Character Encoding Practice 2

1 Name your Jupyter Notebook as:

TASK1_<your name>_<centre number>_<index number>.ipynb

The task is to implement a Caesar cypher encryption algorithm.

A Caesar cypher encodes each letter with a different letter. A 10-place Caesar cypher uses the ASCII value of each letter and adds the number 10 to it.

For example:

- The letter 'A' has the ASCII value 65. Adding 10 to the number will give the ASCII value 75. The character for 75 is 'K'.
- When an uppercase letter's code goes beyond 'Z' it returns to 'A'. For example, the character 'Z' will be encrypted as 'J'.
- When a lowercase letter's code goes beyond 'z' it returns to 'a'. For example, the character 'x' will be encrypted as 'h'.
- Spaces ' ' are replaced with the character'!'.

You will only need to convert letters and spaces. If the character is invalid, -1 is returned.

The following table shows the ASCII values of some of the characters.

Character	ASCII Value
A	65
Z	90
a	97
z	122
' ' (space)	32
!	33

In ASCII the letters follow on numerically. For example, the letter 'A' is 65, 'B' is 66, 'C' is 67 etc.

For each of the sub-tasks, add a comment statement, at the beginning of the code using the hash symbol '#', to indicate the sub-task the program code belongs to, for example:

In [1]:
```
# Task 1.1
Program code
```

Output:

Task 1.1

This program will encrypt each letter by adding the number 10 to its ASCII value. Spaces will be replaced with '!'. If the character is invalid, -1 is returned.

Write program code for a function that takes a character as a parameter and returns the ASCII value of the new encrypted character.   [5]

Task 1.2

Write program code to:

- read in a single character from the user
- call your function from **Task 1.1** with this character
- output its encrypted character or an appropriate message if the character is invalid.   [3]

Test your program **four** times, with the following test data:

```
A
a
#
' ' (space)
```
[2]

Task 1.3

The text file DATATOENCRPYT.txt contains a message that needs to be encrypted and then stored in a text file named ENCRYPTEDMESSAGE.txt

Write program code to:

- read the data from the text file DATATOENCRPYT.txt
- use your function from **Task 1.1** to encrypt each character
- store the encrypted message in the text file ENCRYPTEDMESSAGE.txt

Do **not** append invalid characters to the encrypted message.   [7]

Test your program with DATATOENCRPYT.txt

Show the contents of ENCRYPTEDMESSAGE.txt after you have run the program.   [1]

Save your Jupyter Notebook for Task 1.