Cipher Machine-Manual

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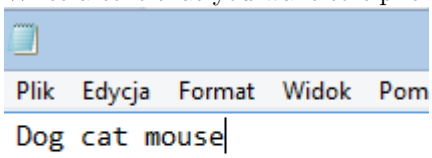
1 Introduction

Cipher machine is a computer program designed to cipher and decipher texts by using some well known ciphers. Its main function takes normal English text as an input and as an output it returns the very same text but transcribed with a Morse alphabet. Other functions of the cipher machine allow user to translate a text written with Morse alphabet into an English text. This program also has an option to cipher/decipher a text using Cesar's cipher, and afine cipher. Warning: This manual shows how to use the program with PyCharm, it may not work with different IDE's.

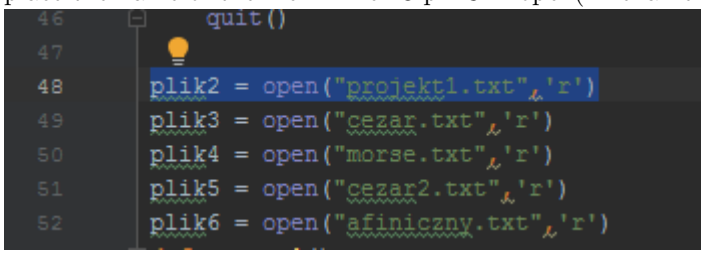
2 Morse alphabet

To cipher:

1. Create a new text file in your PycharmProjects folder.
2. Write a text that you want to cipher.



3. Save the file.
4. Ppen Pycharm.
5. place the name of the file in line 48 plik3 = open("filename.txt",'r')



6. Run the cipher machine.
7. Run the project(optionally:press Ctrl + Shift + F10).
8. Press 1 to run the program.

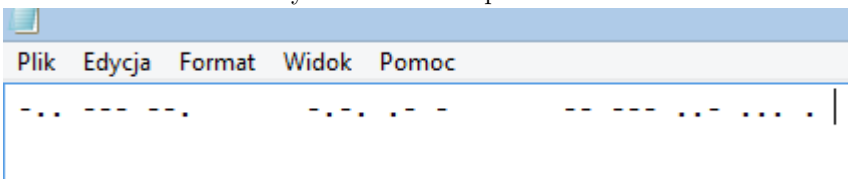
9. Enjoy the output!

```
1
-.. --- --.       -.-. .- -       -- --- ..- ... .
Process finished with exit code 0
```

To decipher:

(a) Create a new text file in your PyCharmProjects folder.

(b) Write a Morse text that you want to decipher.



(c) Save the file.

(d) Open PyCharm.

(e) Place the name of the file in line 50. plik4=open(”filename.txt”,’r’)

```
47
48      plik2 = open("projekt1.txt",'r')
49      plik3 = open("cezar.txt",'r')
50      plik4 = open("morse.txt",'r')
51      plik5 = open("cezar2.txt",'r')
52      plik6 = open("afiniczny.txt",'r')
```

(f) Run the cipher machine.

(g) Run the project (Ctrl + Shift + F10)

(h) Press 2 to run the program.

(i) Enjoy your output!

```
2
d o g c a t m o u s e
Process finished with exit code 0
```

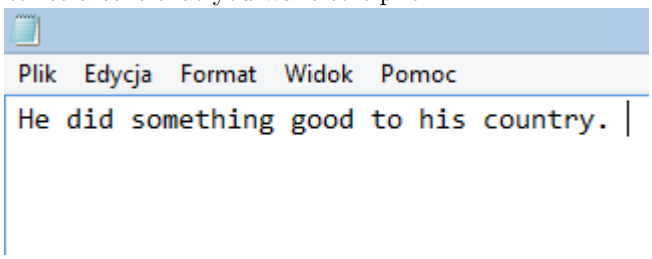
3 Cesar's cipher

The main aim of Cesar's cipher is to shift letters according to this equation:

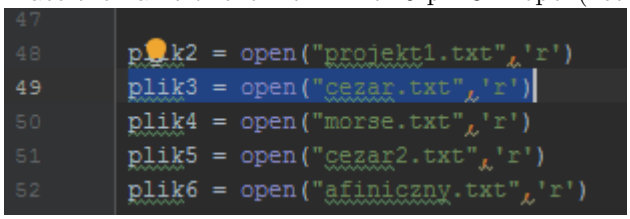
$$\mathbf{c(x) = x + 3} \tag{1}$$

This cipher assumes that each letter has its own number equivalent. According to this cipher a = 0, b = 1... z = 25.

1. Create a new text file in your PyCharmProjects folder.
2. Write a text that you want to cipher.



3. Save the file.
4. Open PyCharm.
5. Place the name of the file in line 49 plik3 = open("cezar.txt",'r')



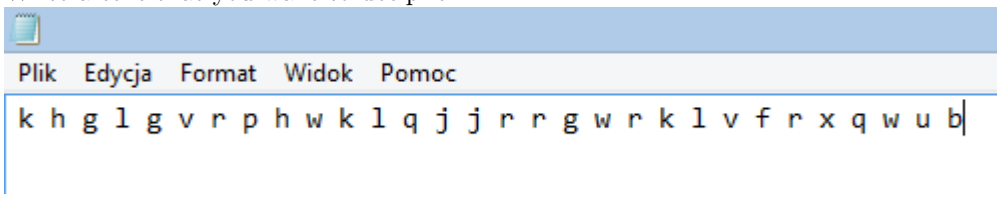
6. Run the cipher machine.
7. Run the project(Ctrl + Shift + F10)

8. Press 3 to run the program.
9. Enjoy your output!

```
3
k h g l g v r p h w k l q j j r r g w r k l v f r x q w u b
```

To decipher:

1. Create a new text file in your PyCharmProjects folder.
2. Write a text that you want to decipher.



3. Save the file.
4. Open PyCharm.
5. Place the name of the file in line 51 plik5 = open("filename.txt",'r')

```
48  plik2 = open("projekt1.txt",'r')
49  plik3 = open("cezar.txt",'r')
50  plik4 = open("morse.txt",'r')
51  plik5 = open("cezar2.txt",'r')
52  plik6 = open("afiniczny.txt",'r')
```

6. Run the cipher machine.
7. Run the project(Ctrl + Shift + F10)
8. Press 4 to run the program.
9. Enjoy your output!

```
4
h e d i d s o m e t h i n g g o o d t o h i s c o u n t r y
Process finished with exit code 0
```

4 Afine cipher

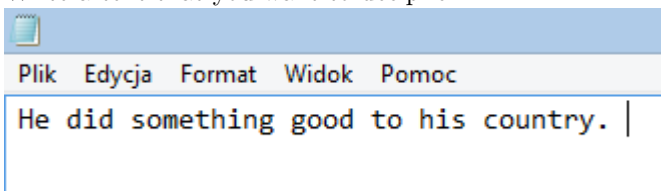
The main aim of the afine cipher is very simillar to Cesar's cipher as it shifts lettesr but it uses different equation:

$$f(x) = (ax + b) mod n \tag{2}$$

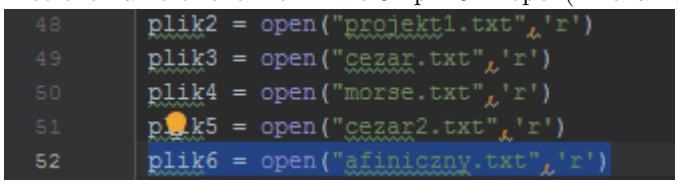
In this cipher, a and b are keys. They are selected by the user. X is the vlue of a given letter i.e a=1, b=2... z =25. N is the length of the alphabet so in case of English n = 26.

To cipherr:

1. Create a new text file in your PyCharmProjects folder.
2. Write a text that you want to decipher.

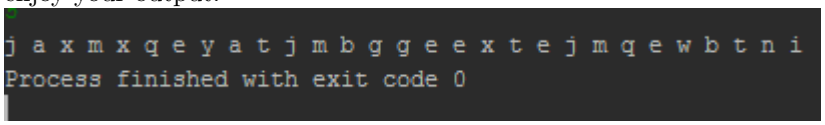


3. Save the file.
4. Open PyCharm.
5. Plce the name of the file in line 52 plik6 = open("filename.txt",'r')



6. Run the cipher machine.
7. Run the project(Ctrl + Shift + F10)

8. Press 5 to run the program
9. enjoy your output!



5 Extra

The cipher machine allows user to generate a comparison of two different ciphers. To compare ***Morse and Cesar***:

1. Write the same text in two text files in your PyCharmProjects folder.
2. Place names of your files in lines 48 (plik2 = open("filename.txt", 'r') and 49(pliik 3 = open("filename.txt",'r')
3. Save files.
4. Open PyCharm.
5. Run Projecr (Ctrl + Shitf + F10)
6. Press 6.
7. Enjoy your output!

To compare *Afine* and *Cesar's* ciphers:

1. Write the same text in two text files in your PyCharmProjects folder.
2. Place names of your files in lines 49 (plik3 = open("filename.txt", 'r') and 52(pliik6 = open("filename.txt",'r')
3. Save files.
4. Open PyCharm.
5. Run Projecr (Ctrl + Shitf + F10)
6. Press 7.
7. Enjoy your output!

To compare *Morse* and *afine* cipher:

1. Write the same text in two text files in your PyCharmProjects folder
2. Place names of your files in lines 48 (plik2 = open("filename.txt", 'r') and 42(pliik6 = open("filename.txt",'r')
3. Save files.
4. Open PyCharm.
5. Run Projecr (Ctrl + Shitf + F10)
6. Press 6.
7. Enjoy your output!