Name: Jyothiradithya Neti

Contact Number: 9963831217

Email Id: jyothiradithya23@gmail.com

Assignment-2:

```
import java.util.Scanner; // Importing Scanner class for taking user input
// Main class definition
public class ceaser_cipher {
  public static void main(String[] args) {
    // Create a Scanner object to take input from user
    Scanner sc = new Scanner(System.in);
    // Boolean variable to control the while loop
    boolean val = true;
    // Loop runs continuously until user chooses to exit (option 3)
    while (val) {
      // Display the available menu options
      display();
      // Ask user to enter an option
      System.out.println("Enter the option (1.Encrypt, 2.Decrypt, 3.Exit): ");
      int s = sc.nextInt(); // Takes numeric option input
      sc.nextLine(); // Consumes the leftover newline character
      // Switch case based on user's choice
      switch (s) {
        case 1: // Case for encryption
          System.out.println("Enter the text to encrypt: ");
          String text = sc.nextLine(); // Read the full text (can include spaces)
          System.out.println("Enter the key (single digit): ");
          int key = sc.nextInt(); // Read the key (shift value)
  sc.nextLine(); // Consume leftover newline
  // Call the encryption function
  String encrypt = encrypted(text, key);
  // Display the encrypted result
  System.out.println("Encrypted String: " + encrypt);
  System.out.println("--------");
  break;
case 2: // Case for decryption
  System.out.println("Enter the text to decrypt: ");
  String text1 = sc.nextLine(); // Read the encrypted text
  System.out.println("Enter the key (single digit): ");
  int key1 = sc.nextInt(); // Read the same key used for encryption
  sc.nextLine(); // Consume leftover newline
  // Call the encrypted text
  String encText = encrypted(text1, key1);
  // Call the decryption function
  String decrypt = decrypted(encText, key1);
  // Display the decrypted result
  System.out.println("Encrypted String: " + encText);
  System.out.println("Decrypted String: " + decrypt);
  System.out.println("--------");
  break;
case 3: // Case to exit the program
  val = false; // Set loop variable to false → loop stops
  System.out.println("Exiting... Goodbye!");
  break;
default: // Handles invalid option input
  System.out.println("Invalid option! Try again.");
```

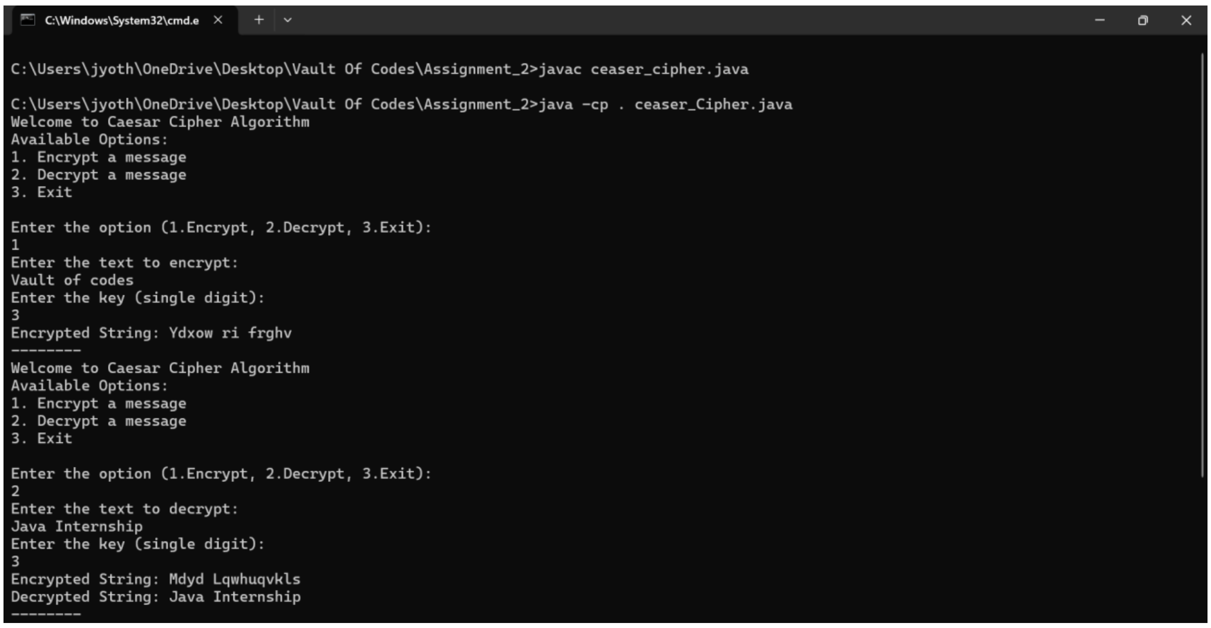
```
        }
    }
    // Close the scanner to free resources
    sc.close();
}

// ------------------- ENCRYPTION FUNCTION -------------------
public static String encrypted(String text, int key) {
    String result = ""; // String to store the final encrypted text
    // Loop through each character of the input text
    for (int i = 0; i < text.length(); i++) {
        char c = text.charAt(i); // Extract each character
        // If character is uppercase (A–Z)
        if (Character.isUpperCase(c)) {
            // Shift within A–Z range using modulo to wrap around after Z
            c = (char) (((c - 'A' + key) % 26) + 'A');
        }
        // If character is lowercase (a–z)
        else if (Character.isLowerCase(c)) {
            // Shift within a–z range using modulo
            c = (char) (((c - 'a' + key) % 26) + 'a');
        }
        // Non-alphabetic characters (spaces, digits, punctuation) remain unchanged
        result += c;
    }
    // Return the final encrypted string
    return result;
}
```

```java
// ------------------- DECRYPTION FUNCTION -------------------
public static String decrypted(String text, int key) {
  String result = ""; // String to store final decrypted text
  // Loop through each character in the encrypted text
  for (int i = 0; i < text.length(); i++) {
    char c = text.charAt(i); // Extract character
    // If character is uppercase
    if (Character.isUpperCase(c)) {
      // Reverse the shift (subtract key) and wrap using modulo
      c = (char) (((c - 'A' - key + 26) % 26) + 'A');
    }
    // If character is lowercase
    else if (Character.isLowerCase(c)) {
      // Reverse shift for lowercase letters
      c = (char) (((c - 'a' - key + 26) % 26) + 'a');
    }
    // Non-letter characters remain the same
    result += c;
  }
  // Return the final decrypted text
  return result;
}
// ------------------- DISPLAY MENU FUNCTION -------------------
public static void display() {
  // This method displays the menu options every time the loop runs
  System.out.println("Welcome to Caesar Cipher Algorithm");
  System.out.println("Available Options:");
```

```
        System.out.println("1. Encrypt a message");
        System.out.println("2. Decrypt a message");
        System.out.println("3. Exit");
        System.out.println(); // Print a blank line for spacing
    }
}
```

Output:

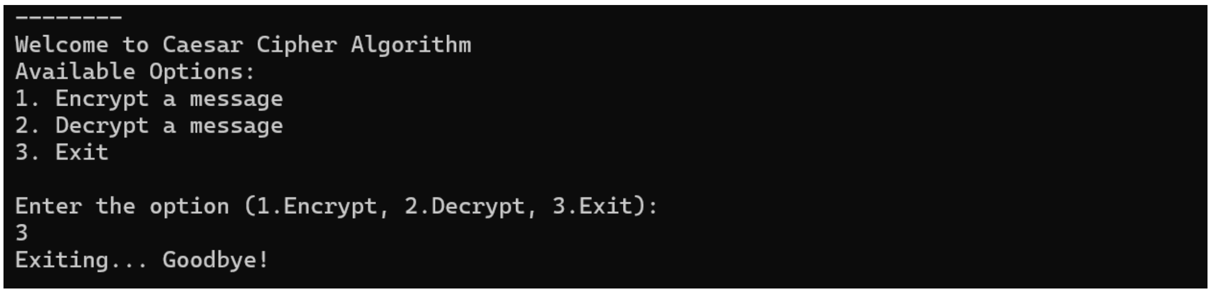


```
C:\Users\jyoth\OneDrive\Desktop\Vault Of Codes\Assignment_2>javac ceaser_cipher.java

C:\Users\jyoth\OneDrive\Desktop\Vault Of Codes\Assignment_2>java -cp . ceaser_Cipher.java
Welcome to Caesar Cipher Algorithm
Available Options:
1. Encrypt a message
2. Decrypt a message
3. Exit

Enter the option (1.Encrypt, 2.Decrypt, 3.Exit):
1
Enter the text to encrypt:
Vault of codes
Enter the key (single digit):
3
Encrypted String: Ydxow ri frghv
--------
Welcome to Caesar Cipher Algorithm
Available Options:
1. Encrypt a message
2. Decrypt a message
3. Exit

Enter the option (1.Encrypt, 2.Decrypt, 3.Exit):
2
Enter the text to decrypt:
Java Internship
Enter the key (single digit):
3
Encrypted String: Mdyd Lqwhuqvkls
Decrypted String: Java Internship
--------
```



```
--------
Welcome to Caesar Cipher Algorithm
Available Options:
1. Encrypt a message
2. Decrypt a message
3. Exit

Enter the option (1.Encrypt, 2.Decrypt, 3.Exit):
3
Exiting... Goodbye!
```