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CSC 242

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**Playfair Cipher Pseudocode**

This program describes how to encrypt or decrypt an input file into an output file using a playfair cipher.

Create constant string variable ALPHABET with all upper case letters

Create constant integer variable SIZE equal to 5

Create string function named create\_encrypted\_alphabet

Purpose: Create encrypted alphabet using keyword and remaining letters excluding ‘J’

Parameter named keyword: keyword used for playfair cipher

Return: a string containing the encrypted alphabet

Create string named encrypted\_alphabet

Create Boolean array that holds used letters

For every character in keyword

Convert character to uppercase

If character is ‘J’ convert it to ‘I’

If character is a letter and is not in the used array

Append character to encrypted\_alphabet

Update the element representing the current character in used to true

For every character in ALPHABET

If the character hasn’t been used yet and is not ‘J’

Append the character to encrypted\_alphabet

Return encrypted\_alphabet

Create vector function named create\_playfair\_matrix

Purpose: Creates 5x5 vector matrix and fills with encrypted alphabet

Parameter named encrypted\_alphabet: string containing encrypted alphabet

Return: 5x5 matrix filled with encrypted alphabet

Initialize a 5x5 vector named matrix

Create integer variable named index

For every row in matrix

For every column in row

Update matrix[i][j] to corresponding character in encrypted alphabet

Increment index

Return matrix

Create void function named find\_position

Purpose: Finds position of character within matrix

Parameter named ch: the character we are finding the position of

Parameter named matrix: the 5x5 matrix that contains encrypted alphabet

Parameter named row: the row the character is found in

Parameter named col: the column the character is found in

For every row in matrix

For every column in matrix

If we find the character we are looking for

Set row equal to i

Set col equal to j

Return

Create string function named encrypt\_pair

Purpose: encrypts/decrypts a pair of letters using playfair\_matrix

Parameter named input\_pair: Pair of letters being encrypted/decrypted

Parameter named matrix: the 5x5 matrix that contains encrypted alphabet

Return: a string that contains encrypted pair of letters

Create char variable named ch1 and set equal to first letter

Create char variable named ch2 and set equal to second letter

If ch1 or ch2 are not letters

Return original pair of characters

Create string variable named encrypted\_pair

Create integer variables that hold row and column of each character

Use find\_position function for ch1 to update row1 and col1

Use find\_position function for ch2 to update row2 and col2

If the characters are in the same row or same column

Reverse input\_pair

Set encrypted\_pair equal to input pair

Return encrypted\_pair

Else (characters form a rectangle)

Change ch1 to opposite corner in same row

Change ch2 to opposite corner in same row

Append ch1 to encrypted\_pair

Append ch2 to encrypted\_pair

Return encrypted\_pair

Create string function named process\_line

Purpose: converts line to uppercase and removes any ‘J’ characters

Parameter named line: line that is being processed

Return: a string with letters in uppercase and no ‘J’

Create string named processed\_line

For every character in line

If character is a letter

Convert character to uppercase

If character is equal to ‘J’

Set character equal to ‘I’

Append character to processed\_line

Else (character is not ‘J’)

Append character to processed\_line

Else (if character is not a letter)

Append character to processed\_line

Return processed\_line

Create string function named encrypt\_line

Purpose: encrypts/decrypts line using a keyword

Parameter named keyword: keyword used to create playfair cipher

Parameter named input\_line: the line being encrypted/decrypted

Return: a string containing the encrypted line

Create encrypted alphabet using the function create\_encrypted\_alphabet

Create matrix using the function create\_playfair\_matrix

Process the input line using the function process\_line

Create string named encrypted\_line

For every 2 characters in line:

Extract the 2 characters into variable named input\_pair

Encrypt the pair using the function encrypt\_pair

Append encrypted\_pair to encrypted\_line

Return encrypted\_line

Main Function:

Create string variable named keyword

Create string variable named input\_text

Prompt user to enter keyword

Store user input into keyword

Clear the newline character left after cin >> keyword

Prompt user to enter text that will be encrypted/decrypted

Store user input into input\_text

Encrypt/decrypt the input text using the function encrypt\_line and keyword

Output the encrypted\_text