(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.