Week 2

Question 1:

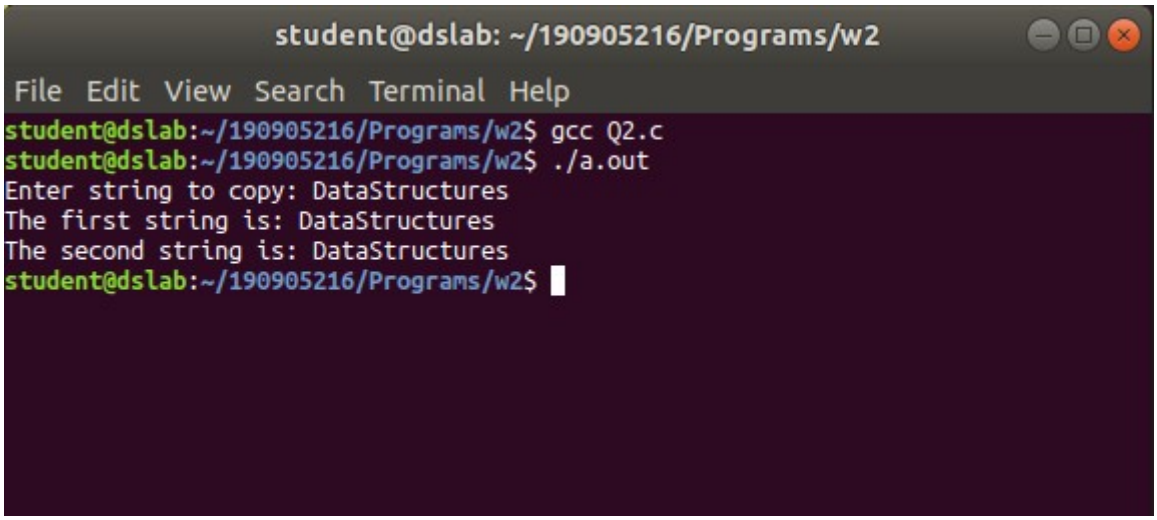
```
#include<stdio.h>
#include<stdlib.h>
#include<string.h>

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

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

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

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


int main(){

        char[10] month;

        struct STUDENT * stu = (struct STUDENT *)malloc(sizeof(struct
STUDENT));
        stu->dob= (char *)malloc(sizeof(struct DOB));
        stu->dob->mth= (char *)malloc(sizeof(struct month));
        stu->stu_info.name= (char *)malloc((sizeof(char)*25));
        stu->clg.clg_name= (char *)malloc((sizeof(char)*50));
```

```
        printf("Enter Student Details:  \n");
        printf("Name:  \n");
        scanf("%s", stu->stu_info.name);
        printf("Reg Number:   \n");
        scanf("%d", &(stu->stu_info.reg_no);
        printf("Address \n");
        scanf("%s", stu->stu_info.adrs);
        printf("DOB  \n");
        scanf("%d", &(stu->dob.day));
        scanf("%s", stu->dob.mth);
        scanf("%d", &(stu->dob.year));
        printf("Colege Name  \n");
        scanf("%s", stu->clg.clg_name);
        printf("University Name  \n");
        scanf("%s", stu->clg.univ_name);


        printf("\n\nStudent Details Are:  \n");

        printf("Name: %s\n", stu->stu_info.name);
        printf("Reg Number: %d\n",stu->stu_info.reg_no);
        printf("Address: %s\n",stu->stu_info.adrs));
        printf("DOB: %d, %s , %d\n", stu->dob.day, stu->dob.mth,stu-
>dob.year);
        printf("Colege Name  %s\n", stu->clg.clg_name);
        printf("University Name %s\n", stu->clg.univ_name);


        //scanf(“%s”, month);
        //student.dob.mth = (char*) malloc (sizeof (month);
        //strcpy(student.dob.mth, month);

}
```

Question2:

```
#include <stdio.h>

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

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

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

Output:

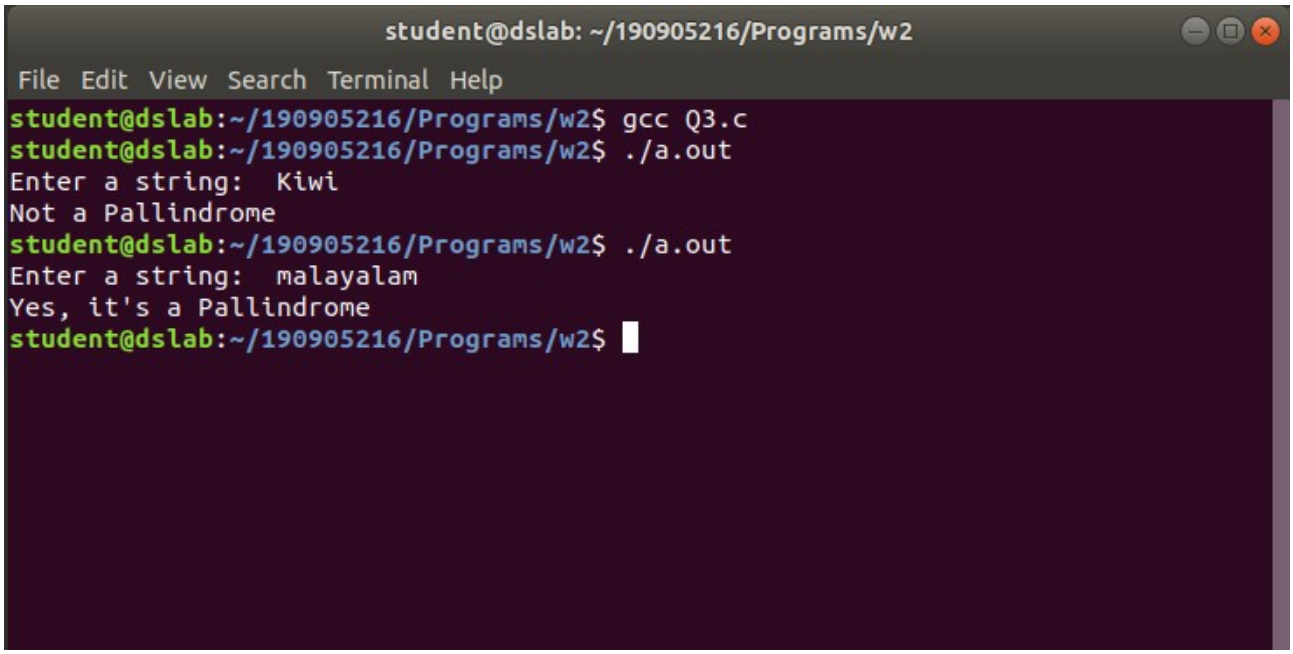


Question3:

```
#include<stdio.h>
#include<string.h>


int  PalindromeCheck(char str[],  int start, int end)
{
   if (start == end)
   return 1;

   if (str[start] != str[end])
   return 0;

   if (start < end + 1) //String is more than 2 characters
      // Checking for the inner substring to be a palindrome or not
   return PalindromeCheck(str, start + 1, end - 1);

   return 1;
}


int main()
{
        int n, flag;

        char str[100];
        printf("Enter a string:  ");
        scanf("%s", str);
   //char str[] = "Geeg";

        n = strlen(str);

        if (n == 0){
                printf("yes, it's a Pallindrome \n");
                return 0;
        }


        flag = PalindromeCheck(str,0,n-1);
```

```
    if (flag ==1)
    printf("Yes, it's a Pallindrome\n");
    else
    printf("Not a Pallindrome\n");

    return 0;
}
```

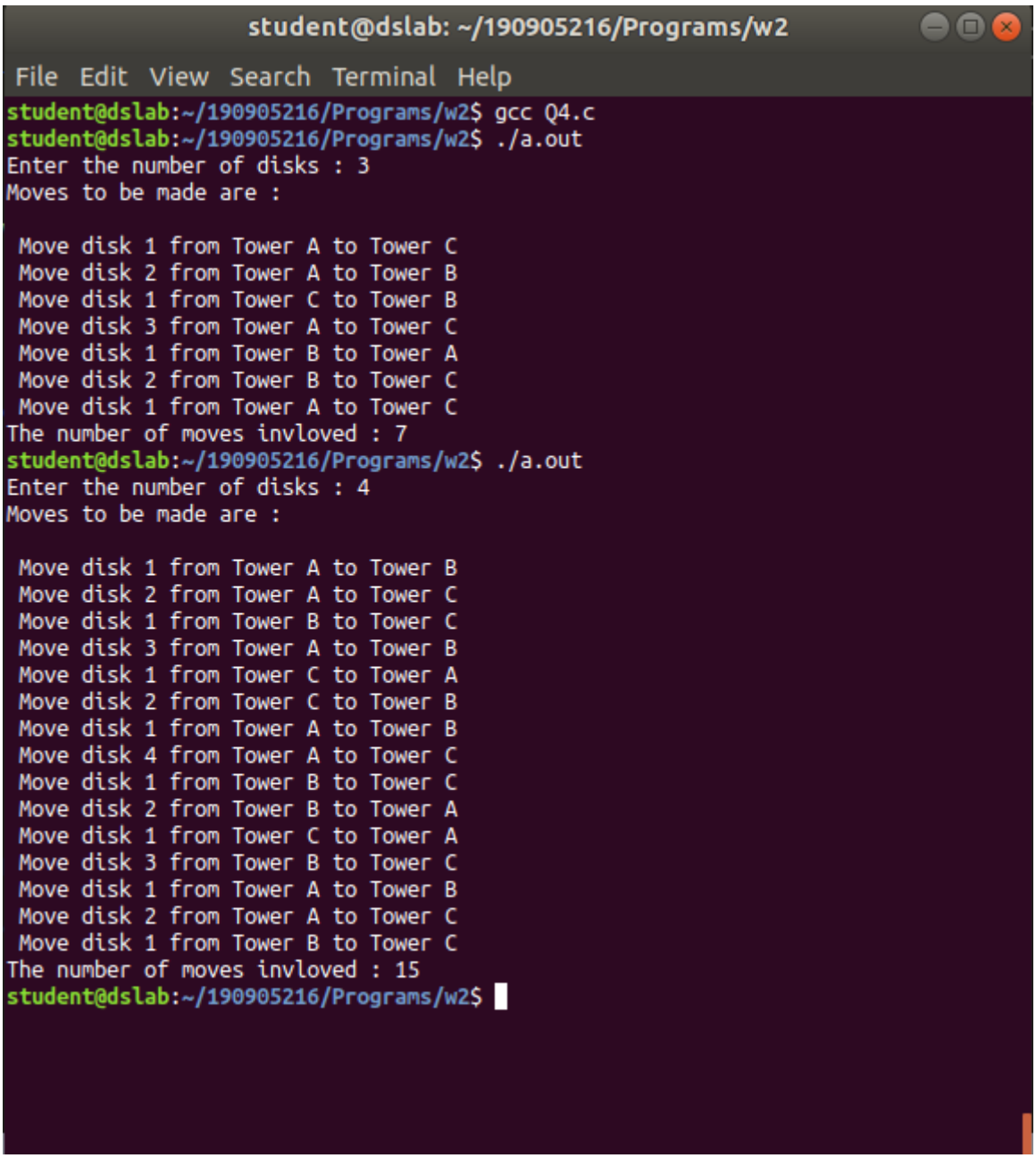
Output:



Question 4:

```
#include <stdio.h>

int towers(int num, char source, char temp, char destination){

    static int count=0;

    if (num == 1){
        printf("\n Move disk 1 from Tower %c to Tower %c", source, temp);
        count++;
        return  count;
    }


    towers(num - 1, source,  destination, temp);
    count++;
    printf("\n Move disk %d from Tower %c to Tower %c", num, source, temp);
    towers(num - 1,  destination, temp, source);

}

int main() {

    int num;

    printf("Enter the number of disks : ");
    scanf("%d", &num);

    printf("Moves to be made are :\n");
    int moves =towers(num, 'A', 'C', 'B');

    printf("\nThe number of moves invloved : %d\n", moves);
    return 0;

}
```

Output:


student@dslab: ~/190905216/Programs/w2
File Edit View Search Terminal Help
student@dslab:~/190905216/Programs/w2$ gcc Q4.c
student@dslab:~/190905216/Programs/w2$ ./a.out
Enter the number of disks : 3
Moves to be made are :
Move disk 1 from Tower A to Tower C
Move disk 2 from Tower A to Tower B
Move disk 1 from Tower C to Tower B
Move disk 3 from Tower A to Tower C
Move disk 1 from Tower B to Tower A
Move disk 2 from Tower B to Tower C
Move disk 1 from Tower A to Tower C
The number of moves invloved : 7
student@dslab:~/190905216/Programs/w2$ ./a.out
Enter the number of disks : 4
Moves to be made are :
Move disk 1 from Tower A to Tower B
Move disk 2 from Tower A to Tower C
Move disk 1 from Tower B to Tower C
Move disk 3 from Tower A to Tower B
Move disk 1 from Tower C to Tower A
Move disk 2 from Tower C to Tower B
Move disk 1 from Tower A to Tower B
Move disk 4 from Tower A to Tower C
Move disk 1 from Tower B to Tower C
Move disk 2 from Tower B to Tower A
Move disk 1 from Tower C to Tower A
Move disk 3 from Tower B to Tower C
Move disk 1 from Tower A to Tower B
Move disk 2 from Tower A to Tower C
Move disk 1 from Tower B to Tower C
The number of moves invloved : 15
student@dslab:~/190905216/Programs/w2$