

Philip Pesic

Week 11

October 30 2022

Week 11 Prog 3

Write and run the code for the first example in the lecture notes

```
//
```

```
// main.cpp
```

```
// Week 11 Prog 3
```

```
//
```

```
// Created by Pippo Pesic on 10/24/22.
```

```
//
```

```
#include <iostream>
```

```
using namespace std;
```

```
// Pass by value
```

```
void byValueFun ( int inX )
```

```
{ cout << endl << endl;
```

```
    cout << "Value of inX: " << inX << endl;
```

```
    cout << "Address of inX " << &inX << endl;
```

```
}
```

```
// Pass by Reference method 1
```

```
void byRef1Fun ( int & inX )
```

```
{ cout << endl << endl;
```

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```
    cout << "Value of inX: " << inX << endl;

    cout << "inX is the SAME Address of inX " << &inX << endl;

}

// Pass by Reference method 2

void byRef2Fun ( int * ptrInX ) // Uses pointer variables
{
    cout << endl << endl;

    cout << "Value *inX: " << *ptrInX << endl;

    cout << "Address in inX: " << ptrInX << endl;

}

int main()
{

    int x = 42;

    cout << "-----" << endl;

    cout << endl << "Declared in main: Value of x: " << x << endl;

    cout << "Declared in main: Address of x: " << &x << endl;

    cout << "-----" << endl;
```

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// Pass by value

```
cout << endl << "PASS by Value" << endl;
```

```
cout << "Value of variable x in main, COPIED to variable inX in function byValueFun"
<< endl;
```

```
byValueFun(x);
```

```
cout << "-----" << endl;
```

// Pass by Reference method 1

```
cout << endl << "PASS by Reference method 1" << endl;
```

```
cout << "The address of variable x in main, becomes the SAME address as inX in
function byRef1Fun" << endl;
```

```
byRef1Fun(x);
```

```
cout << "-----" << endl;
```

// Pass by Reference method 2

```
cout << endl << "PASS by Reference method 2" << endl;
```

```
cout << "The address of variable x in main, copied to variable ptrInX in function
byRef2Fun" << endl;
```

```
byRef2Fun(&x);
```

```
cout << "-----" << endl;
```

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```
    cout << "Philip Pesic 10/30/22" << endl;  
    return 0;  
}
```

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The screenshot shows a C++ IDE with a project named "Week 11 Prog 3". The main file, "main.cpp", contains the following code:

```
1 //  
2 // main.cpp  
3 // Week 11 Prog 3  
4 //  
5 // Created by Pippo Pestic on 10/24/22.  
6 //  
7  
8 #include <iostream>  
9 using namespace std;  
10  
11 // Pass by value  
12 void byValueFun ( int inX )  
13 { cout << endl << endl;  
14   cout << "Value of inX: " << inX << endl;  
15   cout << "Address of inX " << &inX << endl;  
16 }  
17 // Pass by Reference method 1  
18 void byRef1Fun ( int &inX )  
19 { cout << endl << endl;  
20   cout << "Value of inX: " << inX << endl;  
21   cout << "inX is the SAME Address of inX " << &inX << endl;  
22 }  
23 // Pass by Reference method 2  
24  
25 void byRef2Fun ( int * ptrInX ) // Uses pointer variables  
26 { cout << endl << endl;  
27   cout << "Value *inX: " << *ptrInX << endl;
```

The output window shows the following results:

```
Declared in main: Value of x: 42  
Declared in main: Address of x: 0x16fdff2a8  
  
PASS by Value  
Value of variable x in main, COPIED to variable inX in function byValueFun  
  
Value of inX: 42  
Address of inX 0x16fdff26c  
  
PASS by Reference method 1  
The address of variable x in main, becomes the SAME address as inX in function byRef1Fun  
  
Value of inX: 42  
inX is the SAME Address of inX 0x16fdff2a8  
  
PASS by Reference method 2  
The address of variable x in main, copied to variable ptrInX in function byRef2Fun  
  
Value *inX: 42  
Address in inX: 0x16fdff2a8  
  
Philip Pestic 10/30/22  
Program ended with exit code: 0
```

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```
Week 11 Prog 3
C++ main
// Week 11 Prog 3
// C++ main
// main()
// cout << endl << "Declared in main: Value of x: " << x << endl;
// cout << "Declared in main: Address of x: " << &x << endl;
// cout << "-----" << endl;
// Pass by value
// cout << endl << "PASS by Value" << endl;
// cout << "Value of variable x in main, COPIED to variable inX in function byValueFun" << endl;
// byValueFun(x);
// cout << "-----" << endl;
// Pass by Reference method 1
// cout << endl << "PASS by Reference method 1" << endl;
// cout << "The address of variable x in main, becomes the SAME address as inX in function byRef1Fun" << endl;
// byRef1Fun(x);
// cout << "-----" << endl;
// Pass by Reference method 2
// cout << endl << "PASS by Reference method 2" << endl;
// cout << "The address of variable x in main, copied to variable ptrInX in function byRef2Fun" << endl;
// byRef2Fun(&x);
// cout << "-----" << endl;
// cout << "Philip Pestic 10/30/22" << endl;
// return 0;
}
```

Declared in main: Value of x: 42
Declared in main: Address of x: 0x16fdff2a8

PASS by Value
Value of variable x in main, COPIED to variable inX in function byValueFun

Value of inX: 42
Address of inX 0x16fdff26c

PASS by Reference method 1
The address of variable x in main, becomes the SAME address as inX in function byRef1Fun

Value of inX: 42
inX is the SAME Address of inX 0x16fdff2a8

PASS by Reference method 2
The address of variable x in main, copied to variable ptrInX in function byRef2Fun

Value =inX: 42
Address in inX: 0x16fdff2a8

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Program ended with exit code: 0

I learned: how to pass by reference and value with different functions