Encoding and Decoding

Analysis

Provide a way to encode and decode messages using two types of ciphers, Substitution Cipher and Shuffle Cipher. The program should allow users to input a message from a file, choose a cipher type, provide a key , specify whether they want to encode or decode the message and processes the message and outputs the result to another file.

1) Input:
    a) Selecting cipher type (Substitution or Shuffle).
    b) Providing the key
    c) Input and output file names.
    d) Encode or decode the message.
    e) Message from the input file.
2) Output:
    a) The message written to the output file, error or success

Algorithm Design:

1) Display a welcome message and menu options to the user.
2) User select a cipher type provide the key.
3) Ask the user to input the input and output file names.
4) Read the input file
5) Method to read the content of the specified input file and process the message
6) For Substitution Cipher
    a) shift each letter in the message by the specified amount.
7) Shuffle Cipher
    a) shuffle or unshuffle the message the n number of times.
8) Write the result to the output file through a method to write the encoded or decoded message to the specified output file.
9) Provide appropriate error messages if any issues occur during file
10) Repeat the process until user says No to processing another message

UML

MessageEncoder
+encode(String plainText): String

MessageDecoder
+decode(String cipherText): String

Cipher
+ cipherType(): String

SubstitutionCipher
- shift: int
+ SubstitutionCipher(int shift) + cipherType(): String + encode(String plainText): String + decode(String cipherText): String

ShuffleCipher
- n: int
+ ShuffleCipher(int n) + cipherType(): String + encode(String plainText): String + decode(String cipherText): String - shuffle(String input): String - unshuffle(String input):String

CodeProgram
- readFile(String fileName): String - writeFile(String fileName, String message): void + main(String[] args): void