<u>AIM:</u> Install Virtual box/VMware Workstation with different flavors of Linux or windows OS on top of windows7 or 8.

THEORY:

VirtualBox is a free and open-source software program for virtualizing the x86 computing architecture. Oracle Corporation developed it. It works as a hypervisor and develops a Virtual Machine where the user can run another operating system. The "host" OS is the operating system where VirtualBox runs. The "guest" OS is the operating system running on the Virtual Machine. As the host OS, VirtualBox supports Windows, Linux, Solaris, Open Solaris, and MacOS.

PROCEDURE:

1.Install Virtual Box



Downloads	If you're looking for the latest VirtualBox 6.0 packages, see VirtualBox 6.0 builds. Please also use version 6.0 if you need to
Documentation	run VMs with software virtualization, as this has been discontinued in 6.1. Version 6.0 will remain supported until July 2020.
End-user docs	If you're looking for the latest VirtualBox 5.2 packages, see VirtualBox 5.2 builds. Please also use version 5.2 if you still need
Technical docs	support for 32-bit hosts, as this has been discontinued in 6.0. Version 5.2 will remain supported until July 2020.
Contribute	VirtualBox 6.1.16 platform packages
Community	
	The binaries are released under the terms of the GPL version 2. See the changelog for what has changed. You might want to compare the checksums to verify the integrity of downloaded packages. The SHA256 checksums should be favored as the MD5 algorithm must be treated as insecure!











- 2.Install Linux OS for PC
- 3.Install Ubuntu in Virtualbox







RESULT:

Installation of Virtual box/VMware Workstation with different flavors of Linux or windows OS on top of windows7 or 8 was performed.

AIM

To Install a C compiler in the virtual machine created using virtual box and execute Simple Programs.

SOFTWARE REQUIRED:

Virtual box/VMware Workstation

PROCEDURE:

Open terminal icon on your Desktop screen. If not, you can find it through the search menu. A shortcut to open terminal is: Press Ctrl + Alt + T.

Open terminal so that we can proceed with the further steps to install the GCC Compiler. The main command for installing the GCC compiler using terminal on Ubuntu is:

sudo apt install GCC

Here, GCC is the C compiler.

Type 'y' when the command prompt which asks "Do you want to continue?" and then press Enter.

Thereafter, your installation will begin

You can find the terminal icon on your Desktop screen or on the search menu. A shortcut to open terminal is: Press Ctrl + Alt + T simultaneously.

gcc - - version

After pressing enter, the version of the terminal software would be displayed.

In order to create a C program, use the 'touch' command and give the name of the file with .c extension

But before that, you need to choose the directory you are working on.

Most of the programmers generally prefer to work on the Desktop folder as it proves to be quite convenient to write, modify and run your programs instantly.

In order to locate your files on the Desktop folder and to change the reference of the current directory to Desktop, use this command:

cd Desktop

CODE:



RESULT:

Installation of the C compiler in the virtual machine created using virtual box and execution of simple C program was performed.

<u>AIM</u>:

To Create hello world app and other simple web applications using python/java.

SOFTWARE REQUIRED:

Google Cloud SDK, Python-3.7 IDE

THEORY:

App Engine is a fully managed, serverless platform for developing and hosting web applications at scale. You can choose from several popular languages, libraries, and frameworks to develop your apps, and then let App Engine take care of provisioning servers and scaling your app instances based on demand.

PROCEDURE:

- 1. Download and Install Google cloud SDK
- 2. Download and Install Python 3.7 IDE
- 3. Create the following yaml and python file and keep it in a desktop folder

YAML

application: hello version: 1 runtime: python27 api_version: 1 threadsafe: false

handlers: - url: /.* script: index.py

Python

print 'Hello NHCE';

4. Perform the following in Cloud SDK

gcloud components install app-engine-go

gcloud-cloud-sdk\bin\dev_appserver.py "location-of-the-desktop-folder"



Output:

<u>RESULT</u>: Created hello world app and other simple web applications using python/java.

AIM

To describe a procedure to transfer the files from one virtual machine to another machine.

SOFTWARE REQUIRED: Python IDE

THEORY:

Virtual machines allow you to run a different operating system in isolation, but you can't directly access files on your host PC. But transferring files between them is straightforward. You can transfer files from a VM to a local machine using methods like drag and drop, USB drives, and shared folders. Each method has its own advantages and is suited for different types of data.

PROCEDURE:

- 1. Open Devices > Shared Folders > Shared Folders Settings.
- 2. Click on the Add new share folder button
- 3. Browse for the folder you plan to share, and click Select Folder.
- 4. In Add Share, give the share a name you can use in both operating systems.
- 5. Check Auto-mount and Make permanent, then OK.
- 6. Click Devices Insert Guest Addition CD Images and install guest addition
- 7. Create New Folder on Ubuntu where you need to attach the Windows file
- 8. Run the following command in the terminal to attach the windows file

sudo mount -t vboxsf <Windows Folder Name> <Ubuntu Folder Name>

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RESULT: File transfer from Windows to Ubuntu OS was done via Virtual box

AIM

Use GAE launcher to launch the web applications.

THEORY

You can use Google App Engine to host a static website. Static web pages can contain client side technologies such as HTML, CSS, and JavaScript. Hosting your static site on App Engine can cost less than using a traditional hosting provider, as App Engine provides a free tier.

PROCEDURE

1. Open Google Cloud Console



2. Create a new project

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3. Select the project and activate cloud shell

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Project info Project name pythonappengine	RPI APIs : Requests (requests/sec)	 Google Cloud Platform status All services normal
Project number 446356727420 Project ID	0.8	→ Go to Cloud status dashboard

3. Execute the following commands in cloud shell

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Welcom To set shobin	e to Cloud Shell! Type "hel your Cloud Platform projec allah@cloudshell:-\$ gcloud	lp" to get started. t in this session use "g projects list	cloud config set y	project [PROJECT_I	D]"					

- 4. Navigate to API and Services in menu. Enable API and services
- 5. Search App Engine API and select App Engine Admin API and Enable
- 6. Open cloud shell and perform the following commands



```
shobinallah@cloudshell:~$ gcloud projects list
PROJECT_ID: disco-sky-337209
NAME: pythonappengine
PROJECT_NUMBER: 446356727420
shobinallah@cloudshell:~$ gcloud config set project disco-sky-337209
Updated property [core/project].
shobinallah@cloudshell:~ (disco-sky-337209)$ gcloud app create
```

- 7. Drag and drop the website documents in the editor window
- 8. Type gcloud app deploy in cloud shell



<u>Result</u>

GAE launcher to launch the web applications was performed.

AIM

Create an AWS account and create EC2 instance for a simple application

PROCEDURE

To launch the EC2 instance and mount an EFS file system

- 1. Open the Amazon EC2 console at <u>https://console.aws.amazon.com/ec2/</u>.
- 2. Choose Launch Instance.
- 3. In **Step 1: Choose an Amazon Machine Image (AMI)**, find an Amazon Linux 2 AMI at the top of the list and choose **Select**.
- 4. In Step 2: Choose an Instance Type, choose Next: Configure Instance Details.
- 5. In Step 3: Configure Instance Details, provide the following information:
 - Leave Number of instances at one.
 - Leave **Purchasing option** at the default setting.
 - For **Network**, choose the entry for the same VPC that you noted when you created your EFS file system in <u>Step 1: Create your Amazon EFS file system</u>.
 - For **Subnet**, choose a default subnet in any Availability Zone.
 - For **File systems**, make sure that the EFS file system that you created in <u>Step</u> <u>1: Create your Amazon EFS file system</u> is selected. The path shown next to the file system ID is the mount point that the EC2 instance will use, which you can change.
 - The User data automatically includes the commands for mounting your Amazon EFS file system.
- 6. Choose Next: Add Storage.
- 7. Choose Next: Add Tags.
- 8. Name your instance and choose Next: Configure Security Group.
- 9. In Step 6: Configure Security Group, set Assign a security group to Select an existing security group. Choose the default security group to make sure that it can access your EFS file system.
- 10. Choose Review and Launch.
- 11. Choose Launch.

12. Select the check box for the key pair that you created, and then choose Launch Instances.

Once the EC2 instance is created and becomes available, it will be mounted to your EFS file system.



Result:

Created an AWS account and EC2 instance for a simple application

AIM:

Install Docker desktop and create a container then pull an image into container.

THEORY

Docker Desktop is a one-click-install application for your Mac, Linux, or Windows environment that lets you to build, share, and run containerized applications and micro services. It provides a straightforward GUI (Graphical User Interface) that lets you manage your containers, applications, and images directly from your machine. Docker Desktop can be used either on its own or as a complementary tool to the CLI. A Docker image is a file used to execute code in a Docker container. Docker images act as a set of instructions to build a Docker container, like a template. Docker images also act as the starting point when using Docker. An image is comparable to a snapshot in virtual machine (VM) environments.

PROCEDURE:

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docker run -d -p 80:80 docker/getting-started



RESULT :

Installed Docker desktop and created a container and performed image pull into container.

AIM:

Write a HTML program in Visual Studio Code and execute in Docker.

PROCEDURE:

In VS Code, select the Docker icon on the left to view the Docker extension.



- Create a Docker and html file in VS Code
- Open the console and create a Docker image
- Pull the html file and run in Docker image



RESULT :

HTML program was written in Visual Studio Code and executed in Docker.

AIM:

Create an AWS S3 bucket and upload the content in the bucket.

PROCEDURE:

- 1. Sign in to the AWS Management Console and open the Amazon S3 console at https://console.aws.amazon.com/s3/.
- 2. In the left navigation pane, choose **Buckets**.
- 3. Choose Create bucket.

The Create bucket page opens.

4. For **Bucket name**, enter a name for your bucket.

The bucket name must:

- Be unique within a partition. A partition is a grouping of Regions. AWS currently has three partitions: aws (Standard Regions), aws-cn (China Regions), and aws-us-gov (AWS GovCloud (US) Regions).
- Be between 3 and 63 characters long.
- Consist only of lowercase letters, numbers, dots (.), and hyphens (-). For best compatibility, we recommend that you avoid using dots (.) in bucket names, except for buckets that are used only for static website hosting.
- Begin and end with a letter or number.

After you create the bucket, you cannot change its name. For more information about naming buckets, see <u>Bucket naming rules</u>.

Important

Avoid including sensitive information, such as account numbers, in the bucket name. The bucket name is visible in the URLs that point to the objects in the bucket.

5. For Region, choose the AWS Region where you want the bucket to reside.

To minimize latency and costs and address regulatory requirements, choose a Region close to you. Objects stored in a Region never leave that Region unless you explicitly transfer them to another Region. For a list of Amazon S3 AWS Regions, see <u>AWS service endpoints</u> in the *Amazon Web Services General Reference*.

- Under Object Ownership, to disable or enable ACLs and control ownership of objects uploaded in your bucket, choose one of the following settings: ACLs disabled
- **Bucket owner enforced (default)** ACLs are disabled, and the bucket owner automatically owns and has full control over every object in the bucket. ACLs no longer affect access

permissions to data in the S3 bucket. The bucket uses policies exclusively to define access control.

By default, ACLs are disabled. A majority of modern use cases in Amazon S3 no longer require the use of ACLs. We recommend that you keep ACLs disabled, except in unusual circumstances where you must control access for each object individually. For more information, see <u>Controlling ownership of objects and disabling ACLs for your bucket</u>. ACLs enabled

• **Bucket owner preferred** – The bucket owner owns and has full control over new objects that other accounts write to the bucket with the bucket-owner-full-control canned ACL.

If you apply the **Bucket owner preferred** setting, to require all Amazon S3 uploads to include the bucket-owner-full-control canned ACL, you can <u>add a bucket policy</u> that allows only object uploads that use this ACL.

Object writer – The AWS account that uploads an object owns the object, has full control over it, and can grant other users access to it through ACLs.
 Note

The default setting is **Bucket owner enforced**. To apply the default setting and keep ACLs disabled, only the s3:CreateBucket permission is needed. To enable ACLs, you must have the s3:PutBucketOwnershipControls permission.

7. Under **Block Public Access settings for this bucket**, choose the Block Public Access settings that you want to apply to the bucket.

By default, all four Block Public Access settings are enabled. We recommend that you keep all settings enabled, unless you know that you need to turn off one or more of them for your specific use case. For more information about blocking public access, see <u>Blocking public</u> access to your Amazon S3 storage.

Note

To enable all Block Public Access settings, only the s3:CreateBucket permission is required. To turn off any Block Public Access settings, you must have the s3:PutBucketPublicAccessBlock permission.

8. (Optional) Under **Bucket Versioning**, you can choose if you wish to keep variants of objects in your bucket. For more information about versioning, see <u>Using versioning in S3 buckets</u>.

To disable or enable versioning on your bucket, choose either **Disable** or **Enable**.

9. (Optional) Under **Tags**, you can choose to add tags to your bucket. Tags are key-value pairs used to categorize storage.

To add a bucket tag, enter a Key and optionally a Value and choose Add Tag.

10. Under Default encryption, choose Edit.

- 11. To configure default encryption, under Encryption type, choose one of the following:
- Amazon S3 managed key (SSE-S3)
- AWS Key Management Service key (SSE-KMS)



<u>RESULT</u> : Created an AWS S3 bucket and uploaded the content in the bucket.

AIM:

Using Amazon Dynamo DB, create a Dynamo table and enter the data into then query it.

THEORY:

Amazon DynamoDB is a NoSQL managed database service provided by Amazon that stores semi-structured data like key-value pairs. A DynamoDB table consists of items. Each item consists of one partition key and one or more attributes.

PROCEDURE:

In this step, you will use the DynamoDB console to create a table.

In the DynamoDB console, choose Create table.

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<u>RESULT</u>: Created a Dynamo table and entered the data into it.