EECE.3220: Data Structures
Spring 2019

Key Questions
Functions (Lecture 4)

QUESTIONS

1. Describe the basics of using functions.

2. Describe the differences between pass by value, pass by address, and pass by reference for function arguments.

EXAMPLE: Show the output of the following short program.

```cpp
#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;
   }
}
```