Experiment 3b

27 March 2024

Objectives

- To learn **ref** and **out** parameters
- To learn RadioButton
- To learn GroupBox

Lab Exercises

Lab Exercise 1 – ROT3 & Ceaser Cipher

ROT3: Its key is simple: each letter of the alphabet is replaced by the next 3 letters, i.e. A is replaced by D, B is replaced by E, C is replaced by F etc. "ROT3" literally means "rotating 3 letters of the alphabet forward."
(Set shift **value to 3** for In ROT3 Cipher.)

        A -> D
        B -> E
        C -> F
        D -> G
        E -> H…

Exp:

        Orijinal : "HELLO"
        ROT3 : "KHOOR" (When the shift amount is taken as 3)

Ceaser Cipher: The Caesar Cipher, named because it was used by Julius Caesar himself, is actually 26 different ciphers, one for each letter of the alphabet. ROT1 is just one of these ciphers. A person only needs to be told which Caesar cipher was used in order to decipher a message. For this experiment take 4 to rotate 4 letter forward through the alphabet.
(**If the user does not enter an integer value into the texbox, the default value is 4 for in Caesar Cipher.**)

        A -> E
        B -> F
        C -> G
        D -> H
        E -> I…

Exp:

        Orijinal : "HELLO"
        Ceaser: "KHOOR" (When the shift amount is taken as 4)

Task
You will be take a string from user via TextBox like **Password**. User will be select ROT3 or Ceaser Cipher option via radio buttons. When Ceaser Cipher is selected, user must be enter ceaser cipher code as integer via a new TextBox which was hidden before selection. The cipher method signature and algorithm is given as coded at the end of the document but fill necessary blocks of code to get calculated values from method. When encrypt button is clicked, Encipher method is called and if password is encrypted, success parameter of method will be true, label parameter of method will be visualize "success" as text message, encryptedMessage parameter will be
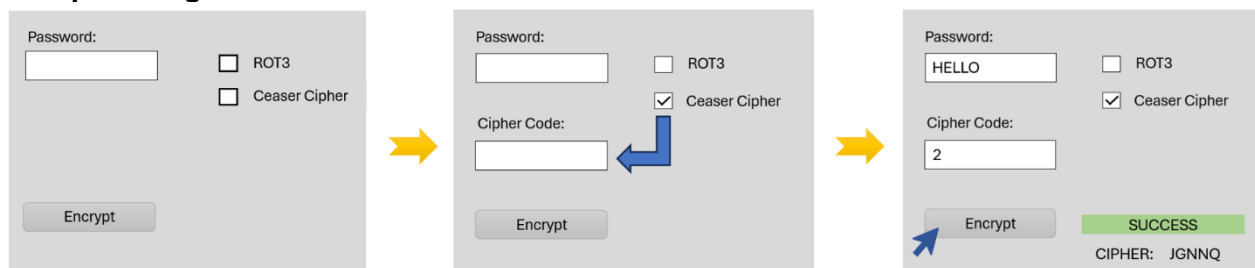
generated as encrypted message. If success paramater value true, successLabel's back ground color will be green.

Tips: Components are TextBox, RadioButton, RadioButton, GroupBox, TextBox, Label, Label

Checkpoints;
1. TextBox should be hide entered character as "*******" (10pt)
2. Only one RadioButton should be selected at the sametime (20pt)
3. If Ceaser Cipher Radio button is selected, a new TextBox should be shown. (15pt)
4. Fix the Encipher and Cipher methods. **You're not allowed to change any part of methods. Only put ref and out keywords.**
   a. True **ref** implementation (10pt)
   b. True **out** implementation (10pt)
5. **Call Encipher method as expected**. (25pt)
6. If success bool value true, successLabel's back ground color will be green (10pt)

Sample Design

Example source codes to encrypt given message

```csharp
public static void Encipher(char[] input, int key, bool success, Label successLabel, string encryptedMessage)
{
    encryptedMessage = string.Empty;
    if (input.Length < 2)
    {
        success = false;
        successLabel.Text = "Failed";
        return;
    }

    for(int i=0; i < input.Length; i++)
    {
        char ch = input[i];
        Cipher(ch, key);
        encryptedMessage += ch;
    }


    success = true;
    successLabel.Text = "Success";
}

public static void Cipher(char ch, int key)
{
    if (char.IsLetter(ch))
    {
        char d = char.IsUpper(ch) ? 'A' : 'a';
        ch = (char)((((ch + key) - d) % 26) + d);
    }
}
```