

# Operating Systems

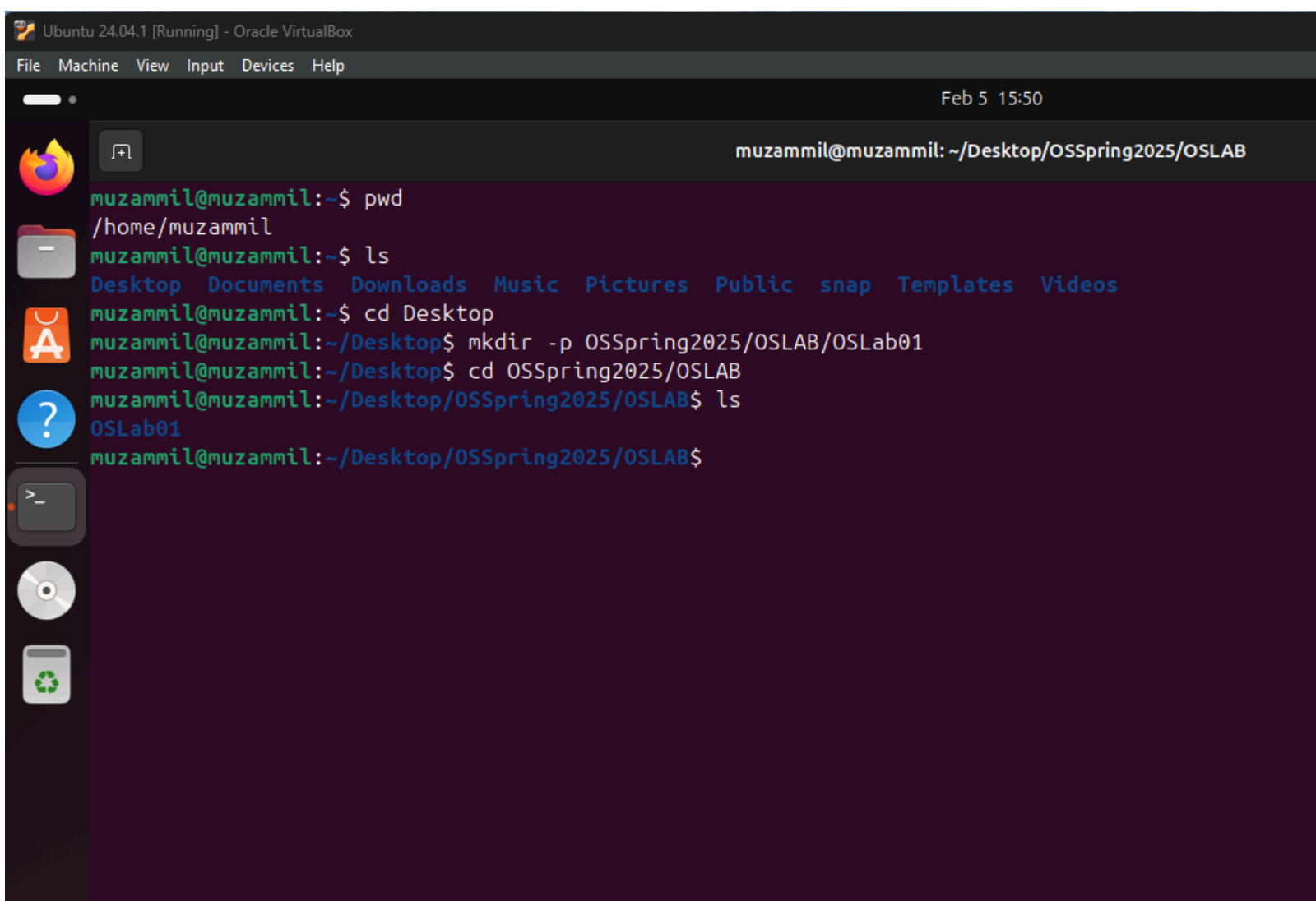
LAB#02



23K-2001

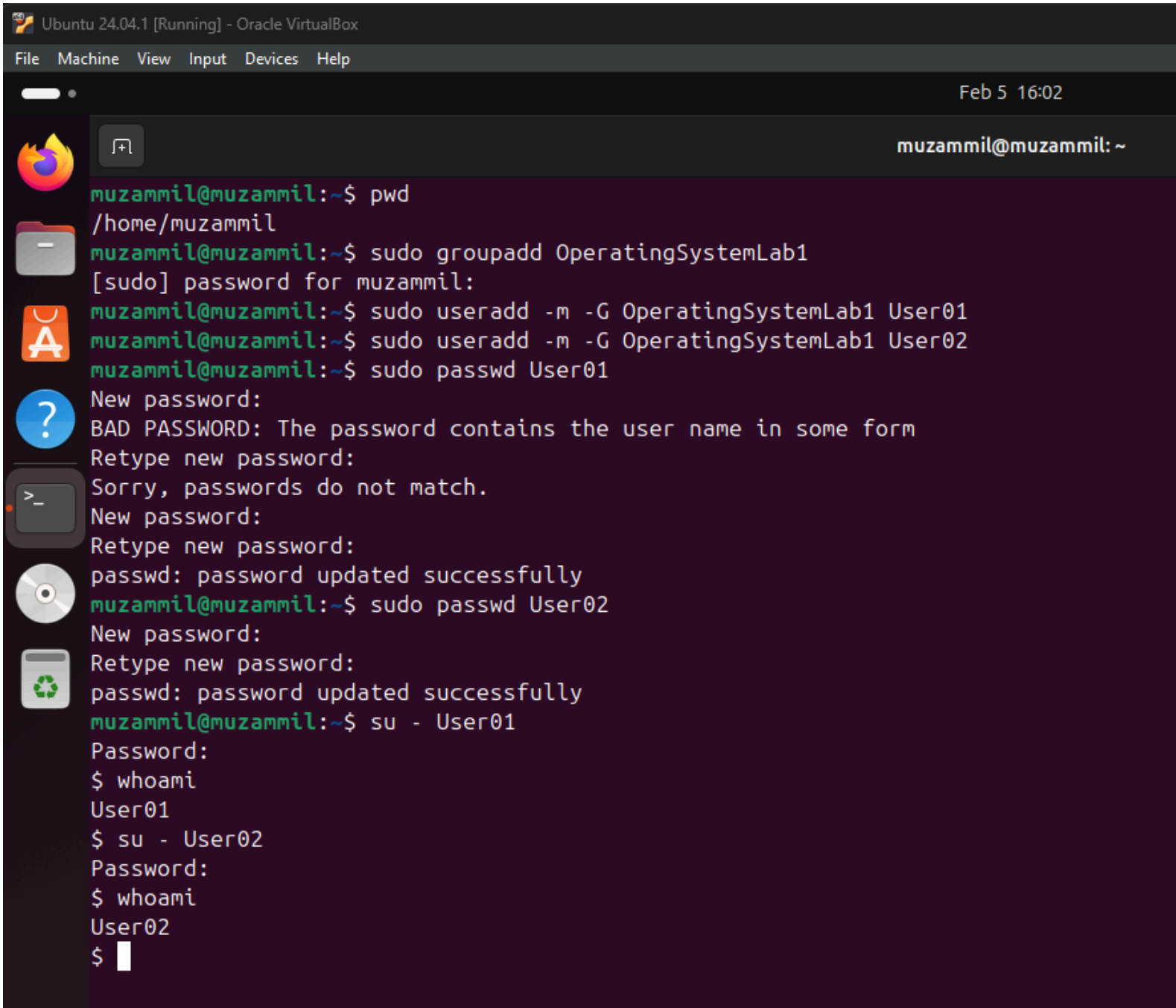
BCS-4J

Q1:



```
Ubuntu 24.04.1 [Running] - Oracle VirtualBox
File Machine View Input Devices Help
Feb 5 15:50
muzammil@muzammil: ~/Desktop/OSSpring2025/OSLAB
muzammil@muzammil:~$ pwd
/home/muzammil
muzammil@muzammil:~$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  snap  Templates  Videos
muzammil@muzammil:~$ cd Desktop
muzammil@muzammil:~/Desktop$ mkdir -p OSSpring2025/OSLAB/OSLab01
muzammil@muzammil:~/Desktop$ cd OSSpring2025/OSLAB
muzammil@muzammil:~/Desktop/OSSpring2025/OSLAB$ ls
OSLab01
muzammil@muzammil:~/Desktop/OSSpring2025/OSLAB$
```

Q2 + Q3:



Ubuntu 24.04.1 [Running] - Oracle VirtualBox

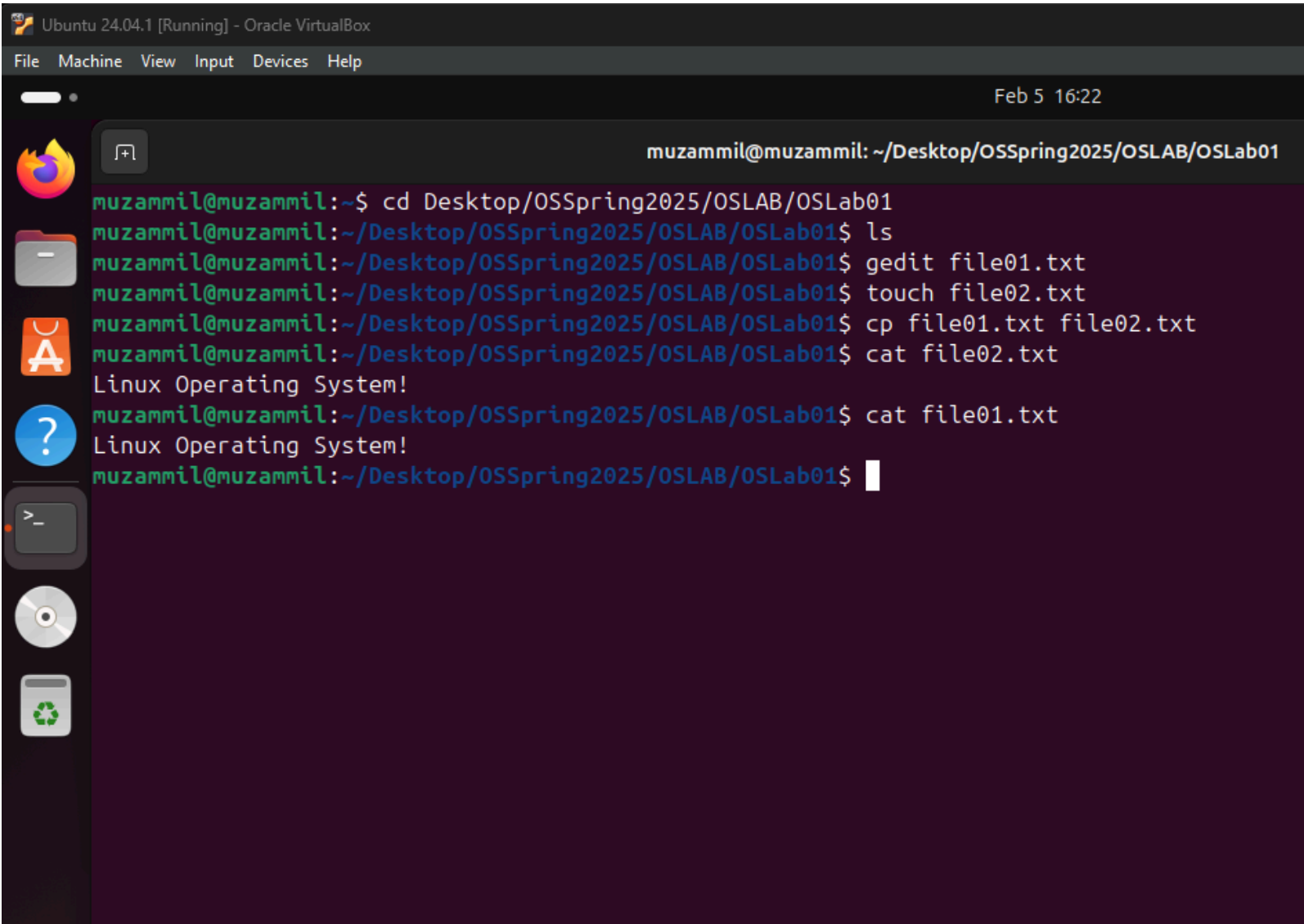
File Machine View Input Devices Help

Feb 5 16:02

muzammil@muzammil: ~

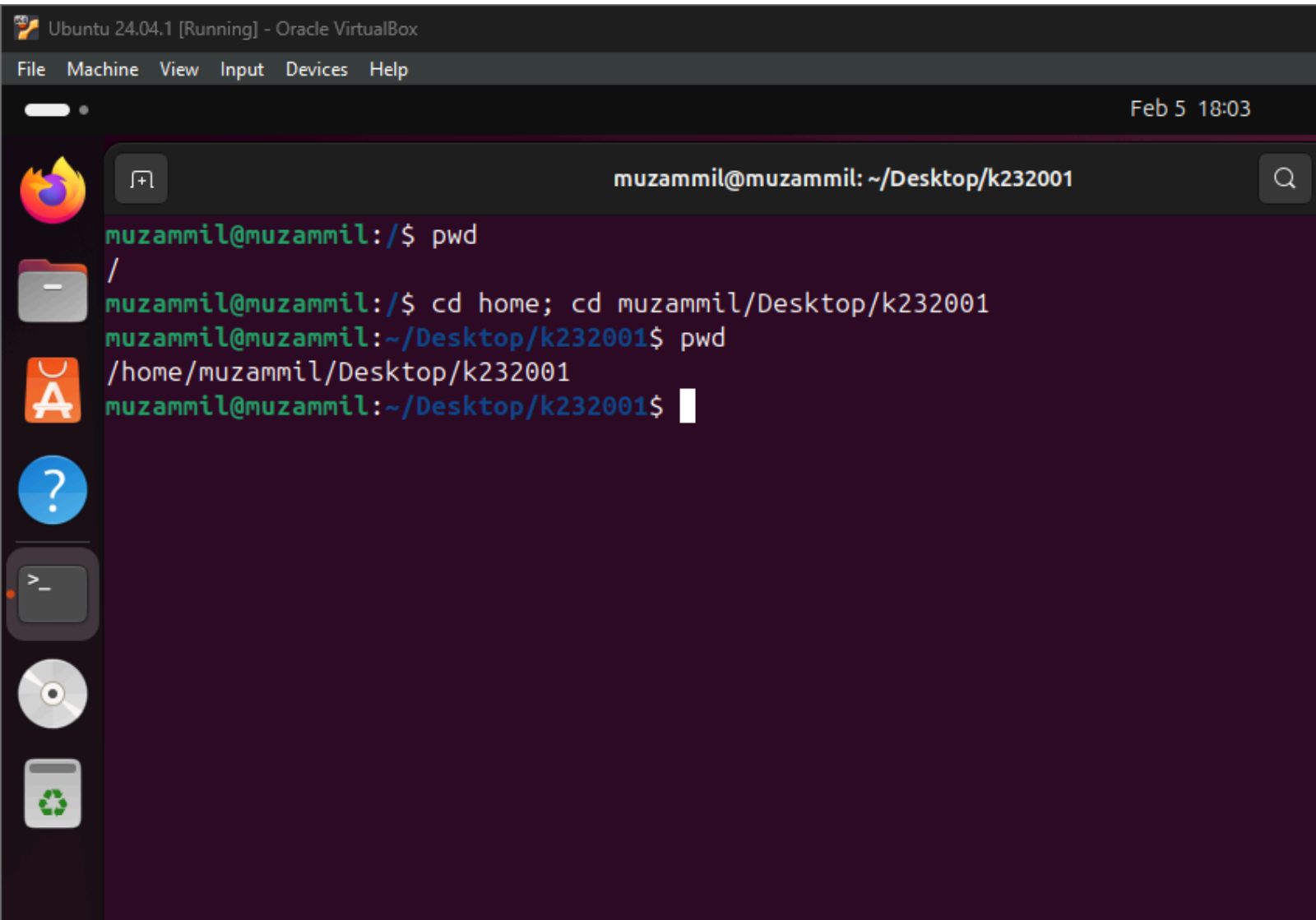
```
muzammil@muzammil:~$ pwd
/home/muzammil
muzammil@muzammil:~$ sudo groupadd OperatingSystemLab1
[sudo] password for muzammil:
muzammil@muzammil:~$ sudo useradd -m -G OperatingSystemLab1 User01
muzammil@muzammil:~$ sudo useradd -m -G OperatingSystemLab1 User02
muzammil@muzammil:~$ sudo passwd User01
New password:
BAD PASSWORD: The password contains the user name in some form
Retype new password:
Sorry, passwords do not match.
New password:
Retype new password:
passwd: password updated successfully
muzammil@muzammil:~$ sudo passwd User02
New password:
Retype new password:
passwd: password updated successfully
muzammil@muzammil:~$ su - User01
Password:
$ whoami
User01
$ su - User02
Password:
$ whoami
User02
$
```

Q4 + Q5 + Q6:



```
Ubuntu 24.04.1 [Running] - Oracle VirtualBox
File Machine View Input Devices Help
Feb 5 16:22
muzammil@muzammil: ~/Desktop/OSSpring2025/OSLAB/OSLab01
muzammil@muzammil:~$ cd Desktop/OSSpring2025/OSLAB/OSLab01
muzammil@muzammil:~/Desktop/OSSpring2025/OSLAB/OSLab01$ ls
muzammil@muzammil:~/Desktop/OSSpring2025/OSLAB/OSLab01$ gedit file01.txt
muzammil@muzammil:~/Desktop/OSSpring2025/OSLAB/OSLab01$ touch file02.txt
muzammil@muzammil:~/Desktop/OSSpring2025/OSLAB/OSLab01$ cp file01.txt file02.txt
muzammil@muzammil:~/Desktop/OSSpring2025/OSLAB/OSLab01$ cat file02.txt
Linux Operating System!
muzammil@muzammil:~/Desktop/OSSpring2025/OSLAB/OSLab01$ cat file01.txt
Linux Operating System!
muzammil@muzammil:~/Desktop/OSSpring2025/OSLAB/OSLab01$
```

Q7:

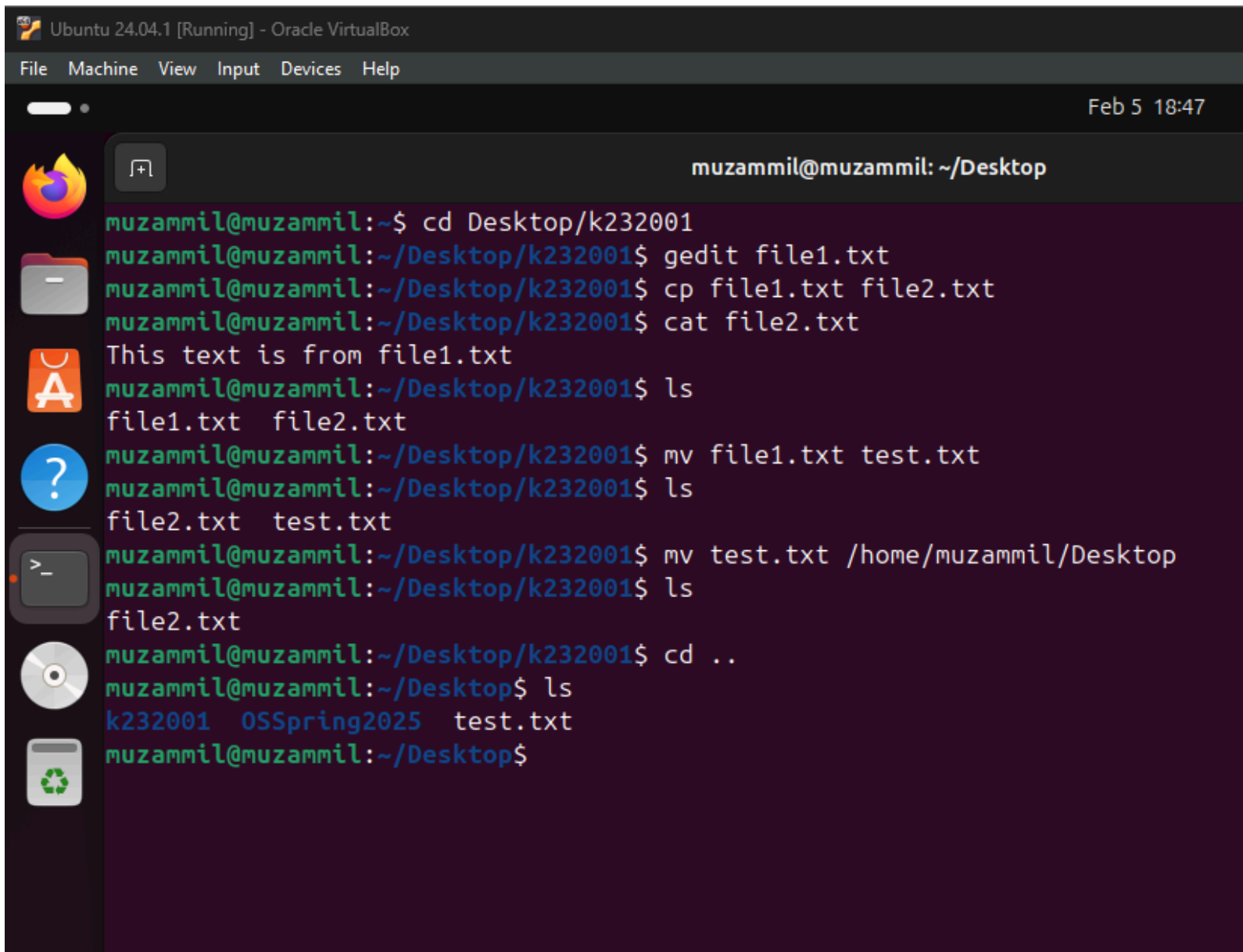


The image shows a terminal window titled "Ubuntu 24.04.1 [Running] - Oracle VirtualBox". The window has a menu bar with "File", "Machine", "View", "Input", "Devices", and "Help". The top right corner shows the date and time "Feb 5 18:03". The terminal prompt is "muzammil@muzammil: ~/Desktop/k232001". The user enters the command "pwd", which returns "/" as the current directory. Then, the user enters "cd home; cd muzammil/Desktop/k232001", which returns the full path "/home/muzammil/Desktop/k232001". Finally, the user enters "pwd" again, which returns the same full path. The terminal window has a dark purple background and a sidebar on the left with icons for various applications like Firefox, Files, and the Dash.

```
muzammil@muzammil:/$ pwd
/
muzammil@muzammil:/$ cd home; cd muzammil/Desktop/k232001
muzammil@muzammil:~/Desktop/k232001$ pwd
/home/muzammil/Desktop/k232001
muzammil@muzammil:~/Desktop/k232001$
```

Q8:

The 'mv' command is used to rename a file or move it to another directory, whereas the 'cp' command copies the contents of a file to another file.

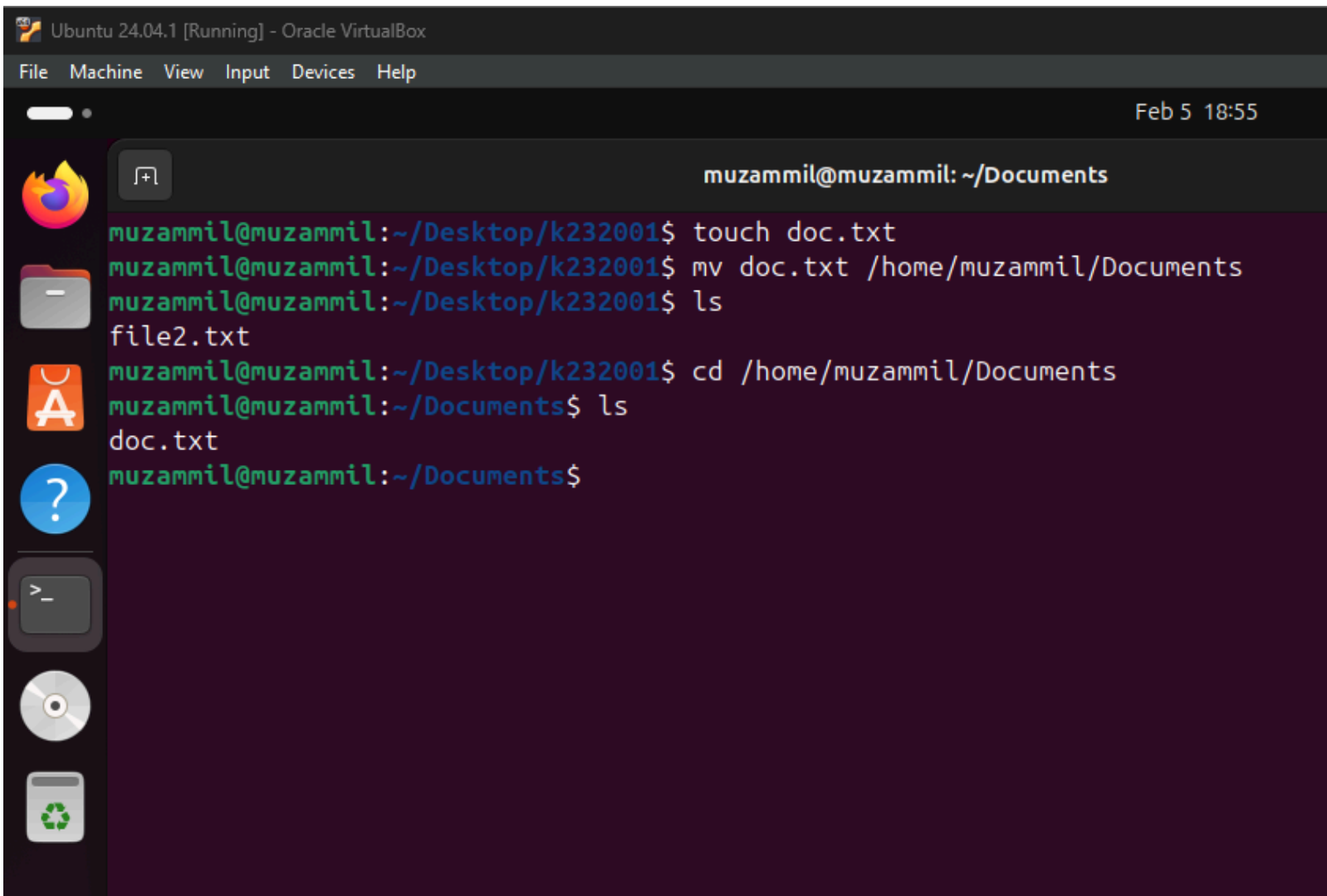


```
Ubuntu 24.04.1 [Running] - Oracle VirtualBox
File Machine View Input Devices Help
Feb 5 18:47
muzammil@muzammil: ~/Desktop
muzammil@muzammil:~$ cd Desktop/k232001
muzammil@muzammil:~/Desktop/k232001$ gedit file1.txt
muzammil@muzammil:~/Desktop/k232001$ cp file1.txt file2.txt
muzammil@muzammil:~/Desktop/k232001$ cat file2.txt
This text is from file1.txt
muzammil@muzammil:~/Desktop/k232001$ ls
file1.txt  file2.txt
muzammil@muzammil:~/Desktop/k232001$ mv file1.txt test.txt
muzammil@muzammil:~/Desktop/k232001$ ls
file2.txt  test.txt
muzammil@muzammil:~/Desktop/k232001$ mv test.txt /home/muzammil/Desktop
muzammil@muzammil:~/Desktop/k232001$ ls
file2.txt
muzammil@muzammil:~/Desktop/k232001$ cd ..
muzammil@muzammil:~/Desktop$ ls
k232001  OSSpring2025  test.txt
muzammil@muzammil:~/Desktop$
```

Q9:

By using:

`mv doc.txt /home/muzammil/Documents`

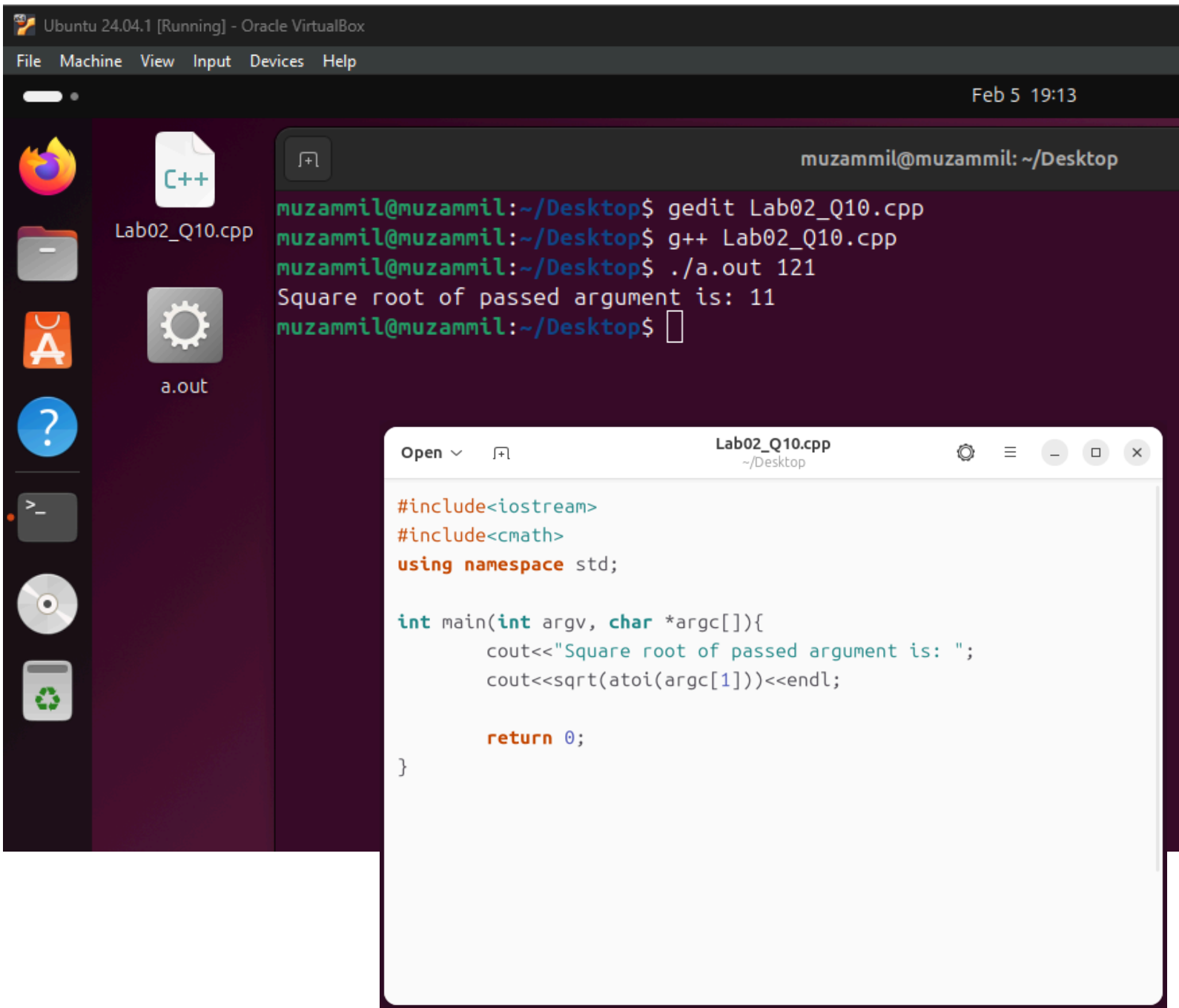


The screenshot shows a terminal window titled "muzammil@muzammil: ~/Documents" running on Ubuntu 24.04.1. The terminal displays the following commands and their outputs:

```
muzammil@muzammil:~/Desktop/k232001$ touch doc.txt
muzammil@muzammil:~/Desktop/k232001$ mv doc.txt /home/muzammil/Documents
muzammil@muzammil:~/Desktop/k232001$ ls
file2.txt
muzammil@muzammil:~/Desktop/k232001$ cd /home/muzammil/Documents
muzammil@muzammil:~/Documents$ ls
doc.txt
muzammil@muzammil:~/Documents$
```

The terminal window is part of an Oracle VM VirtualBox interface, with the title bar showing "Ubuntu 24.04.1 [Running] - Oracle VirtualBox". The menu bar includes "File", "Machine", "View", "Input", "Devices", and "Help". The status bar at the bottom right shows the date and time: "Feb 5 18:55".

Q10:



Ubuntu 24.04.1 [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Feb 5 19:13

muzammil@muzammil: ~/Desktop

```
muzammil@muzammil:~/Desktop$ gedit Lab02_Q10.cpp
muzammil@muzammil:~/Desktop$ g++ Lab02_Q10.cpp
muzammil@muzammil:~/Desktop$ ./a.out 121
Square root of passed argument is: 11
muzammil@muzammil:~/Desktop$
```

Lab02\_Q10.cpp

a.out

Open ▾

Lab02\_Q10.cpp  
~/Desktop

```
#include<iostream>
#include<cmath>
using namespace std;

int main(int argv, char *argc[]){
    cout<<"Square root of passed argument is: ";
    cout<<sqrt(atoi(argc[1]))<<endl;

    return 0;
}
```



Q11:

Ubuntu 24.04.1 [Running] - Oracle VirtualBox

File Machine View Input Devices Help

Feb 5 19:22

muzammil@muzammil: ~/Desktop

```
muzammil@muzammil:~/Desktop$ gedit Lab02_Q11.cpp
muzammil@muzammil:~/Desktop$ g++ Lab02_Q11.cpp
muzammil@muzammil:~/Desktop$ ./a.out 10 9 8 7 1
The sum of arguments passed is : 35
muzammil@muzammil:~/Desktop$
```

Lab02\_Q10.cpp

a.out

Lab02\_Q11.cpp

Open ▾

Lab02\_Q11.cpp  
~/Desktop

Lab02\_Q10.cpp

Lab02\_Q11.cpp

```
#include<iostream>
using namespace std;

int main(int argv, char *argc[]){
    int arr[argv];
    int sum = 0;
    for(int i = 1;i<argv;i++)
        sum = sum + atoi(argc[i]);

    cout<<"The sum of arguments passed is : "<<sum<<endl;
    return 0;
}
```

Q12:

The screenshot shows an Ubuntu 24.04.1 desktop environment running in Oracle VirtualBox. The desktop has a dark purple background with several icons on the left: Firefox, Lab02\_Q10.cpp, a folder icon, a gear icon labeled 'a.out', a question mark icon, a terminal icon, Lab02\_Q11.cpp, Lab02\_Q12.cpp, and a recycling bin icon. A terminal window is open, showing the following commands and output:

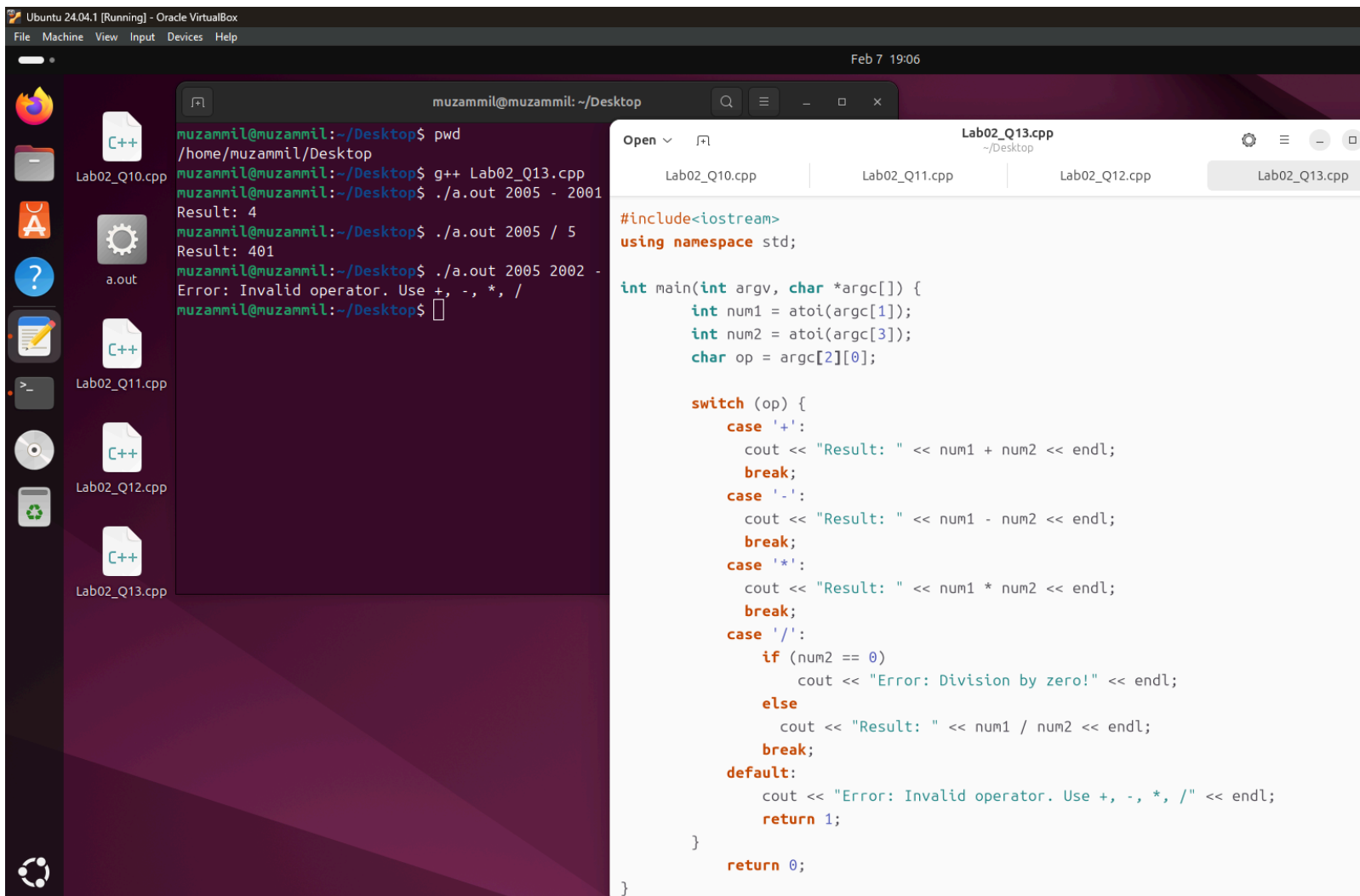
```
muzammil@muzammil:~/Desktop$ gedit Lab02_Q12.cpp
muzammil@muzammil:~/Desktop$ g++ Lab02_Q12.cpp
muzammil@muzammil:~/Desktop$ ./a.out stats
This string is a palindrome!
muzammil@muzammil:~/Desktop$ ./a.out madam
This string is a palindrome!
muzammil@muzammil:~/Desktop$ ./a.out racer
This string is not a palindrome
muzammil@muzammil:~/Desktop$ ./a.out muzammil
This string is not a palindrome
muzammil@muzammil:~/Desktop$ ./a.out muzammilmazum
This string is a palindrome!
muzammil@muzammil:~/Desktop$
```

A code editor window titled 'Lab02\_Q12.cpp' is open, showing the following C++ code:

```
#include<iostream>
using namespace std;

int main(int argv, char *argv[]){
    int c = 0;
    for(int i=0;argv[1][c]!='\0';i++)
        c++;
    for(int i=0;i<c;i++){
        if(argv[1][i]!=argv[1][c-i-1]){
            cout<<"This string is not a
palindrome"<<endl;
            return 0;
        }
    }
    cout<<"This string is a palindrome!"<<endl;
    return 0;
}
```

Q13:



```
muzammil@muzammil:~/Desktop$ pwd
/home/muzammil/Desktop
muzammil@muzammil:~/Desktop$ g++ Lab02_Q13.cpp
muzammil@muzammil:~/Desktop$ ./a.out 2005 - 2001
Result: 4
muzammil@muzammil:~/Desktop$ ./a.out 2005 / 5
Result: 401
muzammil@muzammil:~/Desktop$ ./a.out 2005 2002 -
Error: Invalid operator. Use +, -, *, /
muzammil@muzammil:~/Desktop$
```

```
#include<iostream>
using namespace std;

int main(int argv, char *argv[]) {
    int num1 = atoi(argv[1]);
    int num2 = atoi(argv[3]);
    char op = argv[2][0];

    switch (op) {
        case '+':
            cout << "Result: " << num1 + num2 << endl;
            break;
        case '-':
            cout << "Result: " << num1 - num2 << endl;
            break;
        case '*':
            cout << "Result: " << num1 * num2 << endl;
            break;
        case '/':
            if (num2 == 0)
                cout << "Error: Division by zero!" << endl;
            else
                cout << "Result: " << num1 / num2 << endl;
            break;
        default:
            cout << "Error: Invalid operator. Use +, -, *, /" << endl;
            return 1;
    }

    return 0;
}
```

## Q14:

Ubuntu 24.04.1 [Running] - Oracle VirtualBox

File Machine View Input Devices Help

Feb 7 21:05

muzammil@muzammil: ~/Desktop/Lab02\_Q14

```
muzammil@muzammil:~$ cd Desktop/Lab02_Q14
muzammil@muzammil:~/Desktop/Lab02_Q14$ touch main.c
muzammil@muzammil:~/Desktop/Lab02_Q14$ touch add_student.c
muzammil@muzammil:~/Desktop/Lab02_Q14$ touch display_students.c
muzammil@muzammil:~/Desktop/Lab02_Q14$ touch search_student.c
muzammil@muzammil:~/Desktop/Lab02_Q14$ touch student.h
muzammil@muzammil:~/Desktop/Lab02_Q14$ touch makefile
```

main.c

```
~/Desktop/Lab02_Q14
while (1) {
    printf("\nFLEX Management System\n");
    printf("1. Add Student\n");
    printf("2. Display All Students\n");
    printf("3. Search Student by ID\n");
    printf("4. Exit\n");
    printf("Enter your choice: ");
    scanf("%d", &choice);

    switch (choice) {
        case 1:{
            add_student();
            break;}
        case 2:{
            display_students();
            break;}
        case 3:{
            search_student();
            break;}
        case 4:{
            printf("Exited.\n");
            return 0;
        }
        default:
            printf("Invalid choice. Please try again.\n");
    }
}
```



