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CSI235-01CA

Pseudo Code for Matrix Bonus

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Pseudo Code for Main Function

Declare an integer variable called a\_row

Declare an integer variable called a\_column

Declare an integer variable called b\_row

Declare an integer variable called b\_column

Declare a character variable called ans

While the user does not enter q

if answer equals a

prompt user for their matrix information

set matrix rows and columns to user’s information

if the rows and columns are equal

Call adding function (a\_row, a\_column, b\_row , b\_column)

else

notify user that matrices must be the same in order to add or subtract

if answer equals s

prompt user for their matrix information

set matrix rows and columns to user’s information

if the rows and columns are equal

Call subtraction function (a\_row, a\_column, b\_row , b\_column)

else

notify user that matrices must be the same in order to add or subtract

if answer equals m

prompt user for their matrix information

set matrix rows and columns to user’s information

if the rows of the first matrix are equal to the second matrix’s columns

Call multiplication function (a\_row, a\_column, b\_row , b\_column)

else

notify user that the first matrix’s rows must equal the second matrix’s columns

if answer equals t

prompt user for their matrix information

set matrix rows and columns to user’s information

Call transpose function (a\_row, a\_column)

else

notify user that matrices must be the same in order to add or subtract

if answer equals i

Declare integer variables called row\_size\_matrix1, column\_size\_matrix1, rm1, cm1, rm2, cm2; row\_size\_matrix2, column\_size\_matrix2

Declate float arrays called A[][], B[][], C[][]

Declare an ifstream named myfile

open the matrix.txt file

While zero is greater to or equal to i

set row\_size\_matrix1 to myfile

add one to i

set rm1 to row\_size\_matrix1

set I to one

While one is equal to or greater than i

Set column\_size\_matrix1 to myfile

add one to i

set cm1 equal to column\_size\_matrix1

set i equal to 1

set j equal to 1

While row\_size\_matrix1 is greater than or equal to i

add on to i

While column\_size\_matrix1 is greater than or equal to j

set A[i][k] to myfile

add one to j

set i equal to row\_size\_matrix1

While row\_size\_matrix1 is greater to or equal to i

set row\_size\_matrix2 to myfile

add one to i

set rm2 to row\_size\_matrix2

set i to column\_size\_matrix1

While column\_size\_matrix1 is equal to or greater than i

Set column\_size\_matrix2 to myfile

add one to i

set cm2 equal to column\_size\_matrix2

set i equal to 1

set i to 1

set j to 1

While row\_size\_matrix2 is greater than or equal to i

add on to i

While column\_size\_matrix2 is greater than or equal to j

set B[i][k] to myfile

add one to j

Call displayMatrix1 function with parameter of row\_size\_matrix1, column\_size\_matrix1 and A

Call displayMatrix2 function with parameter of row\_size\_matrix2, column\_size\_matrix2 and B

if row\_size\_matrix1 equals row\_size\_matrix2 and column\_size\_matrix1 equals column\_size\_matrix2

set row equal to row\_size\_matrix2

set col equal to column\_size\_matrix2

Call addMatrix function with parameters of A, B, row, col, and C

else

print that the matrices are not the same dimension

if row\_size\_matrix1 equals row\_size\_matrix2 and column\_size\_matrix1 equals column\_size\_matrix2

set row equal to row\_size\_matrix2

set col equal to column\_size\_matrix2

Call subtractMatrix function with parameters of A, B, row, col, and C

set r1 equal to rm1

set c1 equal to cm1

set r2 equal to rm2

set c2 equal to cm2

Declare int variables named r3 and c3

Call multiplyMatrix with parameters of A, r1, c1, B, r2, c2, C, r3, and c3

If true is returned

Continue

else

notify user that r1 is not equal to c2

else

print that the matrices are not the same dimension

Call transposeMatrix with parameters of A, r1, c1 and C

else

user’s answer was q, exit the program

displayMatrix1 Function

pass in matrix 1 row and column size, the A array

print that the user is viewing matrix 1

print the dimensions of the matrix

set i equal to rows

set j to one

While rows is greater or equal than i

While column size is greater than or equal to j

Print A[i][j]

displayMatrix2 Function

pass in matrix 2 row and column size, the B array

print that the user is viewing matrix 2

print the dimensions of the matrix

set i equal to rows

set j to one

While rows is greater or equal than i

While column size is greater than or equal to j

Print B[i][j]

addMatrix Function

pass in matrix 1, matrix 2 and matrix 3 arrays, and the size of rows and cols

print information so the user knows they are viewing the sum of the matrices

set i to one

set j to one

While rows is equal to or greater than i

add one to i

While columns are greater than or equal to j

Set C[i][j] equal to A[i][j] plus B[i][j]

subtractMatrix Function

pass in matrix 1, matrix 2 and matrix 3 arrays, and the size of rows and cols

print information so the user knows they are viewing the difference of the matrices

set i to one

set j to one

While rows is greater to equal than i

add one to i

While columns are greater than or equal to j

Set C[i][j] equal to A[i][j] minus B[i][j]

multiplyMatrix

pass in matrix 1, matrix 2 and matrix 3 arrays, and the size of their individual rows and cols

if the rows of matrix one is equal to the columns of matrix two

print that the user is viewing the product of the matrices

set i equal to 11

set k equal to 11

While 11 is equal to or greater than i

add one to i

While 11 is equal to or greater than k

set C[i][k] equal to 0

add one to k

set i equal row size of matrix 1

set j equal to column size of matrix 2

set k equal to the column size of matrix 1

While rows of matrix 1 is equal to or greater than i

add one to i

while column size of matrix 2 is equal to or greater than j

add one to j

while the column size of matrix one is equal to or greater than k

set C[i][j] equal to C[i][j] plus the product of A[i][k] and B[k][j]

add one to k

set i equal to the size of rows in matrix 1

set k equal the size of columns in matrix 2

While rows in matrix 1 is equal to or greater than i

add one to i

while the columns in matrix 2 is greater than k

print the value of C[i][k]

add one to k

return true

transposeMatrix

pass in matrix 1, and matrix 3 arrays, and the size of rows and cols in matrix 1

print a notification so that the user knows they are viewing the transpose of matrix 1

set i equal to the rows in matrix 1

set j equal to the amount of columns in matrix 1

While the rows in matrix 1 is equal to or greater than i

add one to i

While the columns in matrix 1 is equal to or greater than j

set C[j][i] equal to A[i][j]

set i equal to the columns in matrix 1

set j equal to the amount of rows in matrix 1

While the columns in matrix 1 is equal to or greater than i

add one to i

While the rows in matrix 1 is equal to or greater than j

print the value of C[i][k]

Adding Function

Declare a float called ar

Declare a float called ac

Declare a float called br

Declare a float called bc

Declare a two-dimensional float array called c of size 100

Declare a two-dimensional float array called a\_matrix of size 100

Declare a two-dimensional float array called b\_matrix of size 100

set ar equal to a\_row

set ac equal to a\_columns

set br equal to b\_row

set bc equal to b\_columns

While ar is greater or equal to i\_row

While ac is greater or equal to i\_column

prompt the user to enter the value for the row and column of a\_matrix

set a\_matrix[i\_row][i\_column] to the information the user entered

add one to i\_column

add one to i\_row

set i\_row and i\_column to one

While br is greater or equal to i\_row

While bc is greater or equal to i\_column

prompt the user to enter the value for the row and column of b\_matrix

set b\_matrix[i\_row][i\_column] to the information the user entered

add one to i\_column

add one to i\_row

set i\_row and i\_column to one

While ar is greater or equal to i\_row

While ac is greater or equal to i\_column

set c[i\_row][i\_column] equal to a\_matrix[i\_row][i\_column] added to b\_matrix[i\_row][i\_column]

print c[i\_row][i\_column]

add one to i\_column

add one to i\_row

call main function

Subtraction Function

Declare a float called ar

Declare a float called ac

Declare a float called br

Declare a float called bc

Declare a two-dimensional float array called c of size 100

Declare a two-dimensional float array called a\_matrix of size 100

Declare a two-dimensional float array called b\_matrix of size 100

set ar equal to a\_row

set ac equal to a\_columns

set br equal to b\_row

set bc equal to b\_columns

While ar is greater or equal to i\_row

While ac is greater or equal to i\_column

prompt the user to enter the value for the row and column of a\_matrix

set a\_matrix[i\_row][i\_column] to the information the user entered

add one to i\_column

add one to i\_row

set i\_row and i\_column to one

While br is greater or equal to i\_row

While bc is greater or equal to i\_column

prompt the user to enter the value for the row and column of b\_matrix

set b\_matrix[i\_row][i\_column] to the information the user entered

add one to i\_column

add one to i\_row

set i\_row and i\_column to one

While ar is greater or equal to i\_row

While ac is greater or equal to i\_column

set c[i\_row][i\_column] equal to a\_matrix[i\_row][i\_column] minus b\_matrix[i\_row][i\_column]

print c[i\_row][i\_column]

add one to i\_column

add one to i\_row

call main function

Multiplication Function

Declare a float called ar

Declare a float called ac

Declare a float called br

Declare a float called bc

Declare a float called i

Declare a float called j

Declare a float called k

Declare a two-dimensional float array called c of size 100

Declare a two-dimensional float array called a\_matrix of size 100

Declare a two-dimensional float array called b\_matrix of size 100

set ar equal to a\_row

set ac equal to a\_columns

set br equal to b\_row

set bc equal to b\_columns

While ar is greater or equal to i\_row

While ac is greater or equal to i\_column

prompt the user to enter the value for the row and column of a\_matrix

set a\_matrix[i\_row][i\_column] to the information the user entered

add one to i\_column

add one to i\_row

set i\_row and i\_column to one

While br is greater or equal to i\_row

While bc is greater or equal to i\_column

prompt the user to enter the value for the row and column of b\_matrix

set b\_matrix[i\_row][i\_column] to the information the user entered

add one to i\_column

add one to i\_row

set i\_row and i\_column to one

While ar is greater or equal to i

While bc is greater or equal to j

set c[i][j] equal to 0

While br is greater or equal to k

set c[i][j] equal to a\_matrix[i][k] multiplied by b\_matrix[k][j] plus c[i][j]

add one to k

add one to j

add one to i

set i\_row and i\_column to one

While ar is greater or equal to i

While ac is greater or equal to k

print c[i][k]

add one to k

add one to i

call main function

Transpose Function

Declare a float called ar

Declare a float called ac

Declare a float called i

Declare a float called j

Declare a float called k

Declare a two-dimensional float array called c of size 100

Declare a two-dimensional float array called a\_matrix of size 100

set ar equal to a\_row

set ac equal to a\_columns

While ar is greater or equal to i\_row

While ac is greater or equal to i\_column

prompt the user to enter the value for the row and column of a\_matrix

set a\_matrix[i\_row][i\_column] to the information the user entered

add one to i\_column

add one to i\_row

set i, k, and j to one

While ar is greater or equal to i

While ac is greater or equal to j

set c[i][k] to zero

While ar is greater or equal to k

set c[i][k] equal to a\_matrix[k][i]

add one to k

add one to j

add one to i

set i, k, and j to one

While ar is greater or equal to i

While ac is greater or equal to k

print c[i][k]

add one to k

add one to i

call main function