/Visual Studio 2010.

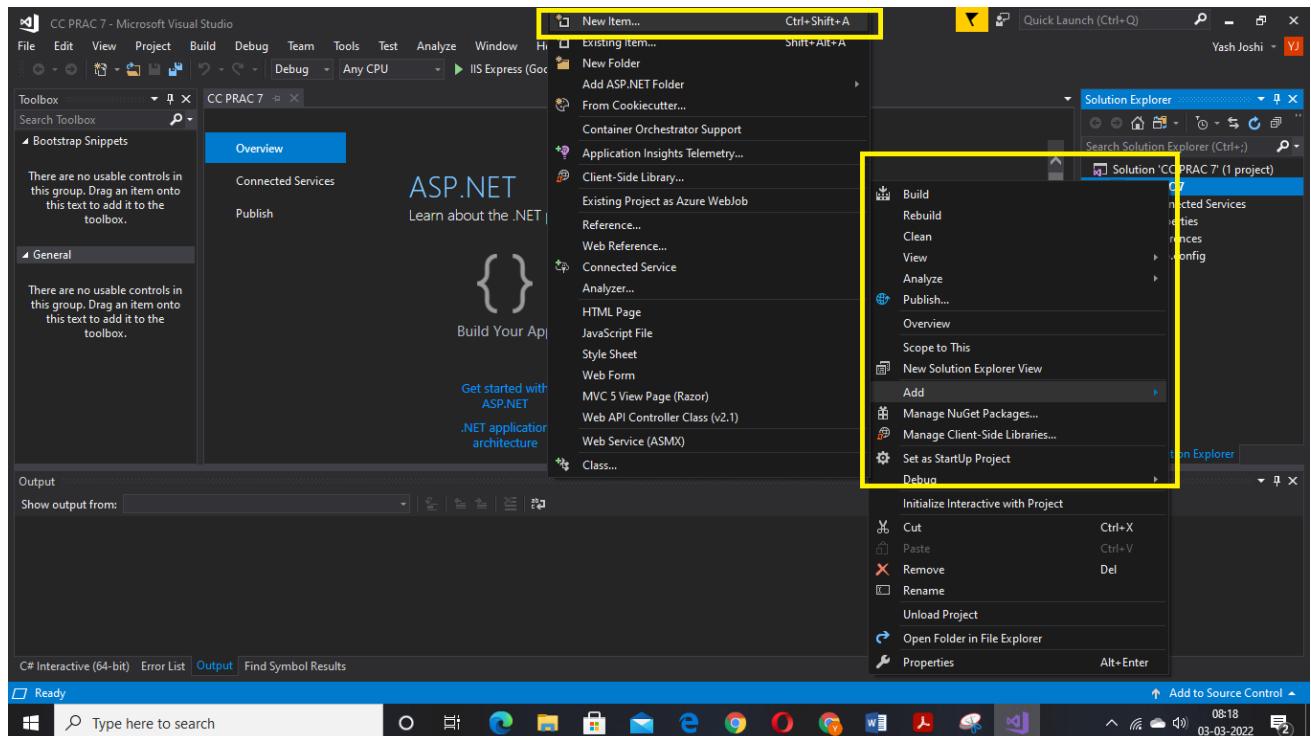
Step 1 :- Open Visual Studio. Select Create a new project – ASP .Net Web Application (.Net Framework) – Next. Fill in all the details and click Create.



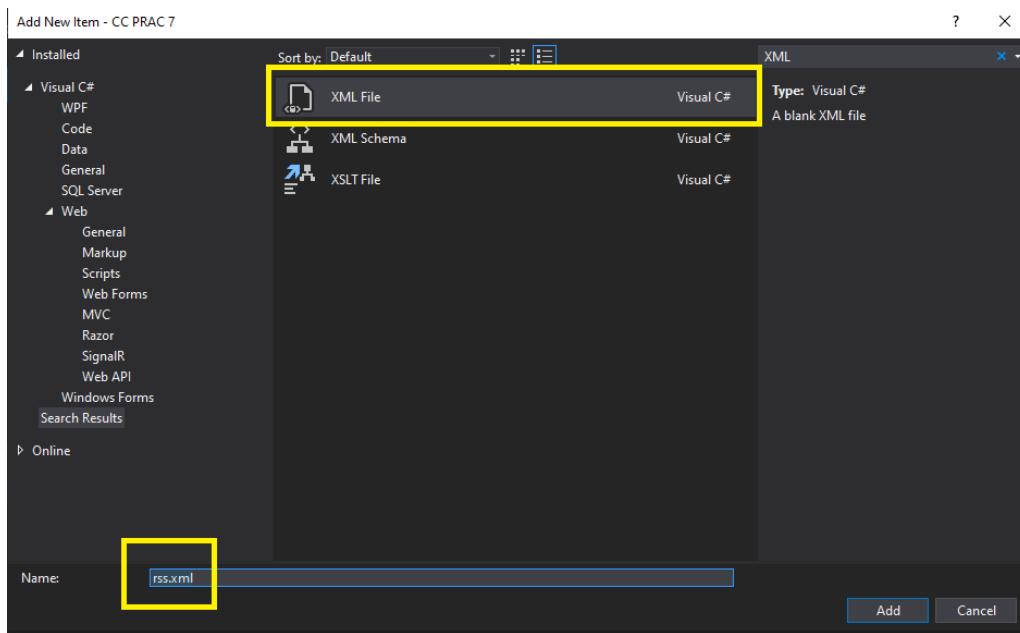
C.C PRACTICAL NO. 7



Step 2 :- Go to Solution Explorer – Right Click – Add – New Item – XML File. Rename it and add the xml code for the RSS feed.



C.C PRACTICAL NO. 7

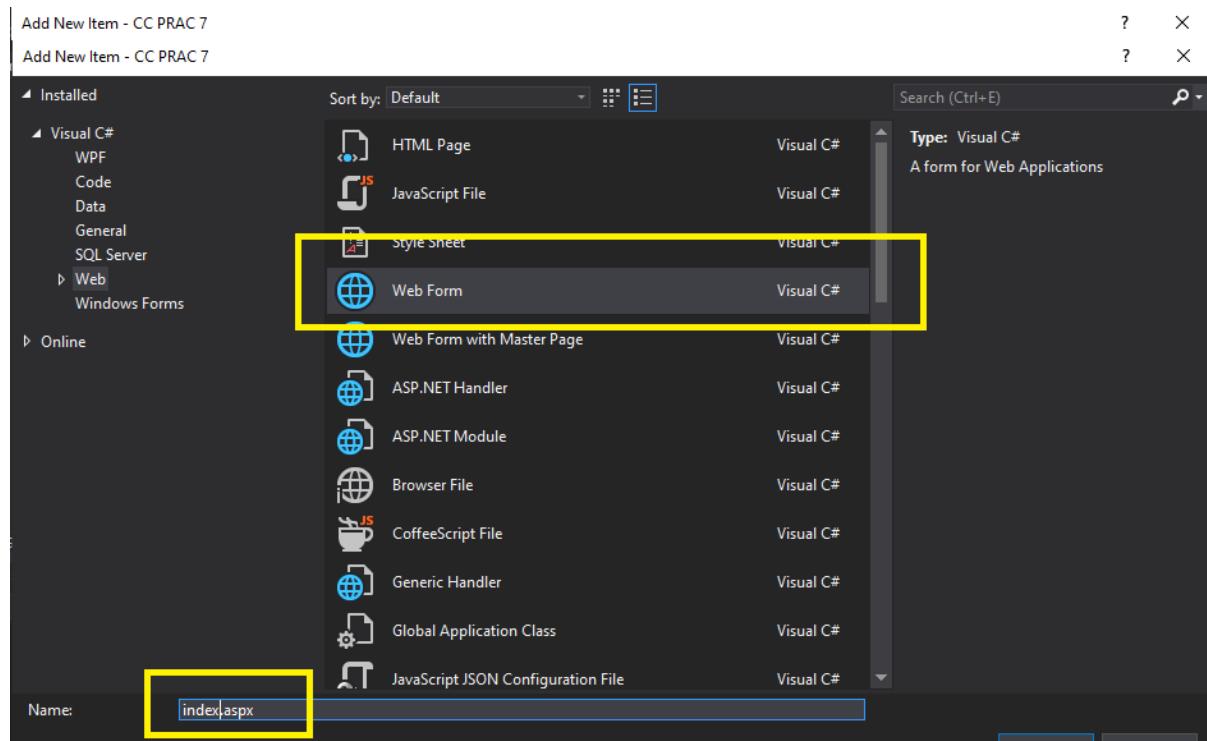


Code :-

```
<?xml version="1.0" encoding="utf-8"?>
<rss version="2.0">
  <channel>
    <generator>RSS Builder by B!Soft</generator>
    <title>Nature</title>
    <link>https://naturebeautii.blogspot.com/</link>
    <description>Beauty of my surrounding. </description>
    <language>en-us</language>
    <managingEditor>yash.joshi1006optimus@gmail.com</managingEditor>
    <webMaster>yash.joshi1006optimus@gmail.com</webMaster>
    <copyright>2019 YashJoshi</copyright>
    <image>
      <title>Nature</title>
      <link>https://naturebeautii.blogspot.com/</link>
      <url>https://3.bp.blogspot.com/-ypPNGdqse1k/WX6_17S5oEI/AAAAAAAAM/tIDApQW8-rY-N_oET8LJs9GoL6KHcZkpwCLcBGAs/w128-h128-p-k-no-nu/green-earth.jpg</url>
    </image>
    <item>
      <title>Nature Beast</title>
      <pubDate>Sat, 14 Dec 2019 09:36:23 +0500</pubDate>
      <link>https://naturebeautii.blogspot.com/2017/09/not-just-beautiful-thoughtthe-stars-are.html</link>
      <author>yash.joshi1006optimus@gmail.com</author>
      <comments>https://naturebeautii.blogspot.com/2017/09/not-just-beautiful-thoughtthe-stars-are.html</comments>
      <category>nature , beast</category>
      <description>
        <![CDATA[<FONT style="BACKGROUND-COLOR: #f3fdfe" color=#222222 size=4 face=Helvetica><em><strong>he stars are like the trees in the forest</strong></em></FONT>]]>
      </description>
    </item>
    <item>
      <title>&lt;new&gt;</title>
      <pubDate>Sat, 14 Dec 2019 09:24:35 +0500</pubDate>
      <description><![CDATA[ ]]></description>
    </item>
  </channel>
</rss>
```

Step 3 :- Go to Solution Explorer – Right Click – Add – New Item – Web Form. Within the div tag add a hyperlink to the rss.xml file as Click here for feed

C.C PRACTICAL NO. 7

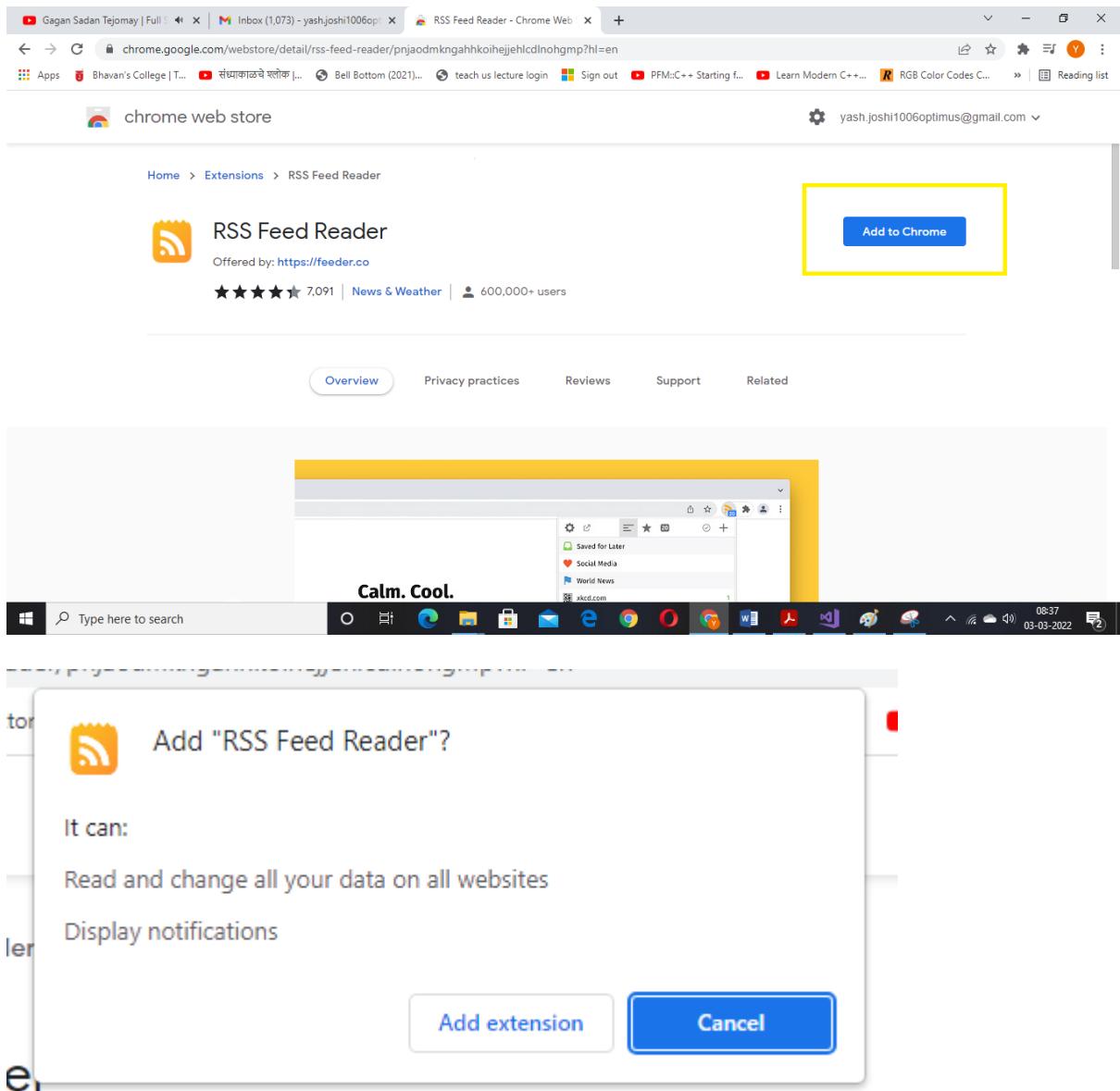


```
<%@ Page Language="C#" AutoEventWireup="true" CodeBehind="index.aspx" %>
<!DOCTYPE html>
<html xmlns="http://www.w3.org/1999/xhtml">
<head runat="server">
    <title></title>
</head>
<body>
    <form id="form1" runat="server">
        <div>
            <a href="rss.xml">Click here for feed</a>
        </div>
    </form>
</body>
</html>
```

Add the anchor tag between div tags.

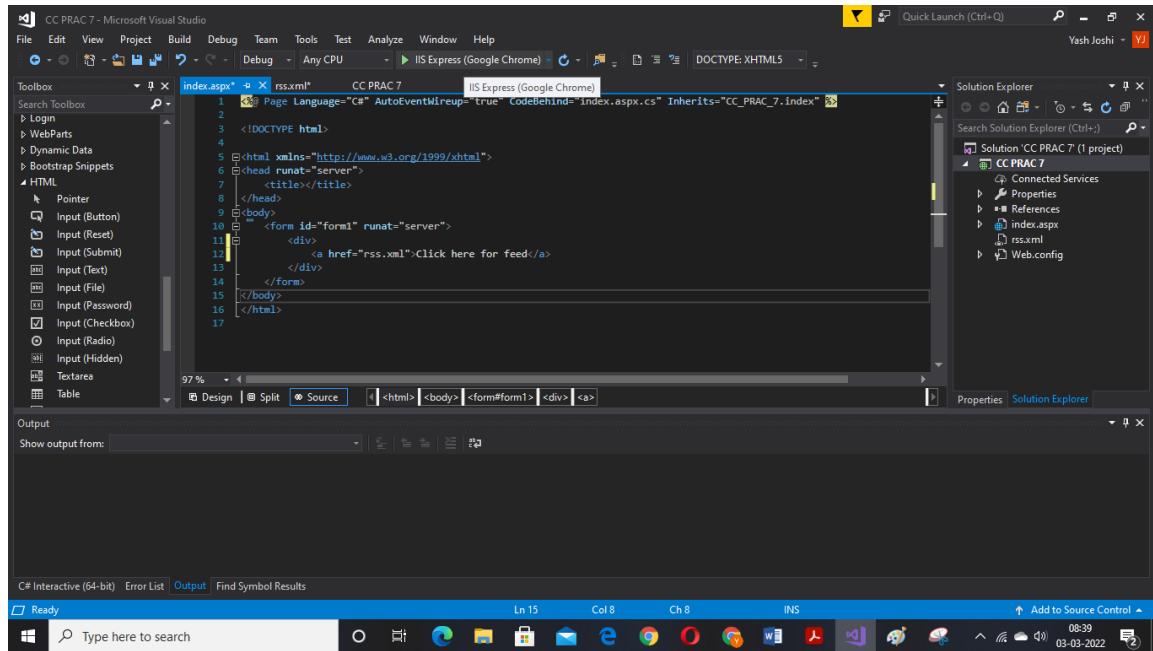
C.C PRACTICAL NO. 7

Step 5 :- Download RSS Feed Reader on your browser, As an extension in your browser

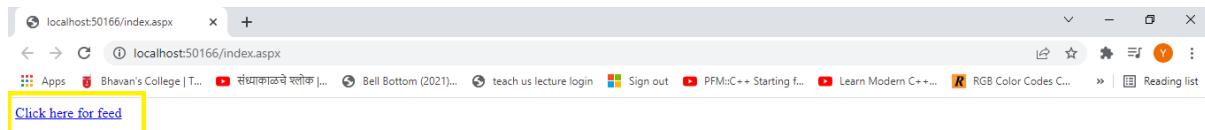


C.C PRACTICAL NO. 7

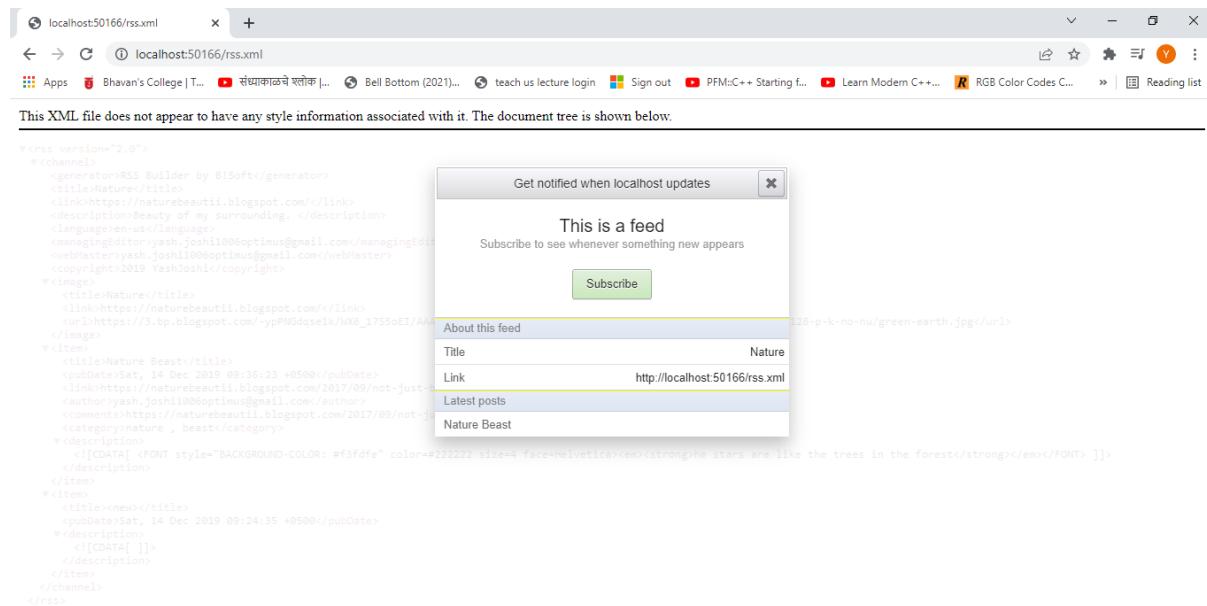
Step 6 :- Run the Code from Visual Studio



Click It !!!



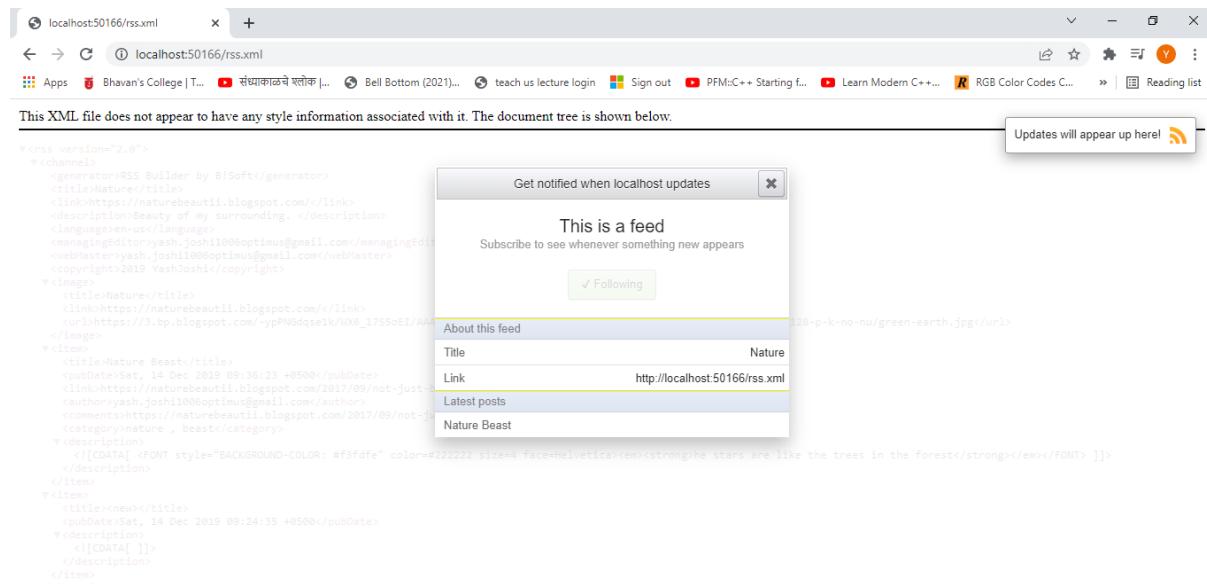
C.C PRACTICAL NO. 7



This XML file does not appear to have any style information associated with it. The document tree is shown below.

```
<?xml version="1.0"?>
<channel>
  <generator>RSS Builder by BiSoft</generator>
  <title>Nature</title>
  <link>https://naturebeautifl.blogspot.com/</link>
  <description>Beauty of my surrounding. </description>
  <language>en-us</language>
  <managingEditor>yash.joshi1000optimus@gmail.com</managingEditor>
  <webMaster>yash.joshi1000optimus@gmail.com</webMaster>
  <copyright>2019 YashJoshi</copyright>
  <image>
    <title>Nature</title>
    <link>https://naturebeautifl.blogspot.com/</link>
    <url>https://3.bp.blogspot.com/-ypPMGdseik/XK6_1755oEI/AA...</url>
  </image>
  <item>
    <title>Nature Beast</title>
    <pubDate>Sat, 14 Dec 2019 09:26:23 +0500</pubDate>
    <link>https://naturebeautifl.blogspot.com/2017/09/not-just...</link>
    <author>yash.joshi1000optimus@gmail.com</author>
    <comments>https://naturebeautifl.blogspot.com/2017/09/not-ji...</comments>
    <category>nature , beast</category>
    <description>
      <![CDATA[ <font style="BACKGROUND-COLOR: #f3fdfe" color="#222222" size=4 face="Helvetica"><em><strong>he stars are like the trees in the forest</strong></em></font> ]]>
    </description>
  </item>
  <item>
    <title>newx</title>
    <pubDate>Sat, 14 Dec 2019 09:24:35 +0500</pubDate>
    <description>
      <![CDATA[ ]]>
    </description>
  </item>
</channel>
</rss>
```

Click on Subscribe, you will see the updates will appear up here pop-up and then click on RSS FEED READER Extension, Click on Nature to get redirected

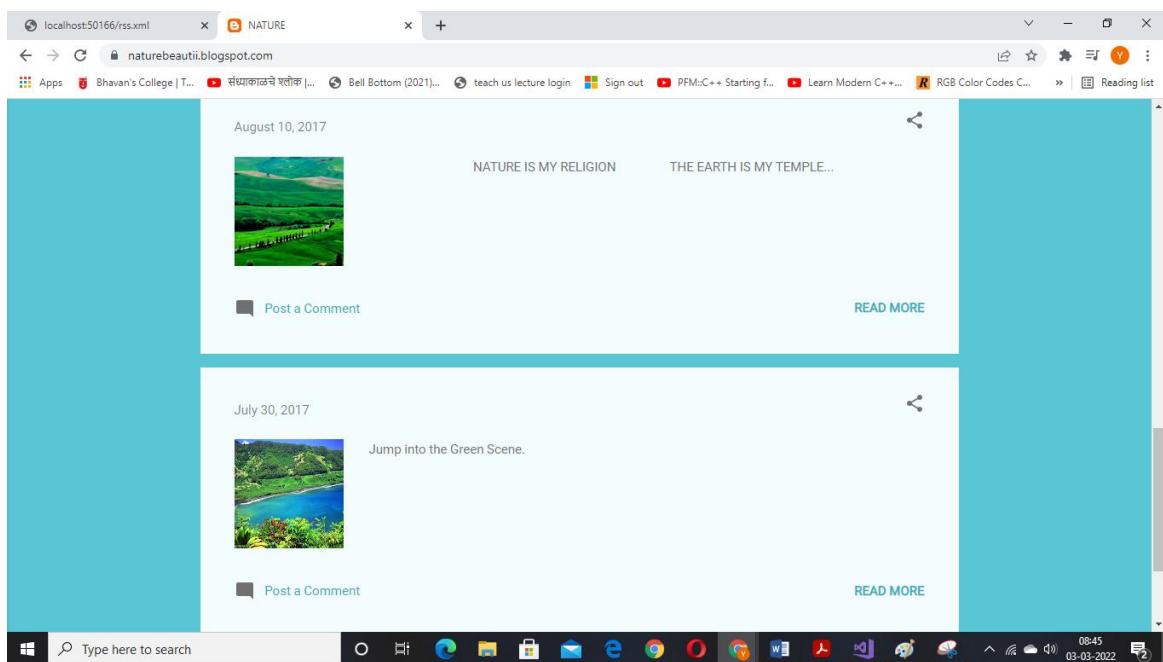
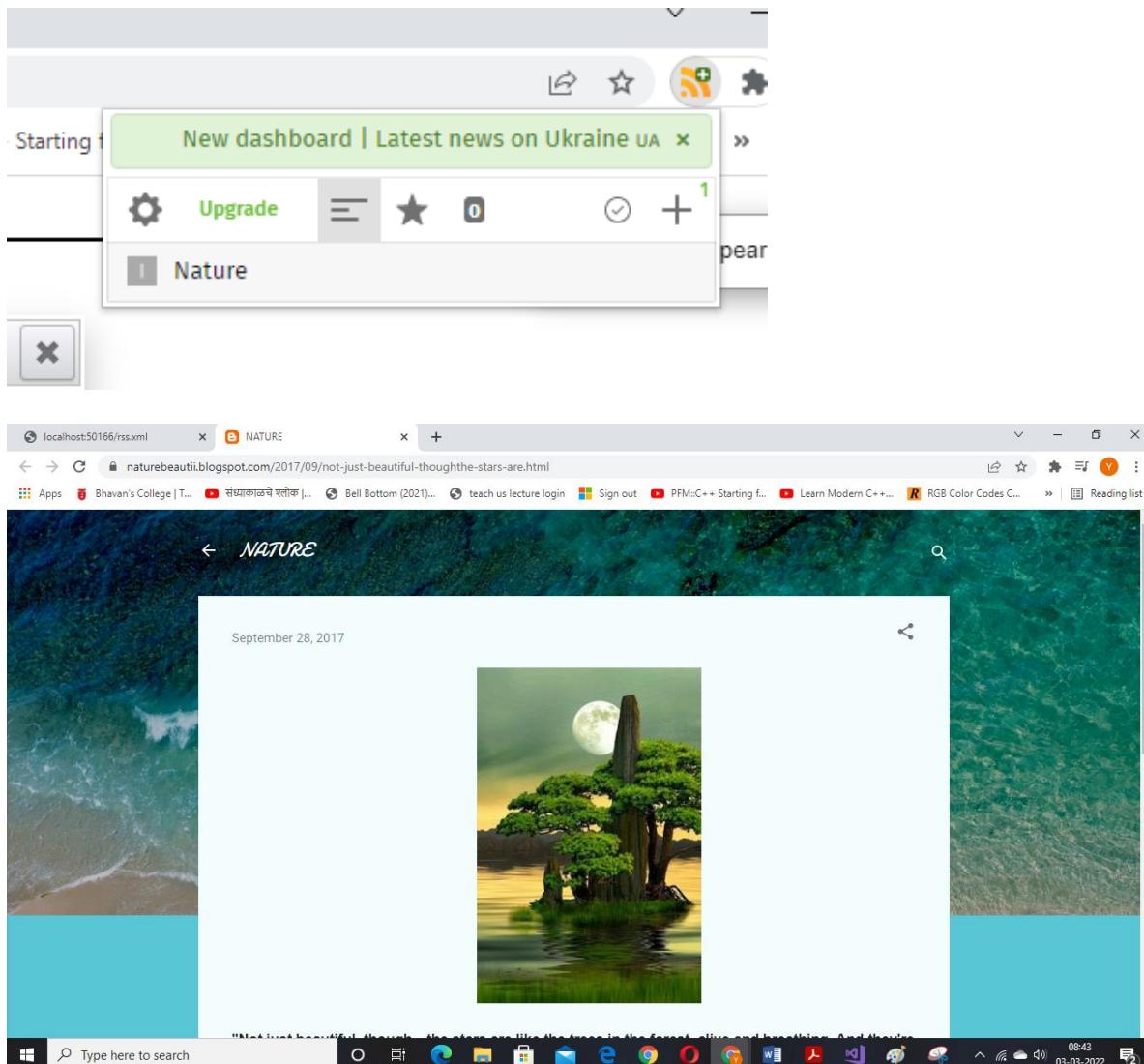


This XML file does not appear to have any style information associated with it. The document tree is shown below.

```
<?xml version="1.0"?>
<channel>
  <generator>RSS Builder by BiSoft</generator>
  <title>Nature</title>
  <link>https://naturebeautifl.blogspot.com/</link>
  <description>Beauty of my surrounding. </description>
  <language>en-us</language>
  <managingEditor>yash.joshi1000optimus@gmail.com</managingEditor>
  <webMaster>yash.joshi1000optimus@gmail.com</webMaster>
  <copyright>2019 YashJoshi</copyright>
  <image>
    <title>Nature</title>
    <link>https://naturebeautifl.blogspot.com/</link>
    <url>https://3.bp.blogspot.com/-ypPMGdseik/XK6_1755oEI/AA...</url>
  </image>
  <item>
    <title>Nature Beast</title>
    <pubDate>Sat, 14 Dec 2019 09:26:23 +0500</pubDate>
    <link>https://naturebeautifl.blogspot.com/2017/09/not-just...</link>
    <author>yash.joshi1000optimus@gmail.com</author>
    <comments>https://naturebeautifl.blogspot.com/2017/09/not-ji...</comments>
    <category>nature , beast</category>
    <description>
      <![CDATA[ <font style="BACKGROUND-COLOR: #f3fdfe" color="#222222" size=4 face="Helvetica"><em><strong>he stars are like the trees in the forest</strong></em></font> ]]>
    </description>
  </item>
  <item>
    <title>newx</title>
    <pubDate>Sat, 14 Dec 2019 09:24:35 +0500</pubDate>
    <description>
      <![CDATA[ ]]>
    </description>
  </item>
</channel>
</rss>
```



C.C PRACTICAL NO. 7



C.C PRACTICAL NO. 8

Aim :- Study and implementation of Single-Sing-On.

THEORY/NOTES:

Auth0 provides authentication and authorization as a service.

You can connect any application (written in any language or on any stack) to Auth0 and define the identity providers you want to use (how you want your users to log in).

Based on your app's technology, choose one of the SDKs (or call our API), and hook it up to your app. Now each time a user tries to authenticate, Auth0 will verify their identity and send the required information back to your app.

The platform works well for developers and allows them to authenticate APIs and apps with various identity providers on different platforms.

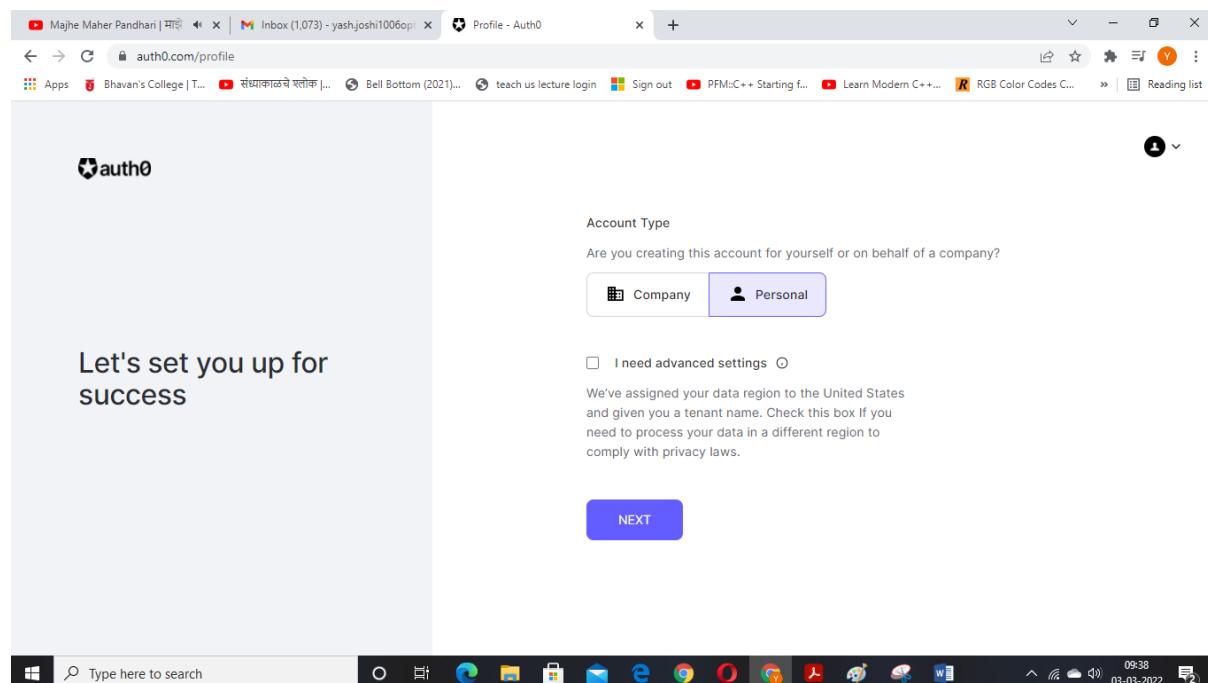
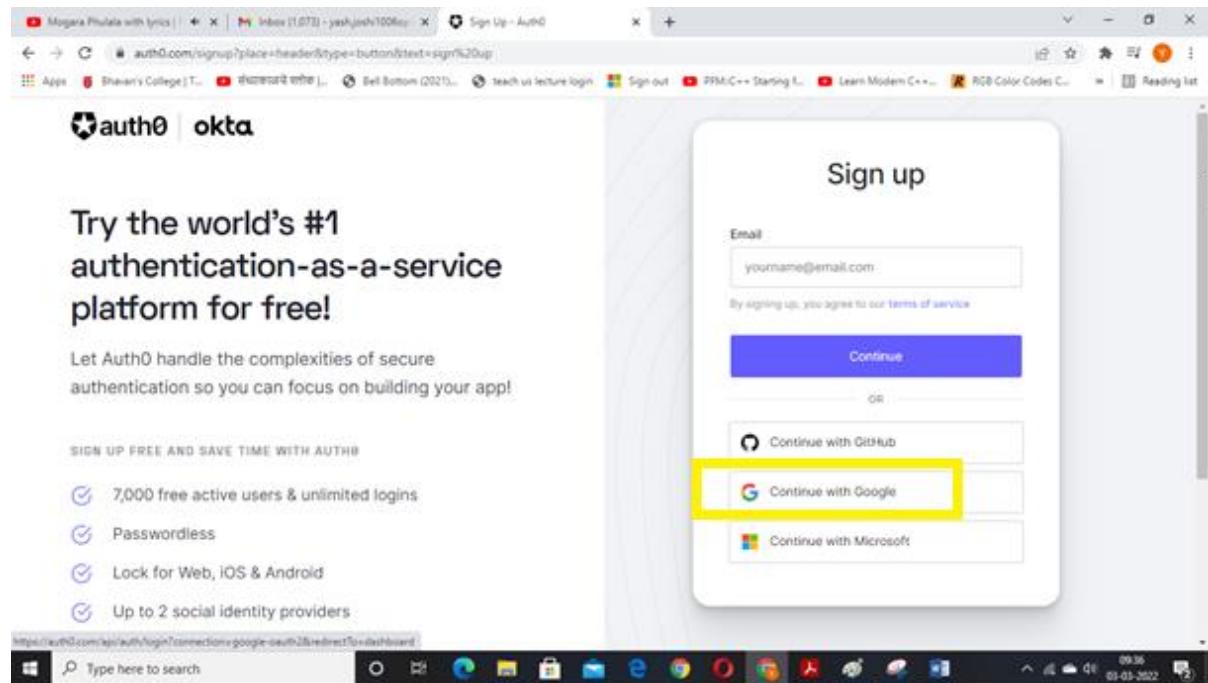
Auth0 helps you to:

- ✓ Add authentication with multiple authentication sources, either social like Google, Facebook, Microsoft Account, LinkedIn, GitHub, Twitter, Box, Salesforce, among others, or enterprise identity systems like Windows Azure AD, Google Apps, Active Directory, ADFS or any SAML Identity Provider.
- ✓ Add authentication through more traditional username/password databases.
- ✓ Add support for linking different user accounts with the same user.
- ✓ Support for generating signed Json Web Tokens to call your APIs and flow the user identity securely.
- ✓ Analytics of how, when and where users are logging in.
- ✓ Pull data from other sources and add it to the user profile, through JavaScript rules.

C.C PRACTICAL NO. 8

Step 1 :- Create a free account in Auth0

1. Go to Auth0 and click Sign Up.
2. Use Google, GitHub or Microsoft Account to login. I have used Google



C.C PRACTICAL NO. 8

The screenshot shows the Auth0 dashboard with the URL <https://manage.auth0.com/dashboard/us/dev-sgu5bdmd/>. The left sidebar is titled 'dev-sgu5bdmd' and includes sections like Getting Started, Activity, Applications, Authentication, Organizations, User Management, Branding, Security, Actions, Auth Pipeline, Monitoring, Marketplace, Extensions, Settings, and Get support. The 'User Management' section is currently selected. The main content area displays a 'Getting Started' section with two cards: 'Try your Login box' and 'Invite your team members'. A small screenshot of a login interface is shown next to the first card. The bottom of the screen shows a Windows taskbar with various icons.

Step 2 :- Click on User Management – Users – Create User. Add the credentials and click on Create. New user will be created.

The screenshot shows the Auth0 dashboard with the URL <https://manage.auth0.com/dashboard/us/dev-sgu5bdmd/users>. The left sidebar is the same as the previous screenshot. The 'User Management' section is selected, and the 'Users' sub-section is highlighted. The main content area displays a message 'You don't have any users yet.' with a note: 'All of your users will be found here, regardless of the authentication method they use to access your applications.' A large blue '+ Create User' button is centered. The bottom of the screen shows a Windows taskbar.

C.C PRACTICAL NO. 8

Create user

Email *

yash.joshi1006optimus@gmail.com

Password *

.....

Repeat Password *

.....

Connection *

Username-Password-Authentication

Cancel

Create

The screenshot shows the 'User Details' page in the Auth0 dashboard. The user has been created with the following details:

Name	Email	Signed Up
yash.joshi1006optimus@gmail.com	yash.joshi1006optimus@gmail.com (pending)	March 3rd 2022, 10:05:26 AM

Primary Identity Provider: Database
Latest Login: Never
Accounts Associated: None
Browser: Other 0.0.0 / Other 0.0.0

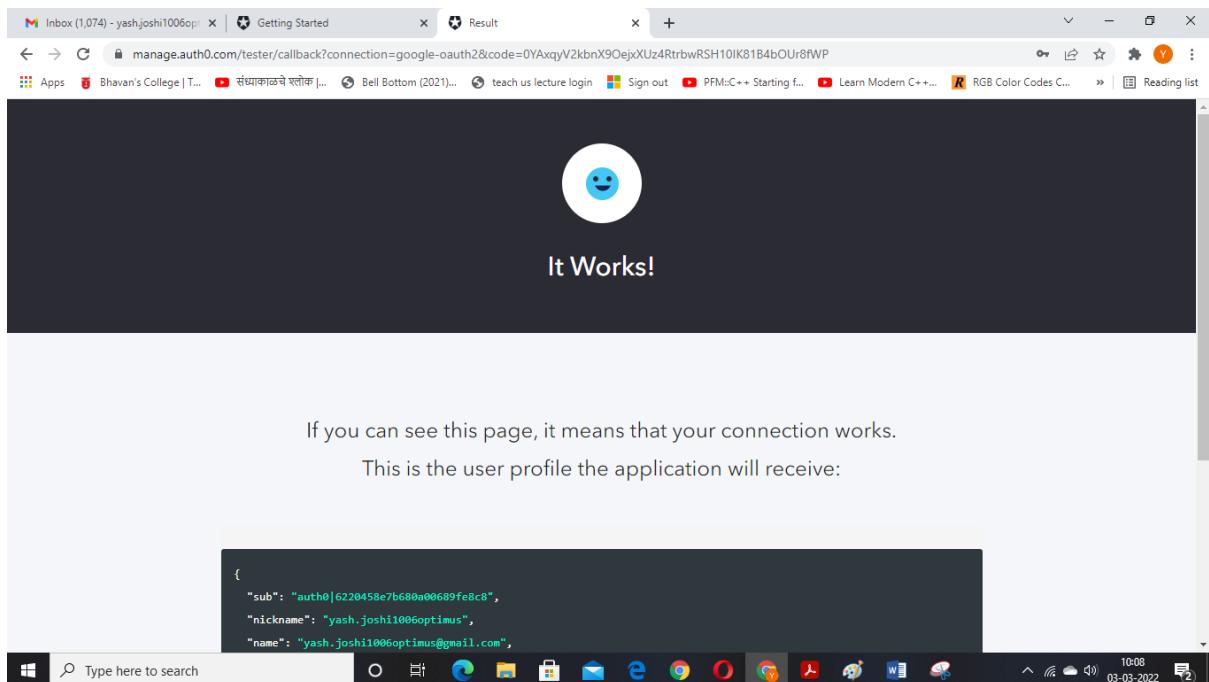
C.C PRACTICAL NO. 8

Step 3 :- Go to Welcome to Auth0 window. Go to Try your Login Box – Try it out. Enter your Username and password.

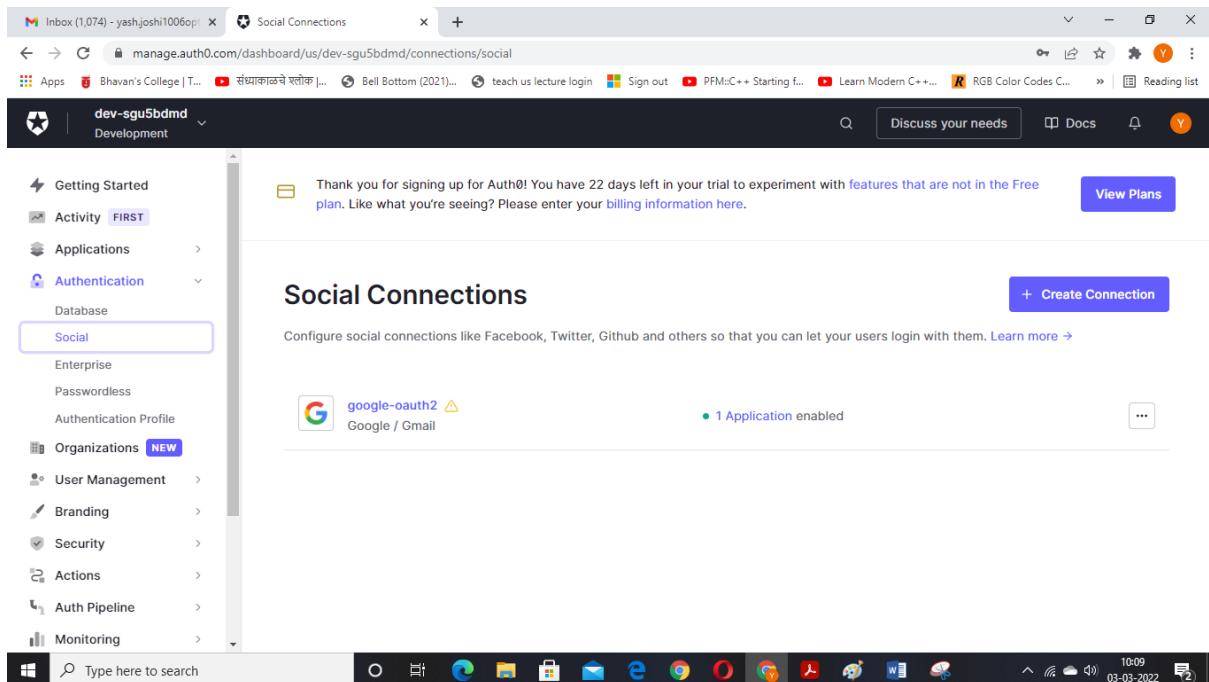
The screenshot shows the 'Getting Started' page of the Auth0 dashboard. On the left, there's a sidebar with various navigation options like Activity, Applications, Authentication, Organizations, User Management, Branding, Security, Actions, Auth Pipeline, Monitoring, Marketplace, Extensions, Settings, and Get support. The main content area is titled 'Getting Started' and contains two sections: 'Try your Login box' and 'Invite your team members'. The 'Try your Login box' section includes a button labeled 'Try it out' which is highlighted with a yellow box in the screenshot. To the right of this section is a preview window showing a login form with fields for 'Email' (user@email.com) and 'Password'. Below these sections, there's a link to 'Integrate Auth0 into your application'.

The screenshot shows the 'Welcome' screen of the Auth0 login interface. It features a logo at the top, followed by the word 'Welcome'. Below that is a message: 'Log in to dev-sgu5bdmd to continue to All Applications.' There are input fields for 'Email address' (yash.joshi1006optimus@gmail.com) and 'Password' (represented by a series of dots). Below the password field is a 'Forgot password?' link. A large blue 'Continue' button is centered at the bottom. At the very bottom, there's a link for users who don't have an account: 'Don't have an account? Sign up'. A red warning icon is visible in the top right corner of the browser window.

C.C PRACTICAL NO. 8



Step 4 :- Configure your social connections



C.C PRACTICAL NO. 8

Step 5 :- Go to Authentication – Social – +Create Connection – Facebook – Continue. Just leave the next page as is, scroll down and click on Create

The screenshot shows the Auth0 dashboard with the URL manage.auth0.com/dashboard/us/dev-sgu5bdmd/connections/social. The left sidebar is expanded, showing the 'Authentication' section with 'Social' selected. A yellow box highlights the 'Social' option. The main content area is titled 'Social Connections' and contains a message: 'Thank you for signing up for Auth0! You have 22 days left in your trial to experiment with features that are not in the Free plan. Like what you're seeing? Please enter your [billing information here](#)'. A blue button labeled '+ Create Connection' is highlighted with a yellow box. Below it, there's a card for 'google-oauth2' which is enabled for 'Google / Gmail'. The system status bar at the bottom shows the date as 03-03-2022 and the time as 10:10.

Click on continue

The screenshot shows the 'New Facebook Social Connection' setup page. The URL is manage.auth0.com/dashboard/us/dev-sgu5bdmd/connections/social/create/facebook. The left sidebar shows the 'Authentication' section with 'Social' selected. The main content area is titled 'Facebook Social Connection by Auth0' and lists three permissions: 'Redirect users to login at Facebook', 'Receive and store user identities from Facebook', and 'Update user root profiles with data from Facebook'. At the bottom, there are 'Continue' and 'Cancel' buttons. A note at the bottom states: 'By continuing, you grant the integration access to the permissions listed above and consent to the integration's Terms of Use and Privacy Policy. By continuing you also agree to Auth0's Marketplace Terms of Use'. The system status bar at the bottom shows the date as 03-03-2022 and the time as 10:31.

C.C PRACTICAL NO. 8

The screenshot shows the Auth0 dashboard with the URL `manage.auth0.com/dashboard/us/dev-sgu5bdmd/connections/social/create/facebook`. On the left sidebar, under the 'Authentication' section, the 'Facebook' option is selected. The main panel displays the 'New Facebook Social Connection' configuration page. The 'General' tab is active, showing fields for 'Name' (set to 'facebook'), 'App ID' (left blank), and 'App Secret' (left blank). A note indicates that leaving the App ID and App Secret blank will use Auth0's dev keys. To the right, a sidebar provides information about the Facebook social connection, stating it allows users to log in using their Facebook profile. It also mentions that Auth0 automatically syncs user profile data with each login. A 'Setup guide' button is located in the top right corner of the main panel.

Leave all the options default and click create

The screenshot shows the continuation of the Facebook social connection setup. The 'Permissions' section is visible, listing various Graph API permissions with checkboxes. The permissions listed are: manage_notifications, publish_actions, read_stream, read_mailbox, user_groups, user_managed_groups, and user_status. Below this, a note states that these permissions are only available for applications using Graph API version v2.3 or older. The 'Advanced' section contains a toggle switch for 'Sync user profile attributes at each login' and a 'Create' button. The rest of the dashboard interface, including the sidebar and taskbar, remains consistent with the previous screenshot.

C.C PRACTICAL NO. 8

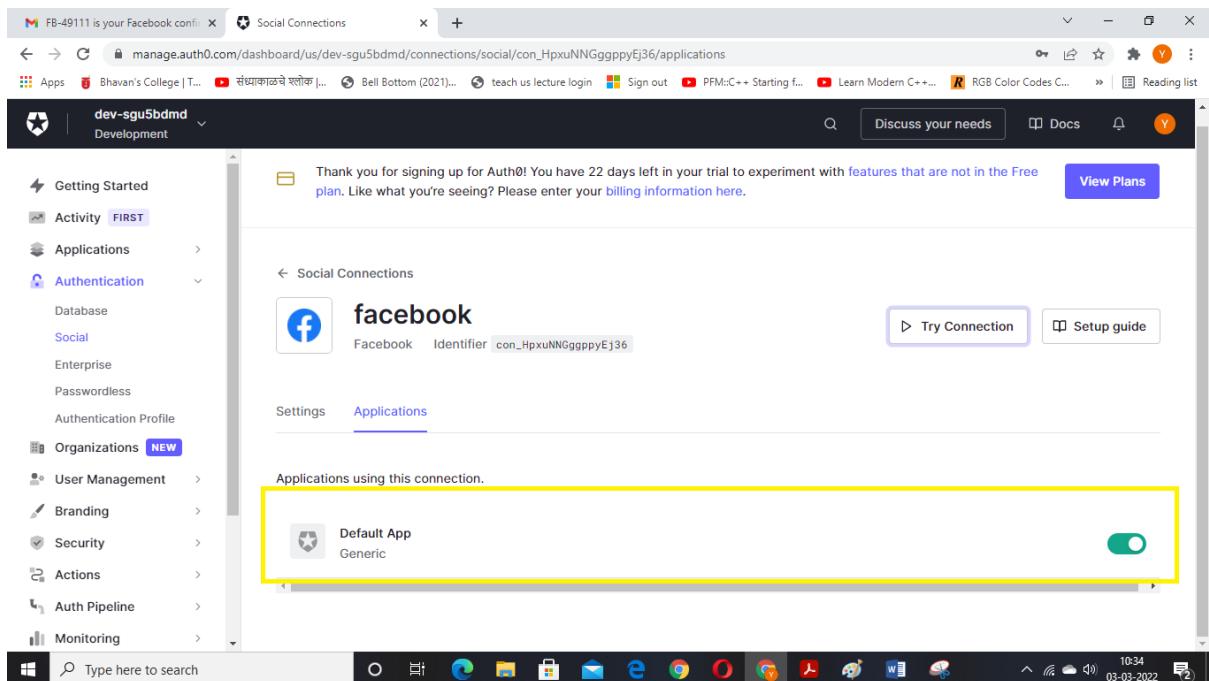
The screenshot shows the Auth0 dashboard with the URL https://manage.auth0.com/dashboard/us/dev-sgu5bdmd/connections/social/con_HpxuNNGggppyEj36/applications. On the left sidebar, under the 'Social' section, 'Facebook' is selected. The main panel displays the 'facebook' connection details, including its identifier 'con_HpxuNNGggppyEj36'. A 'Try Connection' button is highlighted with a yellow box. The status bar at the bottom shows the date and time as '03-03-2022 10:32'.

Step 6 :- On the created connection click on Try Connection. Enter your Facebook details and click Continue. OAuth will ask for some permissions allow it and continue. Your connection is established.

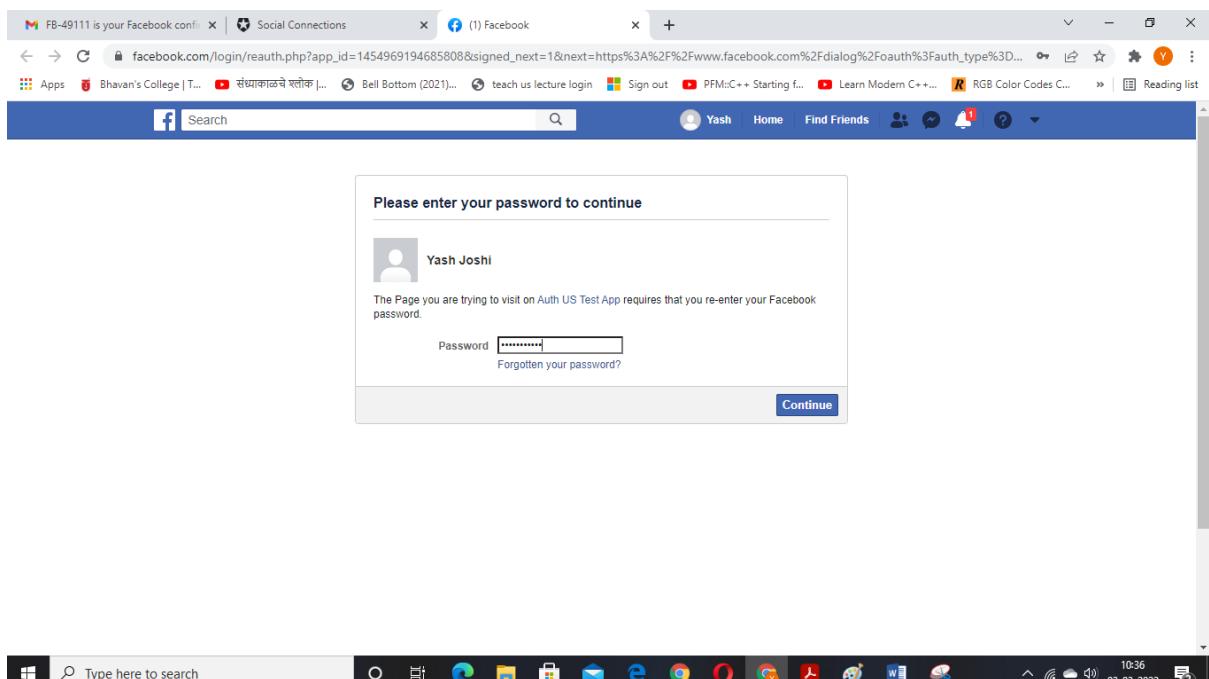
This screenshot is identical to the one above, but the 'Try Connection' button for the Facebook connection is now highlighted with a yellow box, indicating it has been clicked.

C.C PRACTICAL NO. 8

Turn on the Default App option

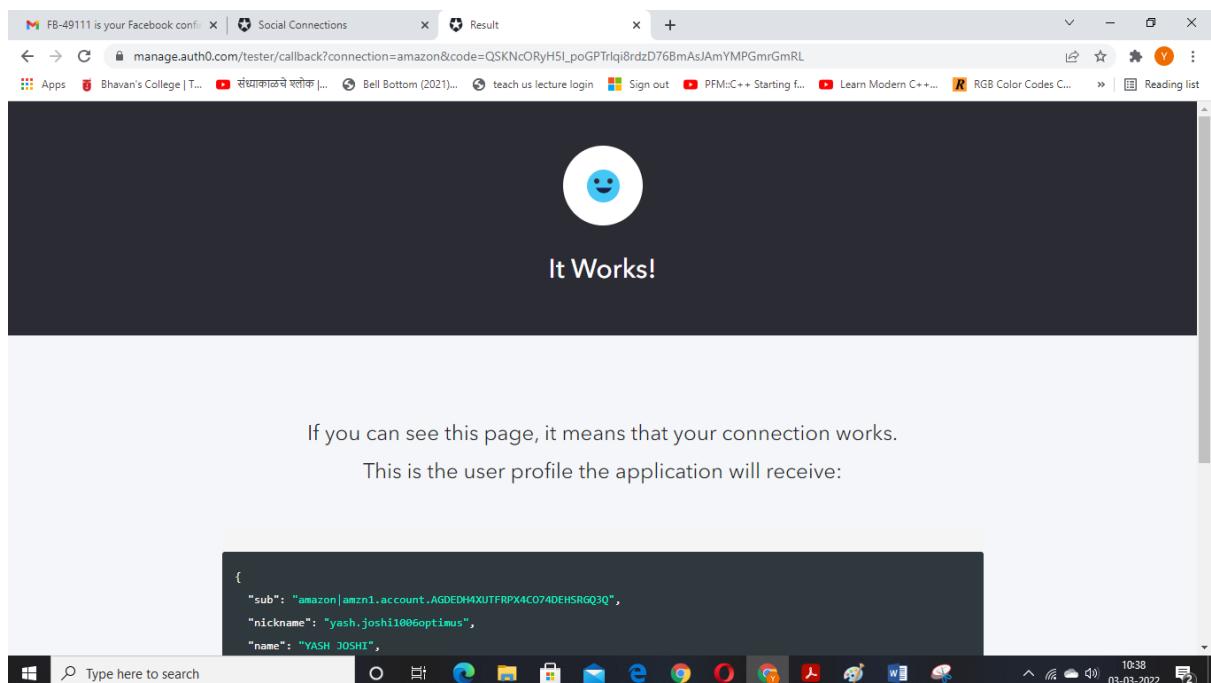
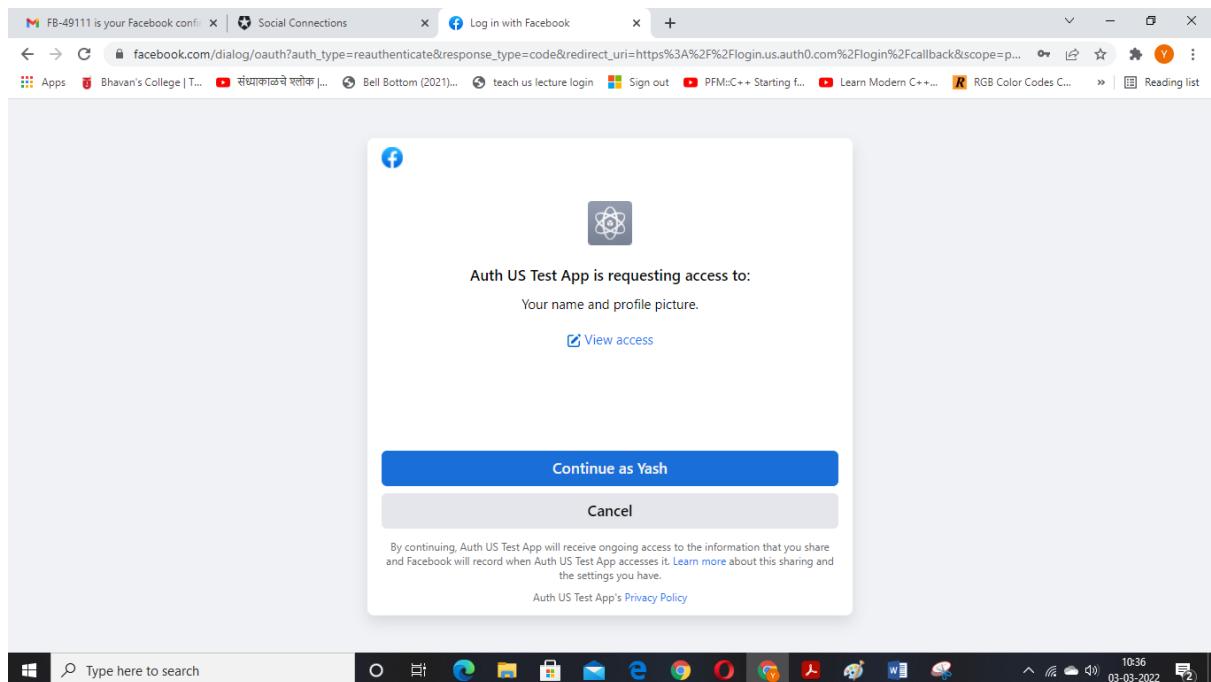


The screenshot shows the Auth0 dashboard under the 'Social Connections' section for a Facebook connection. On the left sidebar, 'Organization' is selected. In the main area, it shows 'Facebook' with the identifier 'con_HpxuNNGgpppyEj36'. Below this, under 'Applications', there is a list titled 'Applications using this connection.' It contains one item: 'Default App Generic'. This item is highlighted with a yellow box, and its toggle switch is turned on.



The screenshot shows a Microsoft Edge browser window displaying a password re-enter dialog box from Facebook. The dialog box has a title 'Please enter your password to continue'. It shows a profile picture of 'Yash Joshi' and a note: 'The page you are trying to visit on Auth US Test App requires that you re-enter your Facebook password.' Below this is a password input field with the placeholder 'Password' and a redacted password. There is also a link 'Forgotten your password?'. At the bottom right of the dialog is a blue 'Continue' button.

C.C PRACTICAL NO. 8



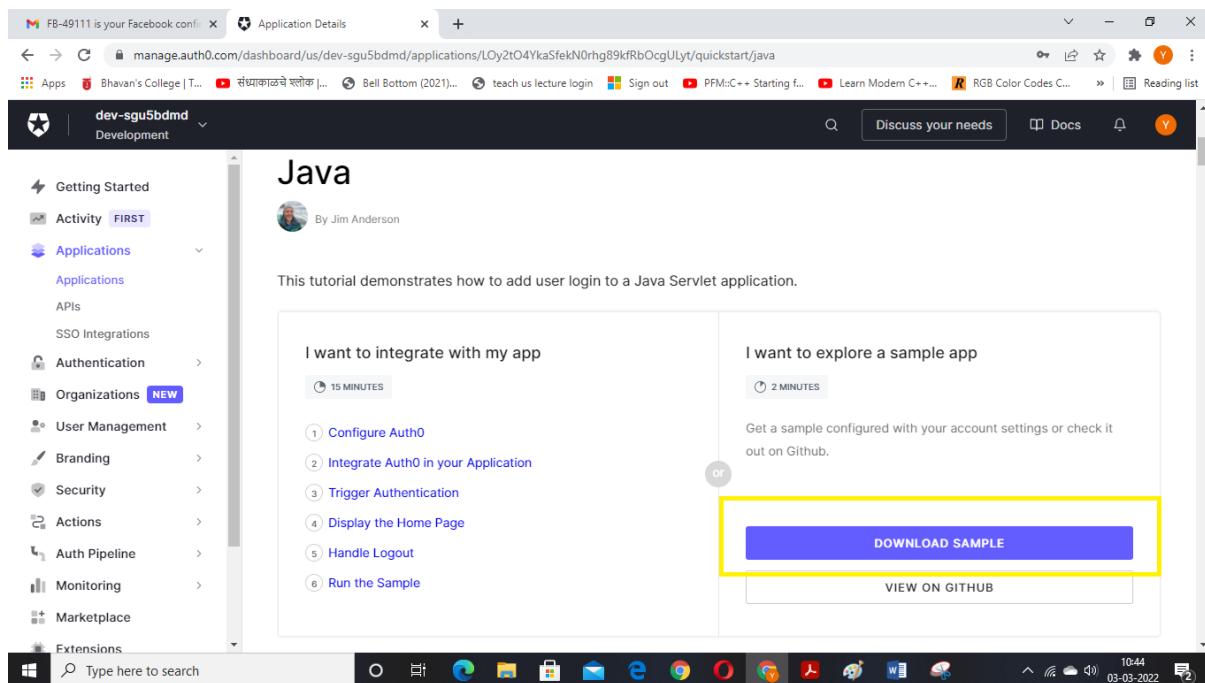
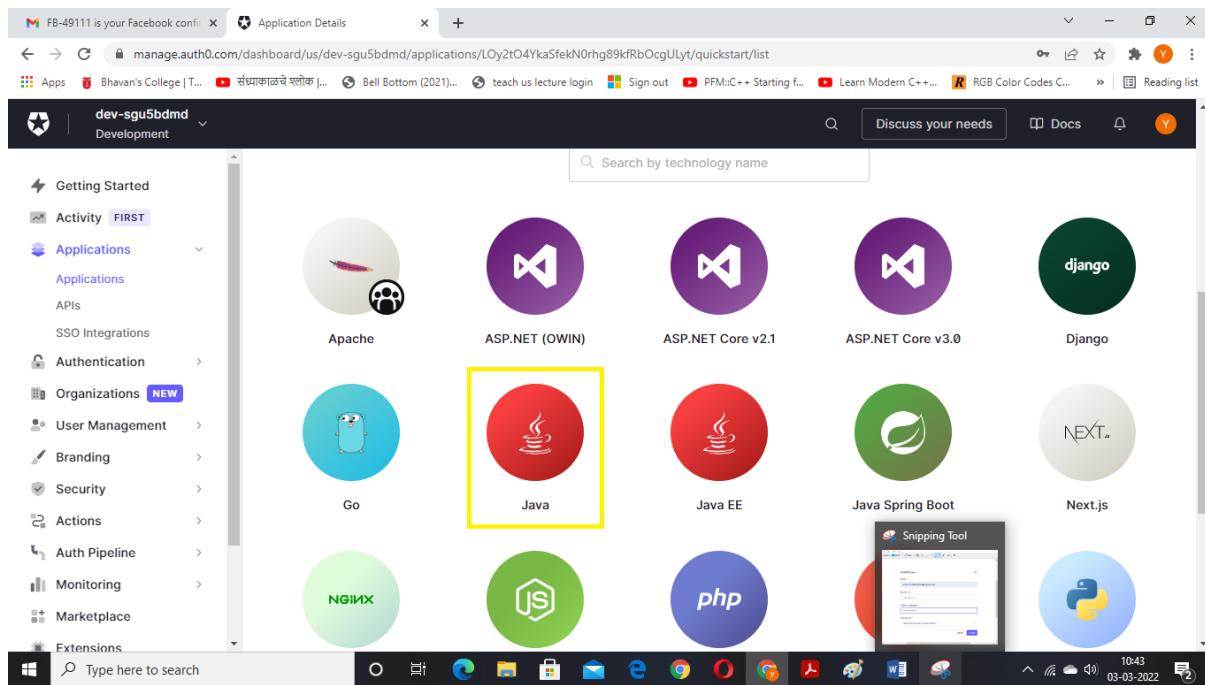
C.C PRACTICAL NO. 8

Step 7 :- To create an application click on Applications – Create Application – Regular Web Applications – Create. Select the technology for your web app: Java after which you application will be created. Click on Download the sample and extract it.

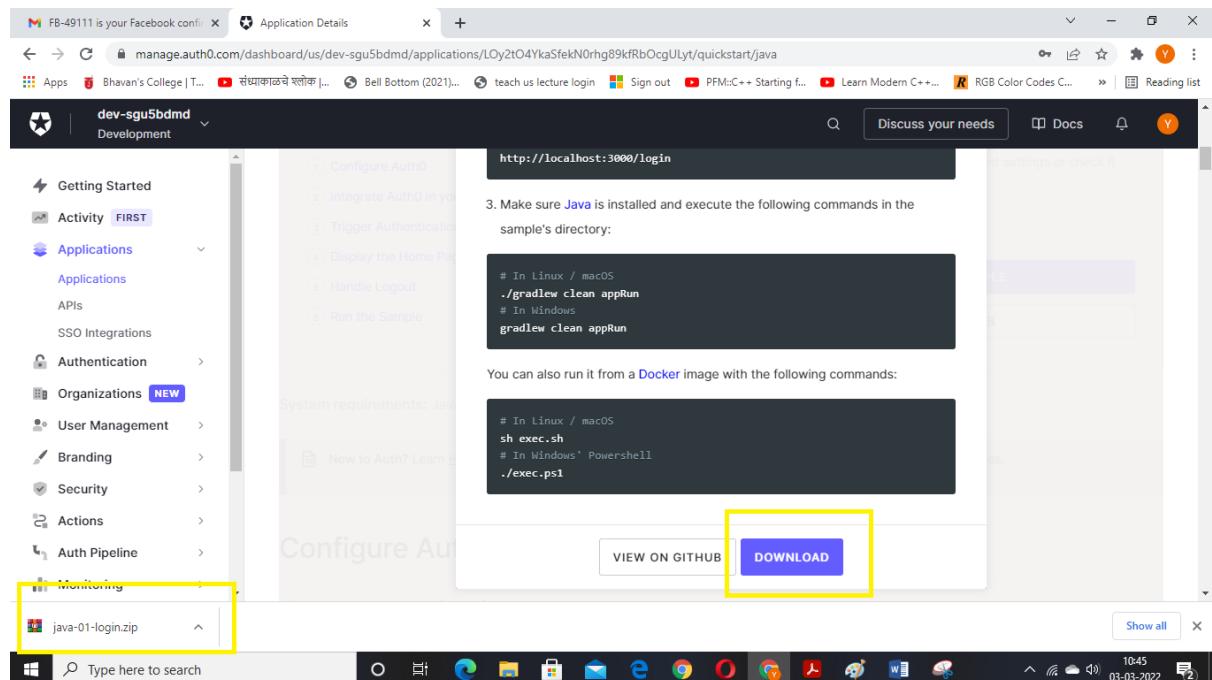
The screenshot shows the Auth0 dashboard with the URL <https://manage.auth0.com/dashboard/us/dev-sgu5bdmd/applications>. The left sidebar is collapsed, and the main area shows the 'Applications' section. A yellow box highlights the 'Applications' button in the sidebar. A second yellow box highlights the '+ Create Application' button in the top right corner of the main content area. The content area displays a message about a 22-day trial and a 'Default App' entry with a Client ID.

The screenshot shows the 'Create application' dialog box overlaid on the Auth0 dashboard. The dialog has a 'Name *' field containing 'My App'. Below it, a note says 'You can change the application name later in the application settings.' The 'Choose an application type' section contains four options: 'Native' (Mobile, desktop, CLI and smart device apps), 'Single Page Web Applications' (A JavaScript front-end app), 'Regular Web Applications' (Traditional web app using), and 'Machine to Machine Applications' (CLIs, daemons or). The 'Regular Web Applications' option is selected and highlighted with a blue border. At the bottom of the dialog are 'Cancel' and 'Create' buttons.

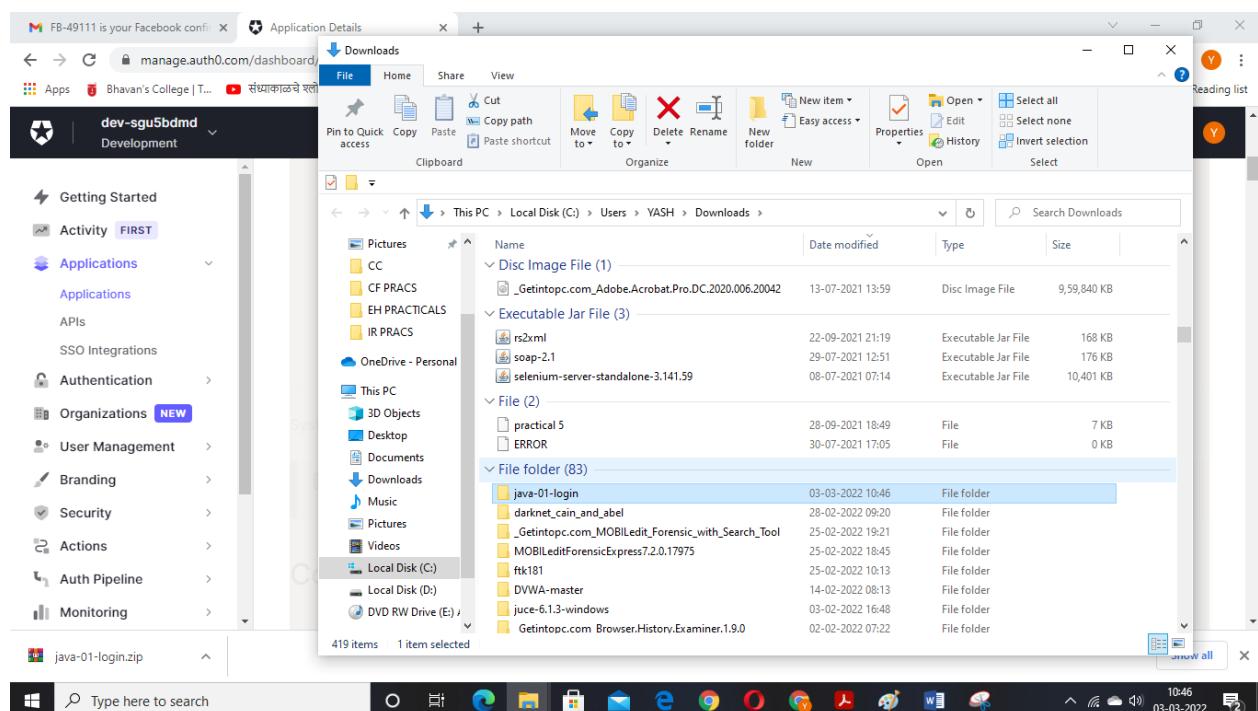
C.C PRACTICAL NO. 8



C.C PRACTICAL NO. 8



Extract the file



C.C PRACTICAL NO. 8

Step 8 :- Go to applications settings and copy-paste the callback and logout URL.

The screenshot shows the Auth0 Application Details page for a Java application. The sidebar lists various application settings like Getting Started, Activity, Applications, Authentication, Organizations, User Management, Branding, Security, Actions, Auth Pipeline, and Monitoring. The main content area displays instructions for setting up the application. It includes a note about downloading a sample configuration for 'My App'. Step 1: Set the Allowed Callback URLs in the Application Settings to `http://localhost:3000/callback`. Step 2: Set the Allowed Logout URLs in the Application Settings to `http://localhost:3000/login`. Step 3: Make sure Java is installed and execute the following commands in the sample's directory:
In Linux / macOS
./gradlew clean appRun
In Windows
gradlew clean appRun

The screenshot shows the Auth0 Application Details page for a Java application. The sidebar lists various application settings. The main content area shows the configuration of Allowed Callback URLs and Allowed Logout URLs. The Allowed Callback URLs field contains `http://localhost:3000/callback`. The Allowed Logout URLs field contains `http://localhost:3000/login`. A note at the top states: "In some scenarios, Auth0 will need to redirect to your application's login page. This URI needs to point to a route in your application that should redirect to your tenant's /authorize endpoint. [Learn more](#)". Below the fields, a note says: "After the user authenticates we will only call back to any of these URLs. You can specify multiple valid URLs by comma-separating them (typically to handle different environments like QA or testing). Make sure to specify the protocol (`https://`) otherwise the callback may fail in some cases. With the exception of custom URI schemes for native clients, all callbacks should use protocol `https://`. You can use [Organization URL](#) parameters in these URLs." At the bottom, it says: "A set of URLs that are valid to redirect to after logout from Auth0. After a user".

Copy Paste both the URL's in the application settings as mentioned above in the image

C.C PRACTICAL NO. 8

Step 9 :- In command prompt switch to the folder containing the downloaded and extracted folder(01-login). Next type the command gradlew clean appRun

```
Command Prompt - gradlew clean appRun
Microsoft Windows [Version 10.0.19042.631]
(c) 2020 Microsoft Corporation. All rights reserved.

C:\Users\YASH>cd C:\Users\YASH\Downloads\java-01-login\01-login

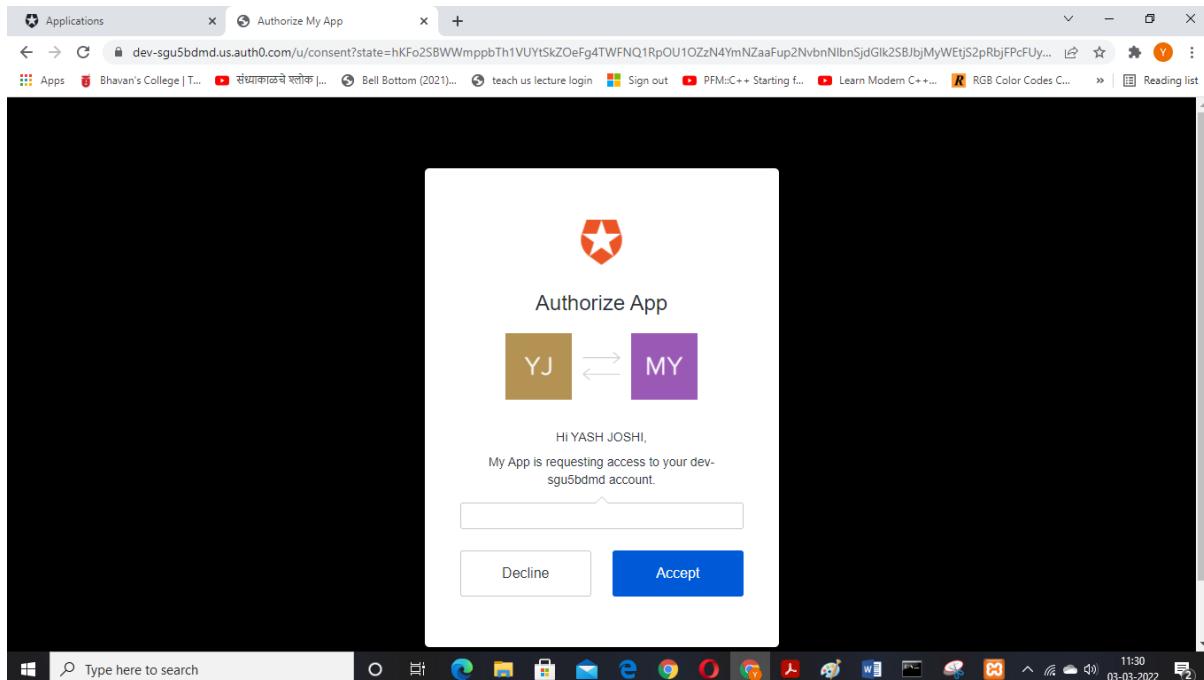
C:\Users\YASH\Downloads\java-01-login\01-login>gradlew clean appRun
Starting a Gradle Daemon (subsequent builds will be faster)
Download https://jcenter.bintray.com/org/akhikhl/gretty/gretty/2.0.0/gretty-2.0.0.pom
Download https://jcenter.bintray.com/org/akhikhl/gretty/gretty-core/2.0.0/gretty-core-2.0.0.pom
Download https://jcenter.bintray.com/org/springframework/boot/spring-boot-loader-tools/1.5.4.RELEASE/spring-boot-loader-tools-1.5.4.RELEASE.pom
Download https://jcenter.bintray.com/org/springframework/boot/spring-boot-tools/1.5.4.RELEASE/spring-boot-tools-1.5.4.RELEASE.pom
Download https://jcenter.bintray.com/org/springframework/boot/spring-boot-parent/1.5.4.RELEASE/spring-boot-parent-1.5.4.RELEASE.pom
Download https://jcenter.bintray.com/org/springframework/boot/spring-boot-dependencies/1.5.4.RELEASE/spring-boot-dependencies-1.5.4.RELEASE.pom
Download https://jcenter.bintray.com/com/fasterxml/jackson/jackson-bom/2.8.8/jackson-bom-2.8.8.pom
Download https://jcenter.bintray.com/com/fasterxml/jackson/jackson-parent/2.8/jackson-parent-2.8.pom
Download https://jcenter.bintray.com/com/fasterxml/oss-parent/27/oss-parent-27.pom
Download https://jcenter.bintray.com/org/apache/logging/log4j/log4j-bom/2.7/log4j-bom-2.7.pom
Download https://jcenter.bintray.com/org/apache/apache/9/apache-9.pom
Download https://jcenter.bintray.com/org/springframework/spring-framework-bom/4.3.9.RELEASE/spring-framework-bom-4.3.9.RELEASE.pom
Download https://jcenter.bintray.com/org/springframework/data/spring-data-releasetrain/Ingalls-SR4/spring-data-releasetrain-Ingalls-SR4.pom
Download https://jcenter.bintray.com/org/springframework/data/build/spring-data-build/1.9.4.RELEASE/spring-data-build-1.9.4.RELEASE.pom
Download https://jcenter.bintray.com/org/springframework/integration/spring-integration-bom/4.3.10.RELEASE/spring-integration-bom-4.3.10.RELEASE.pom
```

```
Command Prompt - gradlew clean appRun
Download https://jcenter.bintray.com/ch/qos/logback/logback-classic/1.1.3/logback-classic-1.1.3.pom
Download https://jcenter.bintray.com/ch/qos/logback/logback-parent/1.1.3/logback-parent-1.1.3.pom
Download https://jcenter.bintray.com/org/slf4j/slf4j-api/1.7.12/slf4j-api-1.7.12.pom
Download https://jcenter.bintray.com/ch/qos/logback/logback-core/1.1.3/logback-core-1.1.3.pom
Download https://jcenter.bintray.com/org/akhikhl/gretty/gretty-runner-tomcat8/2.0.0/gretty-runner-tomcat8-2.0.0.jar
Download https://jcenter.bintray.com/org/akhikhl/gretty/gretty-runner-tomcat/2.0.0/gretty-runner-tomcat-2.0.0.jar
Download https://jcenter.bintray.com/org/apache/tomcat/embed/tomcat-embed-core/8.0.44/tomcat-embed-core-8.0.44.jar
Download https://jcenter.bintray.com/org/apache/tomcat/embed/tomcat-embed-el/8.0.44/tomcat-embed-el-8.0.44.jar
Download https://jcenter.bintray.com/org/apache/tomcat/embed/tomcat-embed-jasper/8.0.44/tomcat-embed-jasper-8.0.44.jar
Download https://jcenter.bintray.com/org/apache/tomcat/embed/tomcat-embed-logging-log4j/8.0.44/tomcat-embed-logging-log4j-8.0.44.jar
Download https://jcenter.bintray.com/org/apache/tomcat/embed/tomcat-embed-websocket/8.0.44/tomcat-embed-websocket-8.0.44.jar
Download https://jcenter.bintray.com/org/akhikhl/gretty/gretty-runner/2.0.0/gretty-runner-2.0.0.jar
Download https://jcenter.bintray.com/org/slf4j/log4j-over-slf4j/1.7.12/log4j-over-slf4j-1.7.12.jar
Download https://jcenter.bintray.com/org/eclipse/jdt/ecj/3.12.3/ecj-3.12.3.jar
Download https://jcenter.bintray.com/ch/qos/logback/logback-classic/1.1.3/logback-classic-1.1.3.jar
Download https://jcenter.bintray.com/org/slf4j/slf4j-api/1.7.12/slf4j-api-1.7.12.jar
Download https://jcenter.bintray.com/ch/qos/logback/logback-core/1.1.3/logback-core-1.1.3.jar
Mar 03, 2022 11:23:35 AM org.apache.coyote.AbstractProtocol init
INFO: Initializing ProtocolHandler ["http-nio-3000"]
Mar 03, 2022 11:23:40 AM org.apache.tomcat.util.net.NioSelectorPool getSharedSelector
INFO: Using a shared selector for servlet write/read
Mar 03, 2022 11:23:40 AM org.apache.catalina.core.StandardService startInternal
INFO: Starting service Tomcat
Mar 03, 2022 11:23:40 AM org.apache.catalina.core.StandardEngine startInternal
INFO: Starting Servlet Engine: Apache Tomcat/8.0.44
Mar 03, 2022 11:23:41 AM org.apache.catalina.startup.ContextConfig getDefaultWebXmlFragment
INFO: No global web.xml found
> Building 88% > :appRun
```

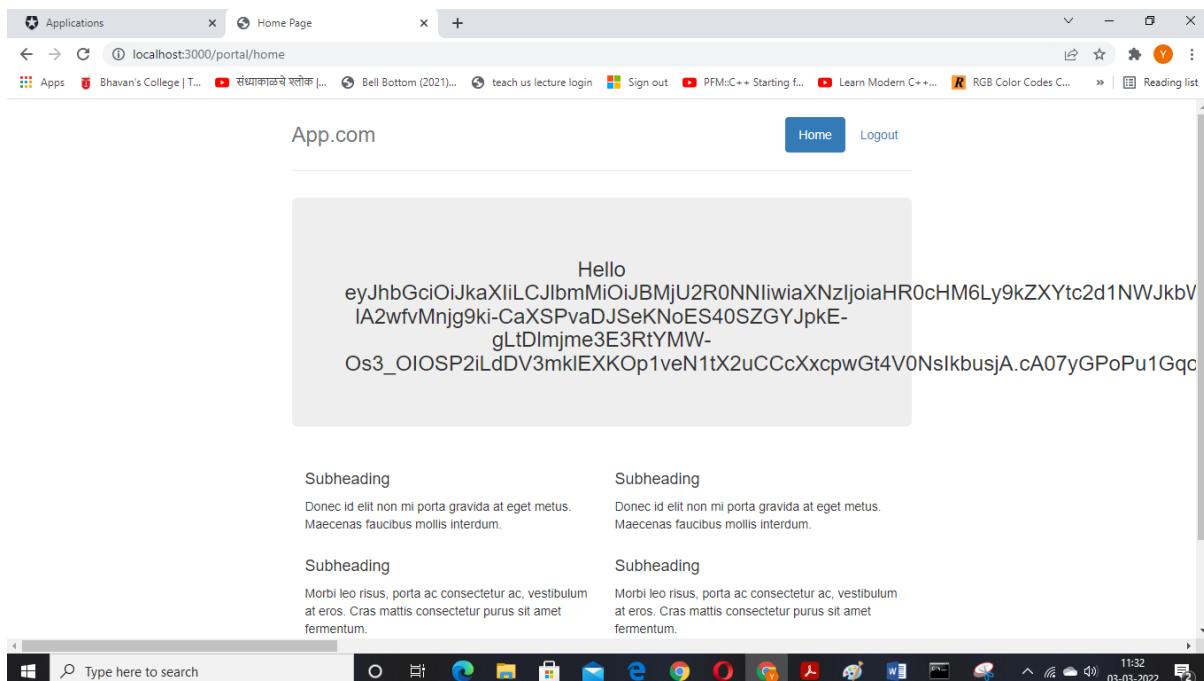
```
Mar 03, 2022 11:23:41 AM org.apache.catalina.core.StandardService startInternal
INFO: Starting service Tomcat
Mar 03, 2022 11:23:42 AM org.apache.catalina.core.StandardEngine startInternal
INFO: Starting Servlet Engine: Apache Tomcat/8.0.44
Mar 03, 2022 11:23:42 AM org.apache.coyote.AbstractProtocol init
INFO: Initializing ProtocolHandler ["http-nio-3000"]
11:23:42 INFO  Tomcat 8.0.44 started and
11:23:42 INFO  runs at:
11:23:42 INFO  http://localhost:3000
Press any key to stop the server.
> Building 88% > :appRun
```

C.C PRACTICAL NO. 8

Step 10 :- Once the server starts open your browser and type <http://localhost:3000/login> your application by clicking on Accept after which your homepage will appear



After Clicking on accept You will get this homepage



C.C PRACTICAL NO. 8

Step 11 :- Now go to the Activity and check the total users, applications,connections. logins and new sign-ups.

The screenshot shows the Auth0 dashboard with the 'Activity' tab selected. On the left, there's a sidebar with various navigation options like Getting Started, Activity, Applications, Authentication, etc. The main area displays activity statistics: Total Users (2), Applications (2), APIs (0), and Connections (4). Below these stats, there's a section for Active Users (0). At the top right, there are buttons for 'View Plans' and 'Compare to last period'. The status bar at the bottom shows it's 11:33 on 03-03-2022.

Step 12 :- Go to User Management – Universal Login if you wish to you can add organisations logo and other credentials.

The screenshot shows the Auth0 dashboard with the 'Universal Login' tab selected. The sidebar includes options like Getting Started, Activity, Applications, Authentication, Organizations, User Management, Branding, and Universal Login. The main content area compares the New Universal Login Experience (lightweight and faster, no JavaScript required) with the Classic Experience (based on Lock.js, more comprehensive features). The status bar at the bottom shows it's 11:35 on 03-03-2022.

C.C PRACTICAL NO. 8

The screenshot shows the Auth0 dashboard with the URL `manage.auth0.com/dashboard/us/dev-sgu5bdm/login_settings`. The left sidebar is titled "dev-sgu5bdm" and contains sections like "Getting Started", "Activity", "Applications", "Authentication", "Organizations", "User Management", "Branding", "Universal Login" (which is selected and highlighted in blue), "Custom Domains", "Email Templates", "Email Provider", "Security", "Actions", "Auth Pipeline", "Monitoring", and "Marketplace". The main panel shows a logo upload section with a placeholder "Your logo URL" and a "Primary Color" input set to "#635dff". Below it is a "Page Background Color" input set to "#000000". A "Save Changes" button is at the bottom right. The Windows taskbar at the bottom shows various application icons.

Step 13 :- Once done you can stop your server by clicking any key in the command prompt.

The screenshot shows a Windows Command Prompt window with the title "Command Prompt". The window displays the following log output:

```
INFO: Starting ProtocolHandler ["http-nio-3000"]
11:28:36 INFO  Tomcat 8.0.44 started and listening on port 3000
11:28:36 INFO  runs at:
11:28:36 INFO  http://localhost:3000
Press any key to stop the server.
> Building 88% > :appRun
Mar 03, 2022 11:35:50 AM org.apache.coyote.AbstractProtocol pause
INFO: Pausing ProtocolHandler ["http-nio-3000"]
Mar 03, 2022 11:35:50 AM org.apache.catalina.core.StandardService stopInternal
INFO: Stopping service Tomcat
Mar 03, 2022 11:35:50 AM org.apache.catalina.loader.WebappClassLoaderBase clearReferencesThreads
WARNING: The web application [ROOT] appears to have started a thread named [OkHttp TaskRunner] but has failed to stop it.
. This is very likely to create a memory leak. Stack trace of thread:
java.lang.Object.wait(Native Method)
java.lang.Object.wait(Object.java:460)
okhttp3.internal.concurrent.TaskRunner$RealBackend.coordinatorWait(TaskRunner.kt:294)
okhttp3.internal.concurrent.TaskRunner.awaitTaskToRun(TaskRunner.kt:218)
okhttp3.internal.concurrent.TaskRunner$runnable$1.run(TaskRunner.kt:59)
java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1149)
java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:624)
java.lang.Thread.run(Thread.java:748)
Mar 03, 2022 11:35:50 AM org.apache.coyote.AbstractProtocol stop
INFO: Stopping ProtocolHandler ["http-nio-3000"]
Mar 03, 2022 11:35:50 AM org.apache.coyote.AbstractProtocol destroy
INFO: Destroying ProtocolHandler ["http-nio-3000"]

BUILD SUCCESSFUL

Total time: 7 mins 28.169 secs
C:\Users\YASH\Downloads\java-01-login\01-login>
```

C.C PRACTICAL NO. 9

Aim :- Study and implementation of Storage as a Service

HARDWARE / SOFTWARE REQUIRED:

Online mode: Google account → login into the google drive.

Offline mode: owncloud server.

THEORY:

Google Docs:

Google Docs (docs.google.com) is the most popular web-based word processor available today. Docs is actually a suite of applications that also includes Google Spreadsheets and Google Presentations; the Docs part of the Docs suite is the actual word processing application. When you log in to Google Docs with your Google account, you see the page. This is the home page for all the Docs applications (word processing, spreadsheets, and presentations); all your previously created documents are listed on this page. The leftmost pane helps you organize your documents. You can store files in folders, view documents by type (word processing document or spreadsheet), and display documents shared with specific people.

Collaborating on Databases:

A local database is one in which all the data is stored on an individual computer.

A networked database is one in which the data is stored on a computer or server connected to a network, and accessible by all computers connected to that network.

Finally, an online or web-based database stores data on a cloud of servers somewhere on the Internet, which is accessible by any authorized user with an Internet connection.

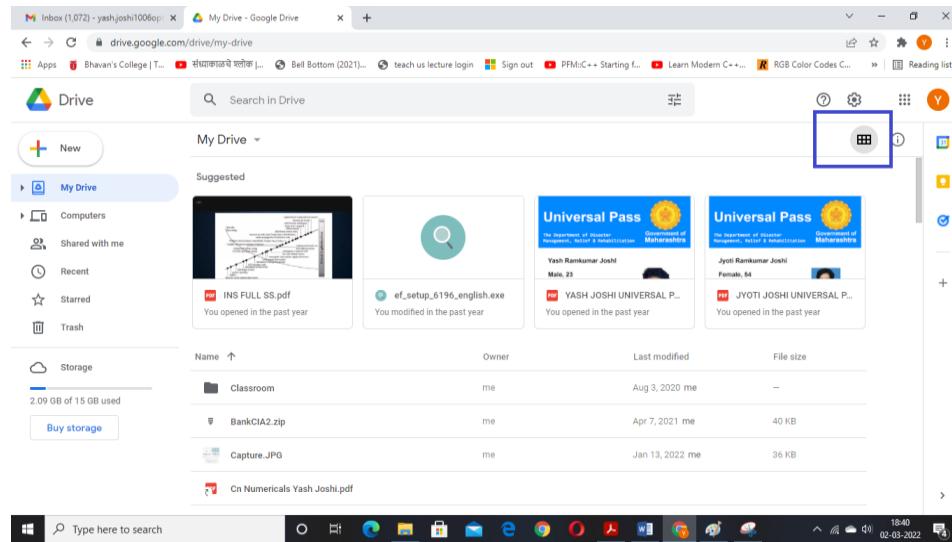
Eg: Cebase

Cebase (www.cebase.com) lets you create new database applications with a few clicks of your mouse; all you have to do is fill in a few forms and make a few choices from some pull-down lists. Data entry is via web forms, and then your data is displayed in a spreadsheet-like layout. You can then sort, filter, and group your data as you like. Sharing is accomplished by clicking the Share link at the top of any data page. You invite users to share your database via email, and then adjust their permissions after they've accepted your invitation.

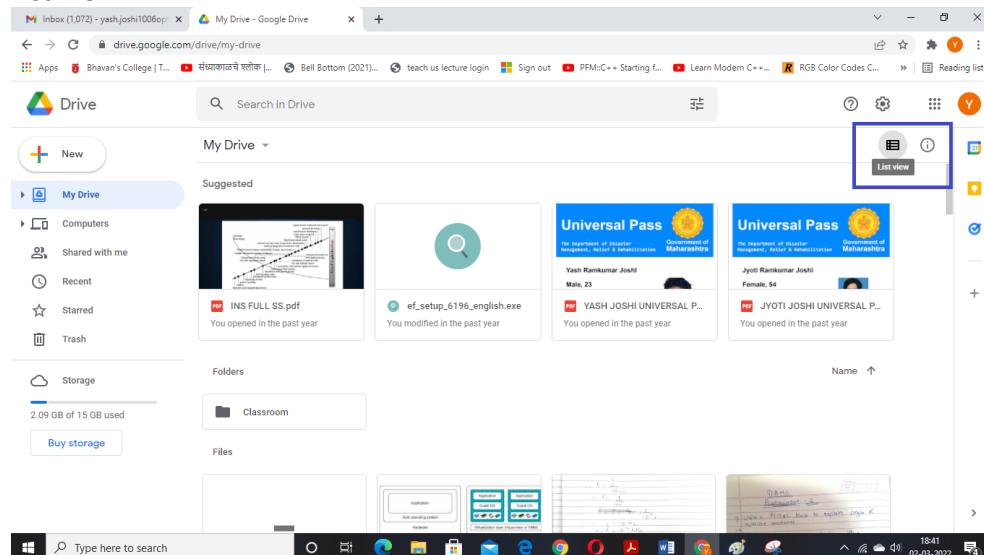
C.C PRACTICAL NO. 9

Step 1 :- Change the way your files are displayed.

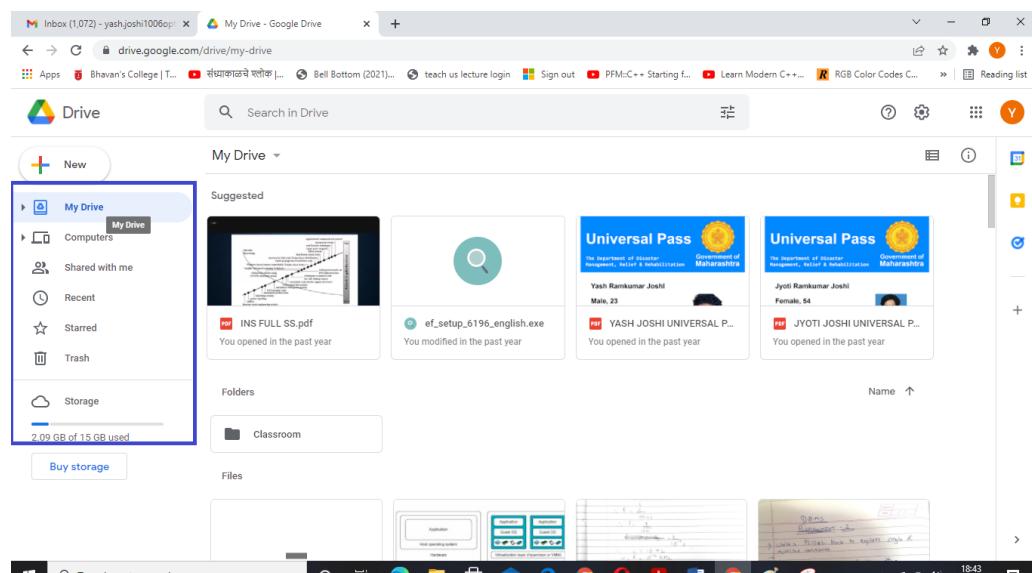
Grid View :-



List View :-



Step 2 :- Use the navigation bar on the left side to browse your files.

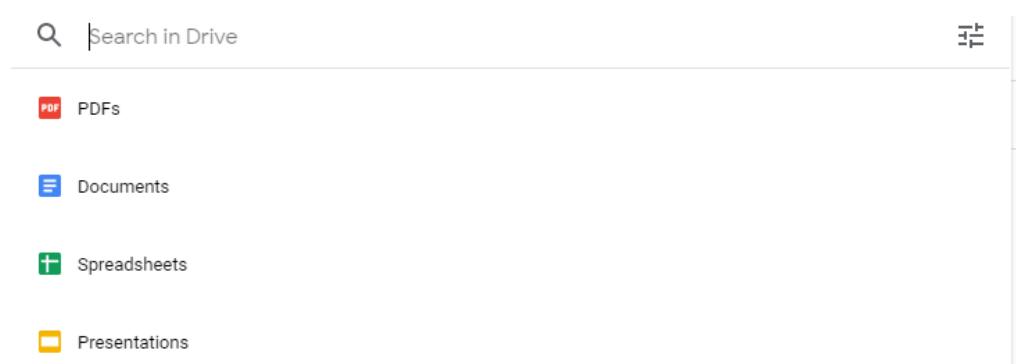
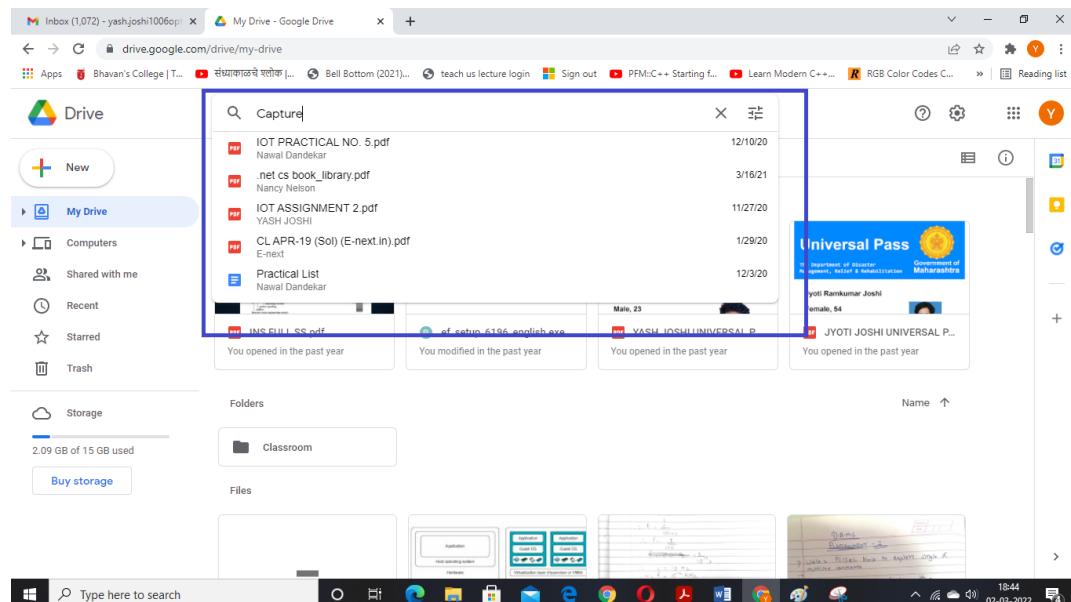


NAME :- YASH JOSHI

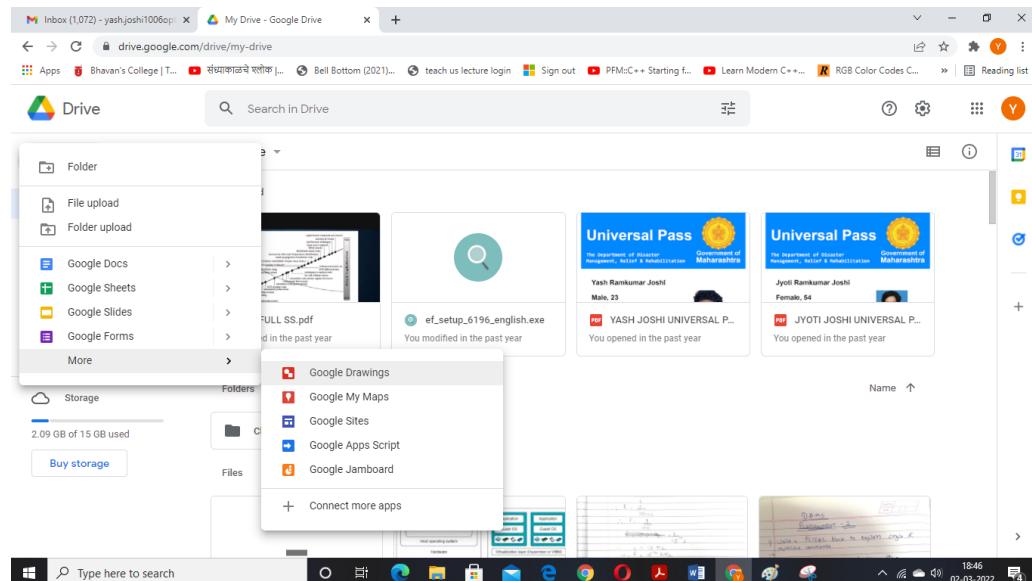
ROLL NO. :- TYCS222

C.C PRACTICAL NO. 9

Step 3 :- Search for files.

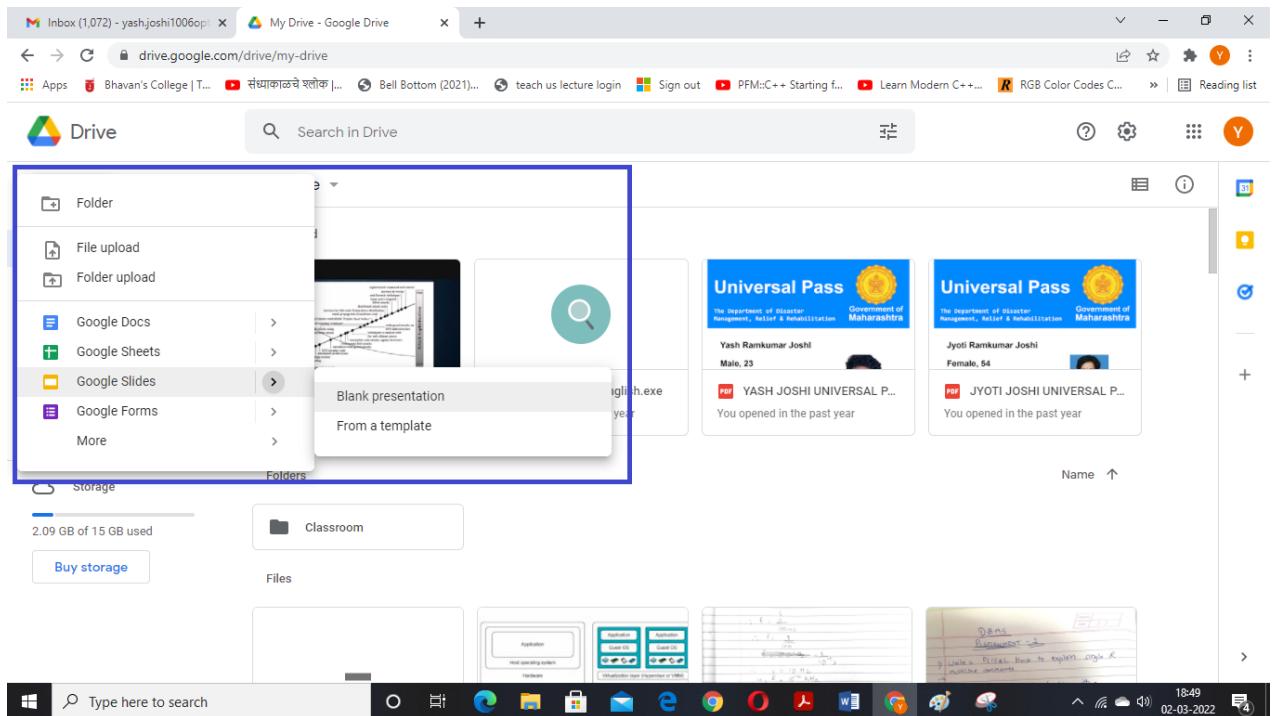


Step 4 :- Click the NEW button.

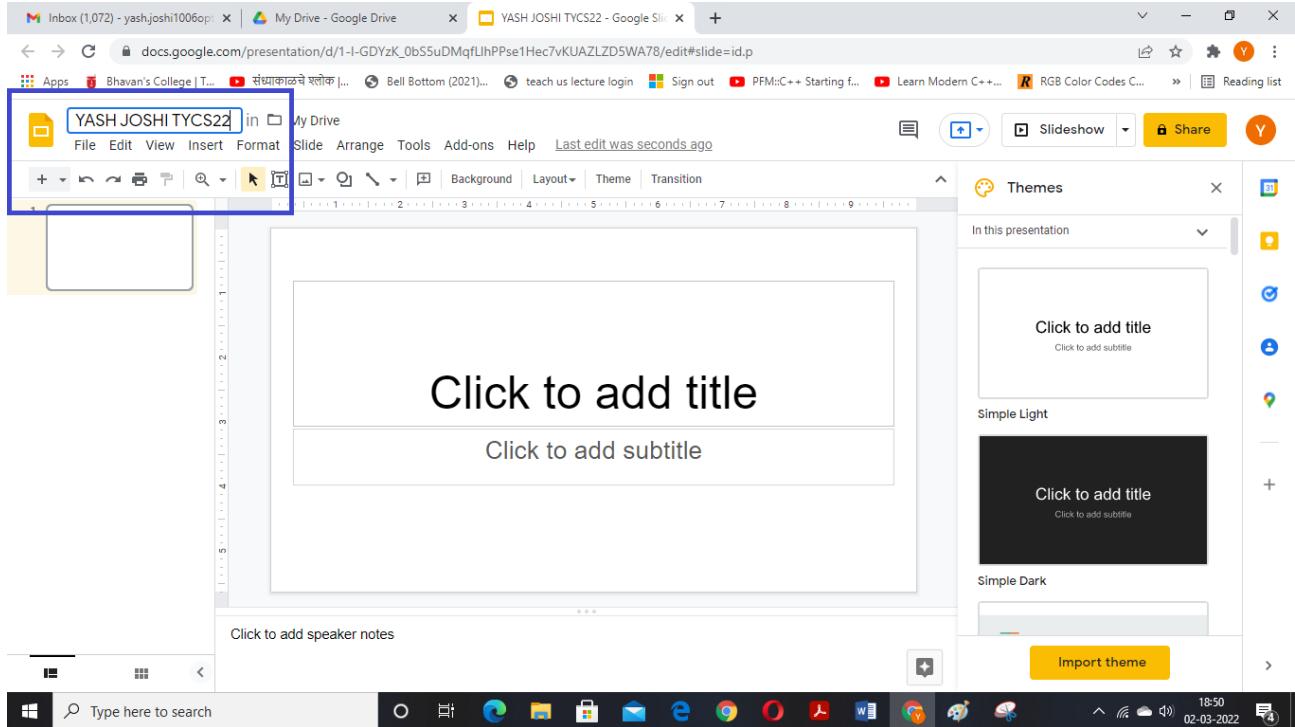


C.C PRACTICAL NO. 9

Step 5 :- Create a new file.

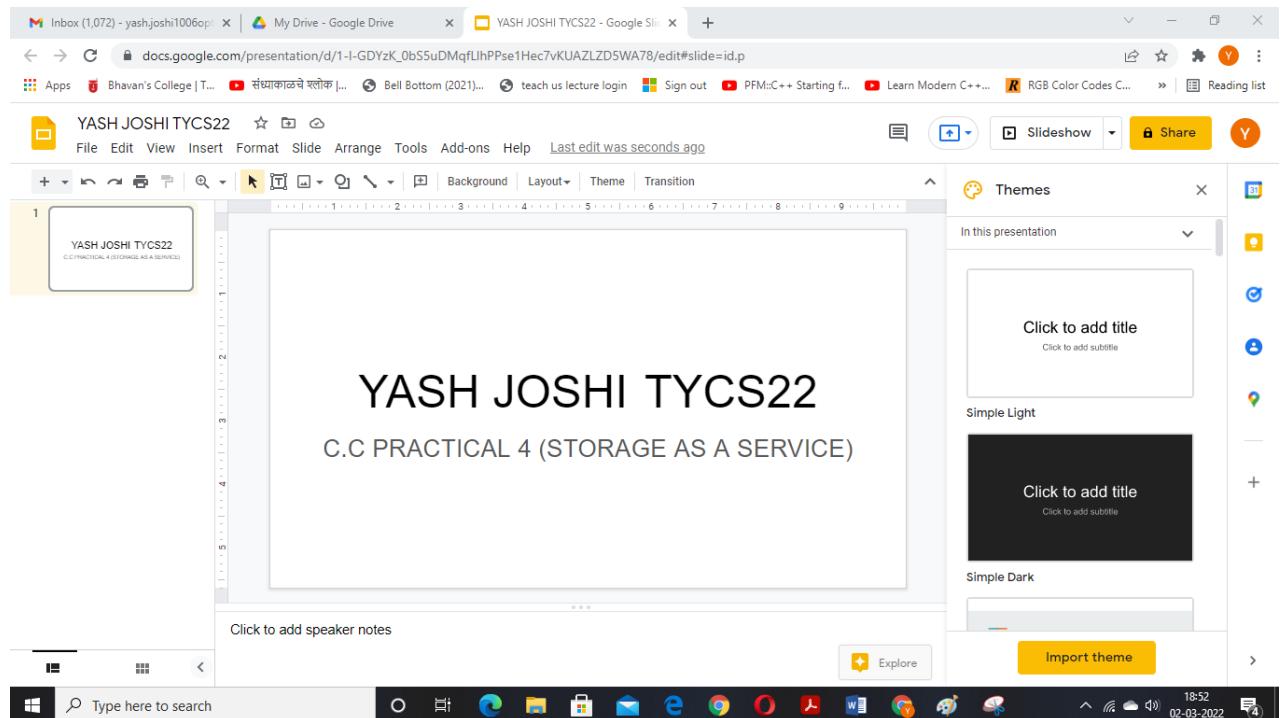


Step 6 :- Name the file.

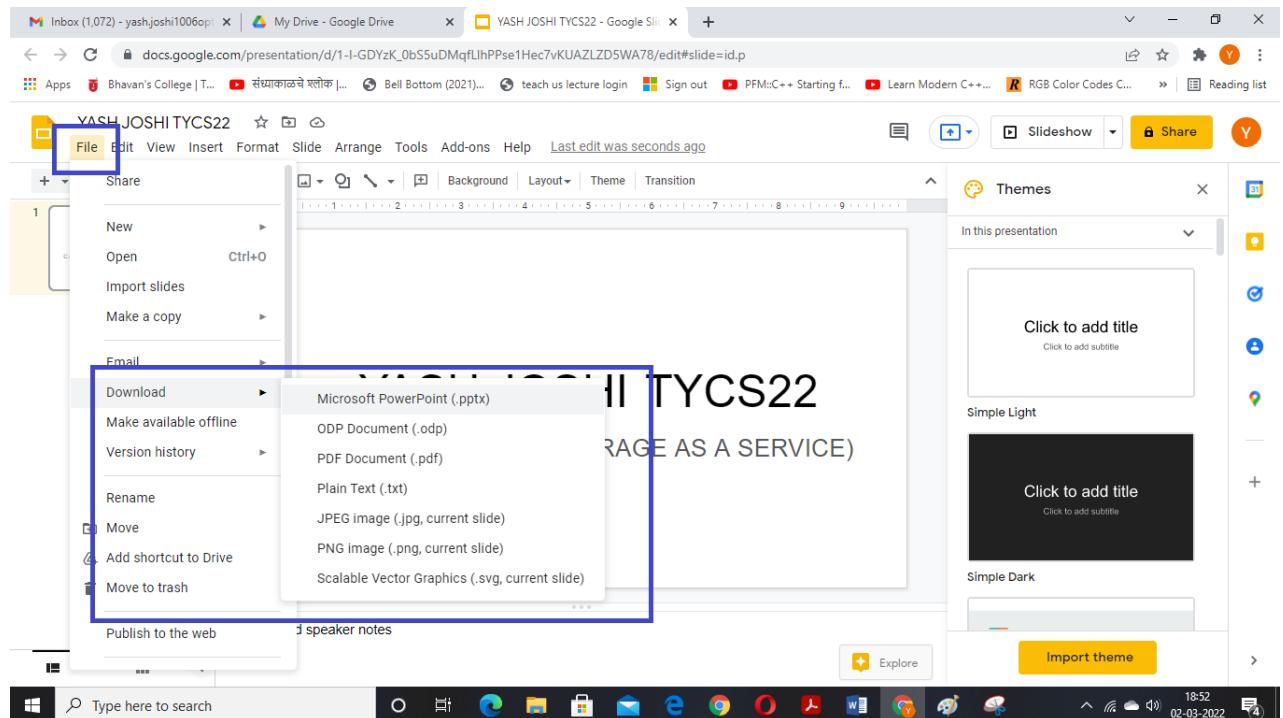


C.C PRACTICAL NO. 9

Step 7 :- Edit your document.



Step 8 :- Export and convert the file.

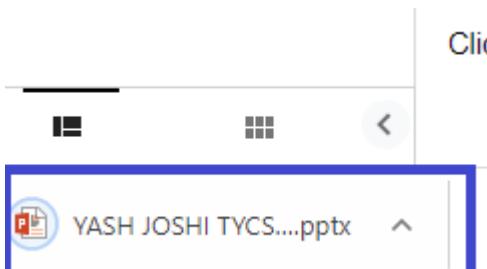


And the File gets downloaded

NAME :- YASH JOSHI

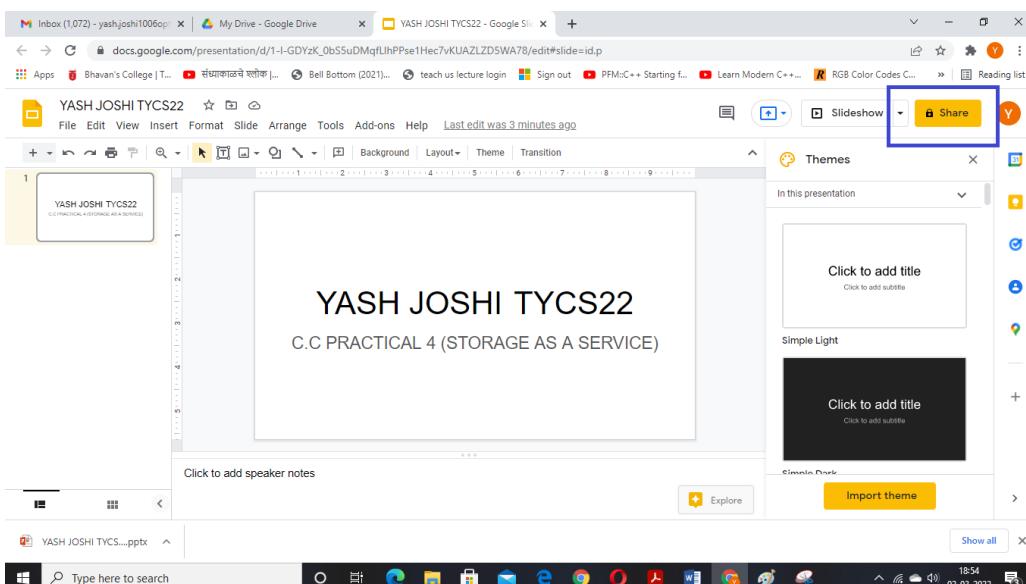
ROLL NO. :- TYCS222

C.C PRACTICAL NO. 9

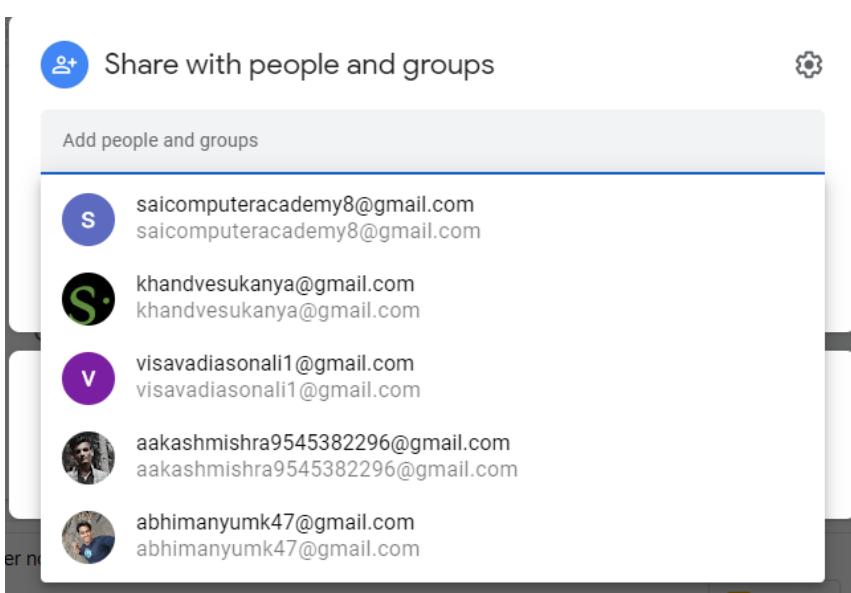


Step 9 :- Share your document.

Click on Share Button on right hand corner

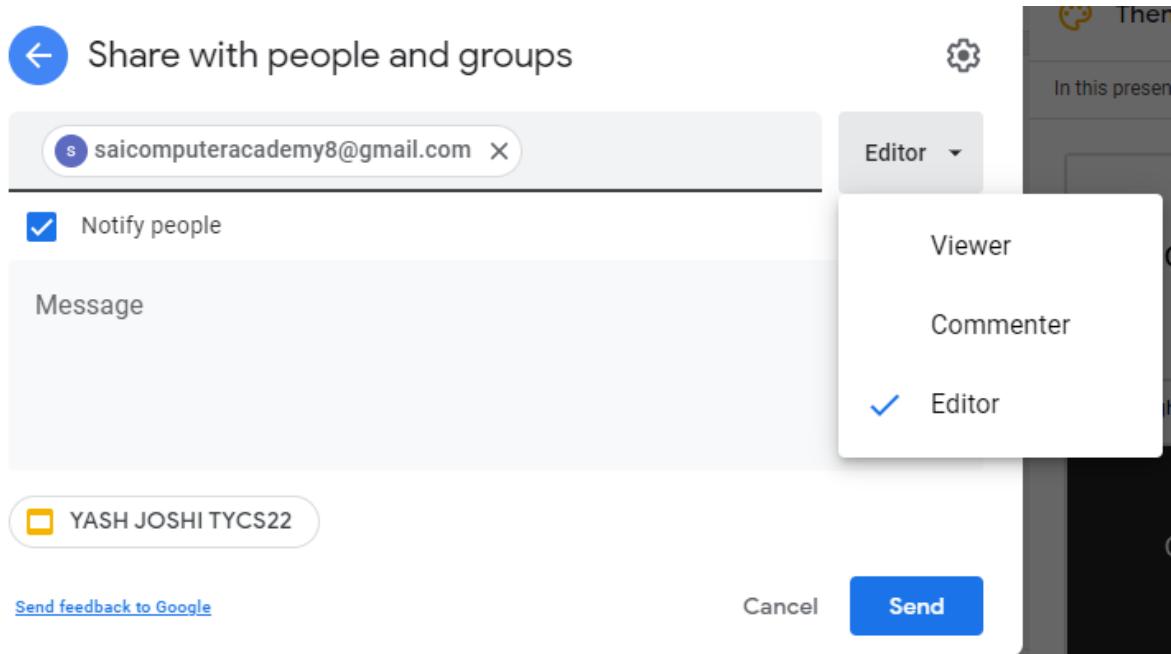


Enter the email Id's of the people you want to share this document with



You can permissions to the shared people whether the person is able to edit or view the application or he is just goin to be a commenter

C.C PRACTICAL NO. 9



And then just click on Send the document will get shared to all the people you mentioned.

C.C PRACTICAL NO. 10

Aim: Case study on Amazon EC2.

Amazon EC2

What is Amazon EC2 exactly ?

It's an Cloud Computing Platform.

Amazon Elastic Compute Cloud (Amazon EC2) provides scalable computing capacity in the Amazon Web Services (AWS) cloud. Using Amazon EC2 eliminates your need to invest in hardware up front, so you can develop and deploy applications faster. You can use Amazon EC2 to launch as many or as few virtual servers as you need, configure security and networking, and manage storage. Amazon EC2 enables you to scale up or down to handle changes in requirements or spikes in popularity, reducing your need to forecast traffic.



History of Amazon EC2:

Amazon announced a limited public beta test of EC2 on August 25, 2006, offering access on a first-come, first-served basis. Amazon EC2 was developed mostly by a team in Cape Town, South Africa led by Chris Pinkham.

Operating System : Microsoft Windows, Linux , Free BSD.

Type: Virtual Private Server

License : Proprietary Software

Features:-

Amazon EC2 provides the following features:

Operating System :

Microsoft Windows, Linux , Free BSD. It supports all these Operating Systems.

Persistent storage:

An EC2 instance may be launched with a choice of two types of storage for its boot disk or “rootdevice” The first option is a local “instance-store” disk as a root device (originally the only choice). The second option is to use an EBS volume as a root device.

Elastic IP addresses:

In this sense an Elastic IP Address belongs to the account and not to a virtual machine instance. It exists until it is explicitly removed, and remains associated

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with the account even while it is associated with no instance. Amazon CloudWatch:

Amazon CloudWatch is a web service that provides real-time monitoring to Amazon EC2 customers on their resource utilization such as CPU, disk, network and replica lag for RDS Database replicas.

Automated scaling:

Amazon auto-scaling feature of EC2 allows it to automatically adapt computing capacity to site traffic.

Reliability:

To make EC2 more fault-tolerant, Amazon engineered Availability Zones that are designed to be insulated from failures in other availability zones. **How to Get Started with Amazon EC2:**

- 1) goto aws.amazon.com
- 2) click on "My Account"
- 3) select "AWS management console" and click on it



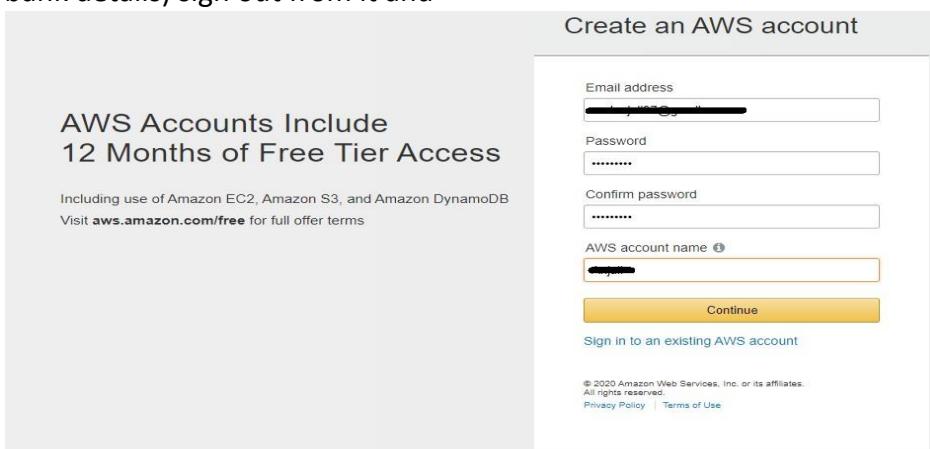
- 4) Give Email id in the required field
- 5) if you are registering first time then select "I am a new user" radio button
- 6) click on "sign in using our secure server" button

A screenshot of the AWS sign-in page. It has the AWS logo at the top left. Below it, there is a 'Sign in' button with a small icon. The main form area has a field labeled 'Email address of your AWS account' with placeholder text 'Or to sign in as an IAM user, enter your account ID or account alias instead.' Below this is a large empty input field. Underneath the input field is a blue 'Next' button. At the bottom of the form, there is a link 'New to AWS?' followed by a 'Create a new AWS account' button.

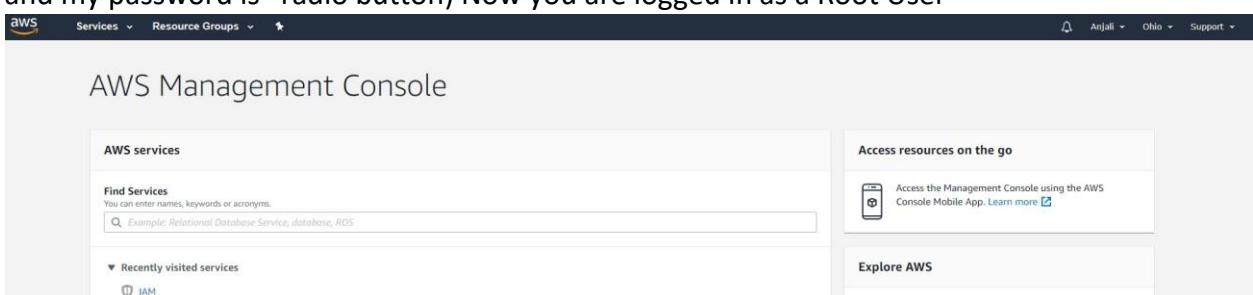
Follow the instruction and complete the formalities

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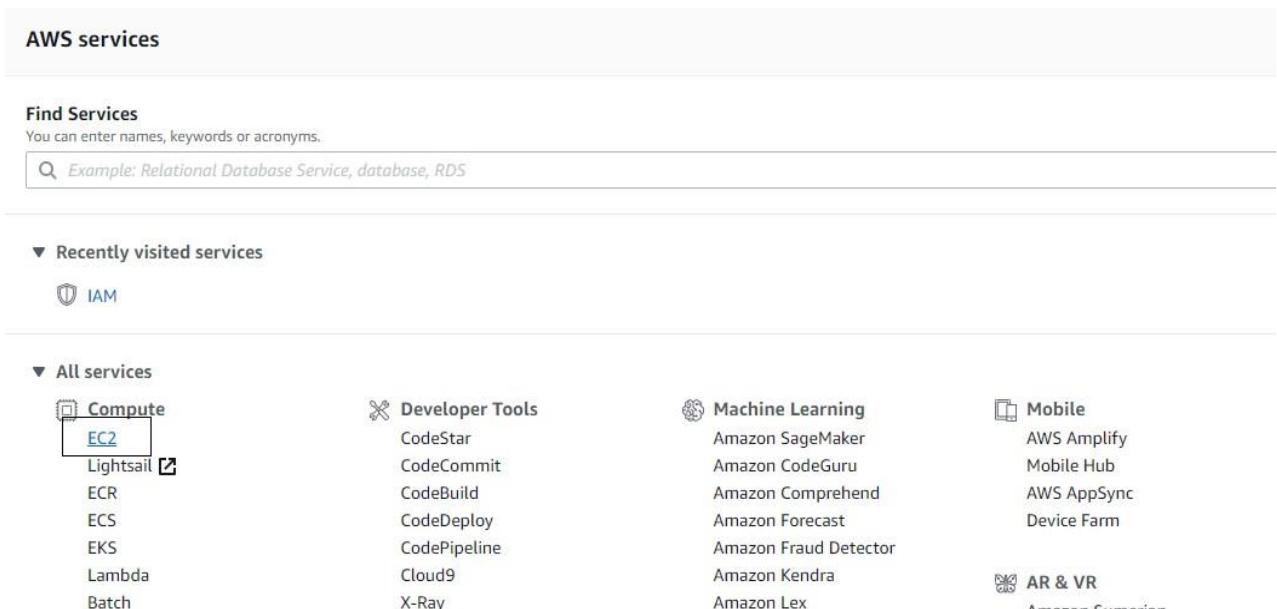
(Note: do not provide any credit card details or bank details) sign out from it and



7) Again, go to “My Account” select “AWS management console” and click on it. Sign in again by entering the user name and valid password (check “I am returning user and my password is” radio button) Now you are logged in as a Root User



AWS service→ All Services tab→EC2



Getting Started with the AWS Management Console

Step 1: Set up and log into your AWS account

Step 2: Launch an Amazon EC2 instance

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Step 3: Configure your instance

Step 4: Connect to your instance

Step 5: Terminate Instances

The screenshot shows the AWS EC2 Dashboard. On the left sidebar, there are sections for EC2 Dashboard, Instances, Images, and Elastic Block Store. The main area displays resource counts: 0 Running Instances, 0 Dedicated Hosts, 1 Volumes, 1 Key Pairs, 0 Placement Groups, 0 Elastic IPs, 0 Snapshots, 0 Load Balancers, and 29 Security Groups. Below this, there's a 'Create Instance' button and a 'Migrate a Machine' section. The right side features 'Account Attributes' for VPC and Default VPC, and an 'Additional Information' sidebar with links to Getting Started Guide, Documentation, and forums.

The screenshot shows the 'Choose AMI' step of the EC2 instance creation wizard. It lists three AMIs: Amazon Linux 2 AMI (HVM), SSD Volume Type, Amazon Linux AMI 2018.03.0 (HVM), SSD Volume Type, and Red Hat Enterprise Linux 8 (HVM), SSD Volume Type. Each item has a 'Select' button and a radio button for 64-bit (x86). The 'Amazon Linux 2 AMI' is currently selected. A sidebar on the left shows 'Quick Start' options: My AMIs, AWS Marketplace, Community AMIs, and a 'Free tier only' checkbox.

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The screenshot shows the AWS EC2 instance creation wizard at Step 2: Choose an Instance Type. The page title is "Step 2: Choose an Instance Type". A sub-header states: "Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. Learn more about instance types and how they can meet your computing needs." Below this, there are filter options: "Filter by: All Instance types" and "Current generation". A note says "Currently selected: t2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB memory, EBS only)". A table lists instance types:

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
<input type="checkbox"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	General purpose	t2.micro Free tier eligible	1	1	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes

Buttons at the bottom include "Cancel", "Previous", "Review and Launch" (highlighted in blue), and "Next: Configure Instance Details".

The screenshot shows the AWS EC2 instance creation wizard at Step 3: Configure Instance Details. The page title is "Step 3: Configure Instance Details". A sub-header states: "Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot Instances to take advantage of the lower pricing, assign an access management role to the instance, and more." Below this, there are configuration fields:

- Number of Instances: 1
- Purchasing option: Request Spot Instances (unchecked)
- Network: vpc-37dae75f (default) - Create new VPC (button)
- Subnet: No preference (default subnet in any Availability Zone) - Create new subnet (button)
- Auto-assign Public IP: Use subnet setting (Enable)
- Placement group: Add instance to placement group (unchecked)
- Capacity Reservation: Open - Create new Capacity Reservation (button)
- IAM role: None - Create new IAM role (button)

Buttons at the bottom include "Cancel", "Previous", "Review and Launch" (highlighted in blue), and "Next: Add Storage" (with a mouse cursor hovering over it).

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The screenshot shows the AWS EC2 instance creation wizard at Step 4: Add Storage. The top navigation bar includes the AWS logo, Services dropdown, Resource Groups dropdown, and account information for Mithun Technologies, Mumbai, and Support. Below the navigation is a horizontal progress bar with steps: 1. Choose AMI, 2. Choose Instance Type, 3. Configure Instance, 4. Add Storage (highlighted in yellow), 5. Add Tags, 6. Configure Security Group, and 7. Review.

Step 4: Add Storage

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. [Learn more](#) about storage options in Amazon EC2.

The main configuration table for the root volume:

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encryption
Root	/dev/sda1	snap-0443d84c4d094af1a	10	General Purpose SSD (gp2)	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted

Add New Volume button is visible below the table.

A note in a callout box states: "Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. [Learn more](#) about free usage tier eligibility and usage restrictions."

At the bottom right of the screen, there are buttons: Cancel, Previous, **Review and Launch**, and Next: Add Tags.

The screenshot shows the AWS EC2 instance creation wizard at Step 5: Add Tags. The top navigation bar and progress bar are identical to the previous step.

Step 5: Add Tags

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver. A copy of a tag can be applied to volumes, instances or both. Tags will be applied to all instances and volumes. [Learn more](#) about tagging your Amazon EC2 resources.

The interface allows adding tags by specifying Key and Value. A note says: "This resource currently has no tags. Choose the Add tag button or click to add a Name tag. Make sure your IAM policy includes permissions to create tags."

Add Tag button is visible. At the bottom right, there are buttons: Cancel, Previous, **Review and Launch**, and Next: Configure Security Group.

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The screenshot shows the AWS EC2 instance creation wizard at Step 6: Configure Security Group. The top navigation bar includes the AWS logo, Services dropdown, Resource Groups dropdown, and account information for Mithun Technologies, Mumbai, and Support. Below the navigation is a progress bar with steps 1 through 7. Step 6, "Configure Security Group," is highlighted. A sub-header "Step 6: Configure Security Group" is followed by a descriptive text about security groups. The main form area contains a section titled "Assign a security group:" with two radio button options: "Create a new security group" (selected) and "Select an existing security group". Below this are fields for "Security group name" (set to "launch-wizard-29") and "Description" (set to "launch-wizard-29 created 2019-09-17T22:42:12.065+05:30"). A table for adding rules shows a single rule for port 22 on TCP protocol from 0.0.0.0/0. A warning message in a yellow box states: "Warning: Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only." At the bottom right are "Cancel," "Previous," and "Review and Launch" buttons.

The screenshot shows the AWS EC2 instance creation wizard at Step 7: Review Instance Launch. The top navigation bar and progress bar are identical to the previous step. The main content area displays the summary of the instance configuration. It includes sections for "AMI Details" (Red Hat Enterprise Linux 8 (HVM), SSD Volume Type - ami-0a74bfeb190bd404f, Free tier eligible), "Instance Type" (t2.micro), and "Security Groups" (Security group name: launch-wizard-29). The "Review" step is highlighted in the progress bar. At the bottom right are "Cancel," "Previous," and "Launch" buttons.

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Step 7: Review Instance

AMI Details

Instance Type

Security Groups

Network Performance

Low to Moderate

Edit security groups

Cancel Previous Launch

Step 7: Review Instance

AMI Details

Instance Type

Security Groups

Network Performance

Low to Moderate

Edit security groups

Cancel Previous Launch

Launch Status

Your instances are now launching

The following instance launches have been initiated: i-02d475495a4fe9420 [View launch log](#)

Get notified of estimated charges

Create billing alerts to get an email notification when estimated charges on your AWS bill exceed an amount you define (for example, if you exceed the free usage tier).

How to connect to your instances

Your instances are launching, and it may take a few minutes until they are in the **running** state, when they will be ready for you to use. Usage hours on your new instances will start immediately and continue to accrue until you stop or terminate your instances.

Click [View Instances](#) to monitor your instances' status. Once your instances are in the **running** state, you can **connect** to them from the Instances screen. Find out how to connect to your instances.

Here are some helpful resources to get you started

- [How to connect to your Linux instance](#)
- [Learn about AWS Free Usage Tier](#)
- [Amazon EC2: User Guide](#)
- [Amazon EC2: Discussion Forum](#)

While your instances are launching you can also

[Feedback](#) [English \(US\)](#)

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C.C PRACTICAL NO. 10

The screenshot shows the AWS EC2 Dashboard. On the left sidebar, under the 'Instances' section, 'Instances' is selected. The main content area displays 'Resources' for the Asia Pacific (Mumbai) region, showing 0 Running Instances, 0 Dedicated Hosts, 2 Volumes, 2 Key Pairs, 0 Placement Groups, 0 Elastic IPs, 0 Snapshots, 0 Load Balancers, and 30 Security Groups. Below this, there's a 'Create Instance' section with a 'Launch Instance' button and a 'Service Health' section showing 'Service Status: Asia Pacific (Mumbai)' with 'No events'. To the right, 'Account Attributes' and 'Additional Information' sections are visible, along with a 'AWS Marketplace' section. The bottom half of the screen shows a detailed view of an instance named 'RedHat Server'. A context menu is open over this instance, with 'Terminate' highlighted. The instance details show it has a Public DNS of ec2-13-232-186-130.ap-south-1.compute.amazonaws.com, an Instance ID of i-02d475495a4fe9420, and is currently running.

Amazon EC2 Instance Types

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A1	T3	T3a	T2	M6g	M5	M5a	M5n	M4																																																															
Amazon EC2 A1 instances deliver significant cost savings and are ideally suited for scale-out and Arm-based workloads that are supported by the extensive Arm ecosystem. A1 instances are the first EC2 instances powered by AWS Graviton Processors that feature 64-bit Arm Neoverse cores and custom silicon designed by AWS.																																																																							
Features:																																																																							
<ul style="list-style-type: none"> ◦ Custom built AWS Graviton Processor with 64-bit Arm Neoverse cores ◦ Support for Enhanced Networking with Up to 10 Gbps of Network bandwidth ◦ EBS-optimized by default ◦ Powered by the AWS Nitro System, a combination of dedicated hardware and lightweight hypervisor 																																																																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Instance</th><th>vCPU</th><th>Mem (GiB)</th><th>Storage</th><th colspan="5">Network Performance (Gbps)</th></tr> </thead> <tbody> <tr> <td>a1.medium</td><td>1</td><td>2</td><td>EBS-Only</td><td colspan="5">Up to 10</td></tr> <tr> <td>a1.large</td><td>2</td><td>4</td><td>EBS-Only</td><td colspan="5">Up to 10</td></tr> <tr> <td>a1.xlarge</td><td>4</td><td>8</td><td>EBS-Only</td><td colspan="5">Up to 10</td></tr> <tr> <td>a1.2xlarge</td><td>8</td><td>16</td><td>EBS-Only</td><td colspan="5">Up to 10</td></tr> <tr> <td>a1.4xlarge</td><td>16</td><td>32</td><td>EBS-Only</td><td colspan="5">Up to 10</td></tr> <tr> <td>a1.metal</td><td>16*</td><td>32</td><td>EBS-Only</td><td colspan="5">Up to 10</td></tr> </tbody> </table>									Instance	vCPU	Mem (GiB)	Storage	Network Performance (Gbps)					a1.medium	1	2	EBS-Only	Up to 10					a1.large	2	4	EBS-Only	Up to 10					a1.xlarge	4	8	EBS-Only	Up to 10					a1.2xlarge	8	16	EBS-Only	Up to 10					a1.4xlarge	16	32	EBS-Only	Up to 10					a1.metal	16*	32	EBS-Only	Up to 10				
Instance	vCPU	Mem (GiB)	Storage	Network Performance (Gbps)																																																																			
a1.medium	1	2	EBS-Only	Up to 10																																																																			
a1.large	2	4	EBS-Only	Up to 10																																																																			
a1.xlarge	4	8	EBS-Only	Up to 10																																																																			
a1.2xlarge	8	16	EBS-Only	Up to 10																																																																			
a1.4xlarge	16	32	EBS-Only	Up to 10																																																																			
a1.metal	16*	32	EBS-Only	Up to 10																																																																			
<small>* a1.metal provides 16 physical cores</small>																																																																							

Pricing :

Amazon EC2 is free to try. There are five ways to pay for Amazon EC2 instances: On-Demand, Savings Plans, Reserved Instances, and Spot Instances. You can also pay for Dedicated Hosts which provide you with EC2 instance capacity on physical servers dedicated for your use

The screenshot shows the AWS Free Tier landing page. It features a sidebar with navigation links like Products, Solutions, Pricing, Documentation, Learn, Partner Network, AWS Marketplace, Customer Enablement, Events, Explore More, and a search bar. The main content area is titled "AWS Free Tier" and includes sections for "Tier Type" (Featured, 12 Months Free, Always Free, Trials) and "Product Categories" (Analytics, Application Integration, AR & VR, Business Productivity, Compute, Customer Engagement, Database, Developer tools, End User Computing, Game Tech, Internet of Things, Machine Learning, Management & Governance, Media Services, Mobile, Networking & Content Delivery, Robotics, Security, Identity, & Compliance, Storage). Below these are four service cards: "Compute" (Amazon EC2 - 750 Hours), "Storage" (Amazon S3 - 5 GB), "Database" (Amazon RDS - 750 Hours), and "Machine Learning" (Amazon SageMaker - 250 Hours). Each card provides details about the free tier, usage limits, and applicable services.

On-Demand →

With On-Demand instances, you pay for compute capacity by the hour or the second depending on which instances you run. No longer-term commitments or upfront payments are needed. You can increase or decrease your compute capacity depending on the demands of your application and only pay the specified per hourly rates for the instance you use

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Spot Instances→

Amazon EC2 Spot instances allow you to request spare Amazon EC2 computing capacity for up to 90% off the On-Demand price.

Savings Plan→

Savings Plans are a flexible pricing model that offer low prices on EC2 and Fargate usage, in exchange for a commitment to a consistent amount of usage (measured in \$/hour) for a 1 or 3 year term.

Reserved Instances→

Reserved Instances provide you with a significant discount (up to 75%) compared to OnDemand instance pricing. In addition, when Reserved Instances are assigned to a specific Availability Zone, they provide a capacity reservation, giving you additional confidence in your ability to launch instances when you need them.

Dedicated Host→

A Dedicated Host is a physical EC2 server dedicated for your use. Dedicated Hosts can help you reduce costs by allowing you to use your existing server-bound software licenses, including Windows Server, SQL Server, and SUSE Linux Enterprise Server (subject to your license terms), and can also help you meet compliance requirements.

Comparison Between Amazon EC2, Microsoft Azure and Google Cloud .

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The most defining cloud battle of the present time is AWS vs Azure vs Google. Choosing one public cloud from three is considered a challenging task, let's make it easy!

CLOUD SERVICE PROVIDERS		
Amazon - Amazon Web Services (AWS)	Azure - Microsoft	Google - Google Cloud
YEAR OF LAUNCH		
2006	2010	2011
WHICH ONE TO CHOOSE AND WHY?		
<ul style="list-style-type: none"> Dominant in many features like configuration, monitoring, security, and others Extensive, mature offerings Enterprise-friendly services Open and Flexible Global reach 	<ul style="list-style-type: none"> Integration with Microsoft tools Broad feature set Ranks first in development and testing tools Open source support Hybrid cloud 	<ul style="list-style-type: none"> Open source support and portability Discounts & flexible contracts Designed for cloud-based businesses DevOps expertise
WHY NOT CHOOSE?		
<ul style="list-style-type: none"> Difficult to use Overwhelming options Cost management 	<ul style="list-style-type: none"> Less efficient management tooling Less "enterprise-ready" 	<ul style="list-style-type: none"> Lately entered in IaaS market Less data centres over the world Fewer services and features
GLOBAL MARKET SHARE		
40 %	30 %	10 %
PRICING (All three follow on-demand pricing model and provides a price calculator on the basis of usage)		
2 VCPUs + 8GB RAM - 69 \$ / month	2 VCPUs + 8GB RAM - 70 \$ / month	2 VCPUs + 8GB RAM - 52 \$ / month
AVAILABILITY		
55 ZONE	44 ZONE	18 ZONE
CUSTOMER BASE		
NETFLIX, BMW, UNILEVER, SAMSUNG, AIRBNB	HP, JOHNSON, HONEYWELL	PAYPAL, HSB, DOMINOS, 20 TH CENTURY FOX
DOWNTIME IN 2014		
7 : 55 HRS	19 HRS	18 MIN

Microsoft Azure

What is Microsoft Azure?

The Azure Service Platform is a big part of Microsoft's cloud computing initiatives. It is designed specifically for the cloud.

Microsoft Azure is a platform as a service (PaaS) solution for building and hosting solutions using Microsoft's products and in their data centres. It is a comprehensive

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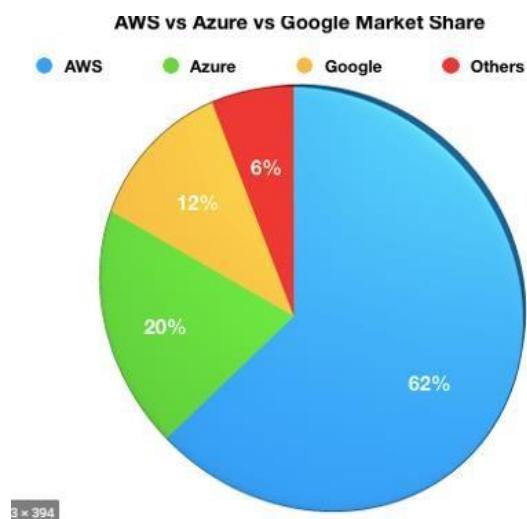
suite of cloud products that allow users to create enterprise-class applications without having to build out their own infrastructure.

The Azure Service Platform is comprised of three cloud centric products: Windows Azure, SQL Azure and Azure App Fabric controller. These are in addition to the application hosting infrastructure facility.

Windows Azure Platform



The two giant cloud platforms i.e.: [AWS](#) and [Azure](#) Market shares:



AWS Compute Instance

2VCPUs+8GB RAMS (Cost ~0.0928 USD/hour)

Azure Compute Instance

2VCPUs + 8GB RAMS (Cost

~0.096 USD/hour) AWS

provide significance number

of services. Free Tier fall

under 2 categories:

Service that will remain free for ever

C.C PRACTICAL NO. 10

>20 free service offered

Example: Amazon SQS SNS

Cloud Watch. Other that are valid for 1 year.

20 services offered

Example: Amazon S3,EC2,Elastic Cache etc.

Both type of service have limit on their usage (example : storage, no of request, Compute time etc),but users are charged for using services that fall under the 'valid for a year' categories after the year of experience

Azure provides a free tier as well it also provide service that belong to the categories of Always free

25+services offered

Example: AppSErvice,Function ,Container Service,Active

Directory etc. Valid for a year

8 services offered

Example:Linux/windows,virtual machine .Blob Storage ,SQL database etc.

Azure also provides user with 200 USD credits to access all their services for 30 days After which they can use the services that fall under the free for a year and always free category.

The largest instance that AWS offers

256 GB RAM +16vCPUS

The largest instance that Azure offers

224 GB RAM +16 vCPUS

KEY DIFFERENCES.

C.C PRACTICAL NO. 10

Both Azure and AWS supports hybrid cloud but Azure supports hybrid cloud better.

Azure offers express routes while AWS offers direct connection.

Azure provides security by offering permissions on the whole account whereas AWS security is provided using defined roles with permission control feature.

Azure machines are grouped into cloud service and respond to the same domain name with various ports whereas the AWS machine can be accessed separately.

Azure has a virtual network cloud whereas AWS has Virtual Private Cloud.

Azure has 140 availability zone whereas AWS has 61 availability zone.

How Azure works?

Microsoft Azure is a private and public cloud platform. You may be familiar with Azure services. But, how does it work?

Azure uses a technology known as virtualization, a priori, nothing new up to this point.

Virtualization separates the close coupling between a computer's CPU or server and its operating system by means of an abstraction layer called a hypervisor. The hypervisor emulates all the functions of a real computer or server and its CPU in a virtual machine. You can run multiple virtual machines at the same time and each virtual machine can run any compatible operating system such as Windows or Linux.

Azure takes this virtualization technology and rethinks it on a massive scale in Microsoft data centres around the world.

Therefore, the cloud is a set of physical servers in one or several data centres that run virtualized hardware on behalf of clients.

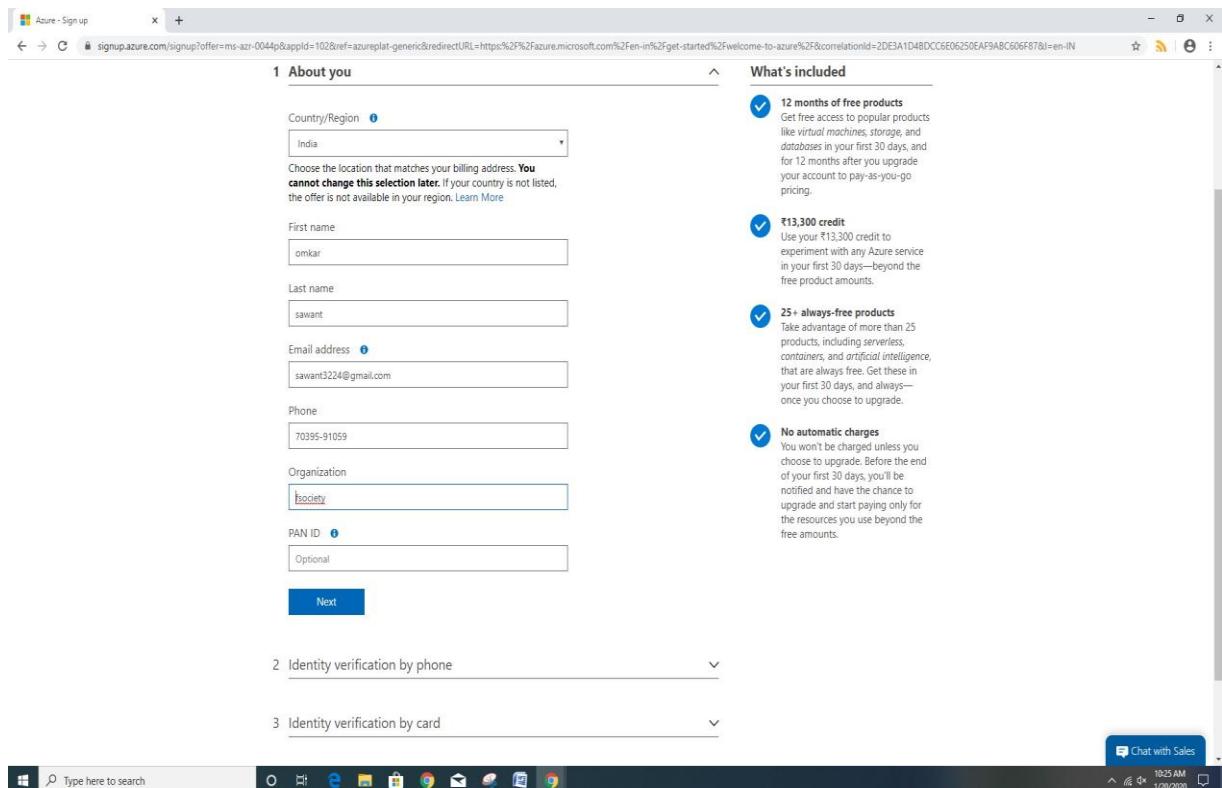
To understand it, let's take a look at the hardware architecture of the data centre.

In each data centre there is a collection of servers located in server racks. Each server rack contains many Blade servers, as well as a network switch that provides network connectivity and a power distribution unit (PDU) that supplies the power. Sometimes, the racks are grouped together into larger units that are known as clusters.

MICROSOFT AZURE SING IN/UP PAGE

Azure user authentication

C.C PRACTICAL NO. 10



Microsoft azure dashboard

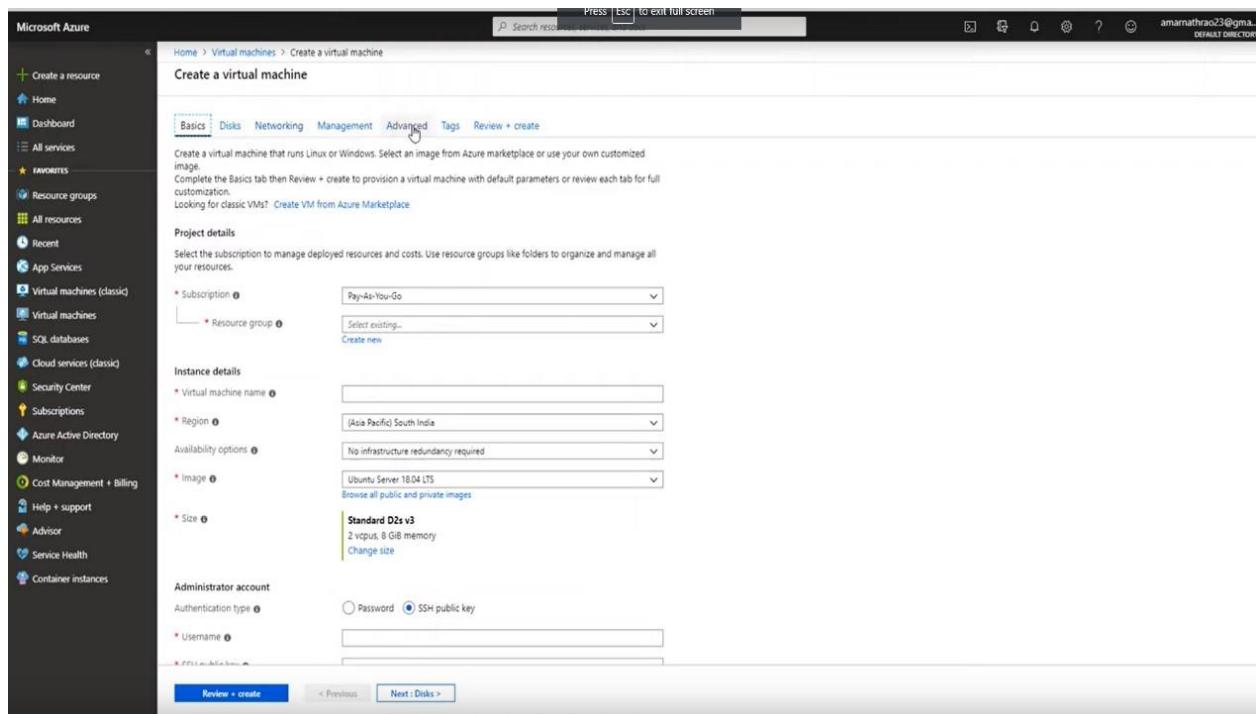
The screenshot shows the Microsoft Azure dashboard. It features a top navigation bar with tabs for Home, How To Insert Image Into Another, Gmail, Downloads, New Tab, and a user profile. Below the navigation is a search bar and a toolbar with icons for Create a resource, Virtual machines, App Services, Storage accounts, SQL databases, Azure Database for PostgreSQL, Azure Cosmos DB, Kubernetes services, Function App, and More services. The main area has sections for Navigate (Subscriptions, Resource groups, All resources, Dashboard), Tools (Microsoft Learn, Cost Management), and Useful links (Technical Documentation, Azure Migration Tools, Azure Services, Recent Azure Updates, Quickstart Center, Azure mobile app). A central 'Welcome to Microsoft Azure' box with 'Start tour' and 'Maybe later' buttons is displayed.

How to create a virtual machine

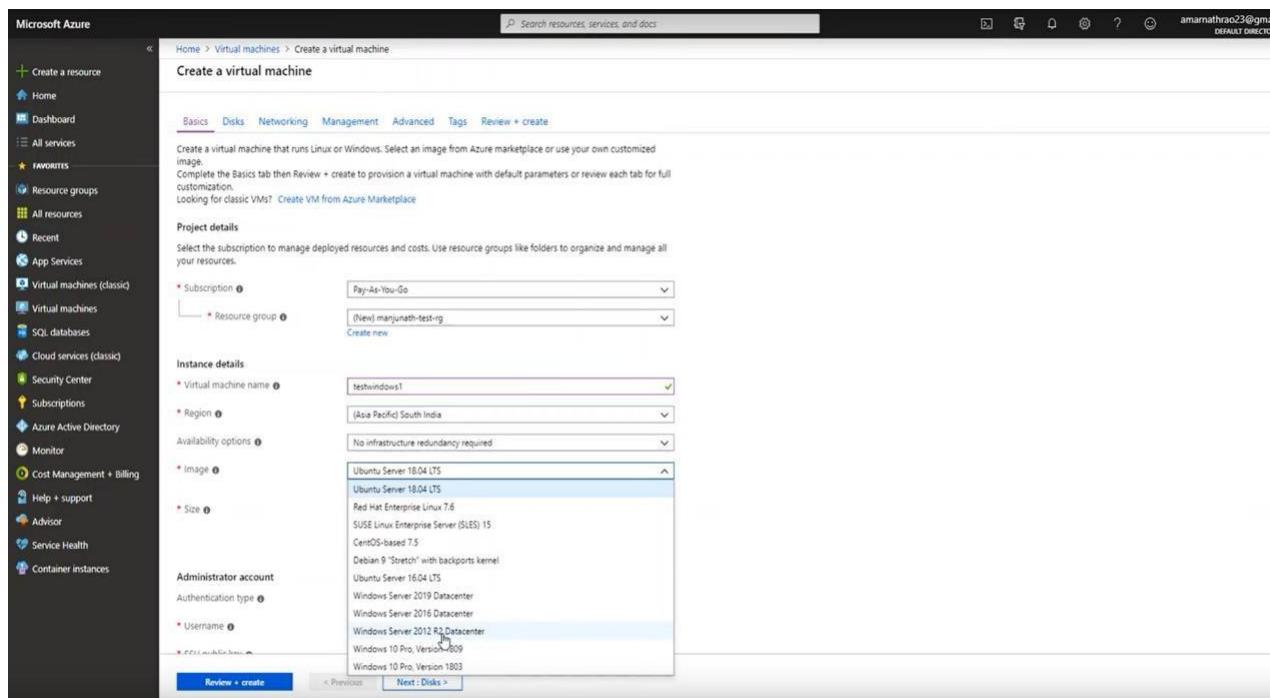
NAME :- YASH JOSHI

ROLL NO. :- TYCS222

C.C PRACTICAL NO. 10



Select the platform which you want to run as a virtual machine.



Select the Size of the virtual machine which you want.

C.C PRACTICAL NO. 10

Select a VM size

Browses available virtual machine sizes and their features.

Showing 11 of 156 VM sizes. | Subscription: Pay-As-You-Go | Region: South India | Current size: Standard_DS1_v2

VM SIZE	OFFERING	FAMILY	vCPUS	RAM (GB)	DATA DISKS	MAX IOPS	TEMPORARY STORAGE	PREMIUM DISK SUPPORT	COST/MONTH (EST.)
B1ls	Standard	General purpose	1	0.5	2	200	4 GB	Yes	₹609.78
B1ms	Standard	General purpose	1	2	2	800	4 GB	Yes	₹1,637.55
B1s	Standard	General purpose	1	1	2	400	4 GB	Yes	₹339.25
B2ms	Standard	General purpose	2	8	4	2400	16 GB	Yes	₹6,540.36
B2s	Standard	General purpose	2	4	4	1600	8 GB	Yes	₹3,461.96
B4ms	Standard	General purpose	4	16	8	3600	32 GB	Yes	₹13,080.71
D2s_v3	Standard	General purpose	2	8	4	3200	16 GB	Yes	₹11,654.62
D4s_v3	Standard	General purpose	4	16	8	6400	32 GB	Yes	₹23,260.06
DS1_v2	Standard	General purpose	1	3.5	4	3200	7 GB	Yes	₹6,392.83
DS2_v2	Standard	General purpose	2	7	8	6400	14 GB	Yes	₹12,834.83
DS3_v2	Standard	General purpose	4	14	16	12800	28 GB	Yes	₹25,620.49

Instance details

Administrator account

INBOUND PORT RULES

Review + create < Previous Next : Disks >

Select Prices presented are estimates in your local currency that include only Azure infrastructure costs and any discounts for the subscription and location. The prices don't include any applicable software costs. View Azure pricing calculator. Final charges will appear in your local currency in cost analysis and billing views.

Select the disk type and the size of the disk.

Create a virtual machine

Basics **Disks** **Networking** **Management** **Advanced** **Tags** **Review + create**

Azure VMs have one operating system disk and a temporary disk for short-term storage. You can attach additional data disks. The size of the VM determines the type of storage you can use and the number of data disks allowed. [Learn more](#)

Disk options

OS disk type: Premium SSD

Enable Ultra SSD compatibility (Preview):

Data disks

You can add and configure additional data disks for your virtual machine or attach existing disks. This VM also comes with a temporary disk.

LUN	NAME	SIZE (GB)	DISK TYPE	HOST CACHING
0	Temporary disk	100	Standard SSD	None

Create and attach a new disk Attach an existing disk

Advanced

Networking

C.C PRACTICAL NO. 10

The screenshot shows the 'Networking' tab of the Azure VM creation wizard. It includes fields for Virtual network (selected), Subnet (selected), and Public IP (selected). Under NIC network security group, 'Basic' is chosen. For Public inbound ports, 'Allow selected ports' is selected, and a dropdown menu is open showing 'Select one or more ports'. Accelerated networking is set to 'Off'. Load balancing is set to 'No'. At the bottom, there are 'Review + create', '< Previous', and 'Next : Management >' buttons.

Management

The screenshot shows the 'Management' tab of the Azure VM creation wizard. It includes sections for Azure Security Center (basic plan selected), Monitoring (Boot diagnostics On, OS guest diagnostics On, Diagnostics storage account selected), Identity (System assigned managed identity Off), and Azure Active Directory (Auto-shutdown Off). At the bottom, there are 'Review + create', '< Previous', and 'Next : Advanced >' buttons.

What services are available in AZURE?

Microsoft Azure offers a wide range of services such as software as a service (SaaS), platform as a service (PaaS) and Infrastructure as a service (IaaS) , Microsoft Azure is a good choice when it comes to cloud based platform applications.

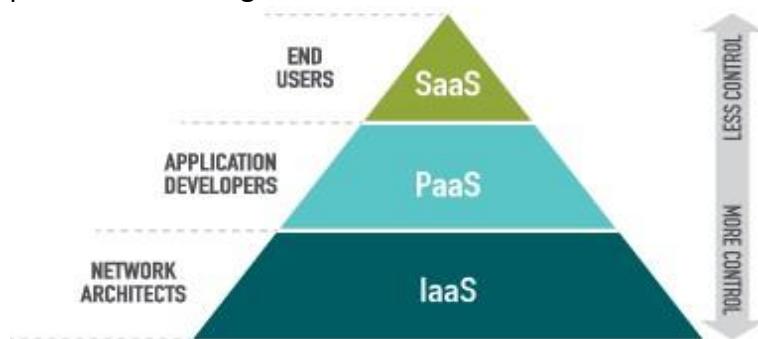
Microsoft Azure Services

- Computer services

Virtual machines, infrastructure as a service (IaaS) allowing users to launch general purpose Microsoft Windows and Linux virtual machines, as well as preconfigured machine images for popular software packages

C.C PRACTICAL NO. 10

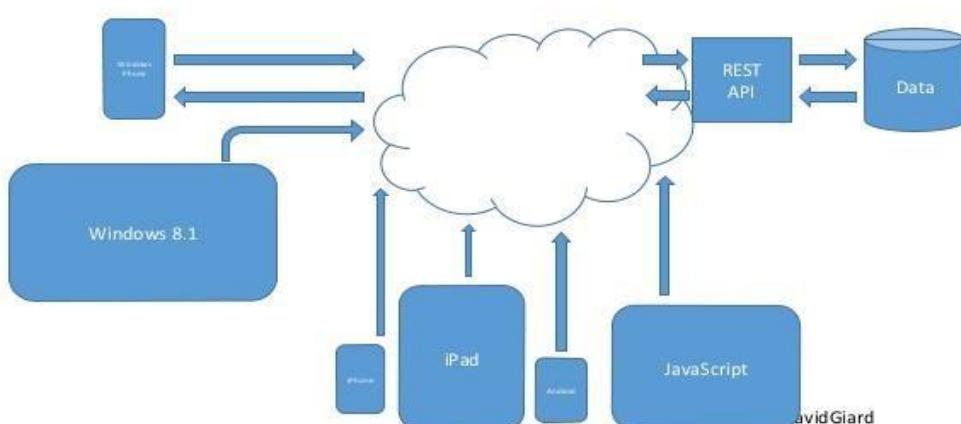
App services, platform as a service (PaaS) environment letting developers easily publish and manage websites.



- **Mobile services**

Mobile Engagement collects real-time analytics that highlight users' behavior. It also provides push notifications to mobile devices.[9]
HockeyApp can be used to develop, distribute, and beta-test mobile apps.

Mobile Architecture



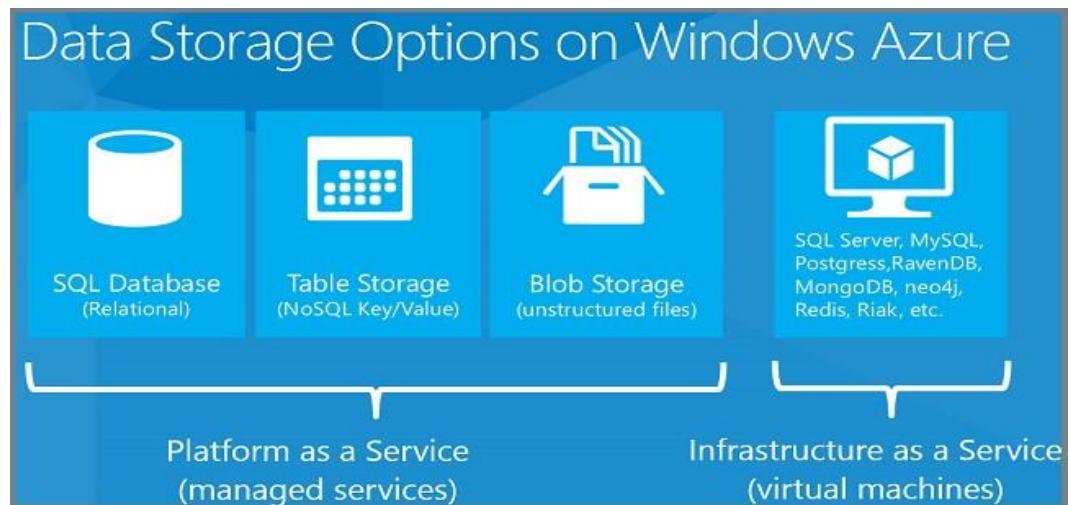
- **Storage services**

Storage Services provides REST and SDK APIs for storing and accessing data on the cloud.

Queue Service lets programs communicate asynchronously by message using queues.

File Service allows storing and access of data on the cloud using the REST APIs or the SMB protocol

C.C PRACTICAL NO. 10

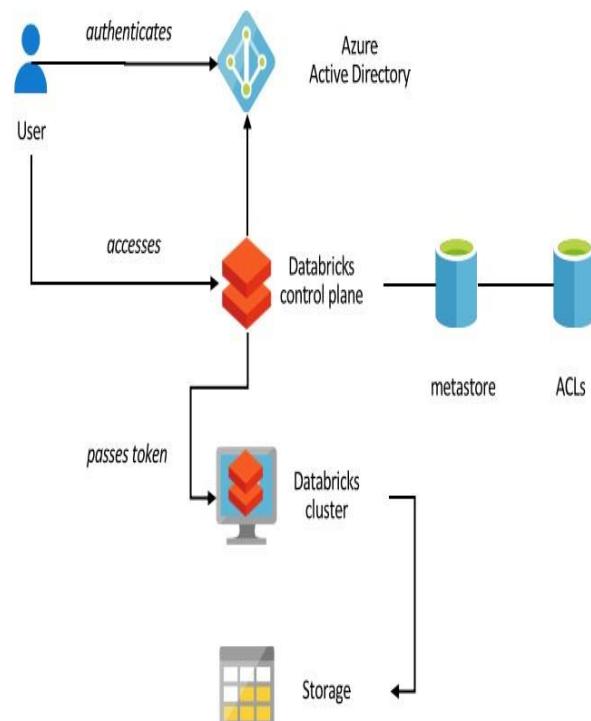


- **Data management**

SQL Database, formerly known as SQL Azure Database, works to create, scale and extend applications into the cloud using Microsoft SQL Server technology. It also integrates with Active Directory and Microsoft System Center.

Azure Managed Disks is a way to simplifies disk management for VMs by managing the storage accounts associated with the VM disks. You only need to specify the type (Premium or Standard) and the size of disk you need, and Azure creates and manages the disk for you.

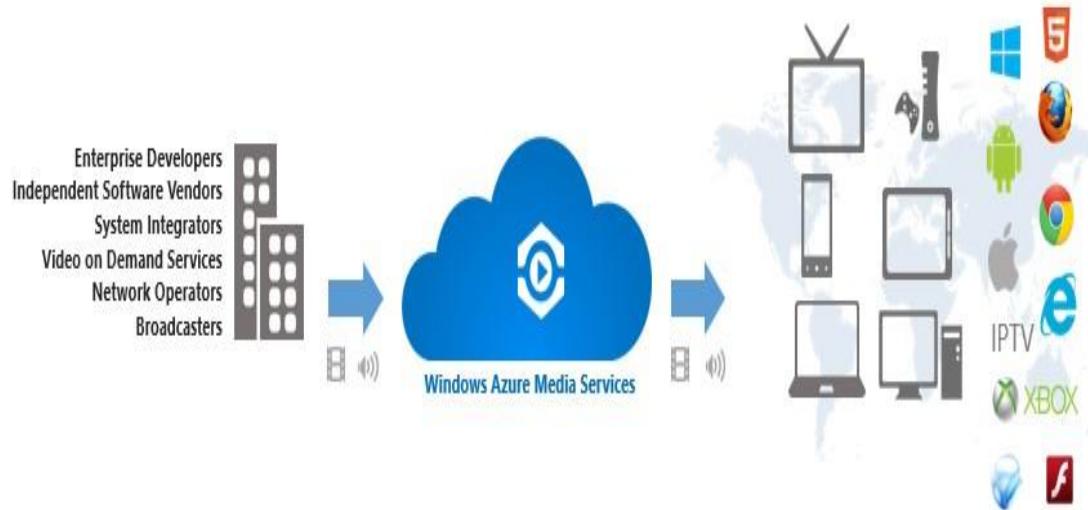
Azure Managed Disks is a way to simplifies disk management for VMs by managing the storage accounts associated with the VM disks. You only need to specify the type (Premium or Standard) and the size of disk you need, and Azure creates and manages the disk for you.



- **Media services**

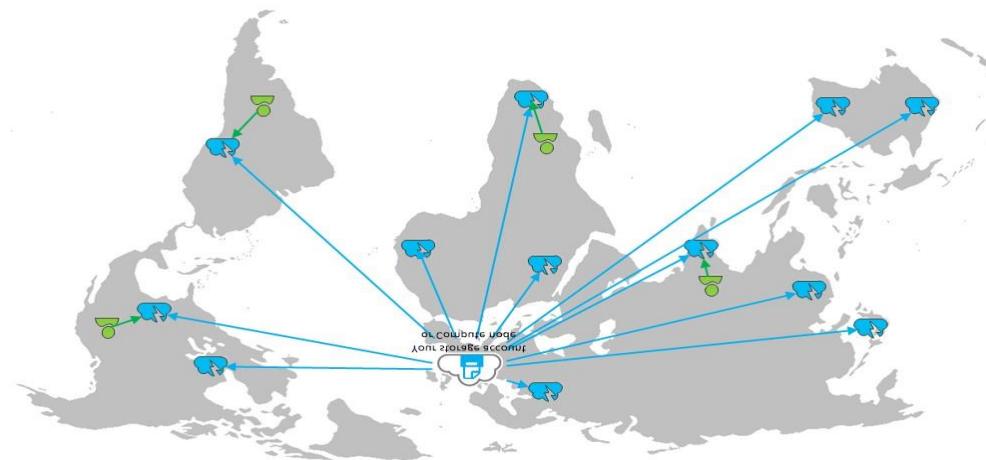
C.C PRACTICAL NO. 10

A PaaS offering that can be used for encoding, content protection, streaming, or analytics



CDN

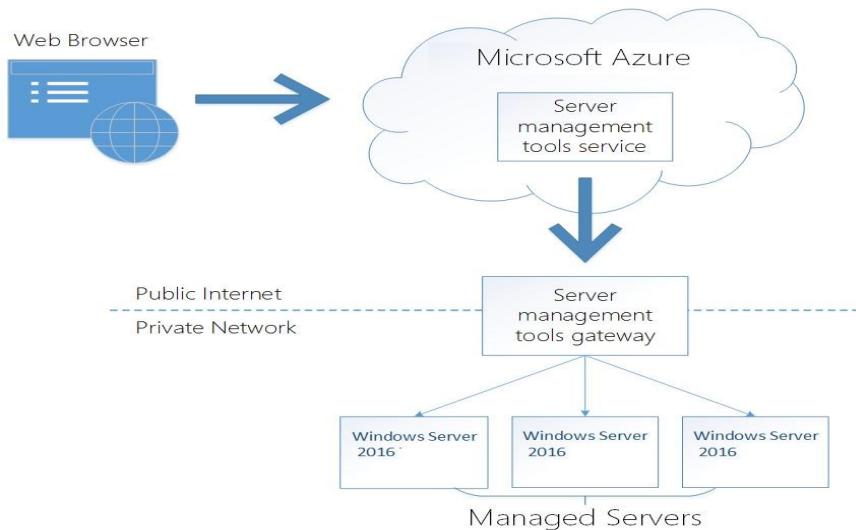
A global content delivery network (CDN) for audio, video, applications, images, and other static files. It can be used to cache static assets of websites geographically closer to users to increase performance. The network can be managed by a REST based HTTP API



Management

Azure Automation, provides a way for users to automate the manual, long-running, error-prone, and frequently repeated tasks that are commonly performed in a cloud and enterprise environment. It saves time and increases the reliability of regular administrative tasks and even schedules them to be automatically performed at regular intervals. You can automate processes using runbooks or automate configuration management using Desired State Configuration.

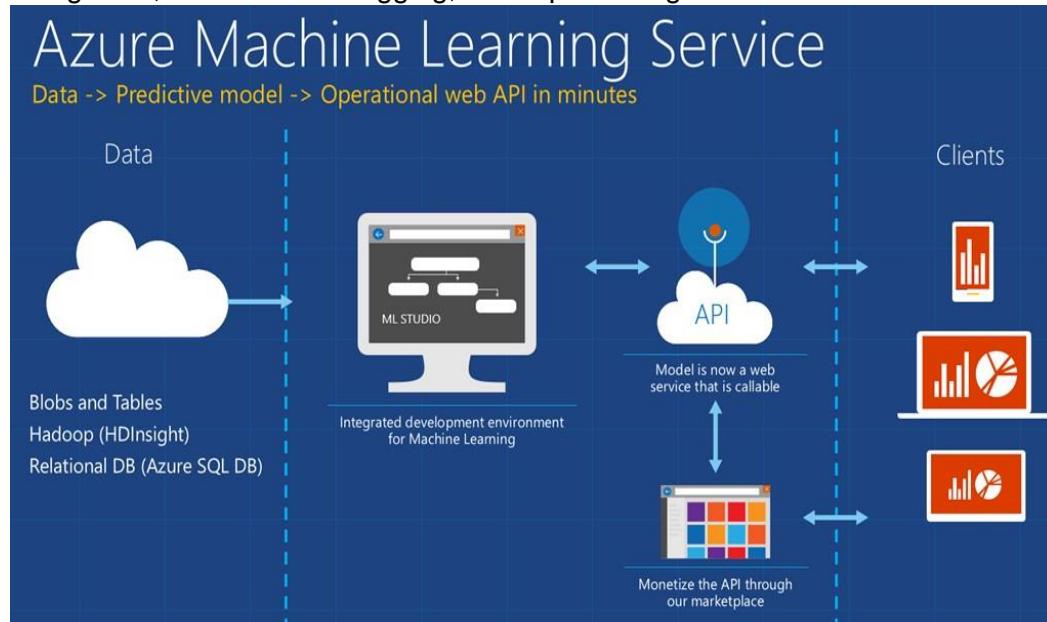
C.C PRACTICAL NO. 10



- **Machine learning**

Microsoft Azure Machine Learning (Azure ML) service is part of Cortana Intelligence Suite that enables predictive analytics and interaction with data using natural language and speech through Cortana.^[22]

Cognitive Services (formerly Project Oxford) are a set of APIs, SDKs and services available to developers to make their applications more intelligent, engaging and discoverable. The services include face recognition and verification, celebrity recognition, visual feature tagging, and clipart recognition



Google Cloud Platform

What is Google Cloud Platform ?

Google Cloud (public cloud-based Platform) launched in 2011, is a provider of computing resources for deploying and operating applications on the web. Its specialty is providing a place for individuals and enterprises to build and run

C.C PRACTICAL NO. 10

software, and it uses the web to connect to the users of that software. **When to use GCP?**

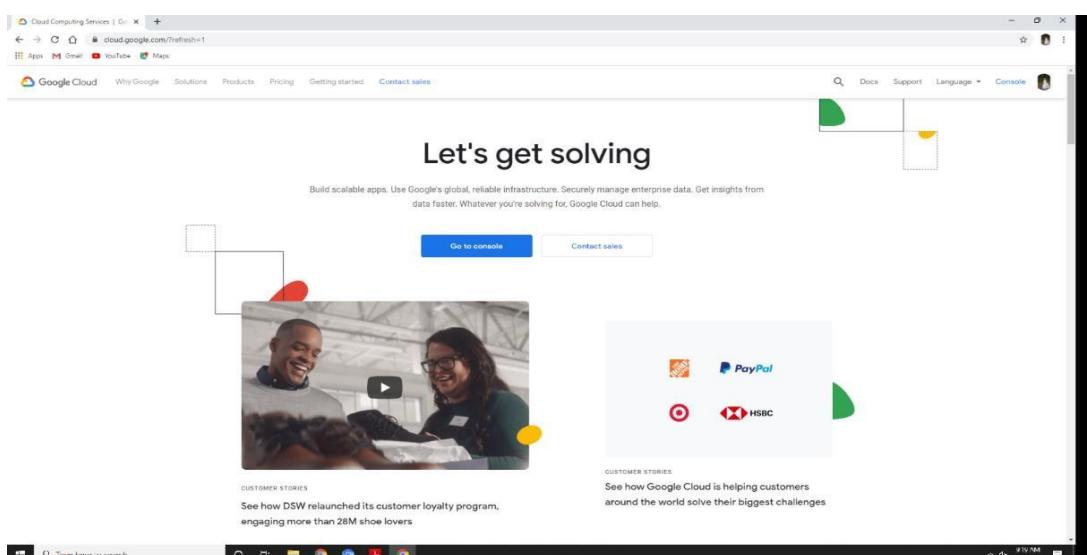
You use a cloud platform such as GCP when you want to build and run an application that can leverage the power of hyperscale data centers in some way i.e. to reach users worldwide, or to borrow sophisticated analytics and AI functions, to utilize massive data storage, and/or Processing Power ,to take advantage of cost efficiencies. You pay not for the machine but only for the resources the machine or Your App (or Whatever Your ?) uses.

Why GCP?



Steps to Create a Google Cloud Platform Account

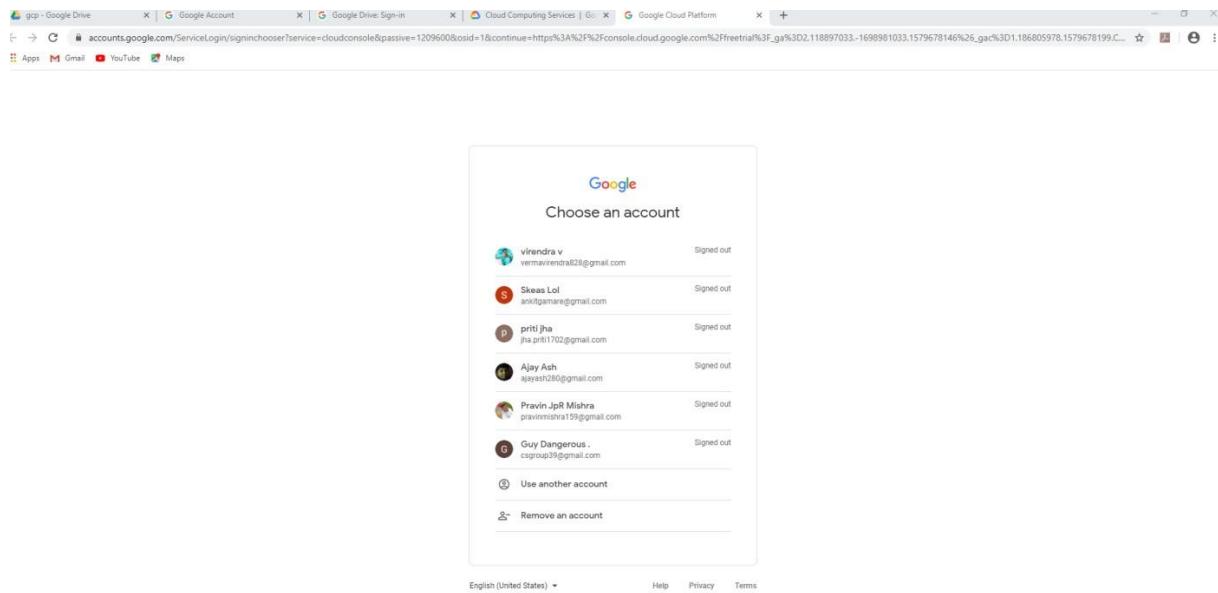
- 1) Visit <https://cloud.google.com/>:



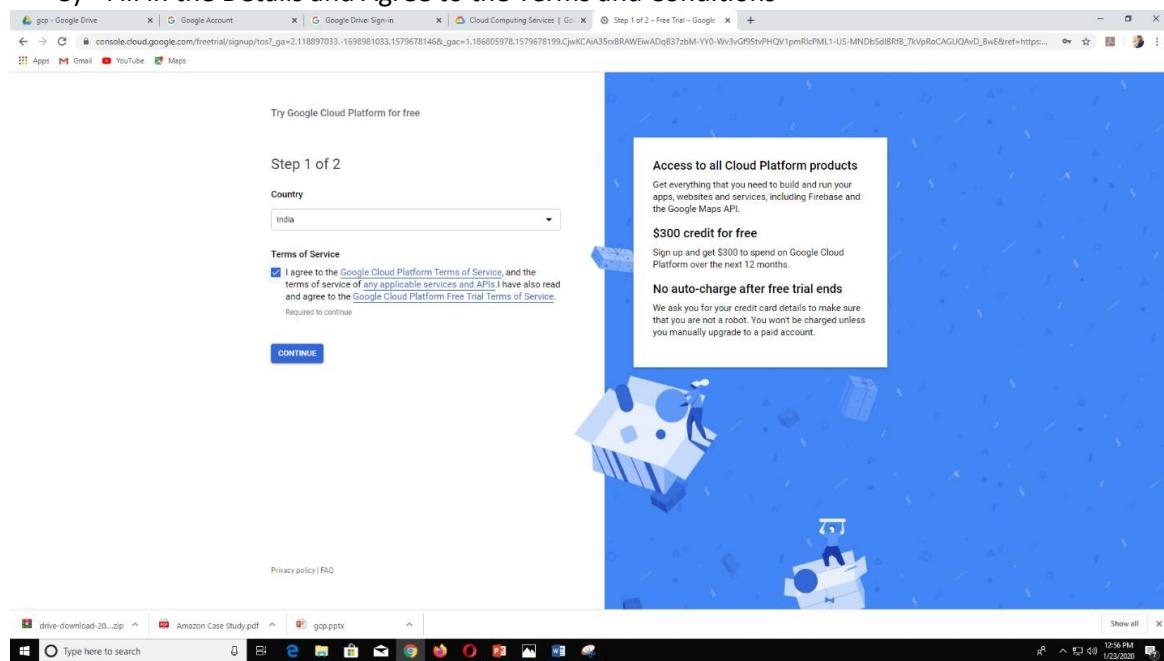
- 2) Click On Get started for Free ,You Have to Sign In With Google Account , SO sign In with Your

C.C PRACTICAL NO. 10

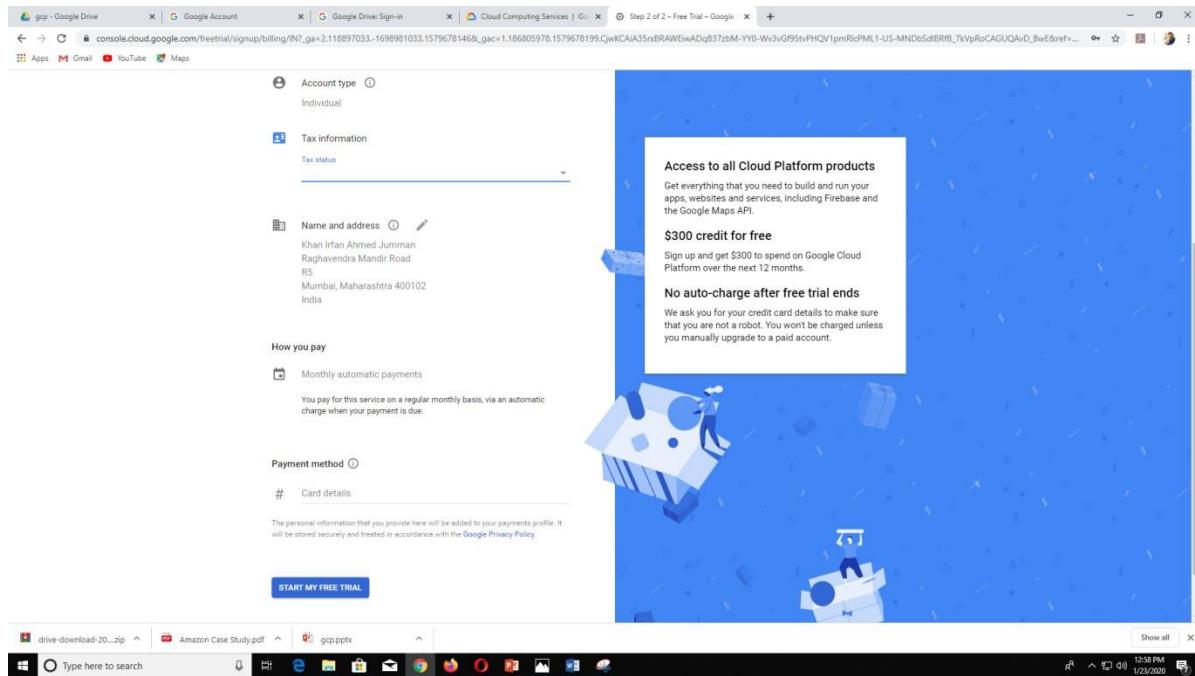
Google Account



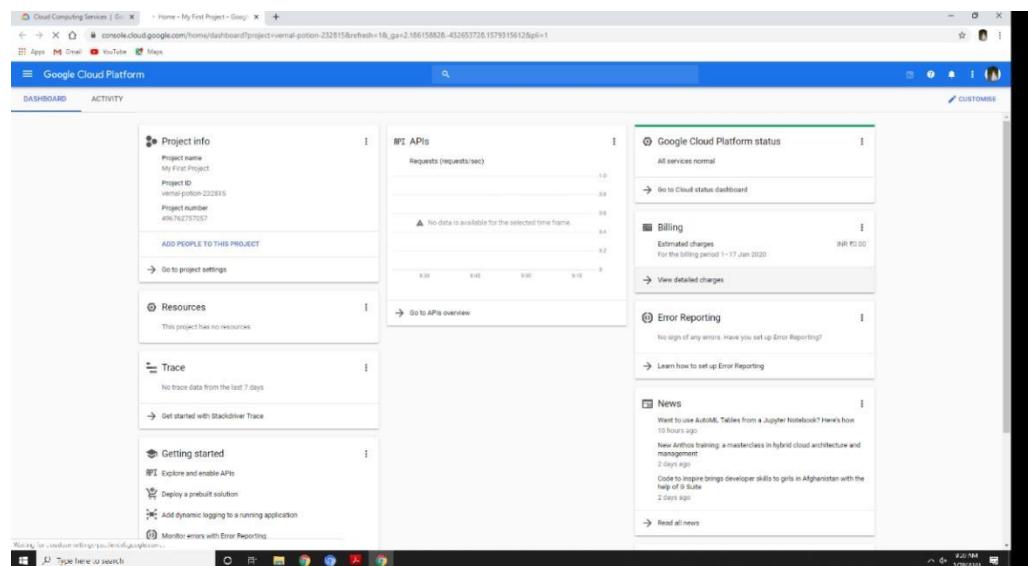
3) Fill in the Details and Agree to the Terms and Conditions



C.C PRACTICAL NO. 10

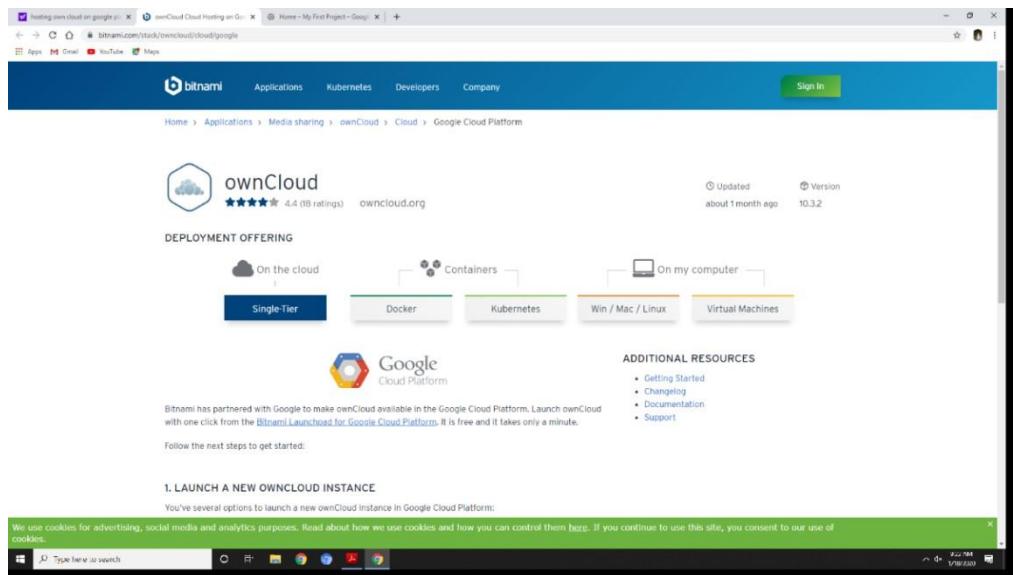


- 4) After You Have Entered Correct Details You will be Successfully Signed In as a Google Cloud Platform Customer with your gmail As Your Identity ! The Following Screen Appears

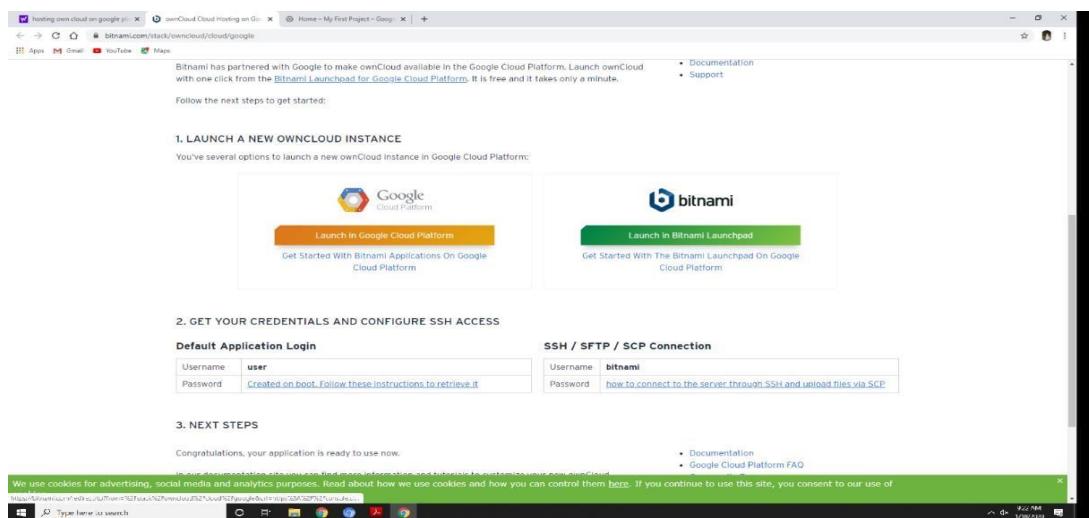


- 5) Make a New Application with owncloud Instance Using Bitnami by a) Visit the website : bitnami.com/stack/owncloud/cloud/google(Make Sure You are Logged in With Your GCP Account)

C.C PRACTICAL NO. 10

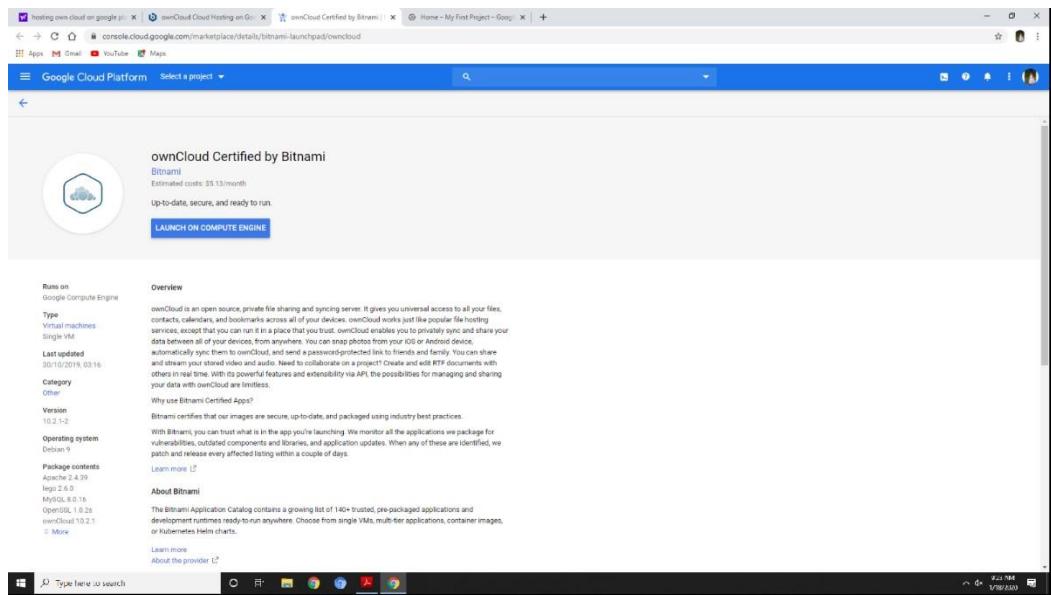


The above Web Page Appears , Scroll down
b) Click on 'Launch in Google Cloud Platform'

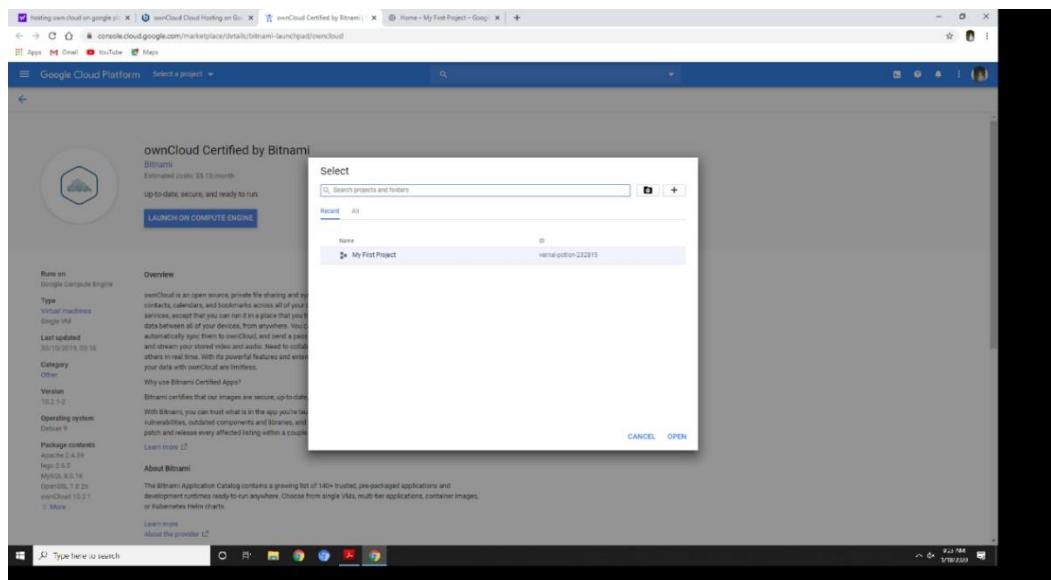


c) Then On the Web Page Click on 'Launch in Compute Engine'

C.C PRACTICAL NO. 10

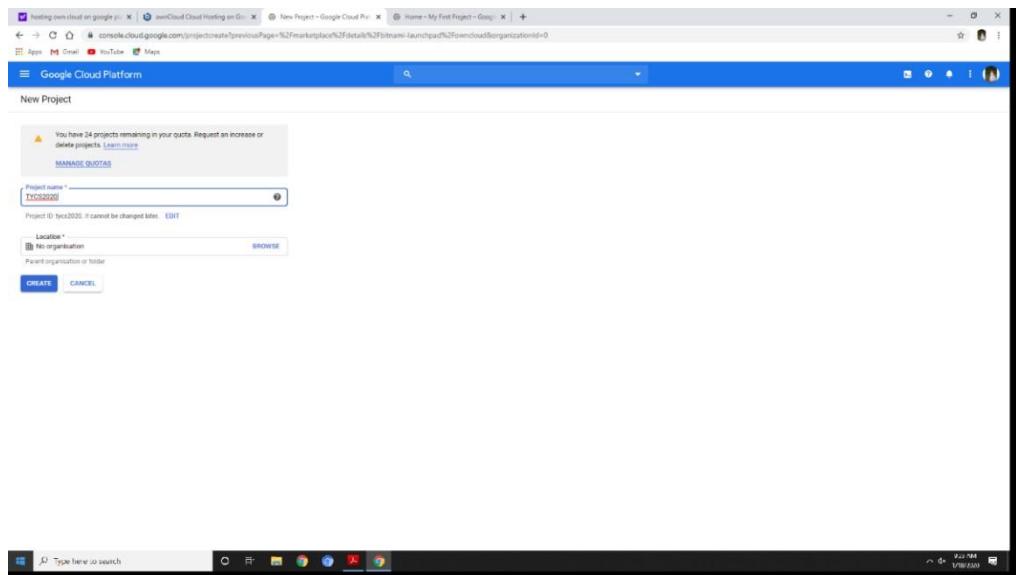


d) Select a Project Or Create A New Project by Clicking the Appropriate Button

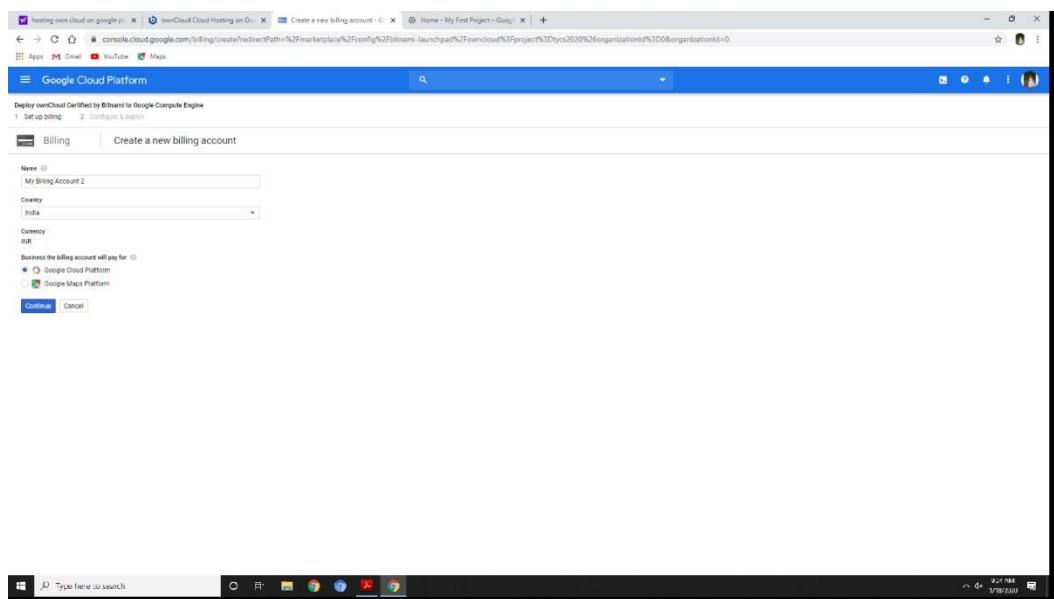


Here We Are Creating A new Project

C.C PRACTICAL NO. 10

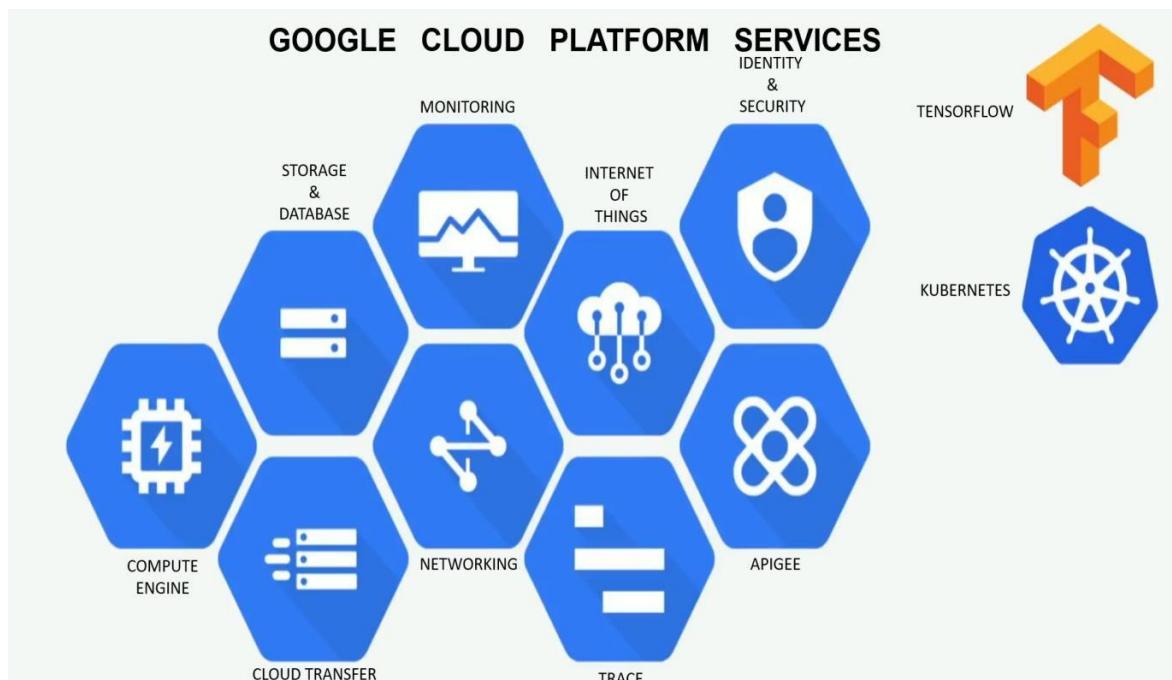
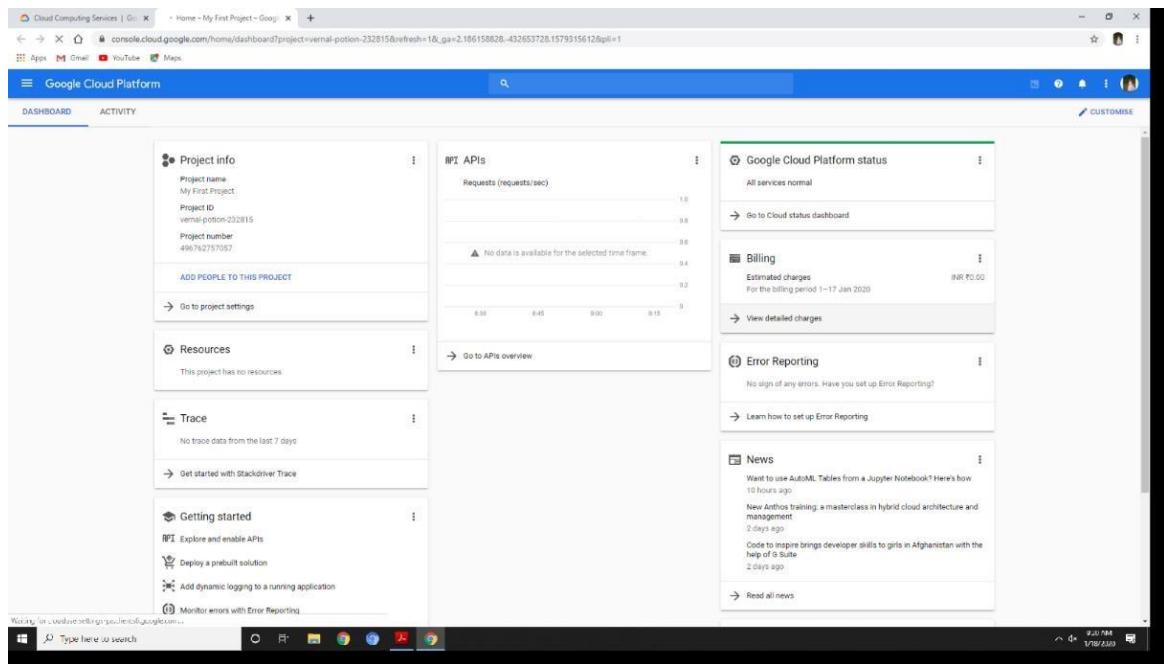


e) Then You Have to Enter Your Billing Details , Enter It



The App will Be Shown In Your GCP dashboard .i.e. on this Page

C.C PRACTICAL NO. 10



Google Compute Engine (GCE)

- competes directly against the service that put Amazon Web Services on the map:
- used for hosting virtual machines (VMs, servers that exist entirely as software).

Google Kubernetes Engine (GKE, formerly Google Container Engine)

- is a platform for a more modern form of *containerized application* (called "Docker containers")
- which is engineered for deployment on cloud platforms.

C.C PRACTICAL NO. 10

Google App Engine

- provides software developers with tools and languages such as Python, PHP, Microsoft's .NET languages,
- for building and deploying a web application directly on Google's cloud.
- This is different from building the application locally and deploying it remotely on the cloud;
- this is "cloud-native" development: building, deploying, and evolving the application all remotely.

Google Cloud Storage

- is GCP's *object data store*, meaning it accepts any quantity of data and represents that data to its user in–
- for example, as files, a database, a data stream, an unordered list of data, or as multimedia.

Nearline

- is a way to utilize Google Cloud Storage for backup and archival data –
- a attractive option for purposes as system backups.

BigQuery : is a data warehousing system using Google Cloud Storage designed for very large quantities of highly distributed data, enabling SQL queries to be executed across multiple databases of varying structure levels. BigQuery utilizes a columnar storage system in which components of records are stacked onto one another and streamed to a parallel storage system. Such an organization proves useful in analytics applications, which collect broad statistics on simple, often general, relationships between data elements.

Cloud SQL : (not yet ready for public consumption) hosts much more traditional, relational database tables and indexes, using a GCE instance that scales itself up to meet the database's performance demands.

Cloud AutoML : is a suite of services geared to enable applications to leverage machine learning -- to detect perceptible patterns throughout large quantities of data, and utilize those patterns within a program.

Cloud Run : is a newly announced service enabling software developers to stage and deploy their applications to Google's cloud using the so-called *serverless* model -- building and running programs with the appearance of being hosted locally instead of in the cloud.

S

Advantages of Google Cloud Platform

C.C PRACTICAL NO. 10

1. **Pricing** : Google Cloud Platform provides 12-month free trial service. After this period, a user can quit all the services if not required or can update if he/she wants to change the current plan. But in other platforms, Pricing is a bit high. They don't allow the users to switch to other plans available in the platform.
2. **Database** : Google Cloud Storage supports all kinds of databases for e.g. MYSQL and also supports Big Data. Other platforms like Amazon Web Services and Microsoft Azure don't support both Structured and Relational Databases.
3. **Live Migration** : Google Cloud Hosting allows users to migrate their Virtual machines while others don't.
4. **Automating the deployment of modern applications** : Google is the originator of Kubernetes, which is an orchestrator for applications comprised of many components. Early on, Google took a proactive approach to automating the deployment of these multifaceted apps to the cloud: for example, opening itself to Kubo, an automation platform originally created to help developers using Cloud Foundry to deploy their applications from dev platforms to the cloud.

Disadvantages of Google Cloud Platform

1. Lack of elastic search
2. Support fee is quite hefty: around 150 USD per month for the most basic service (Silver class)
3. Downloading data from Google Cloud Storage is expensive. 0.12 USD per GB, more than other cloud providers !
4. SDK APIs seem less stable than the Amazon S3 ones.
5. It has a complex pricing schema : similar to AWS S3, so it's easy to get unexpected costs (e.g. number of requests, transfers, etc ...)
6. Small components, difficult to start
7. Out of Free Tier, everything costs.
8. Lacks features compared to AWS.

C.C PRACTICAL NO. 10

Comparison between Amazon EC2, Microsoft Azure and Google Cloud.

CLOUD SERVICE PROVIDERS		
Amazon	Azure-Microsoft	Google
- Amazon Web Services(AWS)		-Google Cloud platform
Year of launch		
2006	2010	2011
WHICH ONE TO CHOOSE AND WHY?		
Dominant in many features like configuration, monitoring security, and others	-Integration with Microsoft tools Broad feature set	-Open source support and Portability
-Extensive, mature offerings	-Ranks first in development and testing tools	-Discounts and flexible contracts -Designed for cloud-based businesses
-Enterprise-friendly services -Open and flexible -Global search	-Open source support -Hybrid cloud	- DevOps expertise
WHY NOT CHOOSE?		
-Difficult to use -Overwhelming options -cost management	-Less efficient management tooling -Less "enterprise-ready"	-Lately entered in IaaS market -Less data centres over the world -Fewer services and features
MARKET SHARE		
40%	30%	10%
PRICING		
2VCPU+8GB RAM - 69\$/month	2VCPU+8GB RAM - 70\$/month	2VCPU+8GB RAM - 52\$/month
Availability		
55 zone	44 zone	18 zone
Downtime in 2014		
7:55 Hrs	19 Hrs	18 Min