

4. Write a python program for polyalphabetic substitution cipher uses a separate monoalphabetic substitution cipher for each successive letter of plaintext, depending on a key.

Code:

```
def vigenere_encrypt(plaintext, key):  
    plaintext = plaintext.upper().replace(" ", "")  
    key = key.upper()  
    ciphertext = ""  
    key_index = 0  
    for ch in plaintext:  
        shift = ord(key[key_index]) - ord('A')  
        encrypted = chr((ord(ch) - ord('A') + shift) % 26 + ord('A'))  
        ciphertext += encrypted  
        key_index = (key_index + 1) % len(key)  
    return ciphertext  
  
def vigenere_decrypt(ciphertext, key):  
    ciphertext = ciphertext.upper()  
    key = key.upper()  
    plaintext = ""  
    key_index = 0  
    for ch in ciphertext:  
        shift = ord(key[key_index]) - ord('A')  
        decrypted = chr((ord(ch) - ord('A') - shift) % 26 + ord('A'))  
        plaintext += decrypted  
        key_index = (key_index + 1) % len(key)  
    return plaintext
```

Example usage

```
text = "HELLO WORLD"
```

```
key = "KEY"
```

```
cipher = vigenere_encrypt(text, key)
```

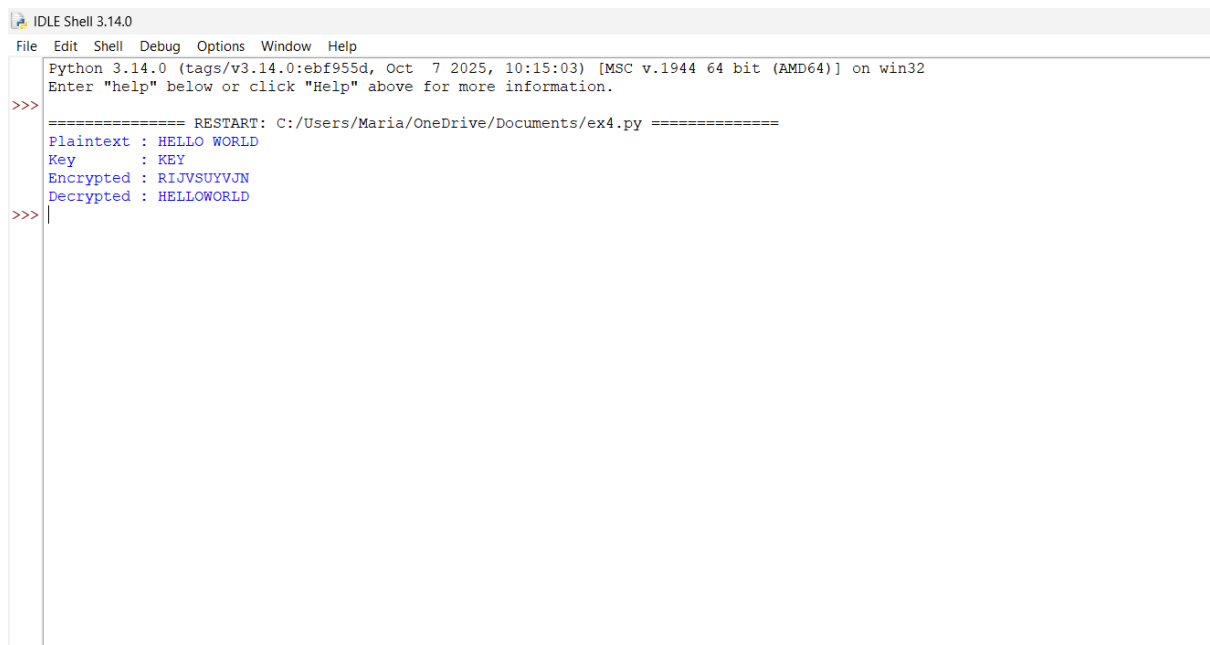
```
plain = vigenere_decrypt(cipher, key)
```

```
print("Plaintext :", text)
```

```
print("Key      :", key)
```

```
print("Encrypted :", cipher)
```

```
print("Decrypted :", plain)
```



The screenshot shows the IDLE Shell 3.14.0 interface. The title bar reads "IDLE Shell 3.14.0". The menu bar includes "File", "Edit", "Shell", "Debug", "Options", "Window", and "Help". The status bar at the bottom indicates "Python 3.14.0 (tags/v3.14.0:ebf955d, Oct 7 2025, 10:15:03) [MSC v.1944 64 bit (AMD64)] on win32". The main text area displays the following output:

```
>>>
===== RESTART: C:/Users/Maria/OneDrive/Documents/ex4.py =====
Plaintext : HELLO WORLD
Key       : KEY
Encrypted  : RIJVSUYVJN
Decrypted  : HELLOWORLD
>>> |
```