SOFTWARE DESIGN DESCRIPTION FOR IMAGE SECURITY PROGRAM

Approved by	**Description**	
Semih BILGEN Yusuf Can SEMERCI	Software design document for Image Security Program (3DES)	
Prepared by		
Deniz Tuana ERGONUL Emre Osman OZUM Hakan YILMAZ Orcun Soner EREN Tugba USTA	**Date**	10/04/2016
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10/04/2016	1.0	First release	Deniz Tuana ERGONUL Emre Osman OZUM Hakan YILMAZ Orcun Soner EREN Tugba USTA

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1. Scope

This document gives brief information about the design of the program. The systems of the program are determined and and relations are shown by use case diagrams. The use case diagrams are elaborated. Object classes are shown. Moreover, a GUI preview for the program is prepared.

Project: Image Security Program with 3DES

Environment: Windows

Language: C++

IDE: Qt

Tools: 3DES Algorithm, BMP Header

Classes: 3DES, Image, GUI

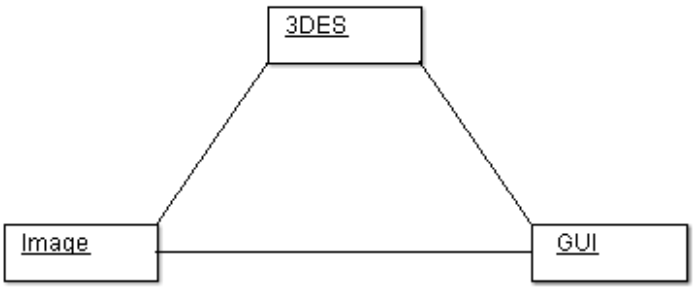
1.1 References

Ian Sommerville, Software Engineering, Ed. 10, Pearson, 2015

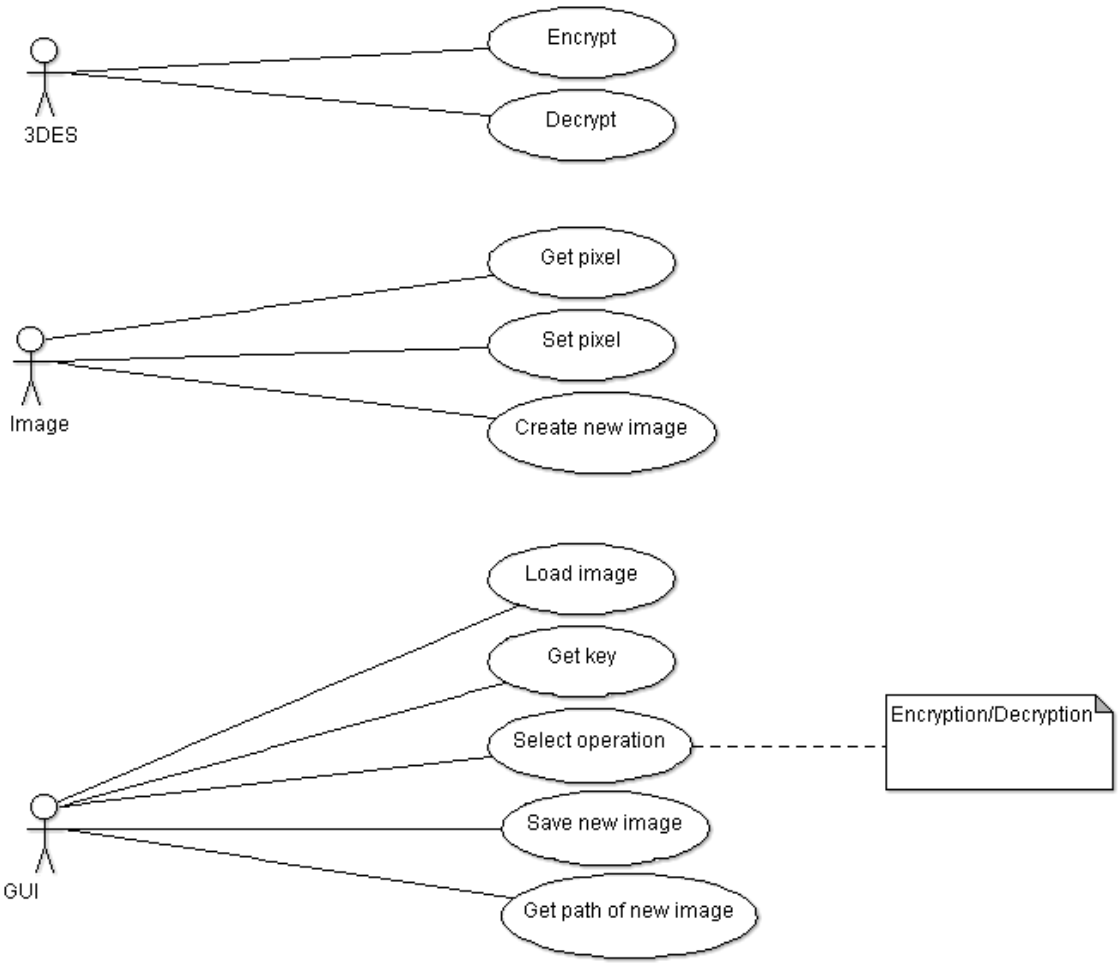
efgh.com/software/des.htm

2. Object-Oriented Design Using the UML

2.1 System Context for the Image Security Program



2.2 Image Security Program Use Cases



2.2.1 Use Case Descriptions

System	**3DES**
Use case	Encrypt
Actors	GUI, 3DES, Image
Dependency	Only available if the "Encrypt" button is selected. GUI sends the image and the key.
Description	Encrypts the image with the key, using 3DES algorithm. Get pixel, Set pixel and Create new image use cases are used. The image cannot be opened after encryption. In the next dialog box, Dolphins logo will be seen as a preview of the new image.

System	**3DES**
Use case	Decrypt
Actors	GUI, 3DES, Image
Dependency	Only available if the "Decrypt" button is selected. GUI sends the image and the key.
Description	Decrypts the image with the key, using 3DES algorithm. Get pixel, Set pixel and Create new image use cases are used. The image can be opened after decryption only with the right key. In the next dialog box, the original image will be seen if the image can be opened. Otherwise, an error message will appear which leads the user to try again.

System	**Image**
Use case	Get pixel
Actors	3DES, Image
Dependency	Encrypt/Decrypt sends the image.
Description	Gets the pixels of the image.

System	**Image**
Use case	Set pixel
Actors	Image, 3DES
Dependency	Get pixel sends pixels of the image. Encrypt/Decrypt sends the key.
Description	Sets the pixels according to the operation desired.

System	**Image**
Use case	Create new image
Actors	Image
Dependency	Set pixel sends the new pixels.
Description	Creates a new image with the new pixels.

System	**GUI**
Use case	Load image
Actor	GUI
Description	The user loads an image. Load image checks whether the image selected is valid. If the image is invalid, it displays an error.

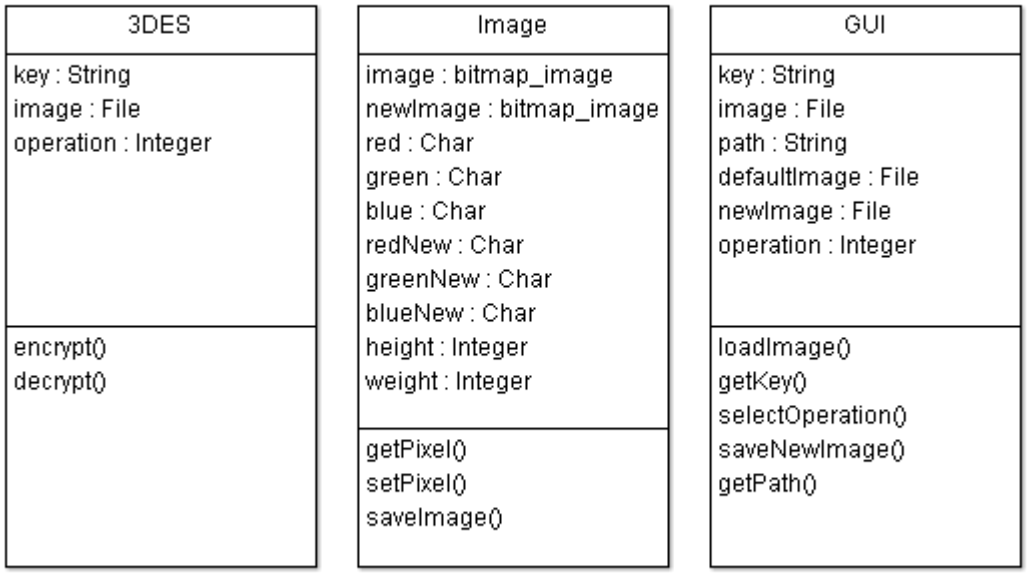
System	**GUI**
Use case	Get key
Actor	GUI
Dependency	Only available if the image is valid.
Description	The user enters a 24 character key.

System	**GUI**
Use case	Select operation
Actors	GUI
Dependency	Only available after a 24 character key is entered.
Description	The user selects encryption/decryption. This action triggers “Encrypt” or “Decrypt” use case to perform.

System	**GUI**
Use case	Save new image
Actors	GUI, 3DES
Dependency	Encrypt/Decrypt sends the new image.
Description	Saves the new image.

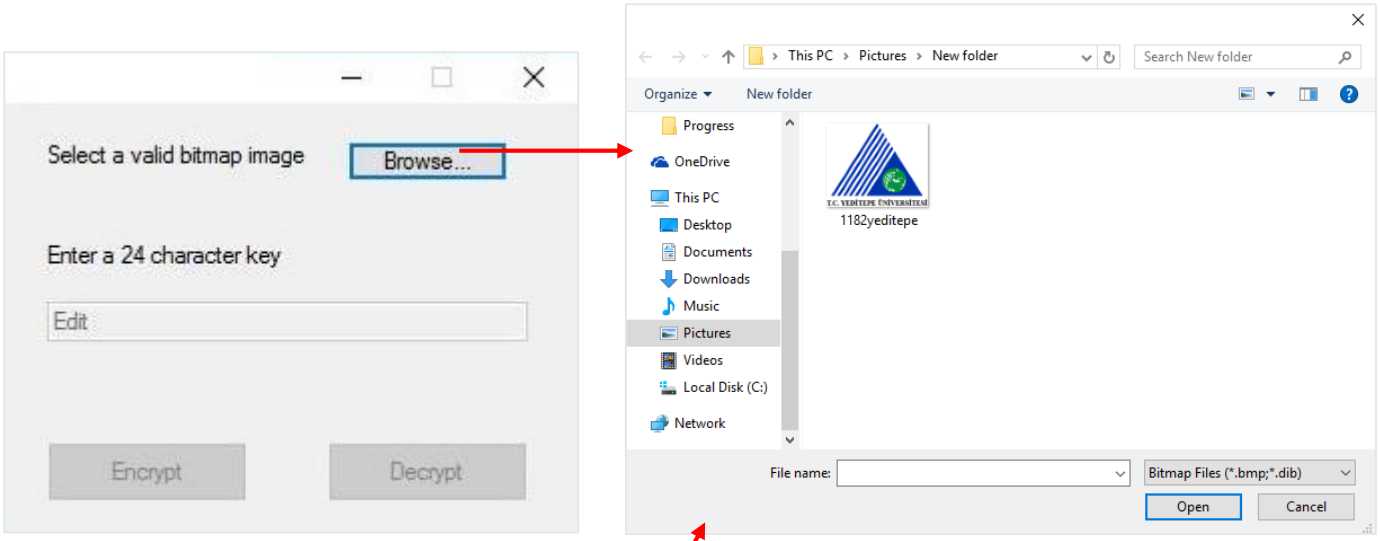
System	**GUI**
Use case	Get path of new image
Actor	GUI
Dependency	Only available after “Save new image”.
GUI Type	Disabled
Description	Gets the path of the new image and shows it to the user.

2.3 Image Security Program Object Classes

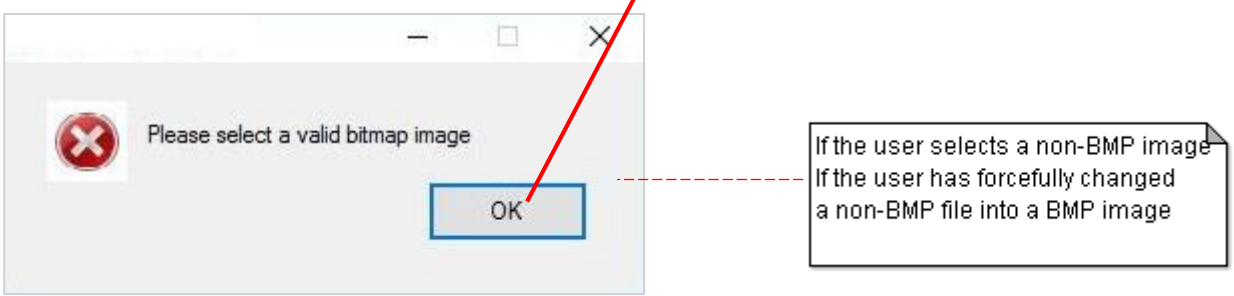


2.4 GUI Preview of the Image Security Program

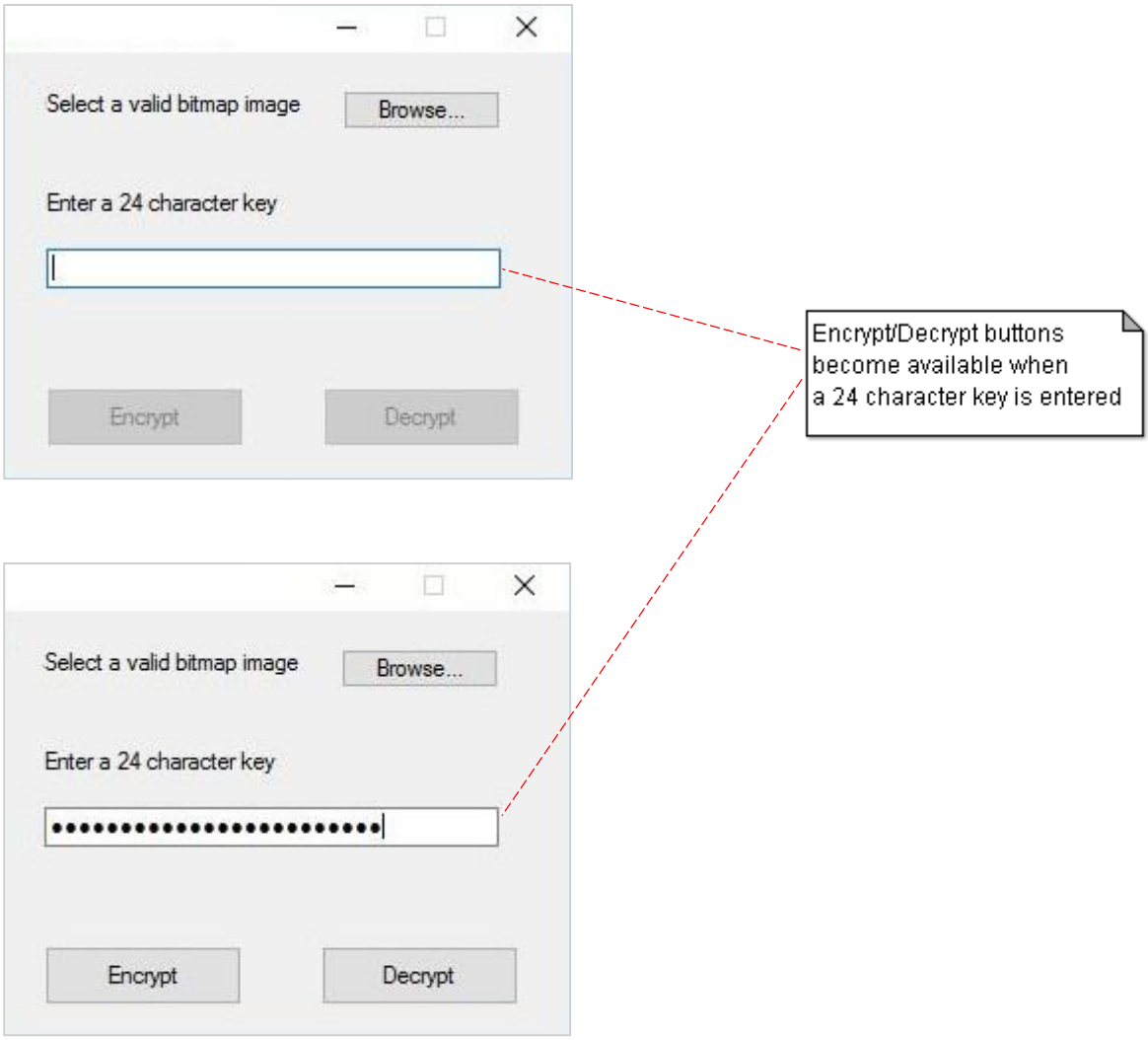
2.4.1 Display Load Image Dialog Box



Possible error:

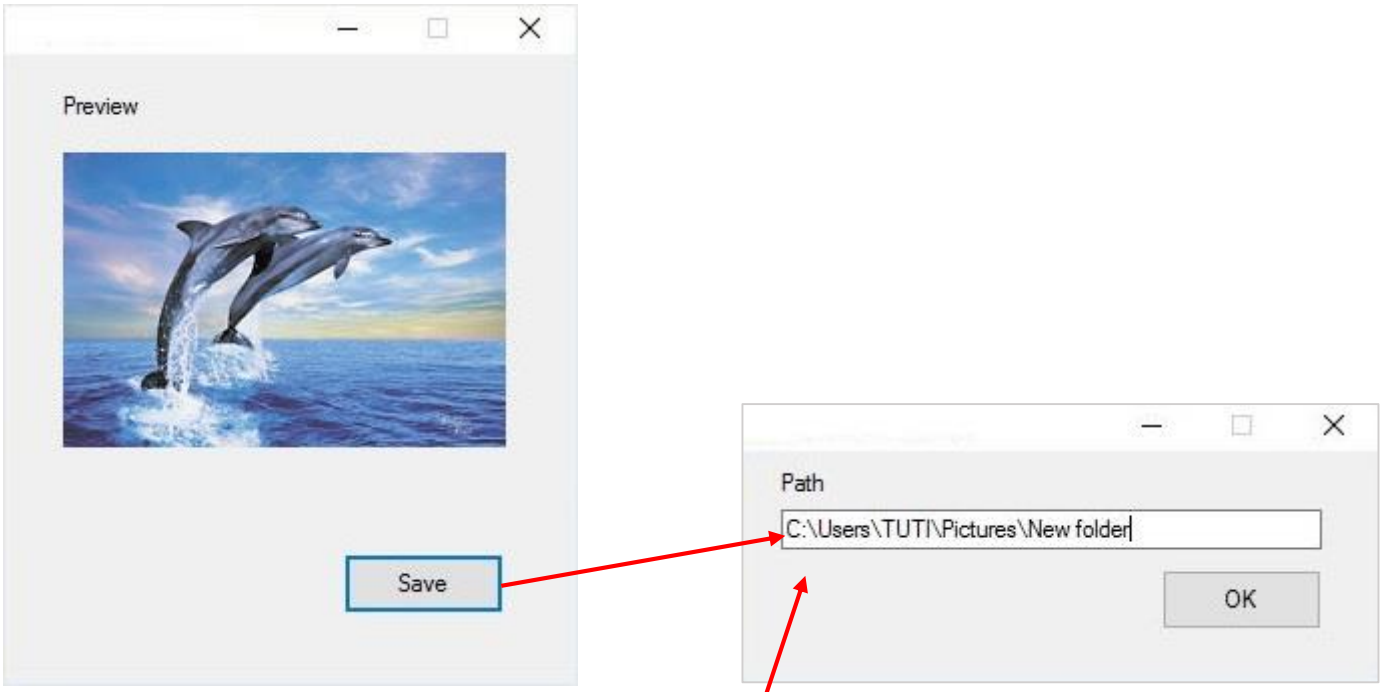


2.4.2 Display Enter Key Dialog Box



2.4.3 Display Encrypted Image and Show Its Path

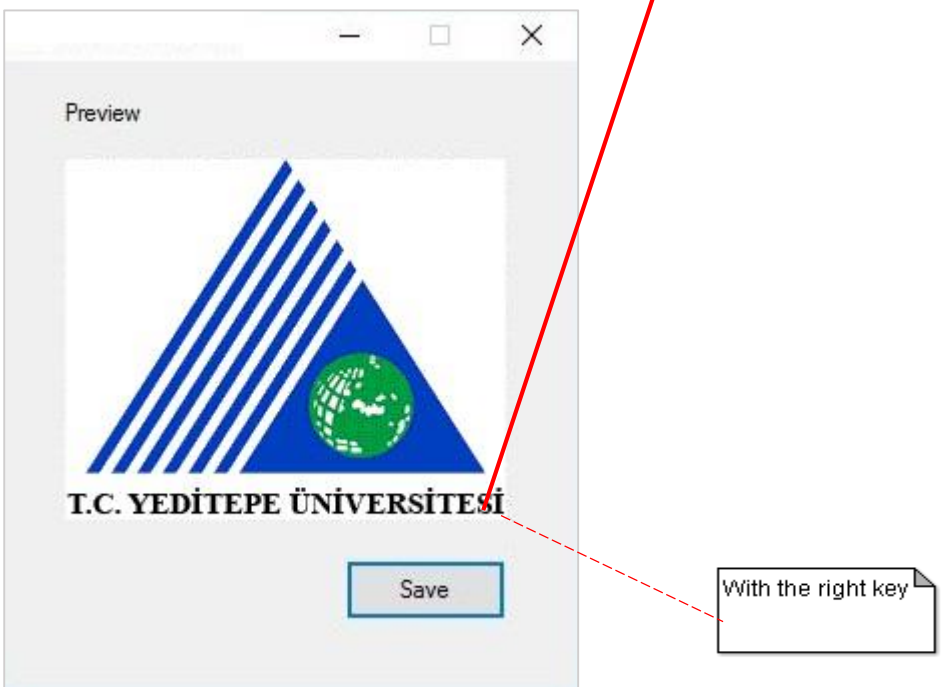
("Encrypt" button is pressed)



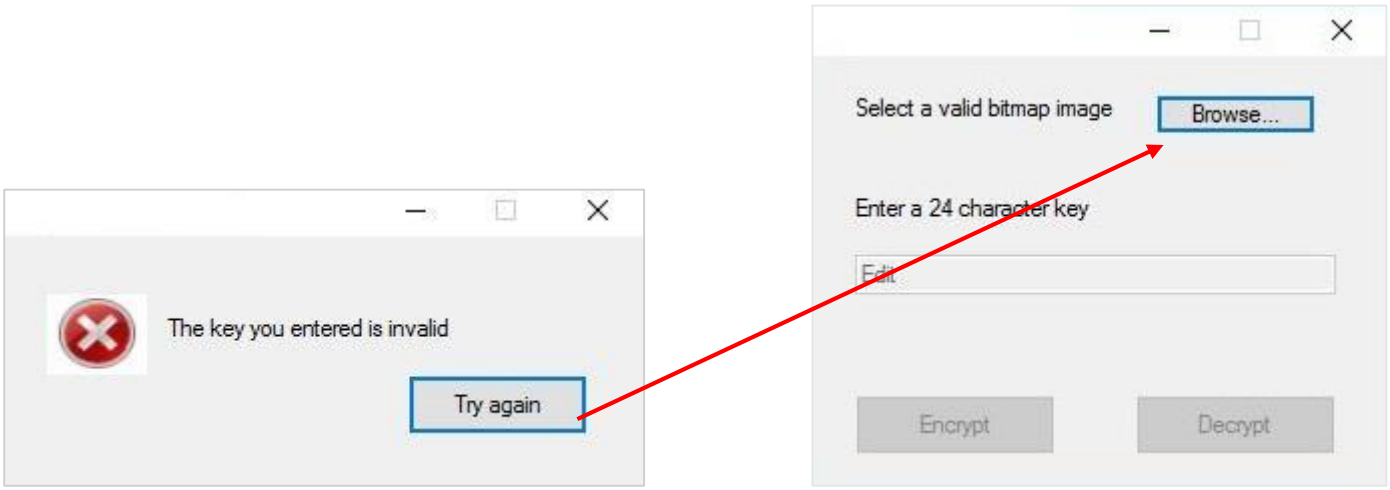
2.4.4 Display Decrypted Image and Show Its Path

("Decrypt" button is pressed)

Case 1:



Case 2:


The key you entered is invalid
Try again
Select a valid bitmap image
Browse...
Enter a 24 character key
Edit
Encrypt
Decrypt