CS211
Extra Credit
Fall 2019

Name: _____

WSU ID: _____

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1. *[3 points]* Write a C++ function (along with helper functions) that prints out all the prime numbers in a given array of integers. Your code should follow the exact function declaration given below:

   void printPrimes(int array[], int arr_size);

   Input:
   int array[]: Array of integers that will be passed to this function as a reference
   int arr_size: Size of the input array
   Output:
   Prints all primes in the array of numbers
   Example:
   array = [2, 5, 6, 8, 7, 9, 3, 10]
   Prints: 2, 5, 7, 3

2. *[3 points]* Write a C++ function (along with helper functions) that can add two integer matrices. Your function should perform element-wise addition for all the array numbers. Element-wise addition basically adds individual elements to create the final values, where *result[x][y] := arr1[x][y] + arr2[x][y]*. Your code should follow the exact function declaration given below:

   void addMatrices(int** matrix1, int matrix1_nrows, int matrix1_ncols,
   int** matrix2, int matrix2_nrows, int matrix2_ncols,
   int** dest_matrix);

   Input:
   int **matrix1: First matrix. 2D array or matrix of integers passed as a double pointer
   int matrix1_nrows, int matrix1_ncols: Number of rows and columns for the first matrix
   int **matrix2: Second matrix. 2D array or matrix of integers passed as a double pointer
   int matrix2_nrows, int matrix2_ncols: Number of rows and columns for the second matrix
   Output:
   int **dest_matrix: Destination matrix. 2D array or matrix of integers passed as a double pointer. Assume that the memory for this matrix is already allocated. This matrix should hold the result of the addition operation.
   Example:

   matrix1:

1	13	5
8	27	10
15	2	8

   matrix2:

2	4	6
8	10	8
4	6	2

   dest_matrix:

3	17	11
16	37	18
19	8	10

3. *[3 points]* Write a C++ function ***using recursion*** that returns the **G**reatest **C**ommon **D**ivisor of two integers. The greatest common divisor (gcd) of two integers, which are not zero, is the largest positive integer that divides each of the integers. For example, the gcd of 8 and 12 is 4. Your code should follow the exact function declaration given below:

   int GCD(int number1, int number2);

   Input:
   int number1, int number2: Input numbers
   Output:
   Returns the greatest common divisor of the input numbers
   Example:
   number1 = 21, number2 = 14
   Returns = 7

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4. *[3 points]* Write a C++ function (along with helper functions) that returns the maximum number in a list of integers stored in the file – *"numbers.txt"*. Your code should follow the exact function declaration given below:

   int maxFileNum(istream& inputFile);

   Input:
   istream& inputFile: File object for reading the numbers. Assume this file has already been opened, and then passed by reference as an argument
   Output:
   Returns the largest number in the file
   Example:
   numbers.txt Content:
   13 7 27 -42 21 4 8 0
   Returns = 27

5. *[3 points]* Write a C++ function (along with helper functions) that deletes all occurrences of a word from a given string. Your code should follow the exact function declaration given below:

   void deleteWords(char* inputString, char* word, char* destString);

   Input:
   char* inputString: Character array containing the input sentence passed as a pointer argument
   char* word: Character array containing the word to be deleted passed as a pointer
   Output:
   char* destString: Passed as a ***nullptr***. Character array containing the resultant sentence after all occurrences of the word has been deleted from the inputString. *You will need to allocate memory of the appropriate size.*
   Example1:
   inputString = "You cannot end a sentence with because because because is a conjunction."
   word = "because"
   destString = "You cannot end a sentence with is a conjunction."
   Example2:
   inputString = "London bridge is falling down"
   word = "down"
   destString = "London bridge is falling"

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