School Of Mechanical & Manufacturing Engineering,
NUST

Department of Mechanical Engineering

CS-114 - Fundamentals of Programing

Home Task 1

Course Instructor: Dr Jawad Khan

Lab Instructor: Muhammad Affan

Student Name: **Ahmed Adil Hussain**

CMS ID: **477537**

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School Of Mechanical & Manufacturing Engineering,
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LAB TASKS

1. Write a C++ code that displays your name, department and degree on the console. Make sure the three things are in three different lines.

CODE:

```cpp
#include <iostream>

using namespace std;
int main()
{
    //TASK 1
    cout<<"Ahmed Adil Hussain"<<endl;
    cout<<"SMME"<<endl;
    cout<<"Bachelors in Mechanical Engineering"<<endl;


    return 0;
}

```

OUTPUT

```
C:\Study Material\programmi
Ahmed Adil Hussain
SMME
Bachelors in Mechanical Engineering

--------------------------------
Process exited after 2.765 seconds with return value 0
Press any key to continue . . .
```

2. Write a C++ code that takes two numbers and displays the addition, subtraction, division, multiplication and square of given numbers, on the console window. Make sure to comment your code.

CODE:

```
#include <iostream>

using namespace std;
int main()
{
    //TASK 2
    float a;
    float b;
    float add;
    float sub;
    float mul;
    float div;
    float sqA;
    float sqB;

    cout<<"Enter a value for the first number:"<<endl;
    cin>>a;
    cout<<"Enter a value for the second number:"<<endl;
    cin>>b;

    add = a + b;
    sub = a - b;
    mul = a * b;
    div = a / b;
    sqA= a * a;
    sqB = b * b;

    cout<<"addition: "<<add <<endl;
    cout<<"subtraction: "<<sub <<endl;
    cout<<"multiplication: "<<mul <<endl;
    cout<<"division: "<<div <<endl;
    cout<<"square of a: "<<sqA <<endl;
    cout<<"square of b: "<<sqB <<en


    return 0;
}

```

OUTPUT:

```
Enter a value for the first number:
8
Enter a value for the second number:
3
addition: 11
subtraction: 5
multiplication: 24
division: 2.66667
square of a: 64
square of b: 9

--------------------------------
Process exited after 11.64 seconds with return value 0
Press any key to continue . . .
```

\

3. Write a code in C++ that takes radius of a circle as input from user and outputs the circumference and area. The output should be clear and readable. Add proper comments to the code. You can set the value of π up to 3 decimal places.

CODE:

```cpp
#include <iostream>

using namespace std;
int main()
{
    float rad;
    float pi = 3.142;
    float cir;
    float area;
    cout<<"What is the radius of the circle in cm?"<<endl;
    cin>>rad;
    cir = 2 * pi * rad;
    area = pi * rad * rad;
    cout<<"Circumference in cm = "<<cir <<endl;
    cout<<"Area in cm2 = "<<area <<endl;

    return 0;
}
```

OUTPUT:

```
C:\Study Material\programmi
What is the radius of the circle in cm?
6.5
Circumference in cm = 40.846
Area in cm2 = 132.749

--------------------------------
Process exited after 7.067 seconds with return value 0
Press any key to continue . . .
```

4. Write a C++ code that prints out the following sequence: 0, 1, 1, 2, 3, 5, 8, 13 using three variables

CODE:

```cpp
#include <iostream>

using namespace std;
int main()
{
    //TASK 4
    int x = 0;
    int y = 1;
    int z = 1;
    cout<<x <<y <<z;
    x = z + y;
    y = x + z;
    z = x + y;
    cout<<x <<y <<z;
    x = z + y;
    y = x + z;
    z = x + y;
    cout<<x <<y <<z;
    x = z + y;
    y = x + z;
    z = x + y;
    cout<<x <<y <<z;
    x = z + y;
    y = x + z;
    z = x + y;
    cout<<x <<y <<z;


    return 0;
}
```

OUTPUT

```
C:\Study Material\programmi

0112358132134558914423337 7
--------------------------------
Process exited after 1.163 seconds with return value 0
Press any key to continue . . .
```

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Home Task 1:

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

$$d = \left(x_2 - x_1\right)^2 + \left(y_2 - y_1\right)^2$$

```cpp
#include <iostream>

using namespace std;
int main()
{
    //HOME TASK 1
    int x;
    int y;
    int x2;
    int y2;
    int d;
    cout<<"Enter the x and y coordinates, respectively, for the first point"<<endl;
    cin>>x;
    cin>>y;
    cout<<"Enter the x and y coordinates, respectively, for the second point"<<endl;
    cin>>x2;
    cin>>y2;
    d = (x2 - x)*(x2 - x) + (y2-y)*(y2-y);
    cout<<"the distance is: " <<d <<endl;
    return 0;
}
```

```
C:\Study Material\programmi
Enter the x and y coordinates, respectively, for the first point
9
3
Enter the x and y coordinates, respectively, for the second point
5
11
the distance is: 80

--------------------------------
Process exited after 4.996 seconds with return value 0
Press any key to continue . . .
```

Home Task 2:

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

```cpp
#include <iostream>

using namespace std;
int main()
{
    //HOME TASK 2
    float length;
    cout<<"Enter the length in cm"<<endl;
    cin>>length;
    cout<<"length in meters: " <<length/100 <<"m" <<endl;
    cout<<"length in kilometers: " <<length/100000 <<"km" <<endl;
    return 0;
}
```

```
C:\Study Material\programmi

Enter the length in cm
8
length in meters: 0.08m
length in kilometers: 8e-005km

--------------------------------
Process exited after 5.928 seconds with return value 0
Press any key to continue . . .
```

Home Task 3:

3. Write a code in C++ that takes values of a and b from the user and displays result of polynomial $a^2 + 2ab + b^2$.

```cpp
#include <iostream>

using namespace std;
int main()
{
    //HOME TASK 3
    float a;
    float b;
    cout<<"Enter the value for a:"<<endl;
    cin>>a;
    cout<<"Enter the value for b:"<<endl;
    cin>>b;
    cout<<"the value for the polynomial a2 + 2ab + b2 = "<<a*a+2*a*b+b*b  <<endl;
    return 0;
}
```

```
C:\Study Material\programmi
Enter the value for a:
4
Enter the value for b:
12
the value for the polynomial a2 + 2ab + b2 = 256

--------------------------------
Process exited after 14.98 seconds with return value 0
Press any key to continue . . .
```

Home Task 4:

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

```cpp
#include <iostream>

using namespace std;
int main()
{
    //HOME TASK 4
    float f;
    float c;
    cout<<"Enter the value for temperature in fahrenheit:"<<endl;
    cin>>f;
    c = (f-32) * 5/9;
    cout<<"The temperature is "<<c <<" in celsius"<<endl;

    return 0;
}
```

```
C:\Study Material\programmi
Enter the value for temperature in fahrenheit:
98.6
The temperature is 37 in celsius

--------------------------------
Process exited after 12.41 seconds with return value 0
Press any key to continue . . .
```