

Introduction to Programming EE2310 Homework 2-1

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Problem

Use float and double to test the formula below:

$$\sin(u) + \sin(v) = 2 \sin\left(\frac{u+v}{2}\right) \cos\left(\frac{u-v}{2}\right)$$

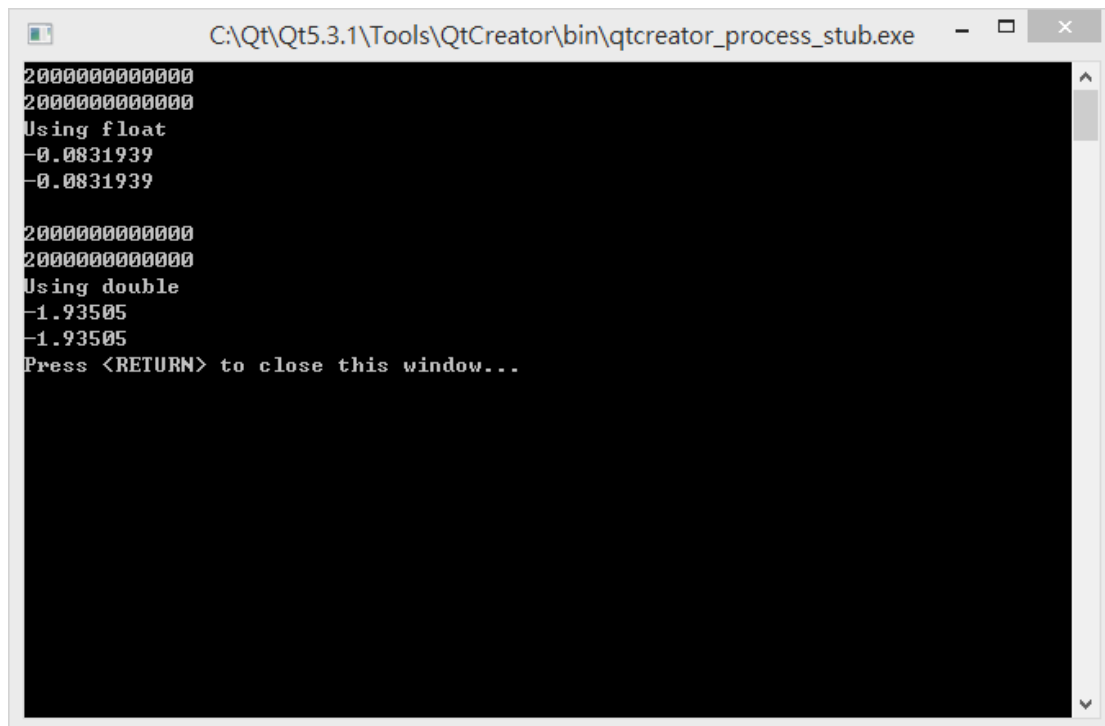
Program Flow & Structure

```
int main()
{
    cin : float f_u&f_v (Line 9
    → calculate f_T1&f_T2 in float (Line 10~11
    → cin : double d_u&d_v (Line 16
    → calculate d_T1&d_T2 in double (Line 18
    → return 0
}
```

Discussion

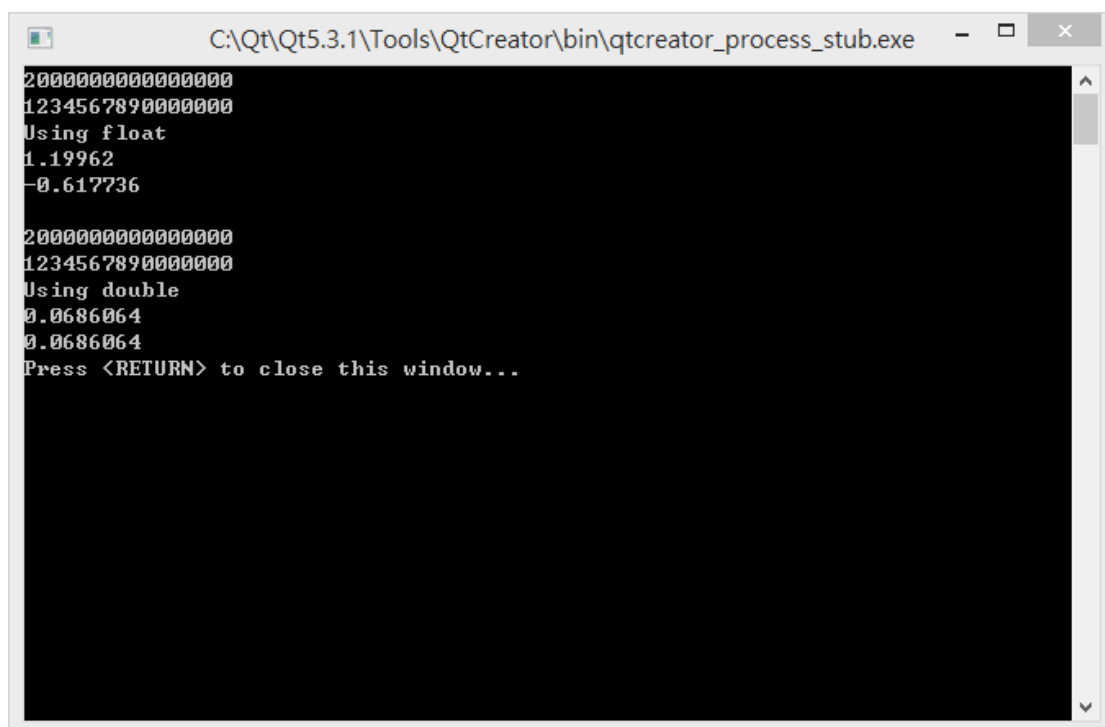
- When u and v are bigger than the limit of float, it will generate overflow, and cause the value incorrect. But double can save the value correctly. The difference between the value range of float and double causes the difference when we input numbers that exceeded the limit of float.

Output Result



```
C:\Qt\Qt5.3.1\Tools\QtCreator\bin\qtcreeator_process_stub.exe
2000000000000000
2000000000000000
Using float
-0.0831939
-0.0831939

2000000000000000
2000000000000000
Using double
-1.93505
-1.93505
Press <RETURN> to close this window...
```



```
C:\Qt\Qt5.3.1\Tools\QtCreator\bin\qtcreeator_process_stub.exe
2000000000000000
1234567890000000
Using float
1.19962
-0.617736

2000000000000000
1234567890000000
Using double
0.0686064
0.0686064
Press <RETURN> to close this window...
```