NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

CS-114- FUNDAMENTAL OF PROGRAMMING

LAB MANUAL 1 AND 2

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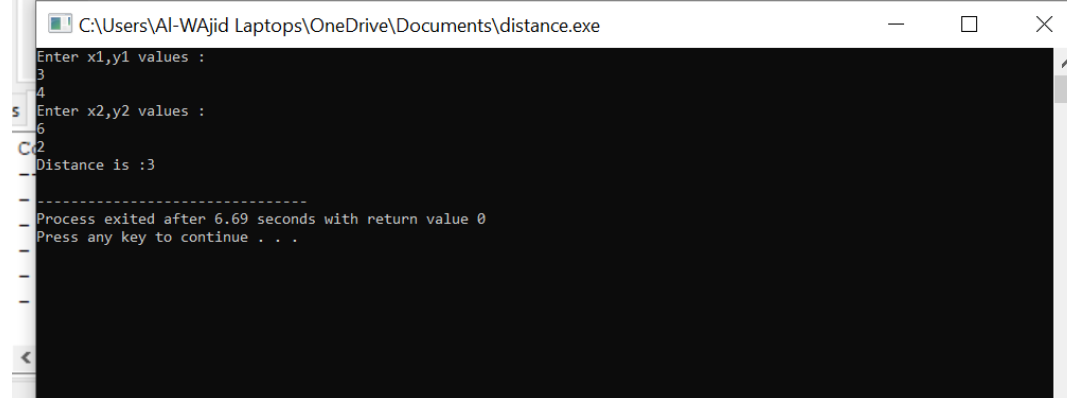
DATE OF SUBMISSION:

12 OCTOBER 2023

LAB MANUAL 1

HOME TASK 1:

Write a C++ program to calculate distance between two points. The values of coordinates should be input by user

CODE:

distance.cpp

```cpp
1    #include <iostream>
2    #include <cmath>
3    using namespace std;
4    int main()
5    {
6        int x1,y1;
7        int x2,y2;
8
9        cout<<"Enter x1,y1 values :"<< endl; //enter inputs
10       cin>>x1;
11       cin>>y1;
12       cout<<"Enter x2,y2 values :"<< endl;
13       cin>>x2;
14       cin>>y2;
15
16       int distance = sqrt (pow(x2-x1 ,2) + pow(y2- y1 ,2)); //given formula
17       cout<<"Distance is :"<<distance<<endl; //output
18       return 0;
19   }
```
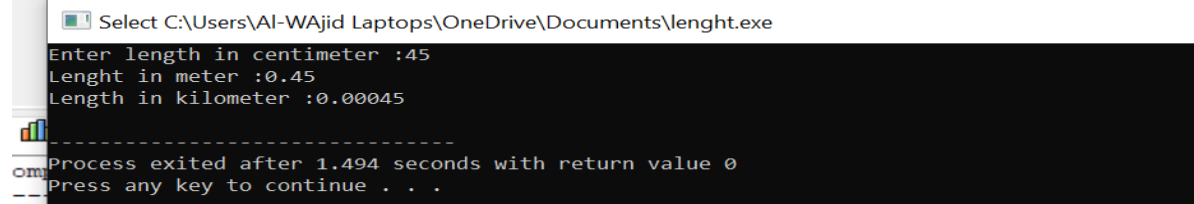
```
C:\Users\Al-WAjid Laptops\OneDrive\Documents\distance.exe

Enter x1,y1 values :
3
4
Enter x2,y2 values :
6
2
Distance is :3

-------------------------------
Process exited after 6.69 seconds with return value 0
Press any key to continue . . .
```

TASK 2:

Write a code in C++ to take length from user in centimeter and convert it into meter and kilometer.

CODE:

```cpp
1    #include <iostream>
2    using namespace std;
3    int main()
4    {
5        float cm,m,km;
6        cout<<"Enter length in centimeter :"; //ask user to provide input
7        cin>>cm;
8
9        m=cm/100; //given formula
10       km=cm/100000; //given formula
11
12       cout<<"Lenght in meter :"<<m<<endl; //output
13       cout<<"Length in kilometer :"<<km<<endl; //output
14       return 0;
15   }
```
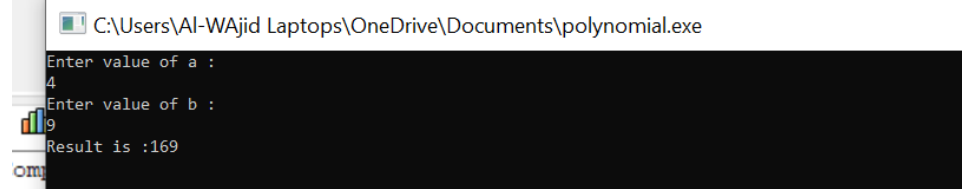
■ Select C:\Users\Al-WAjid Laptops\OneDrive\Documents\lenght.exe

```
Enter length in centimeter :45
Lenght in meter :0.45
Length in kilometer :0.00045

-------------------------------
Process exited after 1.494 seconds with return value 0
Press any key to continue . . .
```

TASK 3:

Write a code in C++ that takes values of a and b from the user and displays the result of polynomial.

```cpp
1    #include <iostream>
2    using namespace std;
3    int main()
4    {
5    int a,b;
6    cout<<"Enter value of a :"<<endl; //enter input
7    cin>>a;
8
9    cout<<"Enter value of b :"<<endl; //enter second input
10   cin>>b;
11
12    int result = a*a + 2*a*b + b*b; //given formula
13   cout<<"Result is :"<<result<<endl; //output
14   return 0;
15   }
```

■ C:\Users\Al-WAjid Laptops\OneDrive\Documents\polynomial.exe

```
Enter value of a :
4
Enter value of b :
9
Result is :169
-------------------------------
```

TASK 4:

Write a program in C++ to convert temperature in Fahrenheit to Celsius.

CODE:

```cpp
#include <iostream>
using namespace std;
int main()
{
    float frh,cel;
    cout<<"Enter temperature in Fahrenheit :"; //ask user to provide input
    cin>>frh;

    cel = (frh - 32)*5/9; //given formula
    cout<<"Temperature in Calsius is :"<<cel<<endl; //output
    return 0;
}
```

```
C:\Users\Al-WAjid Laptops\OneDrive\Documents\calcius.exe
Enter temperature in Fahrenheit :76
Temperature in Calsius is :24.4444

-------------------------------
Process exited after 4.757 seconds with return value 0
```

LAB MANUAL 2

LAB TASKS

LAB TASK 1:

Write a program that determines if a person is eligible to vote based on their age (e.g., 18 years or older) using logical operators.

CODE :

```cpp
1    #include<iostream>
2    using namespace std;
3    int main()
4  ┌ {
5        int age;
6        cout<<"Enter your age :"<<endl; //ask user to provide input
7        cin>>age;
8
9        if (age >= 18) //condition
10 ┌    {
11       cout<<"You are eligibe to vote"<<endl; //output
12 ┌    }
13       else
14 ┌    {
15       cout<<"You are not eligible to vote"<<endl; //output
16 ┌    }
17       return 0;
18
19 └ }
```

■ C:\Users\Al-WAjid Laptops\OneDrive\Documents\eligible.exe

```
Enter your age :
19
You are eligibe to vote

------------------------------------
Process exited after 5.786 seconds with return value 0
```

TASK 2: **Write a program that takes an integer as input and checks if it falls within the range [10, 50] using logical operators.**

```cpp
1    #include <iostream>
2    using namespace std;
3    int main()
4  ┌ {
5        int _input;
6        cout<< "Enter an integer :" <<endl; //ask user to provide input
7        cin>> _input;
8
9        if (_input >= 10 && _input <= 50)
10 ┌    {
11       cout<<"The input is within the range"<<endl; //output
12 ┌    }
13       else
14 ┌    {
15       cout<<"The input is not within the range"<<endl; //output
16 ┌    }
17       return 0;
18 └ }
```
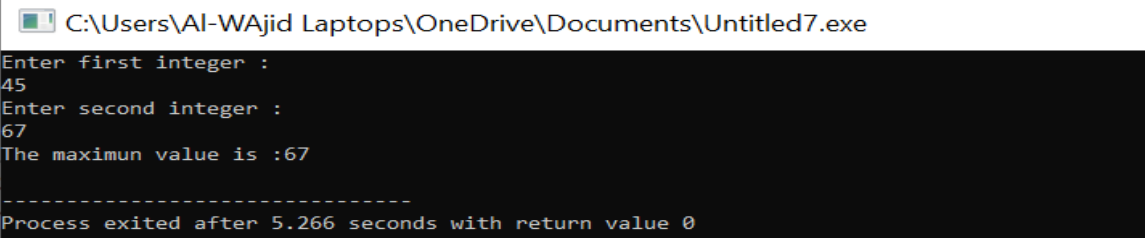
■ C:\Users\Al-WAjid Laptops\OneDrive\Documents\user input.exe

```
Enter an integer :
46
The input is within the range

--------------------------------
```
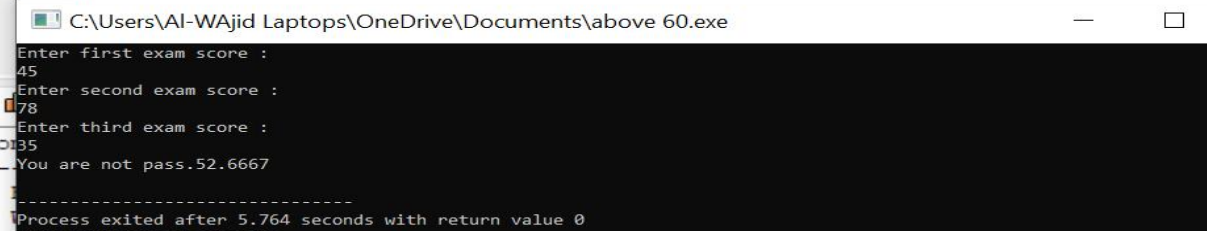
TASK 3: Write a C++ program to compare two integers and find the maximum value.

```
1    #include <iostream>
2    using namespace std;
3    int main ()
4    {
5        int num1,num2;
6        cout <<"Enter first integer :" <<endl; //enter first input
7        cin>>num1;
8
9        cout <<"Enter second integer :" <<endl; //enter second input
10       cin>>num2;
11       if ( num1 < num2) //condition
12       {
13           cout <<"The maximun value is :"<<num2<<endl; //output
14       }
15       else
16       {
17           cout <<"The maximum value is :"<<num1<<endl; //output
18       }
19       return 0;
20   }
```

■ C:\Users\Al-WAjid Laptops\OneDrive\Documents\Untitled7.exe

```
Enter first integer :
45
Enter second integer :
67
The maximun value is :67

--------------------------------
Process exited after 5.266 seconds with return value 0
```

TASK 4: Write a C++ program to calculate the average of three exam scores and determine if it's above a passing grade (e.g., average >= 60).

```
1    #include <iostream>
2    using namespace std;
3    int main()
4    {
5        float score1,score2,score3,average; //declare variables to store exam score
6        cout <<"Enter first exam score :" <<endl;
7        cin>> score1;
8
9        cout <<"Enter second exam score :" <<endl;
10       cin>> score2;
11
12       cout <<"Enter third exam score :" <<endl;
13       cin>> score3;
14
15       average = (score1 + score2 +score3)/3.0;
16   if (average >= 60.0){
17       cout <<"You are pass."<<average <<endl;
18   }else {
19       cout <<"You are not pass." <<average <<endl;}
20       return 0;
21   }
```

■ C:\Users\Al-WAjid Laptops\OneDrive\Documents\above 60.exe

```
Enter first exam score :
45
Enter second exam score :
78
Enter third exam score :
35
You are not pass.52.6667

--------------------------------
Process exited after 5.764 seconds with return value 0
```

HOME TASK

TASK 1:

Create a program that takes a student's score as input and assigns a grade based on

predefined criteria using logical operators (e.g., A, B, C, D, F).
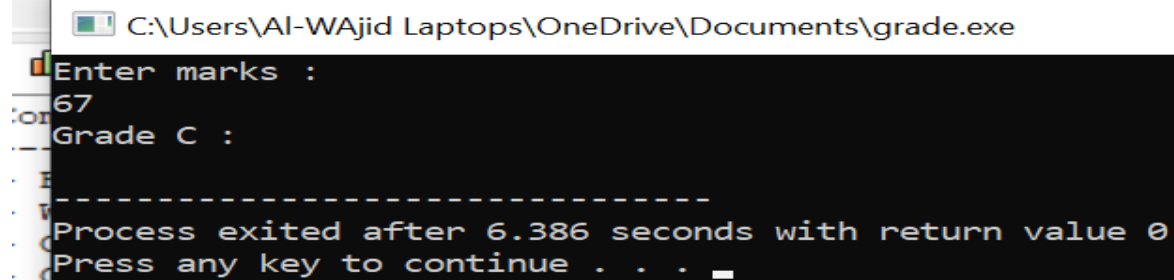
A-Grade: 90-100 Marks

B-Grade: 75-90 Marks

C-Grade: 60-75 Marks

D-Grade: 45-60 Marks

F-Grade: 0-45 Marks

CODE:

```cpp
1    #include <iostream>
2    using namespace std;
3    int main ()
4    {
5        int marks;
6        cout <<"Enter marks :" <<endl; //enter input
7        cin>> marks;
8
9        if (marks >90)
10       cout <<"Grade A :"<<endl; //output
11
12       else if (marks >75)
13       cout <<"Grade B :"<<endl; //output
14
15       else if (marks >60)
16       cout<<"Grade C :"<<endl; //output
17
18       else if (marks >45)
19       cout<<"Grade D :"<<endl; //output
20
21       else if (marks <45)
22       cout<<"Grade F :"<<endl; //output
23
24       return 0;
25   }
```

C:\Users\Al-WAjid Laptops\OneDrive\Documents\grade.exe

```
Enter marks :
67
Grade C :

--------------------------------
Process exited after 6.386 seconds with return value 0
Press any key to continue . . . _
```

TASK 2: Write a program that takes an integer as input and determines if it is both even and divisible by 5.

```
1    #include <iostream>
2    using namespace std;
3    int main ()
4    {
5        int integer;
6        cout<<"Enter an integer :"<<endl; //ask user to give input
7        cin>> integer;
8
9        if (integer %2 == 0 && integer %5 ==0) //condition
10       {
11           cout<<"Integer is both even and divisible by 5. "<<endl; // output
12       }
13       else
14       {
15           cout<<"Integer is not both even and divisible by 5."<<endl; //output
16       }
17       return 0;
18   }
```

```
C:\Users\Al-WAjid Laptops\OneDrive\Documents\task 2,2.exe

Enter an integer :
60
Integer is both even and divisible by 5.

---------------------------------
Process exited after 3.103 seconds with return value 0
```

TASK 3: Create a C++ program that checks if a user-provided year is a leap year.

CODE:

```
1    #include <iostream>
2    using namespace std;
3    int main (){
4        int year;
5        cout <<"Enter year :" <<endl; //ask user to provide input
6        cin>> year;
7
8        if( year % 4 == 0 ) //condition
9        {
10           cout <<"It is leap year :" << year <<endl; //result
11       } else {
12           cout <<"It is not leap year :" << year <<endl; //result
13       }
14
15       return 0;
16   }
17
```

```
C:\Users\Al-WAjid Laptops\OneDrive\Documents\leap year.exe

Enter year :
1986
It is not leap year :1986

---------------------------------
Process exited after 4.312 seconds with return value 0
Press any key to continue . . .
```

TASK 4:. Create a C++ program that determines if a student is eligible for a scholarship based on their GPA (must have GPA >= 3.5) and attendance (must have attended at least 80% of classes)

CODE:

```
1    #include <iostream>
2    using namespace std;
3    int main ()
4    {
5        float gpa,attendence; //Declare input
6        cout <<"Enter your gpa :"<< endl;
7        cin>> gpa;
8
9        cout <<"Enter your attendence"<< endl;
10       cin>>attendence;
11
12       if ( gpa>= 3.5 && attendence>= 80) //check eligibility critaria for scholarship
13       {
14           cout <<"You are eligible."<< endl; //Result
15       } else {
16           cout <<"You are not eligible."<< endl;
17       }
18       return 0;
19   }
```

C:\Users\Al-WAjid Laptops\OneDrive\Documents\scholarship.exe

```
Enter your gpa :
3.7
Enter your attendence
84
You are eligible.

-------------------------------------
Process exited after 11.78 seconds with return value 0
Press any key to continue . . .
```

TASK 5: Write a program that checks if a given character is a vowel (a, e, i, o, u) or a consonant using logical operators.

```
1    #include <iostream>
2    using namespace std;
3    int main ()
4    {
5        char ch;
6        cout <<"Enter a character :"; // ask user to provide input
7        cin>>ch;
8
9        if ( ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u')
10   {
11   cout <<" It is vowel."<<ch<<endl; //result
12       }
13       else{
14       cout <<" It is consonant."<<ch<<endl; //result
15       }
16       return 0;
17   }
```

C:\Users\Al-WAjid Laptops\OneDrive\Documents\vowel.exe

```
Enter a character :r
 It is consonant.r

-------------------------------
Process exited after 1.873 seconds with return value 0
Press any key to continue . . .
```