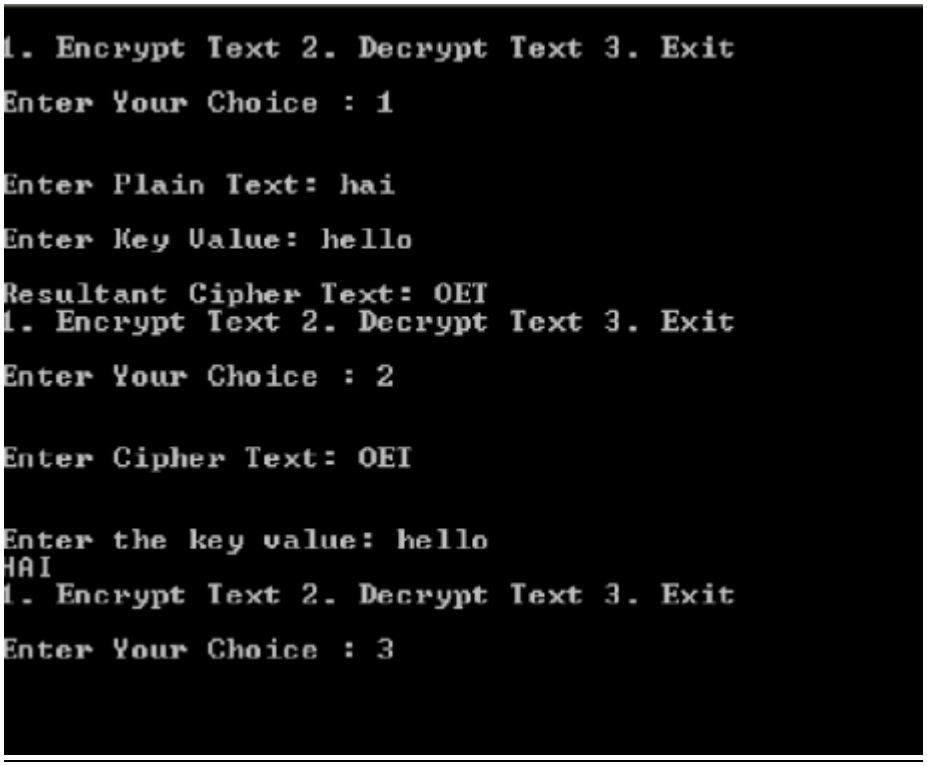
4) To implement the Vigenere Cipher substitution technique using python program.

PROGRAM:-

```
import sys
def encipher():
    input_text = input("\n\nEnter Plain Text (A-Z only): ").upper()
    key = input("Enter Key Value (A-Z only): ").upper()
    # Validate input
    if not (input_text.isalpha() and key.isalpha()):
        print("Error: Only alphabetic characters are allowed.")
        return
    print("\nResultant Cipher Text: ", end="")
    cipher_text = []
    for i in range(len(input_text)):
        j = i % len(key)
        # Vigenère encryption formula: (plain + key) mod 26
        encrypted_char = chr(((ord(input_text[i]) - 65 + ord(key[j]) - 65) % 26) + 65)
        cipher_text.append(encrypted_char)
    print(''.join(cipher_text))
def decipher():
    input_text = input("\n\nEnter Cipher Text (A-Z only): ").upper()
    key = input("Enter Key Value (A-Z only): ").upper()
    # Validate input
    if not (input_text.isalpha() and key.isalpha()):
        print("Error: Only alphabetic characters are allowed.")
        return
    print("\nDecrypted Text: ", end="")
    plain_text = []
    for i in range(len(input_text)):
        j = i % len(key)
        # Vigenère decryption formula: (cipher - key) mod 26
```

```
        decrypted_char = chr(((ord(input_text[i]) - ord(key[j])) % 26) + 65)
        plain_text.append(decrypted_char)
    print(''.join(plain_text))
def main():
    while True:
        print("\nVigenère Cipher")
        print("1. Encrypt Text")
        print("2. Decrypt Text")
        print("3. Exit")
        try:
            choice = int(input("\nEnter Your Choice (1-3): "))
        except ValueError:
            print("Please enter a valid number.")
            continue
        if choice == 3:
            print("Exiting program...")
            sys.exit(0)
        elif choice == 1:
            encipher()
        elif choice == 2:
            decipher()
        else:
            print("Invalid option. Please enter 1, 2, or 3.")
if __name__ == "__main__":
    main()
```

OUTPUT:-


1. Encrypt Text 2. Decrypt Text 3. Exit
Enter Your Choice : 1
Enter Plain Text: hai
Enter Key Value: hello
Resultant Cipher Text: OET
1. Encrypt Text 2. Decrypt Text 3. Exit
Enter Your Choice : 2
Enter Cipher Text: OEI
Enter the key value: hello
HAI
1. Encrypt Text 2. Decrypt Text 3. Exit
Enter Your Choice : 3