

**Programming Assignment**  
**ICS254-Discrete Mathematics ||-Term 202**

Group 26	
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**Problem:**

Implement encryption and decryption method using Vigenère cipher.

• **Requires:**

1-67 character ordered as {A...Z, a...z, 0...9, <,>, <.>, <?>, <!>, <Space>}.

2- Key that will use in encryption.

3-One input file of type (.txt), two output files one for encryption of type (.dec) and another for decryption of type (.txt).

**Brief description of our solution:**

We create Array List of type Character and stored all 67 characters, and create all files that we need it for input and output as follow:

1-input.txt that is stored input statement.

2- output.dec that is stored output after encryption.

3-outputAfterDec.txt that is stored output after decryption.

**Encryption:**

Encryption method works as follow:

1-Read the key that will use to encrypt statement from the first line of input.txt file.

2- Read the statement that we want to encrypt and apply the formula:

**(Index of Statement Letter in Array List+ Index of Key Letter in Array List) mod 67**

we just add the first letter index of the key to the first letter index of the message and the second letter index of the key with the second letter index of the message and so on until we reach the last letter of the message.

3- If we reach to end of key, then we return to first letter in the key.

4- If we get any character that we do not have in our Array List, we copy it as is.

5-After doing encryption of all statements, we stored the result into output.dec file.

### **Decryption:**

- 1-Ask user to enter key he used in encryption method and decrypt the key by applying the formula:  **$(67 - \text{Index of Key Letter in Array List}) \bmod 67$**  and stored the decryption key in the first line of outputAfterDec.txt file
- 2- Read the statement that we want to decrypt from output.dec file and apply encryption method based on decryption key.
- 3- If we reach to end of decryption key, then we return to first letter in the decryption key.
- 4-After doing decryption of all statements, we stored the result into outputAfterDec.txt file.