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Project 5 Report

1. One obstacle that I had was figuring out which functions to implement. I solved this problem by approaching the problem stepwise. I also had difficulty figuring out how to separate the different words in crib and ciphertext using C strings. I solved this by creating a two-dimensional array of characters to hold each word. Another problem that I had was testing for different cases, such as when a new line character is involved. I solved this by adding the new line character as another word in the array. I was able to figure out how to extract the part of ciphertext that matched the crib by using multiple loops and creating a new array of characters.
2. Pseudocode

**void** makeLowerCase(**char** ciphertext[])

{

set all characters in ciphertext to lowercase

}

**void** editText(**char** text[], **char** words[][81]);

{

if text is a letter,

repeatedly:

add characters to 2D array until it is not a letter

else if text is a new line character

add to array

}

**int** length(**char** crib[]);

{

repeatedly:

if character in crib is a letter and the next character is not

increment count

return count

}

**bool** check(**char** ciphertext[], **char** crib[], **char** cipherfragment[], **char** cribfragment[]);

{

if an element in crib is a letter

add to cribfragment array

if first word of crib and cipher and equal in length

if crib is more than one word

check that remaining words are equal

when on the last word of crib

create cipherfragment array

check that the pattern of cribfragment and cipherfragment match

if false, move on to next cipherfragment with same length as crib

return true if all tests passed and checking last character

if pattern is false, break current loop and check next cipherfragment

if crib is only one word,

create cipherfragment

check if pattern of cribfragment and cipherfragment match

if pattern is false, return false

else return true

}

**bool** decrypt(**const** **char** ciphertext[], **const** **char** crib[]);

{  
 make copies of crib and ciphertext

change all characters to lowercase

if crib is empty or has more than 80 characters

return false

use check function and return false if false

set array of characters to equal letters in alphabet

initialize empty array of characters with 27 elements called key

repeatedly:

if character in alphabet equals cipherfragment, set that position of the key to cribfragment

change all characters in key to uppercase

repeatedly:

translate ciphertext to characters in key and leave unchanged if no match

print translated cipher and return true

}

1. Test Data

|  |  |  |
| --- | --- | --- |
| Ciphertext | Crib | Results |
| "abc caced" | “ cat +“ | CAT TCTed |
| "ciil abcd egjh" | “good” | GOOD abGd egjh |
| "abc def gei" | “cat,,,” | abc dAf CAT |
| "abc/ndefgs" | “cat mouse” | false |
| "My network connection at home was down, and I didn't have a way to copy my files and bring them to a SEASnet machine." | "pwddvpaowd ca" | my DVAwWrk PWDDVPAOWD CA hWmV wCs dWwD, CDd O dOdD'A hCvV C wCy AW PWpy my fOlVs CDd brODg AhVm AW C sVCsDVA mCPhODV. |
| “Kpio't dmpbl-boe-ebhhfs opwfm"” | “s cloak and” | kOiN'S CLOAK-AND-DAhhfs NOwfL |
| "abcd efg hijk ilm nppq rst dccb cba uwwx wyz" | “good one” | abcd efg hijk ilm nppq rst dccb cba GOOD ONE |
| "DiebjiggK, zyxZYXzyx--Abca abCa bdefg## $$hidbijk6437 wvuWVUwvu\n\n8 9\n" | " hush???hUSh--- --- until JanuARY !! " | NATURALLY, zyxzyxzyx--HUSH HUSH UNTIL## $$JANUARY6437 wvuwvuwvu  8 9 |
| "Hirdd ejsy zu drvtry od.\nO'z fodvtrry.\n" | “my secret” | hiESS ejsT MY SECRET oS.  o'M foSCREET. |
| "bwra wmwt\nqeirtk spst\n" | “alan turing” | false |
| "Hirdd ejsy zu drvtry od.\nO'z fodvtrry.\n" | “shadow” | false |
| “Zysqjs zbguncyqzo jdsbyo eybmnu bg Wqzsvbbf.\nUnysqx eybmgxrsuu ymtbyu kcq Jicjjsy.\nNbuj sajysts rcvsyqr qgx sajysts zbgusykqjcks nbucjcbgu bg xcuzmuucbg wbymtu.\nZU 31 cu zdqrrsgecge!” | “conspiracy theory” | CREATE CONSPIRACY THEORY eROmPS ON wACEvOOf.  SPREAx eROmNxrESS RmtORS kIA TiITTER.  POST EaTREtE rIvERAr ANx EaTREtE CONSERkATIkE POSITIONS ON xISCmSSION wORmtS.  CS 31 IS CHArrENeINe! |
| "xyz abc" | “dog” | DOG abc |