Lab Book

Experiment 1.

#include <iostream>

using namespace std;

int main()

{

cout <<"The size of an Integer: " << sizeof(int) << endl;

cout << "The size of Float: " << sizeof(float) << endl;

cout << "The size of double: " << sizeof(double) << endl;

cout << "The size of long: " << sizeof(long) << endl;

cout << "Size of char : " << sizeof(char) << endl;

cout << "Size of short int : " << sizeof(short int) << endl;

cout << "Size of long int : " << sizeof(long int) << endl;

cout << "Size of wchar\_t : " << sizeof(wchar\_t) << endl;

return 0;

}

Output =

The size of an Integer: 4

The size of Float: 4

The size of double: 8

The size of long: 4

Size of char : 1

Size of short int : 2

Size of long int : 4

Size of wchar\_t : 2

Reflection:

1byte = 8bits

4bytes = 32bits

* I learnt that "an integer, float, long, long int  occupies 4 bytes in the computer memory. ” In simple terms,it means that when you define an integer type variable, a memory of 4 bytes will be allocated to store its value and similar to double, char and wchar\_t.
* To store larger number “double”

Question:

Why did my program give integer 4byte instead of 2 in my program for integer?

Experiment 2.

double x = 10.0;

double y = 10.0;

if (x == y)

      cout << “X and Y are identical” << endl;

Output: X and Y are identical

Reflection:

Did the program execute as expected? Yes.

However I learned during debugging the value of x and y changed from 10.0 to 10.000000000000000.

Changing y= 20.0/2.0

double x = 10.0;

double y = 20.0/2.0;

if (x == y)

      cout << “X and Y are identical” << endl;

Output: X and Y are identical

#include <iostream>

#include <cmath>

using namespace std;

int main()

{

const double x = 100000.123456789;

const double a = 200000.123456789;

double y = (x + a) / x;

double z = 1.0 + (a / x);

if (y == z) {

cout << "y and z are identical" << endl;

return 0;

} else cout << "Not Identical" << endl;

cout << y << " The value " << z << endl;

return 0;

}

Output:

Not Identical

3 The value 3

Reflection:

* The larger a float or double number gets, the more it’s value changes
* Even though the output was 3, during debugging,  the value of y=2.9999987654336340 and z =2.9999987654336344. Which makes it not Identical.
* Trying a smaller value const double x = 100000.123; and const double a = 200000.1234; The output “Y and Z us identical”.

#include <iostream>

#include <cmath>

using namespace std;

int main()

{

float  y = 2, x = 0.00000000000000000000000000000000000002;

float z = y / x;

cout << " number before it throws an exception is " << z << endl;

return 0;

}

Output result:

 number before it throws an exception is 1e+38

**Program to calculate for Temperature**

#include <iostream>

#include <math.h>

using namespace std;

int main()

{

// declear a varable of type float to store the user's input

float F, Celcius;

const double Res =  5.0 / 9.0;

cout << "Enter your Fareheit to calculate" << endl;

//read the user's input

cin >> F;

//using this formula

// (Fereheit - 32) x 5/9 = Celsius

Celcius = (F - 32) \* Res;

cout << Celcius << endl;

system("PAUSE");

return 0;

}

Output result:

Enter your Fareheit to calculate

56

13.3333

What I learnt:

1. The output was Zero because initially I used an integer instead of using a float and rounded division (5/9) to 0 so my output became Zero.
2. Whenever you divide two integer numbers of variable type double or float, it returns an output of type integer.

#include <iostream>

using namespace std;

int main()

{

int factorialNumber = 5;

int factorialTotal = 1;

for (int n = 2; n <= factorialNumber; ++n)

{

factorialTotal \*= n;

}

cout << factorialTotal << endl;

return 0;

}

Output: 120

Reflection:

* I didn’t change anything. They are the same.