CS 570 Lab 2 Caeser Cipher

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1 Assignment Details

You will be deciphering a given message. It is encrypted with a Caesar Cipher that increases by 2 after every 3 characters (including symbol characters, which are not encoded), starting at key = 5. You should save this message to a file using a text editor. Then, your program will prompt the user for the name of the file, decrypt the message stored in the file, and then write the decrypted message to a new file called solution.txt.

A sample message talking about getting 5 points of extra credit appears below:

```
Htsnyhdjwlevbah! Pfl zxo afsb dwusb srnsyz!
```

2 Libraries and Alphabet

I started by imported the "string" library which allowed me to use the ascii characters. I then made a list of values from 1 to 26 and combined these to make an alphabet dictionary.

```
In [1]: import string
        letters = list(string.ascii_lowercase)
        values = list(range(1,27))
        alphabet = dict(zip(letters, values))
```

3 String to Number

This function takes an input of a string and turn it into a list of numbers. I didn't turn any of punctuation characters into numbers and just ignored them.

```
In [2]: def string_to_num(string):
            lst = list(string.lower())
            i = 0
            for x in lst:
                if x in letters:
                    lst[i] = alphabet[x]
                else:
                    lst[i] = x
                i += 1
            return lst
```

4 Number to String

This function takes in a list of deciphered numbers and applies the conversion of back to a characters onto it. In then joins the list of characters into a string and returns that as the output.

```
In [3]: def num_to_string(lst):
            i = 0
            for x in lst:
                if type(x) == int:
                    lst[i] = letters[(x-1)%26]
                    i+=1
                else:
                    lst[i] = x
                    i+=1
            string = ''.join(str(i) for i in lst)
            return string
```

5 Decipher

This function takes in a string and initially runs in through the String to Number function. After it is returned a list, it iterates it. It performs the Caeser decoding on the items of the list. It ignores elements of the list that aren't integers. The function then returns the Number to String function of the list.

```
In [4]: def decipher(string):
            lst = string_to_num(string)
            i = 0
            j = 5
            for x in lst:
                if type(x) == int:
                    lst[i] = x - 2*int(i/3) - j
                    i += 1
                else:
                    lst[i] = x
                    i += 1
            return num_to_string(lst)
```

6 File I/O

This opens the given file name, reads it and closes it. It then puts the contents of the file through the Decipher function and writes them to a new file labeled solution.txt.

```
In [5]: def file(string):
            file = open(string)
            string = file.read()
            file.close()
            file = open("solution.txt", 'w')
```

```
            file.write(decipher(string))
            file.close
```

7 In Use

Here is a loop that will ask the user to type the file name and will decode it.

```
In [ ]: while True:
            string = input("What is the name of the textfile you want to decode?\n")
            file(string)
            print("Decoded!\n")
```

```
What is the name of the textfile you want to decode?
cipher.txt
Decoded!
```