Lesson 2 from

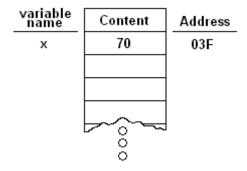# PROGRAMMING FUNDAMENTALS_1

First Class

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Variables Declaration

A declaration is a process of naming the variables and their statements datatypes in C++. C++ allows the declaration of the variables before and after executable statements. A variable is an object that may be taken on values of the specified type.

Also, a variable is a location in the computer's memory where a value can be stored for later use by the program. Variables are like buckets that hold data. These data buckets are real locations in the computer's memory.

The variable must be declared by specifying the datatype and the identifier.

<p align="center">data type id1, id2, …,idn;</p>

A variable is defined by stating its type, followed by one or more spaces, followed by one or more variable names separated by commas, then followed by a semicolon.

Examples of variables:

- float Y;

- float c=3.2;

- char A, a, c;

- char f='g';

- int e=4;

Note: C++ distinguishes between capital and small variables.

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Examples

Ex 1:

The following program read three different inputs statically and outputs them.

```
# include<iostream.h>
#include<conio.h>                                    Output
void main ()
{
     clrscr();
     int n=3;
     cout << "number ="<<n<<"\n";
     char ch='a';
     cout << "character ="<<ch<<"\n";
     float fa=34.45;
     cout << "real number ="<<fa;
     getch();
}
```

Output:
```
number =3
character =a
real number=34.45
```

Ex 2:

The following program reads three different inputs and outputs them.

```
#include<iostream.h>
void main ( )
{  int n; float f; char c;                            Output
   cin<< n;
   cin>>f;
   cin<< c ";
   cout<<" The Integer Number is "<<n ;
   cout<<" The Real Number is "<<f  ;
   cout<<" The Character is "<<c ;
}
```

Output:
```
23
34.87
A
The Integer Number is 23
The Real Number is 34.87
The Character is A
```

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Ex 3:

Write a C++ program that read the radius of a circle, then computes and outputs its area.

```cpp
#include<iostream.h>
void main( )
    {
        float  pi = 3.14;  int r; float c;
        cout << "Enter the radius of a circle: ";
        cin>>r;
        c = r * r * pi;
        cout << "The area of a circle is:  " << c;
    }
```

Output

```
Enter the radius of a circle: 5
The area of a circle is: 78.5
```

Ex 4:

The following program computes the arithmetic operators.

```cpp
#include<iostream.h>
void main ( )
{   int a, b, sum, sub, mult, div;
    cout << "Enter any two numbers<<endl;
    cin>> a>>b;
    sum= a + b;
    sub= a – b;
    mult= a * b;
    div= a / b;
    cout<<"sum="<<sum<<endl;
    cout<<"sub="<<sub<<endl;
    cout<<"mult="<<mult<<endl;
    cout<<"div="<<div;
}
```

Output

```
Enter any two numbers
10    20
sum= 30
sub= –10
mult= 200
div= 0
```

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✓ The modulus operator "%" is used to obtain the remainder of the division "/" process and it is used with integer operands. It can't be used with a float or double operands.

Ex 5:

The following program computes different division operators.

```cpp
#include<iostream.h>
void main( )
{
        int x, y, z, r ;
        x= 7 / 2;
        cout << "x=" << x <<endl;
        y=17/-3;
        cout << "y="<< y <<endl;
        z=-17/3;
        cout << "z="<< z <<endl;
        r=-17/-3;
        cout << "r="<< r <<endl;
        h= 8 % 3;
        cout<<"h=" <<h<<endl;
        w = -17 % 3;
        cout << "w="<< w;
}
```

Output

```
x=3
y=-5
z=-5
r=5
h= 2
w= -2
```

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1. Write a C++ program to read and print your first name, your age, and your city.

2. Write a C++ program to read your full name, one by one, and print it regularly.

3. What is the output of the following program?

```cpp
#include<iostream.h>
void main( )
{
    int x, y, result;
    x= 55;
    y=x;
    result=x+y;
    cout << "The result is:" << result<<endl;
}
```

4. What is the output of the following program?

```cpp
#include<iostream.h>
void main( )
{
    int x, y, result;
    x= 11;
    result=x%2;
    cout << "The result is:" << result<<endl;
}
```

5. What is the output of the following program?

```
#include<iostream.h>
void main( )
{
    int value1, value2, value3, sum;
    cout << "Enter the first value:"<<endl;
    cin>>value1;
    cout << "Enter the second value:"<<endl;
    cin>>value2;
    cout << "Enter the third value:"<<endl;
    cin>>value3;
    sum=value1+value2+value3+3;
    cout << "The result is:" << sum<<endl;
}
```

6. Check whether each of the following commands is true or false and correct the false command.

   a. flot Y;
   b. char A; a; c;
   c. char f='g111';
   d. int e=D;