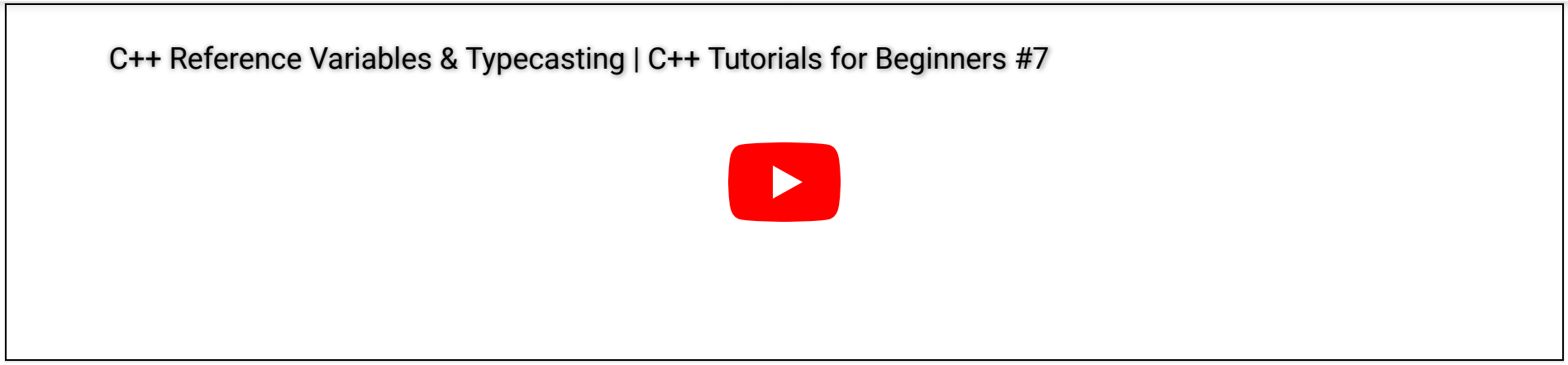

C++ Reference Variables & Typecasting | C++ Tutorials for Beginners #7

In this C++ tutorial, we will discuss the reference variables and typecasting. In our last lesson, we discussed the header files and operators in C++. These are the topics which we are going to cover in this tutorial:

- **Built-in Data Types**
- **Float, Double and Long Double Literals**
- **Reference Variables**
- **Typecasting**

Built-in Data Types

As discussed in our previous lectures, built-in data types are pre-defined by the language and can be used

directly. An example program for built-in data types is shown in figure 1.

```
5  int c = 45;
6
7  int main(){
8      int a, b, c;
9      cout<<"Enter the value of a:"<<endl;
10     cin>>a;
11     cout<<"Enter the value of b:"<<endl;
12     cin>>b;
13     c = a + b;
14     cout<<"The sum is "<<c<<endl;
15     cout<<"The global c is "<<::c;
16
```

Figure 1: Built-in Data Types

The code of built-in data types can be seen in figure 1 where we have declared three variables "**a, b and c"** inside the main function and one variable "**c"** outside the main function which is a global variable. To access the value of the global variable "**c**," we use **scope resolution operator** "**::"** with the "**c"** variable. The output of the following program is shown in figure 2.

```
Enter the value of a:
5
Enter the value of b:
9
The sum is 14
The global c is 45
```

Figure 2: Built-in Data Types Output

As we have entered the value of the variable "**a"** as five and "**b"** as 6, it gives us the sum 14, but for the global variable, it has given us the value 45.

Float, Double and Long Double Literals

The main reason to discuss these literals was to tell you an important concept about them. The float, double and long double literals program is shown in figure 3.

```
float d=34.4F;
long double e = 34.4L;
cout<<"The size of 34.4 is "<<sizeof(34.4)<<endl;
cout<<"The size of 34.4f is "<<sizeof(34.4f)<<endl;
cout<<"The size of 34.4F is "<<sizeof(34.4F)<<endl;
cout<<"The size of 34.4l is "<<sizeof(34.4l)<<endl;
cout<<"The size of 34.4L is "<<sizeof(34.4L)<<endl;
```

Figure 3: Float, Double & Long Double Literals

So the crucial concept which I am talking about is that in C++ language, double is the default type given to a decimal literal (34.4 is double by default and not float), so to use it as float, you have to specify it like "**34.4F**," as shown in figure 3. To display the size of float, double, and long double literals, we have used a "**sizeof"** operator. The output of this program is shown in figure 4.

```
The size of 34.4 is 8
The size of 34.4f is 4
The size of 34.4F is 4
The size of 34.4l is 12
The size of 34.4L is 12
The value of d is 34.4
The value of e is 34.4
```

Figure 4: Float, Double, Long Double Literal Output

Reference Variable

Reference variables can be defined as another name for an already existing variable. These are also called an

alias. For example, let us say we have a variable with the name of "**sum",** but we also want to use the same variable with the name of "**add"**, to do that we will make a reference variable with the name of "**add"**. The example code for the reference variable is shown in figure 5.

```
float x = 455;
float & y = x;
cout<<x<<endl;
cout<<y<<endl;
```

Figure 5: Reference Variable Code

As shown in figure 5, we initialized a variable "**x"** with the value "**455"**. Then we assigned the value of "**x"** to a reference variable "**y"**. The ampersand "**&"** symbol is used with the "**y"** variable to make it reference variable. Now the variable "**y"** will start referring to the value of the variable "**x"**. The output for variable "**x"** and "**y"** is shown in figure 6.

```
PS D:\Business\code playground\C++ course> c
455
455
PS D:\Business\code playground\C++ course>
```

Figure 6: Reference Variable Code Output

Typecasting

Typecasting can be defined as converting one data type into another. Example code for type casting is shown in figure 7.

```
// *************Typecasting****************
int a = 45;
float b = 45.46;
cout<<"The value of a is "<<(float)a<<endl;
cout<<"The value of a is "<<float(a)<<endl;

cout<<"The value of b is "<<(int)b<<endl;
cout<<"The value of b is "<<int(b)<<endl;
```

```
int c = int(b);

cout<<"The expression is "<<a + b<<endl;
cout<<"The expression is "<<a + int(b)<<endl;
cout<<"The expression is "<<a + (int)b<<endl;
```

Figure 7: Typecasting Example Code

As shown in figure 7, we have initialized two variables, integer "**a**" and float "**b**". After that, we converted an integer variable "**a**" into a float variable and float variable "**b**" into an integer variable. In C++, there are two ways to typecast a variable, either using "**(float)a**" or using "**float(a)**". The output for the above program is shown in figure 8.

```
PS D:\Business\code playground\C++ course>
The value of a is 45
The value of a is 45
The value of b is 45
The value of b is 45
The expression is 90.46
The expression is 90
The expression is 90
```

Figure 8: Typecasting Program Output

Code as described/written in the video

```
#include<iostream>

using namespace std;

int c = 45;

int main(){
```

```
// *************Build in Data types****************
// int a, b, c;
// cout<<"Enter the value of a:"<<endl;
// cin>>a;
// cout<<"Enter the value of b:"<<endl;
// cin>>b;
// c = a + b;
// cout<<"The sum is "<<c<<endl;
// cout<<"The global c is "<<::c;

// ************* Float, double and long double Literals****************
// float d=34.4F;
// long double e = 34.4L;
// cout<<"The size of 34.4 is "<<sizeof(34.4)<<endl;
// cout<<"The size of 34.4f is "<<sizeof(34.4f)<<endl;
// cout<<"The size of 34.4F is "<<sizeof(34.4F)<<endl;
// cout<<"The size of 34.4l is "<<sizeof(34.4l)<<endl;
// cout<<"The size of 34.4L is "<<sizeof(34.4L)<<endl;
// cout<<"The value of d is "<<d<<endl<<"The value of e is "<<e;

// *************Reference Variables****************
// Rohan Das----> Monty -----> Rohu ------> Dangerous Coder
// float x = 455;
// float & y = x;
// cout<<x<<endl;
// cout<<y<<endl;
```

```
    // *************Typecasting****************
    int a = 45;
    float b = 45.46;
    cout<<"The value of a is "<<(float)a<<endl;
    cout<<"The value of a is "<<float(a)<<endl;

    cout<<"The value of b is "<<(int)b<<endl;
    cout<<"The value of b is "<<int(b)<<endl;
    int c = int(b);

    cout<<"The expression is "<<a + b<<endl;
    cout<<"The expression is "<<a + int(b)<<endl;
    cout<<"The expression is "<<a + (int)b<<endl;


    return 0;
}
```

Previous Next