Brown University ENGN2912B Fall 2017

Scientific Computing in C++

Homework Assignment 1

Read the submission instructions before you start this assignment

1) The floating point precision of the **cout** stream can be adjusted by the method precision as follows,

```
double x = 0.14580858;
cout.precision(5);
cout << x << endl;
```

A. Determine what happens when **x** is printed.

B. Compute and verify, by printing a few example numbers, the correct print precision for **float** and **double** real types.

2) Given the C++ types of signed and unsigned integers:

A. Determine by programming what happens when each combination of signed -> unsigned casts are performed, e.g. **int -> unsigned short**, **long -> unsigned short**. (Do not bother with the **long long** type. Try all other integer types)

B. Interpret what is happening as a general rule.

3) Determine the value of the 32 bit floating point number **0x3F400000**.

4) Experiment with the comparison operations:

A. Write a program that performs cross-type comparisons, e.g. **float** with **int**.

B. What happens during the comparison to the types of the comparands?

5) Experiment with the meaningless and indeterminate numbers:

A. Write a program to generate both infinite and indeterminate results.

B. Check how the comparison operators work for infinite and indeterminate results. For example, does **#INF==#INF** have the value **true**?