DS LAB

Lab 2

Q1)

File name : “student.h”

```
struct DOB
{
	int day;
	char* mth;
	int year;
};

struct STU_INFO
{
	int reg_no;
	char* name;
	char adrs[20];
};

struct COLLEGE
{
	char* clg_name;
	char univ_name[20] ;
};

struct STUDENT
{
	struct DOB dob;
	struct STU_INFO stu_info;
	struct COLLEGE clg;
};
```

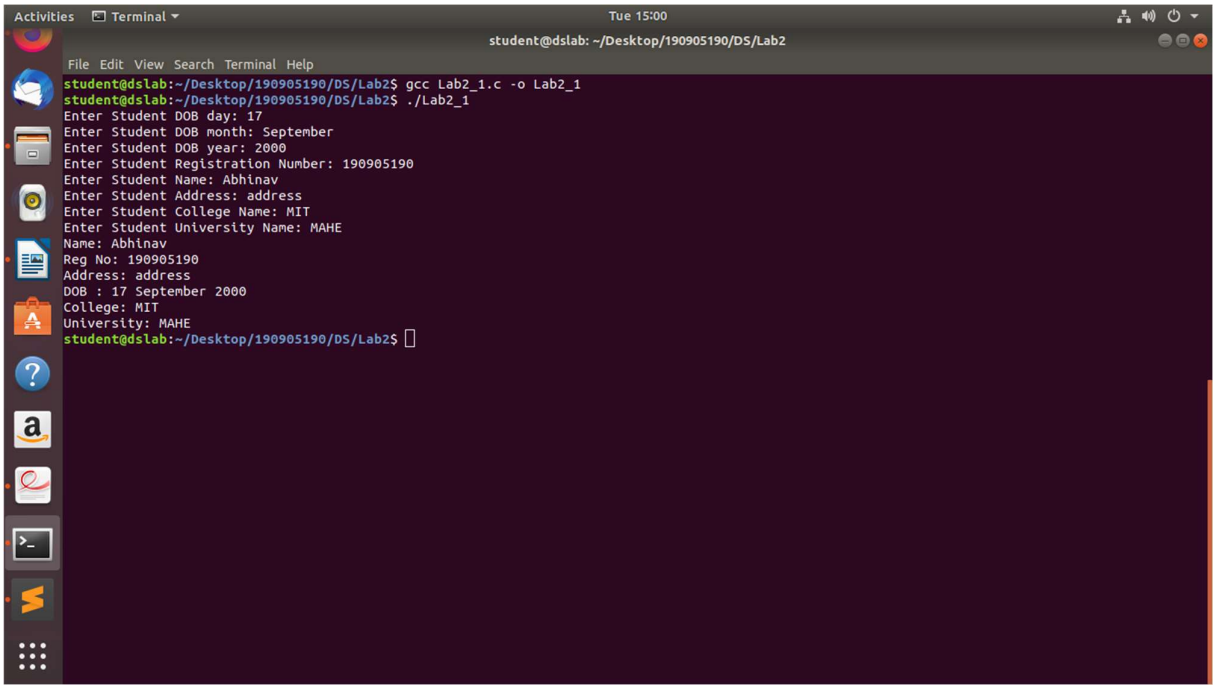
File name : “Lab2_1.c”

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include "student.h"

int main(int argc, char const *argv[])
{
	struct STUDENT student;
	char month[10];
	printf("Enter Student DOB day: ");
	scanf("%d", &student.dob.day);
	printf("Enter Student DOB month: ");
	scanf("%s", month);
	printf("Enter Student DOB year: ");
	scanf("%d", &student.dob.year);
```

```
        student.dob.mth = (char*) malloc(sizeof(month));
        strcpy(student.dob.mth, month);
        char name[20];
        printf("Enter Student Registration Number: ");
        scanf("%d", &student.stu_info.reg_no);
        printf("Enter Student Name: ");
        scanf("%s", name);
        printf("Enter Student Address: ");
        scanf("%s", student.stu_info.adrs);
        student.stu_info.name = (char*) malloc(sizeof(name));
        strcpy(student.stu_info.name, name);
        char college[30];
        printf("Enter Student College Name: ");
        scanf("%s", college);
        printf("Enter Student University Name: ");
        scanf("%s", student.clg.univ_name);
        student.clg.clg_name = (char*) malloc(sizeof(college));
        strcpy(student.clg.clg_name, college);
        printf("Name: %s\n", student.stu_info.name);
        printf("Reg No: %d\n", student.stu_info.reg_no);
        printf("Address: %s\n", student.stu_info.adrs);
        printf("DOB : %d %s %d\n", student.dob.day, student.dob.mth, student.dob.year);
        printf("College: %s\n", student.clg.clg_name);
        printf("University: %s\n", student.clg.univ_name);
        return 0;
}
```

Output:



Q2)

File name: “copy.h”

```
void copy(char str1[], char str2[], int index)
{
   str2[index] = str1[index];
   if (str1[index] == '\0')
      return;
   copy(str1, str2, index + 1);
}
```

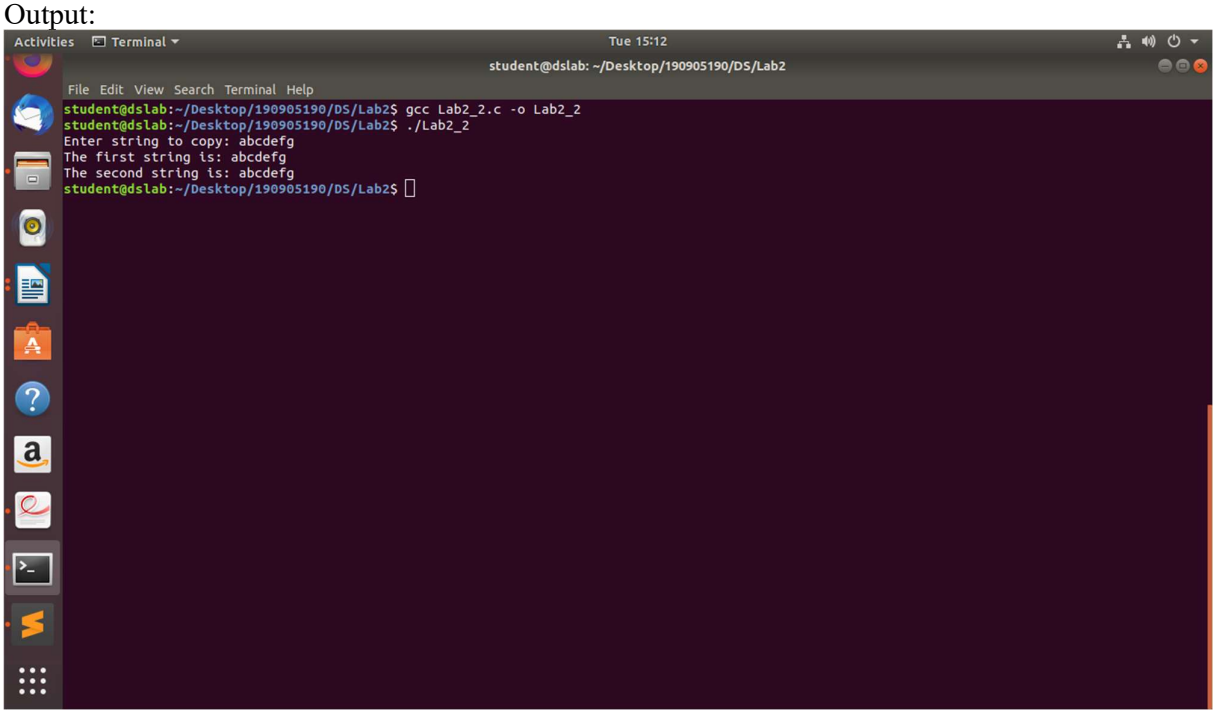
File name: “Lab2_2.c”

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include "copy.h"

int main()
{
   char str1[20], str2[20];

   printf("Enter string to copy: ");
   scanf("%s", str1);
   copy_string(str1, str2, 0);
   printf("The first string is: %s\n", str1);
   printf("The second string is: %s\n", str2);
   return 0;
}
```

Output:



Q3)

File name: “palindrome.h”

```
int checkPalin(char str[], int i, int l)
{
        if(i >= l/2)
                return 1;
        else if(str[i]!=str[l-i-1])
                return 0;
        else if(str[i]==str[l-i-1]){
                i = i+1;
                return checkPalin(str, i, l);
        }
}
```

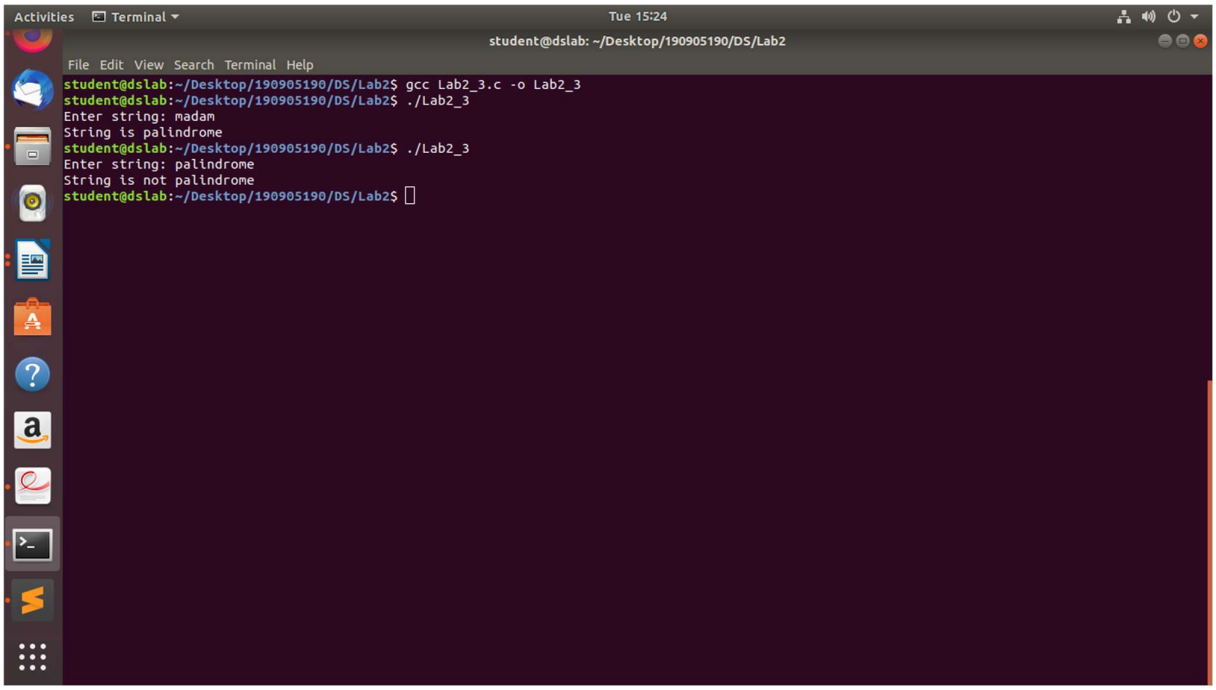
File name: “Lab2_3.c”

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include "palindrome.h"

int main()
{
   char str1[20], str2[20];

   printf("Enter string: ");
   scanf("%s", str1);
   int f = checkPalin(str1, 0, strlen(str1));
   if(f == 1){
        printf("String is palindrome\n");
   }
   else
        printf("String is not palindrome\n");
   return 0;
}
```

Output:


Activities
Terminal
Tue 15:24
student@dslab: ~/Desktop/190905190/DS/Lab2
File Edit View Search Terminal Help
student@dslab:~/Desktop/190905190/DS/Lab2$ gcc Lab2_3.c -o Lab2_3
student@dslab:~/Desktop/190905190/DS/Lab2$ ./Lab2_3
Enter string: madam
String is palindrome
student@dslab:~/Desktop/190905190/DS/Lab2$ ./Lab2_3
Enter string: palindrome
String is not palindrome
student@dslab:~/Desktop/190905190/DS/Lab2$

Q4)

File name: “towerofhanoi.h”

```
void towerOfHanoi(int n, char a, char c, char b)
{
   if (n == 1)
   {
      printf("Move disk 1 from rod %c to rod %c\n", a, c);
      return;
   }
   towerOfHanoi(n - 1, a, b, c);
   printf("Move Disk %d from rod %c to rod %c\n", n, a, c);
   towerOfHanoi(n - 1, b, c, a);
}
```

File name : “Lab2_4.c”

```
#include <stdio.h>
#include "towerofhanoi.h"

int main()
{
   int n;
   printf("Enter Number of Disks: \n");
   scanf("%d", &n);
   towerOfHanoi(n, 'A', 'C', 'B'); // A, B and C are names of rods
   return 0;
}
```

Output: