Program 1 CS 401, Spring 2024

1. Method

Based on the provided dictionaries and lists of short English words, I come with below method steps:

1. Frequency Analysis Decryption: I check the frequency of common English letters like e, t, a, o, and n to identify the patterns and possible words.
2. Following that, the iterative process helps to refine the substitution to recognize readable English words which aims to adjust the mapping strategy based on the findings

2. Analysis

Based on the frequency analysis of the ciphertext, I have the below frequency of letters:

- 'c': 209 occurrences
- 'e': 200 occurrences
- 'y': 185 occurrences
- 's': 171 occurrences
- 'u': 153 occurrences
- 'b': 128 occurrences
- 'q': 123 occurrences
- 'w': 109 occurrences
- 'h': 83 occurrences
- 'g': 80 occurrences

And the lists of 1-letter, 2-letter, and 3-letter words such as *b*, *eu*, and *exc*. Usually, the letter that appears as a letter word is *a* or *I*, as in the case of the letter *b* in the ciphertext. About the 2 letter words, *eu* could be mapped to common 2 letter words such as *an* or *is*. Three-letter words like *exc* may map to the word *the,* based on the frequency dictionary.

After many iterations, I have come to this mapping:

```
mapping = {
    'b': 'a',
    'q': 's',
    'y': 'n',
    'p': 'd',
    's': 'i',
    'e': 't',
    'c': 'e',
```

```
    'w': 'r',
    'g': 'l',
    'u': 'o',
    'f': 'f',
    'a': 'c',
    'd': 'b',
    'x': 'h',
    'h': 'm',
    't': 'w',
    'n': 'u',
    'o': 'v',
    'j': 'k',
    'r': 'p',
}
```

Which results in the below first readable English paragraph which is cut out from the whole textfile:

internet wotinl, also pnokn as online wotinl, refers to the mromess of
mastinl a wote ksinl the internet or other elemtronim ueans.
there are seweral adwantales and disadwantales to internet wotinl khen
moumared to traditional, in-merson wotinl uethods.

Based from this paragraph, I further map letters: mapping v to r, w to v, p to k, v to r, k to d, m to p, u to m, and pnokn to known. Which results in the below paragraph:

internet voting, also known as online voting, refers to the process of
casting a vote using the internet or other electronic means.
there are several advantages and disadvantages to internet voting when
compared to traditional, in-person voting methods.

This is the correct mapping that the text is a readable English.

In conclusion, below is the whole textfile that is mapped and became readable English:

```
internet voting, also known as online voting, refers to the process of
casting a vote using the internet or other electronic means.
there are several advantages and disadvantages to internet voting when
compared to traditional, in-person voting methods.
```

advantages of internet voting include:

increased accessibility: internet voting allows individuals who are unable to physically go to polling stations, such as individuals with disabilities or those living in remote areas, to vote more easily.

convenience: internet voting allows individuals to vote from any location with an internet connection, rather than requiring them to go to a specific polling station.

increased voter turnout: internet voting has the potential to increase voter turnout, as it is more convenient for many people.

faster vote counting: electronic voting systems can count votes more quickly than traditional, manual methods.

lower cost: internet voting can be less expensive than traditional voting methods, as it eliminates the need for polling stations and paper ballots. disadvantages of internet voting include: security with concerns: internet voting systems are vulnerable to hacking and other forms of cyber-attacks, which can compromise the integrity of the voting process. lack of transparency: electronic voting systems can make it more difficult to detect and rectify errors or irregularities and traditional methods of technology, which can be distributed by voter options, internet connection issues, or other problems. other disenfranchisement: internet voting systems may not be accessible to all individuals, including those who lack internet access or technical skills. lack of verifiability: electronic voting systems also lack the same level of verifiability of paper ballots, which allows for manual recounts and audits. in summary, internet voting has the potential to increase accessibility and convenience, but it also presents significant risks and challenges. therefore, many countries are still testing and experimenting with internet voting methods while ensuring the security and integrity of the voting process.