ENGG\*1410: Introductory Programming for Engineers

Mini Project #1: “Encryption/Decryption Utility”

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Preparation File

1. Flowchart

IF COMMAND-LINE ARGUMENTS ARE INVALID

GET COMMAND-LINE ARGUMENTS

YES

PRINT USAGE MESSAGE

NO

ELSE

DECRYPT FILE

ELSE-IF COMMAND LINE ARGUMENT IS -D

ENCRYPT FILE

ELSE-IF COMMAND LINE ARGUMENT IS -E

PRINT INVALID COMMAND-LINE OPTION MESSAGE

1. Pseudo Code

Function Encrypt(filename):

hexBuffer = Allocate memory for a 3-character buffer

open inputFile as read binary

if inputFile is null:

Display an error message

Return

open encryptedFile as write

if encryptedFile is null:

Display an error message

Close inputFile

Return

Loop until end of inputFile:

Read a character ch from inputFile

Get the ASCII value of ch

if ch is a newline character:

Write "TT" to encryptedFile

else:

Calculate outChar = (ASCII - 16)

if outChar < 32:

outChar = (outChar - 32) + 144

Convert outChar to a hexadecimal string

Write the hexadecimal string to encryptedFile

Close inputFile

Close encryptedFile

Free hexBuffer

Function Decrypt(filename):

hexBuffer = Allocate memory for a 2-character buffer

open encryptedFile as read

if encryptedFile is null:

Display an error message

Return

Determine the output file name

open outputFile as write

if outputFile is null:

Display an error message

Close encryptedFile

Return

Loop until end of encryptedFile:

Read two characters c1 and c2 from encryptedFile

Concatenate c1 and c2 to hexBuffer

if hexBuffer is "TT":

Write a newline character to outputFile

else:

Convert hexBuffer to an integer outChar

outChar = outChar + 16

if outChar > 127:

outChar = (outChar - 144) + 32

Write outChar to outputFile

Close encryptedFile

Close outputFile

Free hexBuffer