EECE.3220: Data Structures

Spring 2017

Lecture 6: Key Questions
January 30, 2017

1. (Review) Describe the different methods of function argument passing supported in C++.

2. **Example:** Show the output of the following short program.

```
#include <iostream>
using namespace std;

double f1(int v1, int v2);
void f2(int *ptr1, int *ptr2);
void f3(int &ref1, int &ref2);

int main() {
   int foo = 10;
   int bar = 57;
   double baz;

   baz = f1(foo, bar);
   cout << "After f1(), foo = " << foo << ", bar = "
      << bar << ", baz = " << baz << "\n";

   f2(&foo, &bar);
   cout << "After f2(), foo = " << foo << ", bar = " << bar << "\n";

   f3(foo, bar);
   cout << "After f3(), foo = " << foo << ", bar = "<< bar << "\n";

   return 0;
}

double f1(int v1, int v2) {
   return (v1 + v2) / 2.0;
}

void f2(int *ptr1, int *ptr2) {
   while (*ptr1 > 5) {
      *ptr2 -= 3;
      (*ptr1)--;
   }
}

void f3(int &ref1, int &ref2) {
   if (ref1 == 5 && ref2 >= 45) {
      ref1++;
      ref2--;
   }
   else if (ref1 == 5) {
      ref1--;
      ref2++;
   }
   else {
      ref1 = ref2 - 10;
      ref2 = ref1 + 10;
   }
}
```

3. Explain the use of `setprecision`. Why is `fixed` necessary?

4. What is the output of the following program?

```
#include <iostream>
#include <iomanip>
#include <cmath>
using namespace std;

int main()
{
   double root2 = sqrt( 2.0 ); // calc square root of 2
   int places;                 // precision, vary from 0-9
   cout << "Square root of 2 with precisions 0-9." << endl;

   cout << fixed; // use fixed point format (not sci. not)

   // set precision for each digit, then show square root
   for ( places = 0; places <= 9; places++ )
      cout << setprecision( places ) << root2 << endl;
   return 0;
}
```

5. Explain the stream manipulator `showpoint`.

6. Show the output of the program below if the input stream is:
   `1 2 3.4 5`

```
// NOTE: The include and using statements are not shown
int main()
{
   double i, j, x, y;
   cin >> i >> j >> x >> y;
   cout << fixed << showpoint;
   cout << "First output " << endl;
   cout << i << ',' << j << ','
       << setprecision(3) << x << ',' << y << endl;
   return 0;
}
```

7. Explain the function used to input one or more characters, including whitespace. Show the example we use to illustrate its operation.

8. Explain the function used to input an entire line. Show the example we use to illustrate its operation. What issues exist when mixing this function with the stream extraction operator? (>>) How can we fix those issues?