Programming Fundamentals Lab
Lab Assignment 09

Course Code: CL1002

Syed Muhammad Shuja Ur Rahman

Roll No. 22K-4456

Ms. Ayesha Ali

QUESTION#1

As a programmer, you are required to create a program that takes the first and last name from a user. The program

then combines both the inputs taken and prints the string backwards.

q1.c

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

main(){
    char fname[20],lname[20];
//GETTING INPUT
    gets(fname);
    gets(lname);
//CONCATENATING
    strcat(fname,lname);
    puts(fname);
//FINAL OUTUT
    strrev(fname);
    puts(fname);

}
```

```
C:\Users\Admin\Desktop\PF Lab\PF LAB 9\q1.exe
Syed Muhammad
Shuja
Syed Muhammad Shuja
ajuhS dammahuM deyS

--------------------------------
Process exited after 7.91 seconds with
Press any key to continue . . .
```

QUESTION#2

Each student is required to find out the maximum frequency of characters occurring in their name and the courses offered in Fall 2021. To find it, the student enters their name, courses offered and the program finds the maximum occurrences of a character in the name and course. Course names should be used like Programming Fundamentals, Applied Physics, Pakistan Studies and so on.

q2.c

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

int coursefreq();
int namefreq();

main(){
    char name[30],course[30];
    coursefreq(course);
    namefreq(name);

}
coursefreq(char course[]){
    int i,j,l,freq=0,maxfreq=0; char freqChar;
// GETTING INPUT , 'l' is length of string
    puts("Enter course name: ");
    gets(course);
    l=strlen(course);
// COUNTING FREQUENCY
    for(i=0;i<l;i++){
        freq=1;
        for(j=i+1;j<l-1;j++){
            if(course[j]==course[i]){
            freq++;
            }
//FILTERING OUT MOST FREQUENT ELEMENT
            if(freq>maxfreq){
            maxfreq=freq;
            freqChar=course[i];
            }
        }
    }
    printf("Most frequent character in course name is: %c with %d time\n",freqChar,maxfreq);
}

namefreq(char name[]){
    int l, i,j,freq=0,maxfreq=0; char freqChar;
// GETTING INPUT , 'l' is length of string
    puts("Enter your name: ");
    gets(name);
    l=strlen(name);
// COUNTING FREQUENCY
    for(i=0;i<l;i++){
        freq=1;
        for(j=i+1;j<l-1;j++){
            if(name[j]==name[i]){
            freq++;
            }
//FILTERING OUT MOST FREQUENT ELEMENT
            if(freq>maxfreq){
            maxfreq=freq;
            freqChar=name[i];
            }
        }
    }
    printf("Most frequent character in name is: %c with %d times",freqChar,maxfreq);
}
```

```
C:\Users\Admin\Desktop\PF Lab\PF LAB 9\q2.exe
Enter course name:
applied physics
Most frequent character in course name is: p with 3 time
Enter your name:
shuja ur rahman
Most frequent character in name is: a with 3 times
--------------------------------
Process exited after 18.18 seconds with return value 50
Press any key to continue . . .
```

QUESTION#3

Students are grouped in two to complete a lab task. Each student is required to enter a string of their own choice as an input to the program. The program will then display as a result whether both the strings are equal. If the strings are not equal, the program will display which of the string is greater.

Test cases:

1. Enter two strings that are same.

2. Enter two different strings.

q3.c

```c
#include<stdio.h>
#include<string.h>
main(){
int x; char str1[20],str2[20];
gets(str1);
gets(str2);
x=strcmp(str1,str2);
if(x>0)
printf("string 2 is greater than string 1");
if(x<0)
printf("string 1 is greater than string 2");
if(x==0)
printf("Both string are equal :)");
}
```

```
C:\Users\Admin\Desktop\PF Lab\PF LAB 9\q3.exe
shuja
shuja
Both string are equal :)
--------------------------------
Process exited after 18.77 seconds with
Press any key to continue . . .
```

```
C:\Users\Admin\Desktop\PF Lab\PF LAB 9\q3.exe
shuja
abdullah
string 2 is greater than string 1
--------------------------------
Process exited after 22.41 seconds with
Press any key to continue . . .
```

QUESTION # 4

Salesflow is one of leading software house they are starting their recruitment process for three different following positions:

1. Associate Developer

2. Assistant Developer

3. Trainee Engineer

There is defined criteria for recruitment process, if candidate clear the test with 50 marks then he will be select for the post of trainee engineer, experience is not the requirement in it. if candidate secured 60 marks with one or more than one year of experience and 70 marks with 2 year or more than two years of experience, then he/she will be select as assistant and associate developer respectively. Write a function that will take a test marks from user and ask for experience (if its entered marks x >=60). After that, function will show the assigned position.

q4.c

```c
#include<stdio.h>

int func_recruit();

main(){
    func_recruit();
}
int func_recruit(){
    int marks,exp;

    printf("Marks: ");
    scanf("%d",&marks);
    if (marks>=50){

        if (marks>=60)
        {
        printf("Experience: ");
        scanf("%d",&exp);
            if (marks<70 && exp>=1)
            printf("Assistant developer\n");
            else if (exp>=2)
            printf("Associate Developer\n");
        }
        else
        printf("Trainee Engineer\n");

    }
    else printf("Test not cleared...\n");
}
```

C:\Users\Admin\Desktop\PF Lab\PF LAB 9\q4.exe

```
Marks: 62
Experience: 2
Assistant developer

--------------------------------
Process exited after 9.851 seconds with
Press any key to continue . . .
```

C:\Users\Admin\Desktop\PF Lab\PF LAB 9\q4.exe

```
Marks: 75
Experience: 3
Associate Developer

--------------------------------
Process exited after 4.87 seconds with
Press any key to continue . . .
```

C:\Users\Admin\Desktop\PF Lab\PF LAB 9\q4.exe

```
Marks: 52
Trainee Engineer

--------------------------------
Process exited after 4.29 seconds with
Press any key to continue . . .
```

QUESTION # 5

Write a function that prints all the unique values from a array and the number of times each value occurs. Below is an output sample. The main function takes a size of array as input and generate a random integer array with name “array1”. Random number limit must be between 0 and 10. The ‘main’ function call a function with the named as “CountFrequency ()”. that will find the occurrence of each value in array.

q5.c

```c
#include<stdio.h>
int countfreq();
main(){
    int i, size=0 ;
    printf("Size of array: ");
    scanf("%d",&size);
    int array1[size];
    int freq[size]; //<--array to store frequency

    for( i=0;i<size;i++){
    array1[i]=rand()%10;
    printf("%d ",array1[i]);
    freq[i]=1;
    }
    printf("\n");
    countfreq(array1,freq,size);
}

int countfreq(int array1[], int freq[], int size){
    int i,j,checked=-1;

    for ( i=0; i<size; i++){
    int count=1;

/*ONCE ELEMENT FREQUENCY IS CALCULATED
SAME OTHER ELEMENTS ARE MARKRD AS CHECKED*/

        for(j=i+1;j<size;j++){
        if(array1[i]==array1[j]){
                count++;
            freq[j]=checked;
        }

        if (freq[i]!=checked)
            freq[i]=count;
        }
    }
// FINAL OUTPUT
    for ( i=0; i<size; i++){
        if(freq[i]!=checked)
        printf("\nElement %d occured %d times\n",array1[i],freq[i]);
    }
}
```

```
C:\Users\Admin\Desktop\PF Lab\PF LAB 9\q5.exe
Size of array: 20
1 7 4 0 9 4 8 8 2 4 5 5 1 7 1 1 5 2 7 6

Element 1 occured 4 times

Element 7 occured 3 times

Element 4 occured 3 times

Element 0 occured 1 times

Element 9 occured 1 times

Element 8 occured 2 times

Element 2 occured 2 times

Element 5 occured 3 times

Element 6 occured 1 times

--------------------------------
Process exited after 1.614 seconds with
Press any key to continue . . .
```

QUESTION # 6

Write the program that calculate the volume, $V = a^2 * 1/3\ h$. Create a two separate function

1. One function with the name of "getData (int h, int a)", that will take two input from user for the variable of "h" and "a".

2. Second function "volumeCalu ()" will calculate the volume and function must be called by first function "getData ()". Only first function call from the main function.

q6.c

```c
#include<stdio.h>

int getdata(int h,int a){
    printf("Enter h then a:\n");
    scanf("%d %d",&h,&a);
    volumecal(h,a);
}
volumecal(int h,int a){
    float v;
    v=a*a*(h/3.0);
    printf("volume is %0.2f",v);
}
main(){
    int h,a;
    getdata(h,a);
    return 0;
}
```

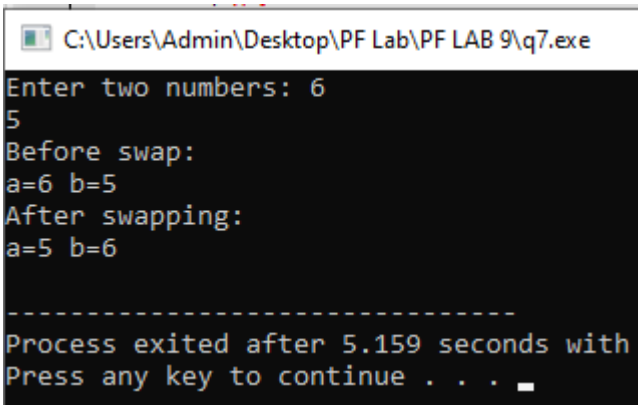
```
C:\Users\Admin\Desktop\PF Lab\PF LAB 9\q6.exe
Enter h then a:
3
4
volume is 16.00
--------------------------------
Process exited after 36.01 seconds with
Press any key to continue . . .
```

QUESTION # 7

Write a program in C to swap two numbers using function.

q7.c

```c
#include<stdio.h>
void swap(){
    int temp;   int a ,b;
    printf("Enter two numbers: ");
    scanf("%d %d",&a,&b);
    printf("Before swap:\na=%d b=%d\n",a,b);
    temp=a;
    a=b;
    b=temp;
    printf("After swapping:\na=%d b=%d\n",a,b);
}
main(){
    swap();
}
```

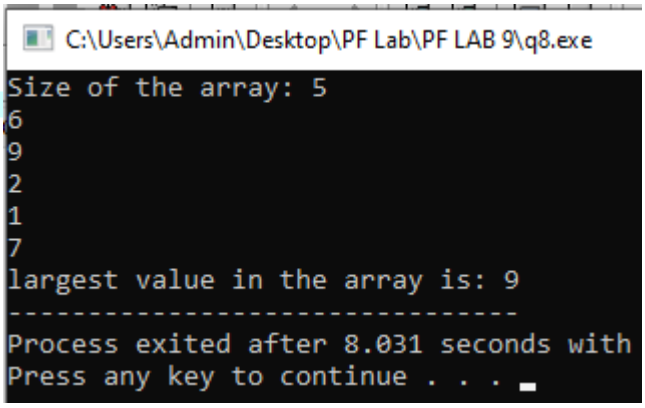


QUESTION # 8

Write a program in C to get the largest element of an array using the function.

q8.c

```c
#include<stdio.h>

int large_element();

int main(){
    large_element();
}
int large_element(){
    int i,size,max;
    printf("Size of the array: ");
    scanf("%d",&size);
int arr[size];
    for(i=0;i<size;i++)
    {
        scanf("%d",&arr[i]);
    }

    max=arr[0];

    for(i=0; i<size ;i++)
    {
        if(arr[i]>max)
        max=arr[i];
    }

    printf("largest value in the array is: %d",max);
}
```



QUESTION # 9

Write a C programming to find out maximum and minimum of some values using function which will return an array.

q9.c

```c
#include<stdio.h>
check(int arr[],int size){
    int min,max,i;
    max=arr[0];min=arr[0];

for (i=0;i<size;i++){
    if (arr[i]<=min)
        min=arr[i];
        }

for (i=0;i<size;i++){
    if (arr[i]>=max)
        max=arr[i];
        }
        printf("Min is: %d\nMax is: %d",min,max);

}
main(){
    int size, i;
    printf("enter size of array: ");
    scanf("%d",&size);

    int arr[size];
    puts("Enter values of the array:");
    for (i=0;i<size;i++){
        scanf("%d",&arr[i]);
    }
    check(arr,size);
}
```

```
C:\Users\Admin\Desktop\PF Lab\PF LAB 9\q9.exe
enter size of array: 5
Enter values of the array:
8
1
2
6
3
Min is: 1
Max is: 8
--------------------------------
Process exited after 9.599 seconds with
Press any key to continue . . .
```