

Can you crack the code?

lopdl lopdl
Xip't uifsf?
Epdup
Epdup xip?

Julius Caesar, one of the emperors of ancient Rome was a very paranoid person, and for good reason as many people had it in for him!

He was very worried that his private messages were being read by his enemies, who were constantly plotting to

overthrow and do away with him. So he came up with a system to make it harder for them to do this.

This system is now called the "Caesar Cypher" and here is how it works.

Every character in the message is shifted along by some fixed amount. So, say Caesar wanted to encrypt the message "infamy, infamy, they've all got it in for me" with a key of 1, every letter would shift along one place and would become:

"jogbnz, jogbnz, uifz'wf bmm hpu ju jo gps nf".

You are going to create a Python program that can encrypt or decrypt a message by using a Caesar cypher. Here is how it will work.

1-input a message to be encrypted or decrypted

2-input a number for the key to encrypt eg 1. (or a negative number to decrypt, eg -1)

3-convert the first character in the message into a number and add (to encrypt) or subtract (to decrypt) the key to this number.

4-Convert this new number back to a character. This new character will be the encrypted or decrypted character. Store this character in another variable.

5-Repeat this process for each character, adding each to the variable until you get to the last one in the message.

6-Output all of the characters in the new variable. This will be your encrypted or decrypted message.

Programming Challenge: Encryption and Decryption

Did you get the challenge right? "Knock knock, who's there? Doctor. Doctor who?"

Create a variable to store a message and let the user input whatever message they want.

`message = input("Enter the message you want to encrypt")` We will need another variable to store the converted message. Let's create it now and give it a blank value.

```
converted = ""
```

We will also need another variable to store our key and ensure it's an integer. Now add this line:

```
key = int(input("Input key (positive number for encryption or negative for decryption): ")
```

Add the following lines to your program:

```
index = 0
```

Here we've made a variable called "index". It will be used to store a number which corresponds to the index of whichever character we want to get from our "message" variable.

```
print(message[index] )
```

This will print out the very first character in your message. Change the value of index and run your program again. It will show whichever character is at that index.

Go back to your program and edit the lines `index = 0` so that it is `index = 4` instead. Run your program and enter a message that has less than 4 characters. EG "dog". You will get an error because the last character ("g") is at `index = 2`.

Go back to your program and edit the lines `index = 0` so that it is `index = 4` instead.

Run your program and enter a message that has less than 4 characters. EG "dog". You will get an error because the last character of "dog" is at `index = 2`.

We need to know how long "message" is as it can vary depending on what has been input. We can use a function `len()` to do this. Try adding these lines to your program:

```
print("Number of characters in message: " )  
print(len(message))
```

Now we can use a for loop to complete the program. If we put it all together and remove anything that's unnecessary (we have been printing lots of extra things to see what they do) it should now look like this:

```
encryptmessage = input("Enter the message you want to encrypt")  
encrypted = ""  
key = int(input("Input key (positive number for encryption or negative for decryption): ")  
for n in range(0, message.len()):  
    number = ord(message[index])  
    number = number + key  
    newCharacter = chr(number)  
    encrypted = encrypted + newCharacter
```

We need to change characters into numbers. We can use the function `ord()` for this.

Try adding the lines :

```
number = ord(message[index])  
print (number)
```

Now run your program. This will convert the character at index into a number and print it out.

Now we can encrypt or decrypt by adding our key:

```
number = number + key
```

Convert it back to a character by using `chr()`

Add this line and run your program:

```
newCharacter = chr(number)  
print(newCharacter)
```