Final for CSC 5 Fall 2017

Points for each question

1 15

2 20

3 15

4 15

5 15

6 20

Note: Submit the Final to my personal email account mark.lehr@rcc.edu

with the following subject: LastName,FirstName - FinalCSC5 - section number.

Be sure to copy yourself on the email and submit to blackboard.

Do the best you can and turn in as much as you can.

Your final project will be in class on finals day.

Do not put this test into Github.

Note: I just want one program for all the solutions to follow.

The program should prompt the user for which problem solution to display.

Code each problem in its own function such as void Problem1(void),

void Problem2(void), etc..... Yes, those functions can use other functions

you might need to solve the problem.

/\*Problem 1

Write a function that takes an unsigned

short integer and returns an signed short

number in reverse. For instance 106

reversed would be 601. Another would be

30000 gives 3. Subtract the largest 2

digit number you can. Check to make sure the

conversion falls within the range for an

signed short. If it doesn't then output

no conversion possible else output the result.

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Problem 2

Write a program that plays the game "Guess the

Number" as follows. Your program chooses the

number to be guessed by selecting an integer

at random in the range 1 to 10^X. The program

inputs X and displays

I have a number between 1 and 10^X

Can you guess my number? You will be

given a maximum of log2(10^X)+1 guesses.

Please type your first guess.

The player then types a guess. The

program responds with one of the following.

1. Congratulations, You guessed the number!

Would you like to play again(y or n)?

2. Too low. Try again.

3. Too High. Try again.

4. Too many tries.

Flowchart the results

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Problem 3

Create a function that fills one vector with even

random 2 digit numbers and another vector with

odd random numbers. Prompt the user for the size

of these vectors. Both will be the same size.

Output the results where you ask the user how

many columns to display. These should be done

with 2 functions, fillVec and prntVec.

Then do the same with a 2-Dim array where the

first column has even numbers and the second

column has the odd numbers.

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Problem #4 (Random Sequence)

Create a function/method/procedure that

returns a random number from the following set,

{18,61,88,101,121}. Loop 10000 times with this

procedure and print the frequency of each of

the 5 numbers obtained. Hint: Use an array for

the sequence and frequency.

The following is a brief hint on items that might

be helpful in obtaining the results. This is not

direct code but more pseudo code related. Don't

try and run the following directly and more code

will be needed.

Setup

const int n=5,ntimes=10000;

int freq[n]={0};

short int rndseq[]={18,61,88,101,121};

Call to the routine to return a random sequence

retrand(rndseq,freq,n,ntimes);

Results

cout<<rndseq[i]<<" occurred "<<

freq[i]<<" times"<<endl;

Sample Output

18 occurred 2055 times

61 occurred 1986 times

88 occurred 1962 times

101 occurred 2079 times

121 occurred 1919 times

Note: Your results are not expected to be exactly

the same! After all these are pseudo-random

number sequences with different seeds.

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Problem #5 (All Kinds of Sorting)

Sort a 10x15 array of characters. Largest located

at index [0][0-14] and smallest at index [9][0-14].

Create a procedure that passes the array to a print routine,

then a procedure that sorts the array and returns the sorted array

to the original procedure, and finish by using the same print routine.

Fill the array with

Lcekoeddhoffbmc

Lkcmggjcdhhglif

Cgldjhcekjigcde

Cgldjhcekjigcdz

Bffmdbkcenlafjk

Fggdijijegfblln

Jjlncnimjldfedj

Amliglfohajcdmm

Balgfcaelhfkgeb

Kmlhmhcddfoeild

Note: This is a character array but the sorting is

done as if there are 10 strings with each string having 15 characters.

The output would be

Lkcmggjcdhhglif

Lcekoeddhoffbmc

Kmlhmhcddfoeild

Jjlncnimjldfedj

Fggdijijegfblln

Cgldjhcekjigcdz

Cgldjhcekjigcde

Bffmdbkcenlafjk

Balgfcaelhfkgeb

Amliglfohajcdmm

Full credit will be given if a file is used to read in the array.

Name the file input.dat

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Problem #6 (Spreadsheet Stuff)

Create the following input tables. Output

the sum of the rows, columns and grand total. You

will need to create procedures that print the table,

then sum rows, columns and grand total, then pass

that information to the same print routine. Note:

the 2 procedures printTable,SumTable and finally a

call to printTable again are all invoked from subroutine

main. I want to see each number formatted to 6 spaces.

Print the table out exactly as below.

Example Input Table

100 101 102 103 104 105

106 107 108 109 110 111

112 113 114 115 116 117

118 119 120 121 122 123

124 125 126 127 129 130

Example Output Augmented Table with rows summed,

columns summed and the grand total printed.

100 101 102 103 104 105 615

106 107 108 109 110 111 651

112 113 114 115 116 117 687

118 119 120 121 122 123 723

124 125 126 127 129 130 761

560 565 570 575 581 587 3438

More credit will be given if you read the input and write

the results to a file. However, if you can't do this in

a procedure then embed in the program. But full credit

will not be given for the problem if files

are not utilized. Name the files table.dat and augtable.dat

Flowchart the result

Extra Credit

New ordering, Instead of using ABCDEFGHIJ to order

letters use the following EDCBAJIHGF to order. I want to

type two 4 letter words and determine which is larger

and smaller based upon the new ordering system.