

16. Write a python program that can perform a letter frequency attack on any monoalphabetic substitution cipher without human intervention. Your software should produce possible plaintexts in rough order of likelihood. It would be good if your user interface allowed the user to specify “give me the top 10 possible plaintexts.”

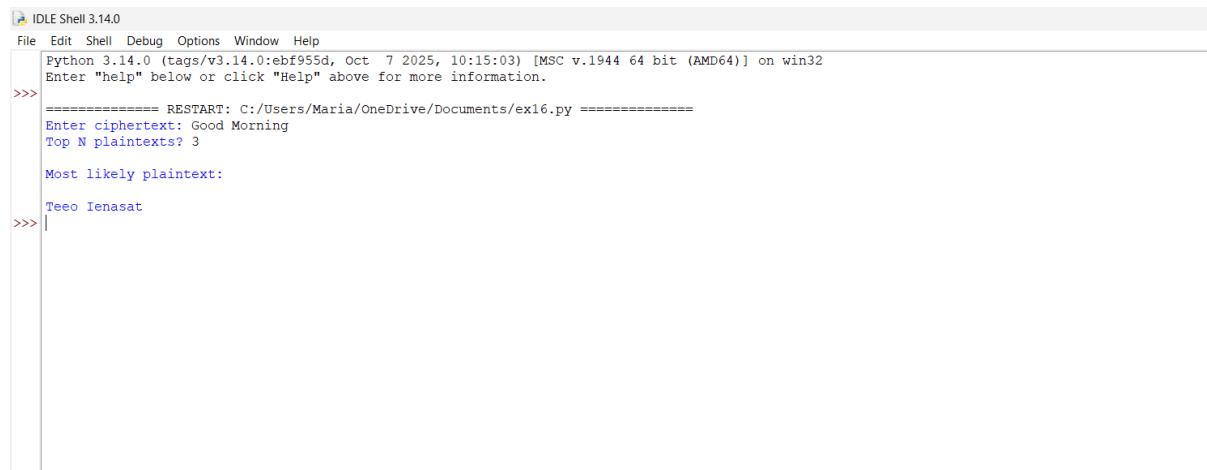
```
# Simple monoalphabetic substitution cipher frequency attack
```

```
english = "ETAOINSHRDLCUMWFGYPBVKJXQ"
```

Code:

```
def score(t):  
    t = t.upper()  
    return sum(t.count(c) * (26 - i) for i, c in enumerate(english))  
  
cipher = input("Enter ciphertext: ")  
top_n = int(input("Top N plaintexts? "))  
  
# Count ciphertext letter frequency  
  
freq = {}  
  
for c in cipher.upper():  
    if c.isalpha():  
        freq[c] = freq.get(c, 0) + 1  
  
# Cipher letters sorted by frequency  
  
cipher_order = "".join(sorted(freq, key=freq.get, reverse=True))  
  
# Build simple substitution map  
  
mapping = {cipher_order[i]: english[i] for i in range(len(cipher_order))}  
  
# Create plaintext  
  
plain = ""  
  
for ch in cipher:  
    if ch.upper() in mapping:  
        p = mapping[ch.upper()]  
        plain += p.lower() if ch.islower() else p  
    else:
```

```
plain += ch  
print("\nMost likely plaintext:\n")  
print(plain)
```



The screenshot shows the IDLE Shell 3.14.0 interface. The menu bar includes File, Edit, Shell, Debug, Options, Window, and Help. A 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 window displays the following text:

```
>>> ===== RESTART: C:/Users/Maria/OneDrive/Documents/ex16.py =====  
Enter ciphertext: Good Morning  
Top N plaintexts? 3  
Most likely plaintext:  
Teeo Ienasat  
>>> |
```