



S.I.E.S College of Arts, Science and Commerce(EAutonomous)
Sion(W), Mumbai – 400 022.

CERTIFICATE

This is to certify that ~~Miss./Mr~~ **Sreenath Shankaran Nair** Roll No. **SCS2526051** has successfully completed the necessary course of experiments in the subject of **Operating System** during the academic year **2025 – 2026** complying with the requirements of **University of Mumbai**, for the course of **SYBSc Computer Science [Semester-III]**.

Prof. In-Charge
Mrs Maya Nair

Examiner's Signature & Date

Head of the Department
Dr. Manoj Singh

College Seal

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Practical-1,2 & 3

Roll no: SCS2526051

Aim: Programs on concept of Multithreading

A) Program to display Summation of numbers using thread.

Code:

```
Program to display Summation of numbers using thread.

[10]: import threading

def summation(num):
    print(f"The Current Running Thread: {threading.current_thread().name}")
    sum = 0
    for i in range(1, num+1):
        sum += i
    print(f"The Summation of {num} is {sum}")

t1 = threading.Thread(target=summation, args=(5,), name="Thread 1")
t2 = threading.Thread(target=summation, args=(10,), name="Thread 2")
t3 = threading.Thread(target=summation, args=(25,), name="Thread 3")
t4 = threading.Thread(target=summation, args=(40,), name="Thread 4")

print("Name: Sreenath Nair, Roll No: SCS2526051")
print(f"The Current Running Thread: {threading.current_thread().name}")
t1.start()
t2.start()
t3.start()
t4.start()
t1.join()
t2.join()
t3.join()
t4.join()

print(f"The Current Running Thread: {threading.current_thread().name}")
print("All Threads Completed!!!")
```

Output:

```
Name: Sreenath Nair, Roll No: SCS2526051
The Current Running Thread: MainThread
The Current Running Thread: Thread 1
The Summation of 5 is 15
The Current Running Thread: Thread 2
The Summation of 10 is 55
The Current Running Thread: Thread 3
The Summation of 25 is 325
The Current Running Thread: Thread 4
The Summation of 40 is 820
The Current Running Thread: MainThread
All Threads Completed!!!
```

B) Program to display the prime numbers using thread

Code:

Program to display the prime numbers using thread

```
[13]: import threading

def is_prime(num1, num2):
    print(f"The Current Running Thread: {threading.current_thread().name}")
    for i in range(num1, num2+1):
        for j in range(2, i):
            if i % j == 0:
                break
        else:
            print(f"Prime Number Between {num1} and {num2} is {i}")

t1 = threading.Thread(target=is_prime, args=(15, 20,), name="Thread 1")
t2 = threading.Thread(target=is_prime, args=(25, 35,), name="Thread 2")
t3 = threading.Thread(target=is_prime, args=(40, 55,), name="Thread 3")

print("Name: Sreenath Nair, Roll No: SCS2526051")
print(f"The Current Running Thread: {threading.current_thread().name}")
t1.start()
t2.start()
t3.start()
t1.join()
t2.join()
t3.join()

print(f"The Current Running Thread: {threading.current_thread().name}")
print("All Threads Completed!!!")
```

Output:

```
Name: Sreenath Nair, Roll No: SCS2526051
The Current Running Thread: MainThread
The Current Running Thread: Thread 1
Prime Number Between 15 and 20 is 17
Prime Number Between 15 and 20 is 19
The Current Running Thread: Thread 2
Prime Number Between 25 and 35 is 29
Prime Number Between 25 and 35 is 31
The Current Running Thread: Thread 3
Prime Number Between 40 and 55 is 41
Prime Number Between 40 and 55 is 43
Prime Number Between 40 and 55 is 47
Prime Number Between 40 and 55 is 53
The Current Running Thread: MainThread
All Threads Completed!!!
```

C) Program to display the Fibonacci series using thread.

Code:

```
Program to display the Fibonacci series using thread.

[18]: import threading

def fibonacci(num):
    print(f"The Current Running Thread: {threading.current_thread().name}")
    print(f"Fibonacci of {num} is")
    a,b=0,1
    print(a,b, end=" ")
    for i in range(2,num):
        a,b=b,a+b
        print(b,end=" ")
    print()

t1 = threading.Thread(target=fibonacci, args=(15,), name="Thread 1")
t2 = threading.Thread(target=fibonacci, args=(20,), name="Thread 2")
t3 = threading.Thread(target=fibonacci, args=(25,), name="Thread 3")

print("Name: Sreenath Nair , Roll No: SCS2526051")
print(f"The Current Running Thread: {threading.current_thread().name}")
t1.start()
t2.start()
t3.start()
t1.join()
t2.join()
t3.join()

print(f"The Current Running Thread: {threading.current_thread().name}")
print("All Threads Completed!!!")
```

Output:

```
Name: Sreenath Nair , Roll No: SCS2526051
The Current Running Thread: MainThread
The Current Running Thread: Thread 1
Fibonacci of 15 is
0 1 1 2 3 5 8 13 21 34 55 89 144 233 377
The Current Running Thread: Thread 2
Fibonacci of 20 is
0 1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181
The Current Running Thread: Thread 3
Fibonacci of 25 is
0 1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181 6765 10946 17711 28657 46368
The Current Running Thread: MainThread
All Threads Completed!!!
```

PRACTICAL-4,5

ROLL NO: SCS2526051

NAME: SREENATH SHANKARAN NAIR

AIM: PROGRAM FOR INTER PROCESS COMMUNICATION

4) INTER-PROCESS COMMUNICATION USING MULTIPROCESSING.DEMO MODULE

CODE:

```
from multiprocessing.dummy import Process, Queue
import time
def sender(q):
    messages=["Message 1", "Message 2", "Message 3"]
    for message in messages:
        q.put(message)
        print(f"Sender: {message}")
        time.sleep(10)

def receiver(q):
    while True:
        message=q.get()
        time.sleep(10)
        print(f"Received:{message}")
        if message=="Done":
            break

queue=Queue()
process1=Process(target=sender,args=(queue,))
process2=Process(target=receiver,args=(queue,))
process1.start()
process2.start()
process1.join()
process2.join()
```

OUTPUT:

```
Sender: Message 1
Sender: Message 2
Received:Message 1
Sender: Message 3
Received:Message 2
Received:Message 3
```

5) INTER-PROCESS COMMUNICATION USING MULTIPROCESSING.

CODE:

```
script_code=''
from multiprocessing import Process,Queue
import multiprocessing
import time
def sender(q):
    for i in range(10):
        print(f"Sending: {i}",flush=True)
        q.put(i)
        time.sleep(1)

def receiver(q):
    for i in range (10):
        data=q.get()
        time.sleep(1)
        print(f"Received:{i}",flush=True)
if __name__== '__main__':
    multiprocessing.freeze_support()

    queue=Queue()
    process1=Process(target=sender,args=(queue,))
    process2=Process(target=receiver,args=(queue,))
    process1.start()
    process2.start()
    process1.join()
    process2.join()
...
with open("ipc_test.py","w") as f:
    f.write(script_code)
```

```
!python ipc_test.py
```

OUTPUT:

```
Sending: 0
Sending: 1
Received:0
Sending: 2
Received:1
Sending: 3
Received:2
Sending: 4
Received:3
Sending: 5
Received:4
Sending: 6
Received:5
Sending: 7
Received:6
Sending: 8
Received:7
Sending: 9
Received:8
Received:9
```

PRACTICAL- 6

ROLL NO: SCS2526051

NAME: SREENATH SHANKARAN NAIR

AIM: APPLICATION ON THE FCFS ALGORITHM

CODE:

```
def getwaitingtime(n,bt,at,wt):
    st=[0]*n
    for i in range(1,n):
        st[i]=st[i-1]+bt[i-1]
        wt[i]=st[i]-at[i]

def getturnaroundtime(n,bt,wt,tt):
    for i in range(n):
        tt[i]=wt[i]+bt[i]

def display(n,pid,bt,at):
    wt=[0]*n #getwaitingtime function
    tt=[0]*n

    getwaitingtime(n,bt,at,wt)
    getturnaroundtime(n,bt,wt,tt)

    totalwt=0
    totaltt=0

    print("Process\tBurst\tArrival\tWaiting\tTurnaround")
    for i in range(n):
        totalwt=totalwt+wt[i]
        totaltt=totaltt+tt[i]
        print(f"{pid[i]}\t{bt[i]}\t{at[i]}\t{wt[i]}\t{tt[i]}")
    avgwt=totalwt/n
    avgtt=totaltt/n

    print("Average Waiting time:",round(avgwt,2))
    print("Average Turnaround time:",round(avgtt,2))

n=int(input("Enter no. of Processes:"))
process_ids=list(map(str,input("Enter process ids sorted by space:").split()))
bursttime=list(map(int,input("Enter CPU Burst time separated by space:").split()))
arrivaltime=list(map(int,input("Enter CPU Arrival time separated by space:").split()))
display(n,process_ids,bursttime,arrivaltime)
```

OUTPUT:

```
Enter no. of Processes: 4
Enter process ids sorted by space: 1 2 3 4
Enter CPU Burst time separated by space: 10 2 4 8
Enter CPU Arrival time separated by space: 0 2 4 5
Process Burst   Arrival Waiting Turnaround
1         10      0         0         10
2          2      2         8         10
3          4      4         8         12
4          8      5        11         19
Average Waiting time: 6.75
Average Turnaround time: 12.75
```


PRACTICAL - 7

ROLL NO: SCS2526051

AIM: PYTHON APPLICATION TO SIMULATE PROCESS SYNCHRONISATION USING SEMAPHORRE

CODE:

```
#SEMAPHORRE
#ROLL NO:51
from threading import Thread
import threading
import time
# shared buffer is defined as an object of the following class
class Buffer:
    def __init__(self,size):
        self.size=size
        self.b=[0]*size
        self.ino=0
        self.out=0
        self.empty=threading.Semaphore(size)
        self.full=threading.Semaphore(0)
        self.mutex=threading.Semaphore(1)
    def getvalue(self): #this is a function that will be invoked by consumer
        item=self.b[self.out]
        self.out=(self.out+1)%self.size
        return item
    def putvalue(self,value):#function invoked by producer
        self.b[self.ino]=value
        self.ino=(self.ino+1)%self.size

class Producer(Thread):
    def __init__(self,buffer1):
        super(Producer,self).__init__()
        self.buffer1=buffer1
    def run(self):
        i=0
        while True:
            i+=1
            self.buffer1.empty.acquire() #if semaphore is less than or equal to zero the process
            #enter the waiting state else the semaphore value is decremented by 1
            self.buffer1.mutex.acquire()
            self.buffer1.putvalue(i)
            self.buffer1.full.release() #increments the semaphore value by 1
            self.buffer1.mutex.release()
            print(f'\n Item {i} is put in the buffer')
            time.sleep(10)

class Consumer(Thread):
    def __init__(self,buffer1):
        super(Consumer,self).__init__()
        self.buffer1=buffer1
    def run(self):
        while True:
            self.buffer1.full.acquire()
            self.buffer1.mutex.acquire()
            item=self.buffer1.getvalue()
            self.buffer1.empty.release() #increments the semaphore value by 1
            self.buffer1.mutex.release()
            print(f'\n Item {item} is consumed from the buffer')
            time.sleep(10)

buffer1=Buffer(5)
p=Producer(buffer1)
c=Consumer(buffer1)
p.start()
c.start()
p.join()
c.join()
```

OUTPUT:

```
Item 1 is put in the buffer
Item 1 is consumed from the buffer
Item 2 is put in the buffer
Item 2 is consumed from the buffer
Item 3 is put in the buffer
Item 3 is consumed from the buffer
Item 4 is put in the buffer
Item 4 is consumed from the buffer
Item 5 is put in the buffer
Item 5 is consumed from the buffer
Item 6 is put in the buffer
Item 6 is consumed from the buffer
```

PRACTICAL - 8, 9, 10, 11

ROLL NO: SCS2526051

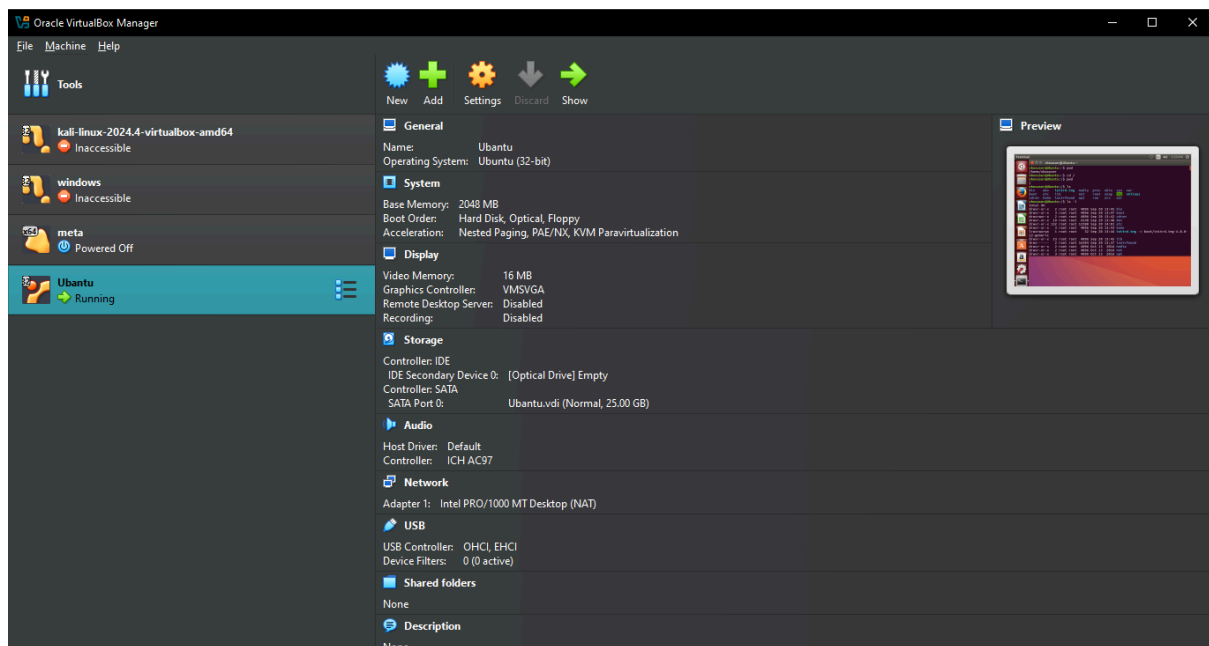
NAME: SREENATH SHANKARAN NAIR

AIM:A) LINUX BASIC COMMANDS

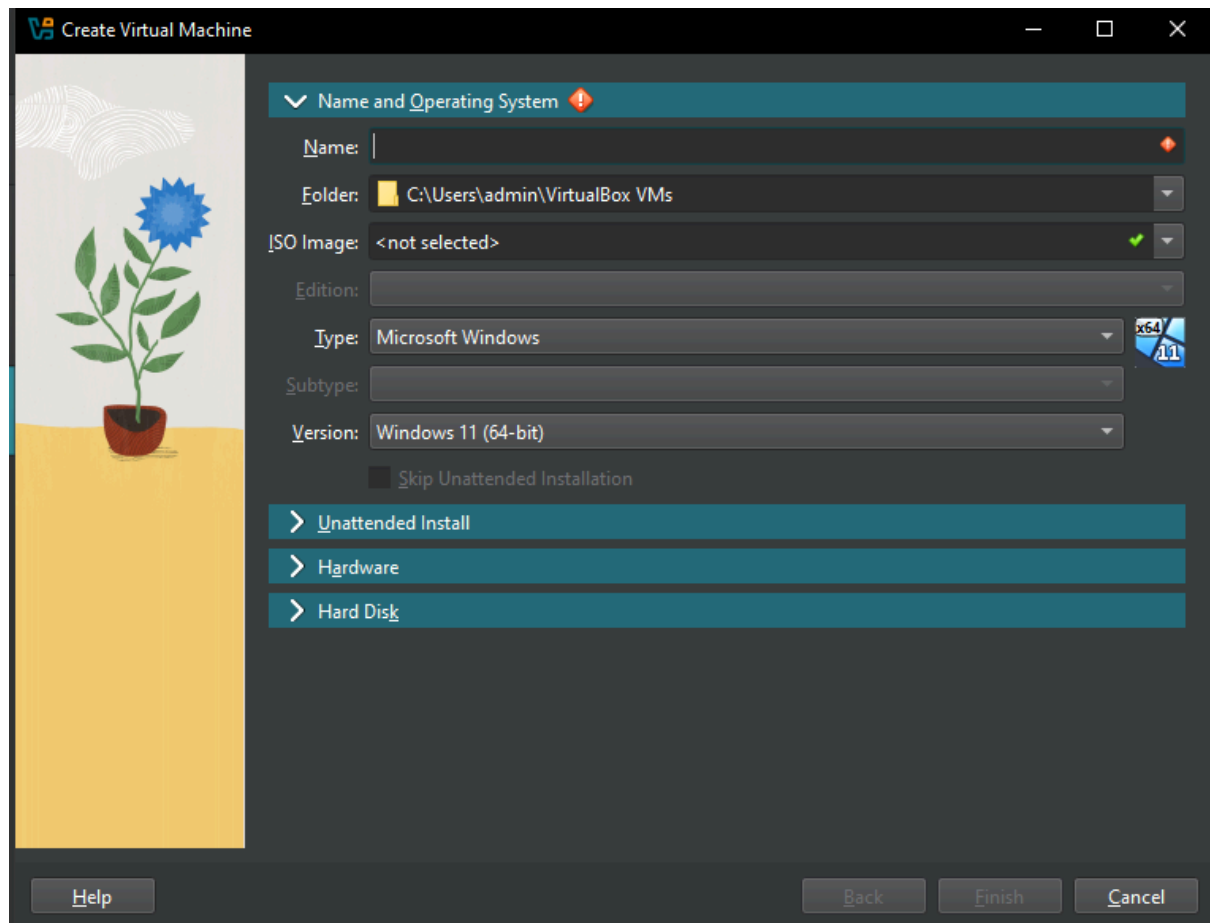
B) SHELL SCRIPTING 1: Write a shell script to perform the following commands on the current working directory

1. Long listing of all files in the pwd
2. To display the current system date
3. Count the number of lines, words, bytes, of the files
4. To display the current user

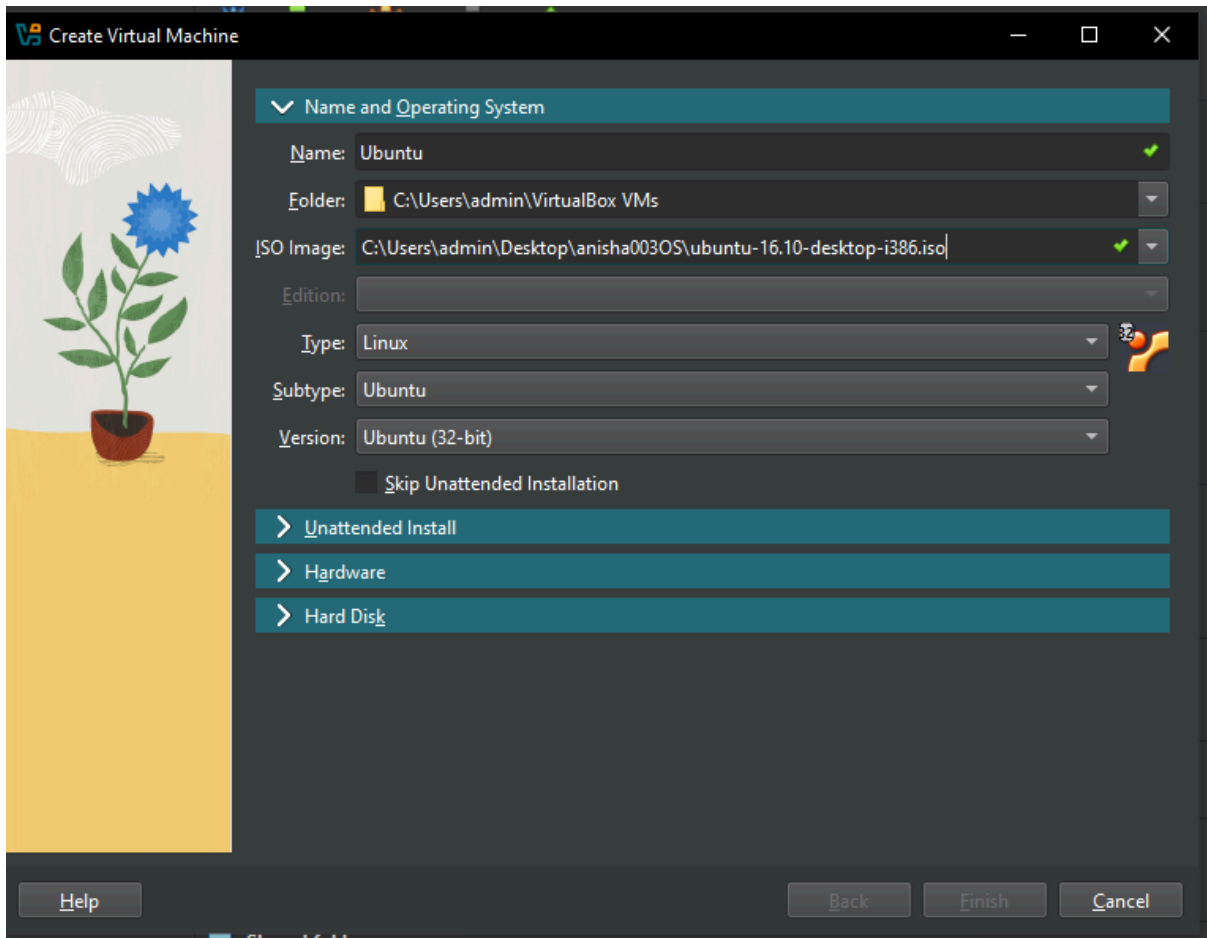
START ORACLE VIRTUALBOX



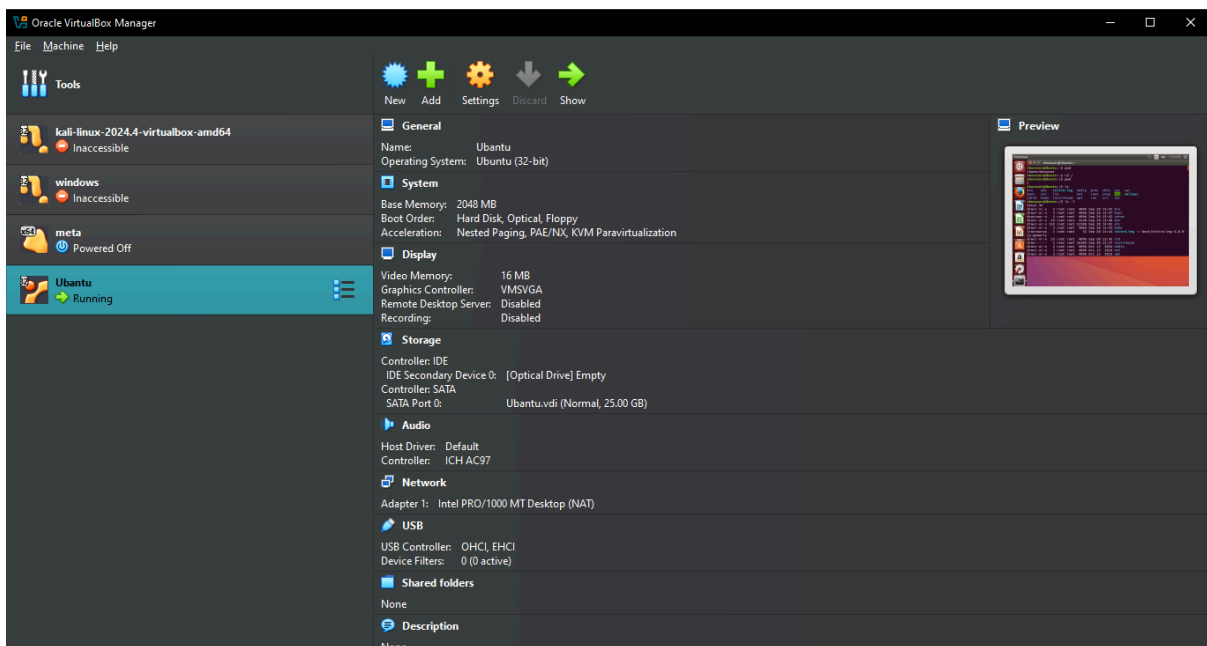
THEN CLICK ON NEW TO ADD UBUNTU



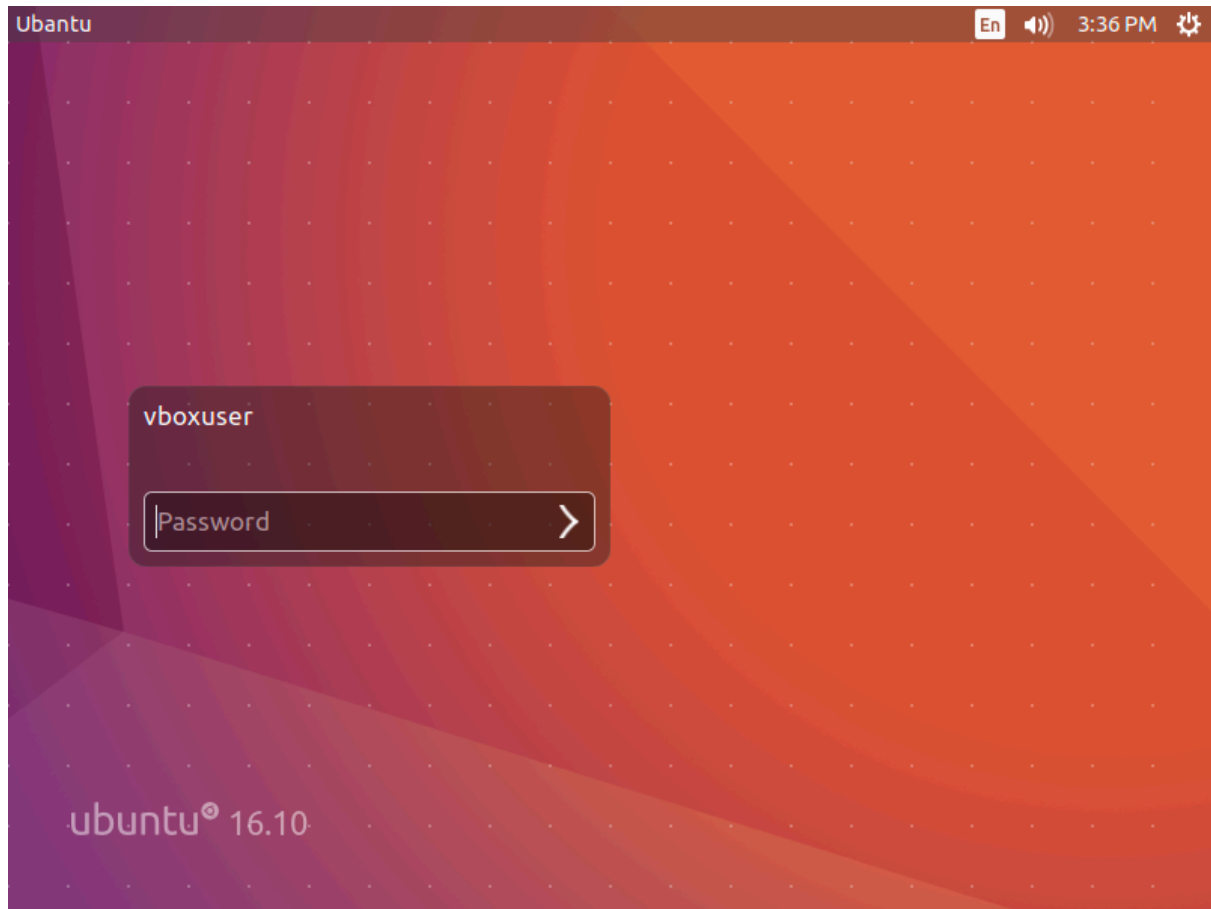
THEN ADD THE DISK IMAGE IN ISO IMAGE



THEN PRESS START BUTTON

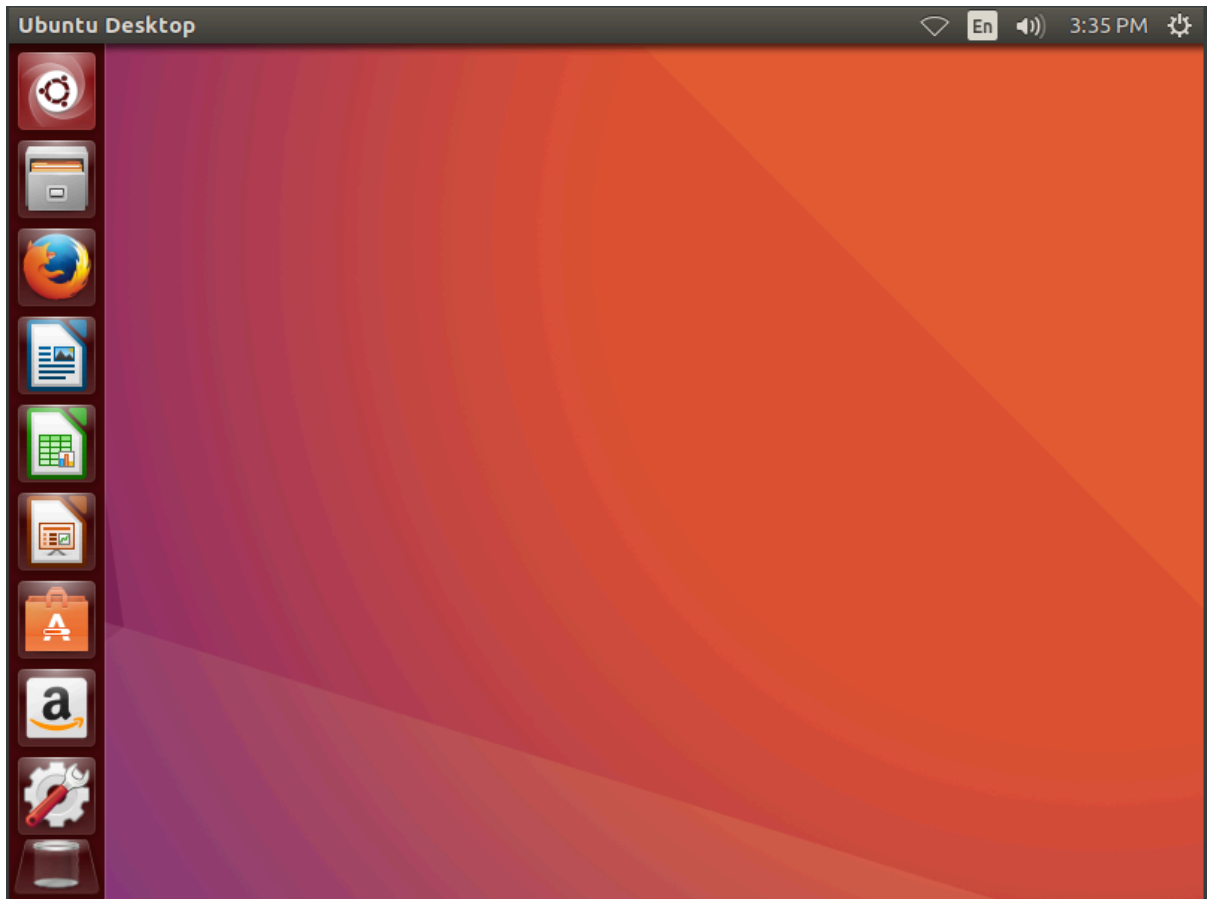


THEN IT WILL SHOW THE LOG IN PAGE



THEN ENTER THE PASSWORD= “changeme”.

IT WILL SHOW YOU THE LINUX SOFTWARE



PWD COMMAND - IT WILL SHOW THE PRESENT WORKING DIRECTORY

CD COMMAND - IT WILL CHANGE DIRECTORY

LS COMMAND - IT WILL LIST ALL THE FILES AND DIRECTORIES

LS -L COMMAND - IT LIST DIRECTORY IN A BETTER FORMAT

LS -A COMMAND - IT LISTS ALL THE FILES WITH HIDDEN FILES

EXECUTION:

```

vboxuser@Ubuntu:~$ pwd
/home/vboxuser
vboxuser@Ubuntu:~$ cd /
vboxuser@Ubuntu:/$ pwd
/
vboxuser@Ubuntu:/$ ls
bin    dev    initrd.img  media  proc  sbin  sys  var
boot  etc    lib         mnt    root  snap  tmp  vmlinuz
cdrom  home  lost+found  opt    run   srv   usr
vboxuser@Ubuntu:/$ ls -l
total 96
drwxr-xr-x  2 root root  4096 Sep 22 10:37 bin
drwxr-xr-x  3 root root  4096 Sep 22 10:39 boot
drwxrwxr-x  2 root root  4096 Sep 22 10:34 cdrom
drwxr-xr-x 19 root root 4240 Sep 22 10:40 dev
drwxr-xr-x 132 root root 12288 Sep 22 10:38 etc
drwxr-xr-x  3 root root  4096 Sep 22 10:35 home
lrwxrwxrwx  1 root root    32 Sep 22 10:36 initrd.img -> boot/initrd.img-4.8.0-
22-generic
drwxr-xr-x 23 root root  4096 Sep 22 10:37 lib
drwx----- 2 root root 16384 Sep 22 10:30 lost+found
drwxr-xr-x  2 root root  4096 Oct 13 2016 media
drwxr-xr-x  2 root root  4096 Oct 13 2016 mnt
drwxr-xr-x  3 root root  4096 Oct 13 2016 opt
dr-xr-xr-x 199 root root    0 Sep 22 10:40 proc

```

```

vboxuser@Ubuntu:/$ ls -a
.    boot  etc    lib    mnt    root  snap  tmp  vmlinuz
..   cdrom  home   lost+found  opt    run   srv   usr
bin  dev    initrd.img  media   proc  sbin  sys  var

```

WHOAMI - ITS RETURNS THE CURRENT USERNAME

MKDIR DIR1 - ITS MAKES A NEW DIRECTORY WITH
 DIRECTORY NAME DIR1

TO CHECK IF ITS MADE OR NOT TYPE COMMAND LS

EXECUTION:


```

vboxuser@Ubuntu:/$ cd /home/vboxuser
vboxuser@Ubuntu:~$ pwd
/home/vboxuser
vboxuser@Ubuntu:~$ ls
Desktop    Downloads      Music      Public      Videos
Documents  examples.desktop Pictures    Templates
vboxuser@Ubuntu:~$ whoami
vboxuser
vboxuser@Ubuntu:~$ mkdir
mkdir: missing operand
Try 'mkdir --help' for more information.
vboxuser@Ubuntu:~$ mkdir dir1
vboxuser@Ubuntu:~$ mkdir dir2
vboxuser@Ubuntu:~$ mkdir dir3
vboxuser@Ubuntu:~$
vboxuser@Ubuntu:~$ pwd
/home/vboxuser
vboxuser@Ubuntu:~$ ls
Desktop  dir2  Documents  examples.desktop  Pictures  Templates
dir1     dir3  Downloads  Music              Public    Videos
vboxuser@Ubuntu:~$ ls -l
total 56
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:40 Desktop
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:49 dir1

```

CAT EXAMPLES.DESKTOP - IT SHOWS THE CONTENT IN THAT PARTICULAR FILE

```

vboxuser@Ubuntu:~$ cat examples.desktop
[Desktop Entry]
Version=1.0
Type=Link
Name=Examples
Name[aa]=Ceelallo
Name[ace]=Contoh
Name[af]=Voorbeelde
Name[am]=ጥንሰታዊ
Name[an]=Exemplos
Name[ar]=أمثلة
Name[ast]=Exemplos
Name[az]=Nümunələri
Name[be]=Прыклады

```

```

Name[be]=Прыклады
Name[bg]=Примери
Name[bn]=উদাহরণ
Name[br]=Skouerioù
Name[bs]=Primjeri
Name[ca]=Exemples
Name[ca@valencia]=Exemples
Name[ckb]=ن لڤ من و مین
Name[cs]=Ukázky
Name[csb]=Przëmiôre
Name[cy]=Enghreifftiau
Name[da]=Eksempler
Name[de]=Beispiele
Name[dv]=མཐོན་མཁན་
Name[el]=Παραδείγματα
Name[en_AU]=Examples
Name[en_CA]=Examples
Name[en_GB]=Examples
Name[eo]=Ekzemploj
Name[es]=Ejemplos
Name[et]=Näidised
Name[eu]=Adibideak
Name[fa]=اوه من و مین
Name[fi]=Esimerkkejä
Name[fil]=Mga halimbawa

```

```

Comment[tg]=Мӯҳтавои намунавӣ барои Ubuntu
Comment[th]=ตัวอย่างข้อมูลสำหรับ Ubuntu
Comment[tr]=Ubuntu için örnek içerik
Comment[tt]=Ubuntu өчен документ мисаллары
Comment[ug]=ئىرلىلىرىم ئۈچۈن ئۇنۇتۇ
Comment[uk]=Приклади контенту для Ubuntu
Comment[ur]=داوم ڪرڻ ڪم ۽ ترتيب ڏيڻ
Comment[uz]=Ubuntu учун намуна таркиби
Comment[vec]=Contenuti de esempio de Ubuntu
Comment[vi]=Mẫu ví dụ cho Ubuntu
Comment[wae]=D'Ubuntu bischbildatija
Comment[zh_CN]=Ubuntu 示例内容
Comment[zh_HK]=Ubuntu 的範例內容
Comment[zh_TW]=Ubuntu 的範例內容
URL=file:///usr/share/example-content/
Icon=folder
X-Ubuntu-Gettext-Domain=example-content

```

Echo - it will print the content you want in any file you wish

```

vboxuser@Ubuntuu:~$ echo "hello world"
hello world
vboxuser@Ubuntuu:~$ echo "This is the first file context" > file1.txt
vboxuser@Ubuntuu:~$ echo "This is the second file context" > file2.txt
vboxuser@Ubuntuu:~$ echo "This is the third file context" > file3.txt
vboxuser@Ubuntuu:~$ ls

```

```
vboxuser@Ubuntu:~$ cat file1.txt
This is the first file context
vboxuser@Ubuntu:~$ cat file2.txt
This is the second file context
vboxuser@Ubuntu:~$ cat file3.txt
This is the third file context
```

To merge call files into one

Cat file1.txt file2.txt file3.txt > combinedfile.txt

“>” this sign is used to enter content in a new file

```
vboxuser@Ubuntu:~$ cat file1.txt file2.txt file3.txt > combinedfile.txt
vboxuser@Ubuntu:~$ ls
combinedfile.txt  dir2      Downloads      file2.txt  Pictures  Videos
Desktop          dir3      examples.desktop file3.txt  Public
dir1             Documents file1.txt      Music      Templates
vboxuser@Ubuntu:~$ ls -l
total 72
-rw-r--r-- 1 vboxuser vboxuser  94 Sep 22 11:03 combinedfile.txt
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:40 Desktop
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:49 dir1
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:50 dir2
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:50 dir3
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:40 Documents
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:40 Downloads
-rw-r--r-- 1 vboxuser vboxuser 8980 Sep 22 10:35 examples.desktop
```

```
vboxuser@Ubuntu:~$ cat combinedfile.txt
This is the first file context
This is the second file context
This is the third file context
```

To add a new line in the existing file

Echo “This is a new line” >> combinedfile.txt

Echo “ Yet another new line” >> combinedfile.txt

“>>” this sign is used to print the content in an existing file

```
vboxuser@Ubuntu:~$ echo "This is an add line" >>combinedfile.txt
vboxuser@Ubuntu:~$ cat combinedfile.txt
This is the first file context
This is the second file context
This is the third file context
This is an add line
vboxuser@Ubuntu:~$ echo "Yet another added line" >>combinedfile.txt
vboxuser@Ubuntu:~$ cat combinedfile.txt
This is the first file context
This is the second file context
This is the third file context
This is an add line
Yet another added line
```

To check the number of lines, character, words, bytes

Command: `cat combinedfile.txt | wc -l`

`cat combinedfile.txt | wc -m`

`cat combinedfile.txt | wc -w`

`cat combinedfile.txt | wc -c`

```
vboxuser@Ubuntu:~$ cat combinedfile.txt | wc -l
5
vboxuser@Ubuntu:~$ cat combinedfile.txt | wc -w
27
vboxuser@Ubuntu:~$ cat combinedfile.txt | wc -c
137
vboxuser@Ubuntu:~$ cat combinedfile.txt | wc -m
137
```

To move the file to another directory

Command: `mv file1.txt dir1`

```
vboxuser@Ubuntu:~$ mv file1.txt dir1
vboxuser@Ubuntu:~$ ls
combinedfile.txt  dir2      Downloads  file3.txt  Public
Desktop          dir3      examples.desktop  Music      Templates
dir1             Documents file2.txt   Pictures   Videos
vboxuser@Ubuntu:~$ ls dir1
file1.txt
```

To copy the file to another directory

Command: `cp file2.txt dir2`

`cp *.txt dir2` (this will copy all the files extensions with txt to dir2)

```
vboxuser@Ubuntu:~$ cp file2.txt dir1
vboxuser@Ubuntu:~$ ls
combinedfile.txt  dir2      Downloads  file3.txt  Public
Desktop          dir3      examples.desktop  Music      Templates
dir1             Documents file2.txt   Pictures   Videos
vboxuser@Ubuntu:~$ ls dir1
file1.txt  file2.txt
vboxuser@Ubuntu:~$ cp *.txt dir2
vboxuser@Ubuntu:~$ ls dir2
combinedfile.txt  file2.txt  file3.txt
```

To remove a file or directory

Command: `rm file3.txt`

`rm dir3`

```

vboxuser@Ubuntu:~$ rm file3.txt
vboxuser@Ubuntu:~$ ls
combinedfile.txt  dir2      Downloads      Music      Templates
Desktop          dir3      examples.desktop Pictures    Videos
dir1             Documents file2.txt      Public
vboxuser@Ubuntu:~$ rmdir dir3
vboxuser@Ubuntu:~$ ls
combinedfile.txt  dir2      examples.desktop Pictures    Videos
Desktop          Documents file2.txt      Public
dir1             Downloads Music          Templates
vboxuser@Ubuntu:~$ 

```

To make the file zip and unzip

Command: `gzip examples.desktop`

`gunzip examples.desktop`

```

vboxuser@Ubuntu:~$ gzip examples.desktop
vboxuser@Ubuntu:~$ ls
combinedfile.txt  dir2      examples.desktop.gz Pictures    Videos
Desktop          Documents file2.txt      Public
dir1             Downloads Music          Templates
vboxuser@Ubuntu:~$ gunzip examples.desktop.gz
vboxuser@Ubuntu:~$ ls
combinedfile.txt  dir2      examples.desktop Pictures    Videos
Desktop          Documents file2.txt      Public
dir1             Downloads Music          Templates
vboxuser@Ubuntu:~$ 

```

To show the contents of the file part by part

Command: `more fileex.txt`

`less file.txt` (the contents are showed on the other file you need to press q to come out of it)

```

vboxuser@Ubuntu:~$ more fileex.txt
[Desktop Entry]
Version=1.0
Type=Link
Name=Examples
Name[aa]=Ceelallo
Name[ace]=Contoh
Name[af]=Voorbeelde
Name[am]=ጥንሰታ
Name[an]=Exemplos
Name[ar]=أمثلة
Name[ast]=Exemplos
Name[az]=Nümunələr
Name[be]=Прыклады
Name[bg]=Примери
Name[bn]=উদাহরণ
Name[br]=Skouerioù
Name[bs]=Primjeri
Name[ca]=Exemples
Name[ca@valencia]=Exemples

```

```
Name[cy]=Enghreifftiau
Name[da]=Eksempler
Name[de]=Beispiele
Name[dv]=نماينده
Name[el]=Παραδείγματα
Name[en_AU]=Examples
Name[en_CA]=Examples
Name[en_GB]=Examples
Name[eo]=Ekzemploj
Name[es]=Ejemplos
--More-- (7%)
```

```
vboxuser@Ubuntu:~$ less fileex.txt
```

```
vboxuser@Ubuntu: ~
[Desktop Entry]
Version=1.0
Type=Link
Name=Examples
Name[aa]=Ceelallo
Name[ace]=Contoh
Name[af]=Voorbeelde
Name[am]=ጥንሰታ
Name[an]=Exemplos
Name[ar]=أمثلة
Name[ast]=Exemplos
Name[az]=Nümunələr
Name[be]=Прыклады
Name[bg]=Примери
Name[bn]=উদাহরণ
Name[br]=Skouerioù
Name[bs]=Primjeri
Name[ca]=Exemples
Name[ca@valencia]=Exemples
Name[ckb]=نمونە
Name[cs]=Ukázky
Name[csb]=Przëmiôre
Name[cy]=Enghreifftiau
Name[da]=Eksempler
Name[de]=Beispiele
Name[dv]=ನಮೂನೆ
Name[el]=Παραδείγματα
Name[en_AU]=Examples
Name[en_CA]=Examples
Name[en_GB]=Examples
Name[eo]=Ekzemploj
Name[es]=Ejemplos
fileex.txt
```

To see the head contents and tail contents

Command: `cat fileex.txt | head`

`cat fileex.txt | tail`


```

vboxuser@Ubuntu:~$ cat fileex.txt | head
[Desktop Entry]
Version=1.0
Type=Link
Name=Examples
Name[aa]=Ceelallo
Name[ace]=Contoh
Name[af]=Voorbeelde
Name[am]=ጥንጥሮች
Name[an]=Exemplos
Name[ar]=أمثلة
vboxuser@Ubuntu:~$ cat fileex.txt | tail
Comment[vec]=Contenuti de esempio de Ubuntu
Comment[vi]=Mẫu ví dụ cho Ubuntu
Comment[wae]=D'Ubuntu bischbildati jä
Comment[zh_CN]=Ubuntu 示例内容
Comment[zh_HK]=Ubuntu 的範例內容
Comment[zh_TW]=Ubuntu 的範例內容
URL=file:///usr/share/example-content/
Icon=folder
X-Ubuntu-Gettext-Domain=example-content

vboxuser@Ubuntu:~$ █

```

To see the patterns use GREP command

Command: grep Example fileex.txt

grep -i Example fileex.txt (This will show the all contents ignoring case)

grep -c Example fileex.txt (this will give the count of the word repeated)

grep -ic Example fileex.txt(this will give the count of the word repeated ignoring case)

```

vboxuser@Ubuntu:~$ grep Example fileex.txt
Name=Examples
Name[en_AU]=Examples
Name[en_CA]=Examples
Name[en_GB]=Examples
Name[sco]=Examples
Comment=Example content for Ubuntu
Comment[en_AU]=Example content for Ubuntu
Comment[en_CA]=Example content for Ubuntu
Comment[en_GB]=Example content for Ubuntu
Comment[sco]=Example content fur Ubuntu
vboxuser@Ubuntu:~$

```

```
vboxuser@Ubuntu:~$ grep -i Example fileex.txt
Name=Examples
Name[en_AU]=Examples
Name[en_CA]=Examples
Name[en_GB]=Examples
Name[sco]=Examples
Comment=Example content for Ubuntu
Comment[en_AU]=Example content for Ubuntu
Comment[en_CA]=Example content for Ubuntu
Comment[en_GB]=Example content for Ubuntu
Comment[sco]=Example content fur Ubuntu
URL=file:///usr/share/example-content/
X-Ubuntu-Gettext-Domain=example-content
vboxuser@Ubuntu:~$ grep -c Example fileex.txt
10
vboxuser@Ubuntu:~$ grep -ic Example fileex.txt
12
```

Chmod- To convert a normal file into executable file and give permission to various users

Every file in linux is gives 3 permission to: (read, write , execute (rwx))

Honor of the file : Honour is represented by a character u

Users of the file: A grp or user is represented by character

Others: It is represented as o

All three are represented as a

We can use + to add permission and – to remove permission

For example: If we want to give a permission to a grp :

Code: chmod g+w file2.txt

```
vboxuser@Ubuntu:~$ chmod g+w file2.txt
vboxuser@Ubuntu:~$ ls -l
ls-l: command not found
vboxuser@Ubuntu:~$ ls -l
total 72
-rw-r--r-- 1 vboxuser vboxuser 137 Sep 22 11:07 combinedfile.txt
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:40 Desktop
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 11:20 dir1
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 11:22 dir2
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:40 Documents
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:40 Downloads
-rw-r--r-- 1 vboxuser vboxuser 8980 Sep 22 10:35 examples.desktop
-rw-rw-r-- 1 vboxuser vboxuser 32 Sep 22 10:58 file2.txt
-rw-r--r-- 1 vboxuser vboxuser 8980 Sep 23 10:12 fileex.txt
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:40 Music
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:40 Pictures
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:40 Public
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:40 Templates
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:40 Videos
vboxuser@Ubuntu:~$
```


SHELL SCRIPTING:

Q: quit a shell

Wq: To quit the shell mode

K: To go to the upper line

J: To go to the lower line

h: To go toward left character

l: To go toward right character
line

i: to insert at the current location

I : To insert the text at the beginning of the current line

a: To insert a text after the current location

A: To insert text at the end of a current location

o: To create a new line for text entry below the cursor

O: To create a new line for text above the cursor

X: To delete a character at before the current position

dw: Delete a word starting from cursor

d\$: Delete from current position to end of the line

Dd: Delete a complete

#What is shell script?

It is different commands written as batch for execution..The ss will ensure all commands run one after another and the output is shown

#Creation of scriptshell

Vi script1.sh (all shellscripts have extension of sh)

#We come inside a vi- editor

Type i (for insertion)

Write all commands

Click esc

Type -wq

Arithmetic Operators

Addition: +

Subtraction: -

Multiplication: *

Division: /

Comparison Operators

-eq = Equal to

-lt = Lesser than

-le = Lesser than or Equal to

-gt = Greater than

-ge = Greater than or Equal to

-ne = Not equal to

Conditional Statements (if, elif, else)

Syntax:

if [condition]

then

statements

elif [condition]

statements

else

statement

fi

Switch - Case Statement (Case Statement)

Syntax:

case value in

pattern “1”)

statements

::

pattern “2”)

statements

::

pattern “3”)

statements

```
::  
pattern *)  
statements  
::  
esac  
done
```

Looping Statement

While

Syntax

```
while [condition]  
do  
Statements  
done
```

Until: Until execute when the condition is true it will stop

Syntax:

```
until [condition]  
do  
statements  
done
```

For

Syntax:

```
for loopvariable in [range]  
do  
statement  
Done
```

Break: It will stop iteration and will come out of the loop

Continue: Current iteration is stop then it will execute

PRACTICAL - 8B

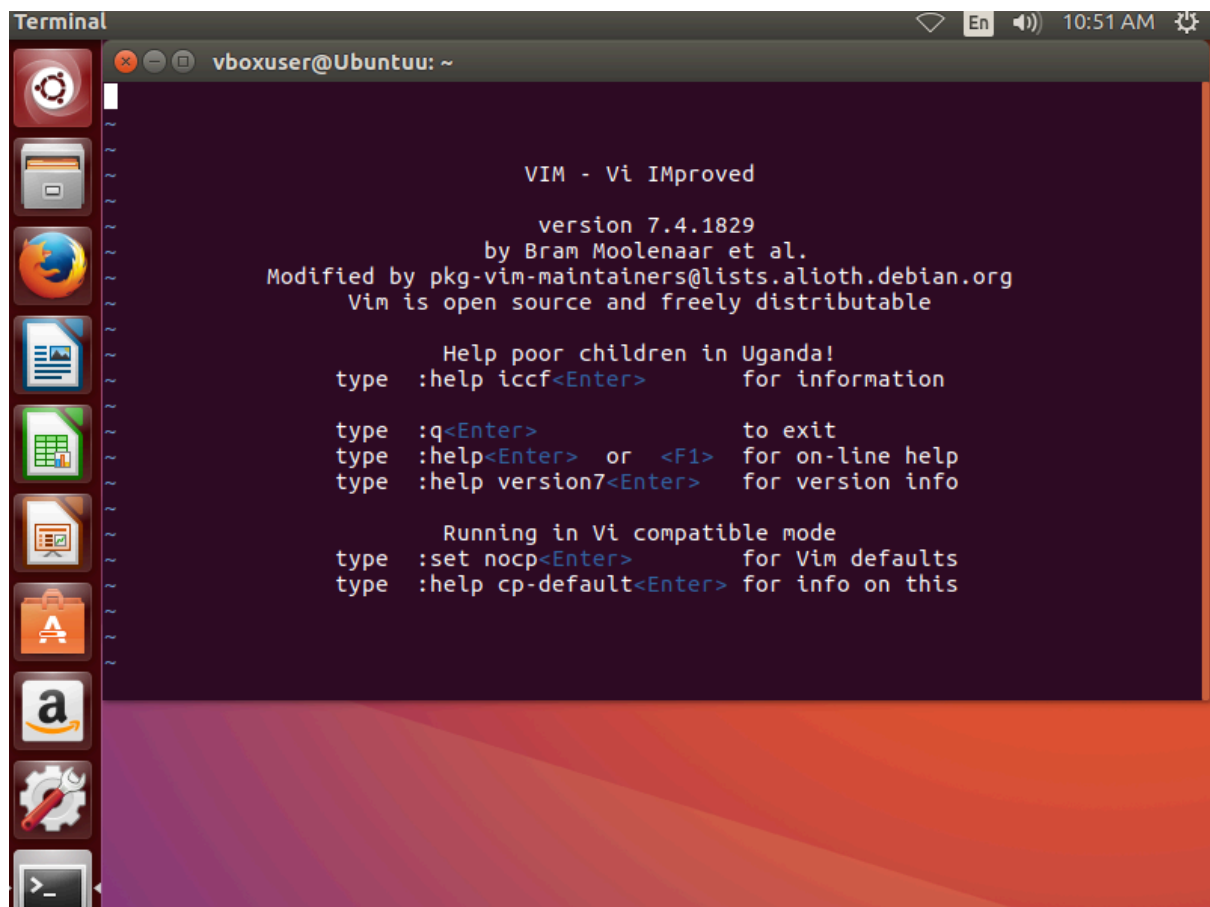
Write a shell script to perform the following commands on the current working directory

Long listing of all files in the current working directory[ls -l]

To display the current system date [date]

To count the no of lines ,words and no of bytes of the file ex.txt []

To display the current user [whoami]

A screenshot of a terminal window titled "Terminal" with a dark background. The window shows the Vim editor's startup screen. At the top, it says "VIM - Vi IMproved" followed by "version 7.4.1829" and "by Bram Moolenaar et al.". Below this, it says "Modified by pkg-vim-maintainers@lists.alioth.debian.org" and "Vim is open source and freely distributable". There are several lines of help text: "Help poor children in Uganda!", "type :help iccf<Enter> for information", "type :q<Enter> to exit", "type :help<Enter> or <F1> for on-line help", "type :help version7<Enter> for version info", "Running in Vi compatible mode", "type :set nocp<Enter> for Vim defaults", and "type :help cp-default<Enter> for info on this". The terminal window has a sidebar on the left with various application icons. The top of the window shows the username "vboxuser@Ubuntu: ~" and the time "10:51 AM".

```
Terminal
vboxuser@Ubuntu: ~

VIM - Vi IMproved
version 7.4.1829
by Bram Moolenaar et al.
Modified by pkg-vim-maintainers@lists.alioth.debian.org
Vim is open source and freely distributable

Help poor children in Uganda!
type :help iccf<Enter> for information

type :q<Enter> to exit
type :help<Enter> or <F1> for on-line help
type :help version7<Enter> for version info

Running in Vi compatible mode
type :set nocp<Enter> for Vim defaults
type :help cp-default<Enter> for info on this
```



```
vboxuser@ubuntu:~$ ./script5.sh
/home/vboxuser
total 76
-rw-r--r-- 1 vboxuser vboxuser 131 Sep 22 11:08 combinedfile.txt
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:15 Desktop
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 11:21 dir1
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 11:23 dir2
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:15 Documents
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:15 Downloads
-rw-r--r-- 1 vboxuser vboxuser 8980 Sep 22 10:12 examples.desktop
-rw-rw-r-- 1 vboxuser vboxuser 32 Sep 22 10:58 file2.txt
-rw-r--r-- 1 vboxuser vboxuser 8980 Sep 23 10:11 fileex.txt
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:15 Music
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:15 Pictures
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:15 Public
-rwxr--r-- 1 vboxuser vboxuser 101 Sep 23 11:21 script5.sh
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:15 Templates
drwxr-xr-x 2 vboxuser vboxuser 4096 Sep 22 10:15 Videos
Tue Sep 23 11:24:31 IST 2025
240
569
8980
vboxuser
```

PRACTICAL- 9

ROLL NO: SCS2526051

NAME: SREENATH SHANKARAN NAIR

AIM: SHELL SCRIPTING 2: Write a shell script to accept a number and display the summation of the number

Enter VI script

```
vboxuser@Ubuntu:~$ vi sum.sh
```

CODE:

```
echo "Enter the number fo summation:"
read n
i=1
sum=0

until [ "$i" -gt "$n" ]
do
sum=`expr $sum + $i`
i=`expr $i + 1`
done
echo "The summation of $i is $sum"
~
~
~
~
~
~
~
~
~
~
~
:wq
```

OUTPUT

```
vboxuser@Ubuntu:~$ chmod u+x sum.sh
vboxuser@Ubuntu:~$ ./sum.sh
Enter the number fo summation:
5
The summation of 6 is 15
```


PRACTICAL - 10

ROLL NO: SCS2526051

NAME: SREENATH SHANKARAN NAIR

AIM: SHELL SCRIPTING 3 :Write a shell script to accept the total marks and out of marks and calculate the percentage and display the grade of the student

Enter VI script

```
vboxuser@Ubuntu:~$ vi grade.sh
```

CODE:

```
echo "display grade of astudent:"
echo "enter total marks:"
read total
echo "enter out off marks:"
read outoff

percent=`expr $total \* 100 / $outoff`
if [ "$percent" -ge 80 ]
then
echo "Grade O"

elif [ "$percent" -ge 70 ]
then
echo "Grade A"
elif [ "$percent" -ge 60 ]
then
echo "Grade B"
elif [ "$percent" -ge 50 ]
then
echo "Grade C"
elif [ "$percent" -ge 40 ]
then
echo "Grade D"
"grade.sh" 29 lines, 457 characters

echo "Grade D"
elif [ "$percent" -ge 30 ]
then
echo "grade E"
else
echo "Grade F"
fi
:wq
```

OUTPUT

```
vboxuser@Ubuntu:~$ chmod u+x grade.sh
vboxuser@Ubuntu:~$ ./grade.sh
display grade of astudent:
enter total marks:
400
enter out off marks:
500
Grade 0
```

```
vboxuser@Ubuntu:~$ ./grade.sh
display grade of astudent:
enter total marks:
50
enter out off marks:
500
Grade F
```

PRACTICAL - 11

ROLL NO: SCS2526051

NAME: SREENATH SHANKARAN NAIR

AIM: SHELL SCRIPTING 4 : Write a menu driven shell script to perform various arithmetic operations like addition, subtraction, multiplication and division on two numbers as per user's choice. (Use case statements)

Enter VI script

```
vboxuser@Ubuntu:~$ vi menu2.sh
```

CODE:

```
while true
do
echo "Choose any of the following operations"
echo "1.Addition"
echo "2.Subtraction"
echo "3.Multiplication"
echo "4.Division"
echo "5.Quit"
echo "Enter your choice"
read n
if [ "$n" -eq 5 ]
then
echo "Exiting your choice"
break
fi
echo "Enter the first number"
read num1
echo "Enter the second number"
read num2
case "$n" in
"1")
result=`expr $num1 + $num2`
echo "Sum: $result"
```

```

echo "Sum: $result"
;;
"2")
result=`expr $num1 - $num2`
echo "Difference: $result"
;;
"3")
result=`expr $num1 \* $num2`
echo "Multiplication: $result"
;;
"4")
result=`expr $num1 / $num2`
echo "Divison: $result"
;;
*)
echo "Enter choice only betwwen 1 to 5"
;;
esac
done

```

OUTPUT:

```

vboxuser@Ubuntu:~$ chmod u+x menu2.sh
vboxuser@Ubuntu:~$ ./menu2.sh
Choose any of the following operations
1.Addition
2.Subtraction
3.Multiplication
4.Division
5.Quit
Enter your choice
1
Enter the first number
4
Enter the second number
5
Sum: 9

```

```

Choose any of the following operations
1.Addition
2.Subtraction
3.Multiplication
4.Division
5.Quit
Enter your choice
2
Enter the first number
4
Enter the second number
5
Difference: -1

```

```

Choose any of the following operations
1.Addition
2.Subtraction
3.Multiplication
4.Division
5.Quit
Enter your choice
3
Enter the first number
4
Enter the second number
5
Multiplication: 20

```

```
Choose any of the following operations
1.Addition
2.Subtraction
3.Multiplication
4.Division
5.Quit
Enter your choice
4
Enter the first number
5
Enter the second number
4
Divison: 1
```

```
Choose any of the following operations
1.Addition
2.Subtraction
3.Multiplication
4.Division
5.Quit
Enter your choice
5
Exiting your choice
```