## (60-140) ASSIGNMENT 5

Due: 11:59pm, Dec. 2, 2016

1. **9.1** (p. 214) The following function, which computes the area of a triangle, contains two errors. Locate the errors and show how to fix them. (Hint: There are no errors in the formula.)

```
double triangle_area(double base, height)
double product;
{
   product = base * height;
   return product / 2;
}
```

2. **9.7** (p. 214) Suppose that the function **f()** has the following definition:

```
int f(int a, int b) { ... }
```

Which of the following statements are legal? (Assume that i has type int and x has type double.)

```
(a) i = f(83, 12);
(b) x = f(83, 12);
(c) i = f(3.15, 9.28);
(d) x = f(3.15, 9.28);
(e) f(83, 12);
```

3. 9.18\* (p. 216) Create a flowchart that first uses the built-in function random to set variables n and m to two random numbers in the range between 2 and 100 inclusively, and then calls a recursive function/procedure to find their gcd (see Exercise 3). Name the flowchart as a5\_gcd\_recursive.rap, and submit it online as your solution to this question. The following provides several possible examples of running the program:

```
The GCD of 5 and 3 is 1
The GCD of 60 and 12 is 12
The GCD of 90 and 12 is 6
```

(*Hint:* Here is the strategy to use for computing gcd(m, n): if n is 0, return m. Otherwise, call gcd recursively, passing n as the first argument and m % n as the second.)

- 4. 9.18 (p. 216) Write an equivalent C program that accomplishes what the a5\_gcd\_recursive.rap flowchart does, and save the program as a5\_gcd\_recursive.c for online submission.
- 5. 10.3 (pp. 238) Suppose that a program has only one function (main). How many different variables named i could this program contain? Among all the i variables, which one(s) should always be avoided to improve software maintainability?
- 6. 10.2 (p. 239, optional with bonus marks) Modify the poker.c program of Section 10.5 by moving the num\_in\_rank and num\_in\_suit arrays into main, which will pass them as arguments to read\_cards and analyze\_hand. Save the program in a file named as a5\_poker.c, and submit the file online as your solution to this question.