CS 100 Exam Three – Coding – Fall 2018

You are not allowed to use the Internet while coding the two problems below.
You can log into the cs-intro server to test your programs if you wish.
When you have finished coding your problems, submit your exam via Blackboard

Create a directory called **exam3** using **mkdir exam3** and move into that directory with **cd exam3**

Complete the two programs shown below.

1. Name this program **one.c** – This program takes a single command line argument, a file name. It reads the stings from the file one by one. If the string read is an integer, the string will be written out to a file named `integers`. Otherwise the string will be written out to a file named `others`. An integer is a sequence of digits (0 through 9) with an optional plus (+) or minus (-) sign at the beginning. See an example below.

```
./a.out data
```

Input file: data November 6, 2018 0075 + 100 - 70 = 105 +10 plus -10 is 0 and 1 = 4. times .25 3.14 is PI.
Output file: integers 2018 0075 100 70 105 +10 -10 0 1
Output file: others November 6, + - = plus is and = 4. times .25 3.14 is PI.

You can assume all the files can be opened for either reading or writing, and each string in the input file has up to 50 characters in length. You can use any white space to separate the strings in the output files. We recommend you write a function to check whether a string is an integer.

2. Name this program **two.c** – **You can download the starting two.c from Blackboard**. This program reads a square matrix of integers from a file with its filename furnished on the command line. It then computes and prints the sum of all the integers on the main and secondary diagonals of the matrix. Your job is to complete the `sumDiagonals` function to compute the sum of all the integers on the main and secondary diagonals of the matrix. The `sumDiagonals` function has the following signature.

```
int sumDiagonals(int **matrix, int size);
```

The following are examples of four matrices and their sums computed by the function. The elements on the main and secondary diagonals are in black. If an element appears on both diagonals, it will be added once.

Matrix	1 5	2 5 7 9 8	5 88 86 18 8 45 13 45 3 23 82 96 61 63 4 91 68 40 23 66 43 50 94 52 29 2	6 19 35 35 82 80 72 21 87 70 67 66 53 89 26 56 74 96 54 84 17 50 11 70 79 63 75 75 94 85 88 84 30 34 17 93 84
Sum	5	29	422	763

Submit your exam

- First, on your machine, compress your **exam3** directory into a single (compressed) file, i.e. **exam3.zip**. **Please make sure exam3.zip contains the exam3 directory as well as one.c and two.c under it.**
- Second, once you have a compressed file named **exam3.zip**, submit that file to Blackboard.