CS 1713, Intro. to Computer Science, *Exam 2*

(25) 1. Write a simple loop in C that will keep reading *pairs* of integers as long as they are not both negative integers. As soon as two negative integers are read, the loop should terminate.

(25) 2. Write a complete C program that will scan in an integer `n`, and then will print a hollow triangle of stars of height `n`, as shown below for `n == 10` and `n == 5`. (Assume that `n > 1`. The program needs to work for general `n` and not just 10 and 5.)

```
runner% exam2_2
10
*
**
* *
*  *
*   *
*    *
*     *
*      *
*       *
*        *
**********
```

```
runner% exam2_2
5
*
**
* *
*  *
*****
runner%
```

If you wish, you may use the following function:

```
void chars(int n, char ch)
{
   int i;
   for(i = 0; i < n; i++)
      printf("%c", ch);
}
```

Here, `chars(5, '*')` will print 5 stars with no newline.

(25) 3. Consider the following C program:

```
#include <stdio.h>
int addup(int n);

void main(void)
{
   int n, sum;
   scanf("%i", &n);
   sum = addup(n);
   printf("Sum of integers up to %i == %i\n", n, sum);
}
```

Supply code for the function `addup`, so that it will add the integers from 1 to `n` and return the sum. Thus if `n` is 5, `addup(n)` should return 15. (You need a loop inside `addup` so that it will work no matter what the value of `n` is.)

(25) 4. Write a *complete* C program that will use the random number generator `drand48()` to roll a single die over and over again, keeping track of the number of times each of the number of spots 1 through 6 appears. To keep track of the counts you should use an array

```
int spots[7];
```

of counters, where in case a 4 appears, you would increment the counter `spots[4]`. Have your program do 1000 rolls. Don't forget to initialize the counters. The program should print the results, that is, the counts for each of the six spots and the percentage. Also don't forget to initialize the random number generator. Your output might look as follows:

```
runner% exam2_4
Roll of 1,  177 times, 17.70%
Roll of 2,  181 times, 18.10%
Roll of 3,  156 times, 15.60%
Roll of 4,  168 times, 16.80%
Roll of 5,  157 times, 15.70%
Roll of 6,  161 times, 16.10%
```