Programming Fundamentals Lab
Lab Assignment 04

Course Code: CL1002

Syed Muhammad Shuja Ur Rahman

Roll No. 22K-4456

Ms. Ayesha Ali

Task 01: Ahmed answered 30% of the questions correctly. The test contained a total of 80 questions. Write a program to tell how many questions did Ahmed answer correctly.

Q1.cpp | Q2.cpp | Q3.cpp | Q4.cpp | Q5.cpp | Q6.cpp | Q7.cpp | Q8.cpp | Q9.cpp | Q10.cpp

```c
#include<stdio.h>

main(){
    int totQ = 80 , correctQ ;
    printf("total questions: %d\n",totQ );
    correctQ = 80 * 0.3 ;
    printf("Number of qustions Ali answered correct are: %d", correctQ );
}

```

C:\Users\Admin\Documents\Programs\Q1.exe

```
total questions: 80
Number of qustions Ali answered correct are: 24
--------------------------------
Process exited after 0.02509 seconds with return value 0
Press any key to continue . . .
```

Task 02: Write a program to find the sum of two integers without using '+' operator.

Q1.cpp | Q2.cpp | Q3.cpp | Q4.cpp | Q5.cpp | Q6.cpp | Q7.cpp | Q8.cpp | Q9.cpp | Q10.cpp

```
1   #include<stdio.h>
2
3   main(){
4       int x, y, result;
5       printf("Enter two numbers here: \n");
6       scanf("%d %d", &x, &y);
7       result = x - (-y);
8       printf("the result is:\n%d-(-%d) = %d", x, y, result);
9   }
```

C:\Users\Admin\Documents\Programs\Q2.exe

```
Enter two numbers here:
15
15
the result is:
15-(-15) = 30
--------------------------------
Process exited after 9.393 seconds with return value 0
Press any key to continue . . .
```

Task 03: Take relevant inputs from the user according to formula and calculate the area of: (1). Circle (2) Square (3). Rectangle; Formulas:

Area of Circle = pi * radius2

Area of Square = length2

Area of Rectangle = length * height

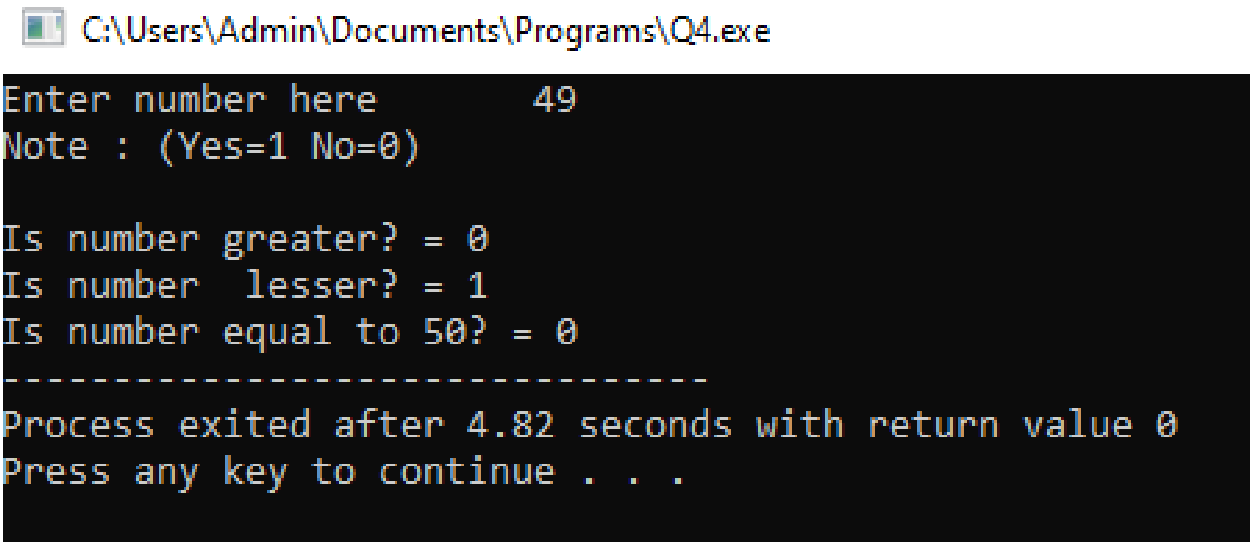
Q1.cpp | Q2.cpp | Q3.cpp | Q4.cpp | Q5.cpp | Q6.cpp | Q7.cpp | Q8.cpp | Q9.cpp | Q10.cpp

```c
#include<stdio.h>

main(){
float radius, sq_len, rect_len, height, Acirc, Asq, A_rect;
const float pi = 3.142;
    printf("Enter Radius of the circle\n");
    scanf("%f", &radius);
    Acirc = pi * radius * radius;
    printf("Area of circle = %0.3f\n\n", Acirc);

    printf("Enter the length of the square\n");
    scanf("%f", &sq_len);
    Asq = sq_len * sq_len ;
    printf ("Area of Square is: %0.3f\n\n", Asq);

    printf("Enter length and the height of rectangle\n");
    scanf("%f %f", &rect_len, &height);
    A_rect = rect_len * height ;
    printf("Area of rectangle is: %0.3f", A_rect);
    }
```

```
Enter Radius of the circle
2
Area of circle = 12.568

Enter the length of the square
4
Area of Square is: 16.000

Enter length and the height of rectangle
4
2
Area of rectangle is: 8.000
--------------------------------
Process exited after 39.28 seconds with return value 0
Press any key to continue . . .
```

Task 04 Write a program to take a number as user input and the check the following conditions (1). Number is greater than 50. (2). Number is less than 50, (3). Number is equal to fifty.

```c
#include<stdio.h>

main(){
    float num; int check;
    printf("Enter number here \t");
    scanf("%f", &num);
    printf("Note : (Yes=1 No=0)\n\n");
    check = num > 50;
    printf("Is number greater? = %d\n", check);
    check = num < 50;
    printf("Is number  lesser? = %d \n", check);
    check = num == 50;
    printf("Is number equal to 50? = %d", check);
}
```



Task 05 A students' report card needs to be developed. Write a program that takes marks of 5 subjects each of 100 marks. The subjects are: 1. Math 2. Urdu 3. English 4. Islamiyah 5. Pakistan Studies Calculate the percentage and total marks obtained.

```c
#include<stdio.h>

main(){
    float math, urdu, eng, isl, pst, percentage, obt_marks;
    const int total_marks = 500;
    printf("Enter Maths marks here: \t");
    scanf("%f", &math);
    printf("Enter Urdu marks here:  \t");
    scanf("%f", &urdu);
    printf("Enter English marks here: \t");
    scanf("%f", &eng);
    printf("Enter Islamiyah marks here: \t");
    scanf("%f", &isl);
    printf("Enter Pak Studies marks here: \t");
    scanf("%f", &pst);

    obt_marks = math + urdu + eng + isl + pst;
    printf("obtained marks: %0.2f\n", obt_marks);

    percentage = (obt_marks / total_marks)*100;
    printf("Percentage obtained is: %0.2f", percentage);
}
```

```
C:\Users\Admin\Documents\Programs\Q5.exe
Enter Maths marks here:         95
Enter Urdu marks here:          95
Enter English marks here:       95
Enter Islamiyah marks here:     85
Enter Pak Studies marks here:   57
obtained marks: 427.00
Percentage obtained is: 85.40
--------------------------------
Process exited after 8.673 seconds with return value 0
Press any key to continue . . .
```

Task 06 Write a C program that performs the following tasks: (1). Take hours from user, convert it into minutes and seconds. (2). Take years from user, convert it into weeks and days.

```c
#include<stdio.h>

main(){
    int hours, min, sec, year, week, days ;

    printf("Enter hours here: ");
    scanf("%d", &hours);
    min = hours * 60;
    sec = hours * 60 * 60;
    printf("%d * 60 = %d minutes\n", hours, min);
    printf("%d * 60 * 60 = %d seconds\n\n", hours, sec);

    printf("Enter Years here: ");
    scanf("%d", &year);
    week = year * 52;
    printf("%d * 52 = %d weeks\n", year, week);
    days  = week * 7;
    printf("%d * 7 = %d days", week, days);

 }
```

```
C:\Users\Admin\Documents\Programs\Q6.exe
Enter hours here: 3
3 * 60 = 180 minutes
3 * 60 * 60 = 10800 seconds

Enter Years here: 2
2 * 52 = 104 weeks
104 * 7 = 728 days
--------------------------------
Process exited after 5.235 seconds with return value 0
Press any key to continue . . .
```

Task 07 Write a program to swap 2 numbers using a third variable. For example: A = 2, B=4 After swap A=4, B=2

```c
#include<stdio.h>

main(){
    int a, b, swapper;
    printf("Enter 2 numbers: ");
    scanf("%d %d", &a, &b);
    printf("Before swapping a=%d b=%d\n", a, b);
    swapper = a ;
    a = b ;
    b = swapper ;
    printf("After swapping a=%d b=%d", a, b);
}
```

```
C:\Users\Admin\Documents\Programs\Q7.exe
Enter 2 numbers: 10
25

Before swapping: a=10 b=25

After swapping: a=25 b=10
--------------------------------
Process exited after 2.616 seconds with return value 0
Press any key to continue . . .
```

Task 08 Create a two-input truth table of AND gate, OR gate and Not gate using logical operators

```c
#include<stdio.h>

main(){
    int a, b, AND, OR, NOTa, NOTb;
    printf("Enter 2 inputs( 0 or 1 only):\n");
    scanf("%d %d", &a, &b);
    AND = a && b;
    OR = a || b;
    NOTa = !(a) ;
    NOTb = !(b) ;
    printf("\na b AND OR NOTa NOTb\n%d %d  %d   %d   %d   %d",a ,b, AND, OR, NOTa, NOTb);
}
```

```
Enter 2 inputs( 0 or 1 only):
0
1

a b AND OR NOTa NOTb
0 1  0   1   1   0
--------------------------------
Process exited after 1.804 seconds with return value 0
Press any key to continue . . .
```

Task 09: Write a C program to Find out distance, coordinates of midpoint using distance formula, derived from Pythagorean Theorem and value of X by Quadratic formula, as follows***: Midpoint= ((x2+x1/2), (y2+y1/2))***

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

main(){
    float x1, x2, y1, y2, distance, avgX, avgY;
    printf("Enter x1 \n");
    scanf("%f",&x1);
    printf("Enter x2\n");
    scanf("%f",&x2);
    printf("Enter y1\n");
    scanf("%f",&y1);
    printf("Enter y2\n");
    scanf("%f",&y2);

    distance = sqrt((x2-x1)*(x2-x1) + (y2-y1)*(y2-y1));
    printf("The distance between the two points is: %0.2f\n", distance);

    avgX = (x2+x1)/2;
    avgY = (y2+y1)/2;
    printf("The mid point of the coordinates is (%0.1f , %0.1f)", avgX,avgY);
```

```
C:\Users\Admin\Documents\Programs\Q9.exe
Enter x1
4
Enter x2
2
Enter y1
10
Enter y2
6
The distance between the two points is: 4.47
The mid point of the coordinates is (3.0 , 8.0)
--------------------------------
Process exited after 9.486 seconds with return value 0
Press any key to continue . . .
```

Task 10:

Write a C program to Find the Roots of a Quadratic Equation. Take user input values of b, a, c:

x = (−b±√b2−4ac)/2a Given (a≠0).

Q10.cpp

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

main(){
    float a, b, c, d, x1 , x2;
    printf("Enter value of a: ");
    scanf("%f",&a);
    printf("Enter value of b: ");
    scanf("%f",&b);
    printf("Enter value of c: ");
    scanf("%f",&c);

    if(a==0){
        printf("Roots are imaginary.");
    }
    else {
        d = (b*b)-(4*a*c);
        x1 = (-b + sqrt(d))/(2*a);
        x2 = (-b - sqrt(d))/(2*a);
        printf("\nRoots are (x1, x2) = (%0.2f , %0.2f)",x1,x2);
    }

}
```

```
C:\Users\Admin\Documents\Programs\Q10.exe
Enter value of a: -2
Enter value of b: -9
Enter value of c: 35

Roots are (x1, x2) = (-7.00 , 2.50)
--------------------------------
Process exited after 5.805 seconds with return value 0
Press any key to continue . . .
```