## **16.216: ECE Application Programming**

Fall 2012

Lecture 15: Key Questions October 12, 2012

1. Describe the basic use and syntax of functions, including return types and arguments.

2.	What is a function prototype? When and why is it necessary?
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3. Explain the idea of scope and how it relates to functions. Also, explain what happens when function arguments are passed by value.

You may wish to refer to the following example:

```
#include <stdio.h>
#include <math.h>
double hyp(double a, double b);
void main()
  double x,y,h;
  printf("Enter two legs of triangle: ");
  scanf("%lf %lf",&x,&y);
  h=hyp(x,y);
  printf("Trgle w legs %lf and %lf has hyp of %lf\n",
          x,y,h);
}
double hyp(double a, double b)
  double sum, result;
  sum = a*a + b*b;
  result = sqrt(sum);
  return result;
}
```

## 4. **Example:** What does the following program print?

```
#include <stdio.h>
int main() {
    int x = 1;
    int y = 2;
    int result1, result2, result3;
    result1 = f(x, y);
    result2 = f(y, result1);
    result3 = f(result1, result2);
    printf("x = %d, y = %d\n", x, y);
    printf("Result 1: %d\n", result1);
    printf("Result 2: %d\n", result2);
    printf("Result 3: %d\n", result3);
    return 0;
}
int f(int a, int b) // Function definition
    for (i = 0; i < a; i++)</pre>
        r += b;
   return r;
}
```

- 5. **Example:** Write a function to do each of the following:
- a. Prints a series of LINE\_LENGTH dashes on a single line, where LINE\_LENGTH is a predefined constant (using #define)

b. Reads a value from the console input and returns 1 if the value is even, 0 if it's odd

c. Takes four numbers as arguments and returns their average