Class XII computer Science

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Ex.1

Pig Latin is a common secret language (also known as an argot). Words are created in Pig Latin by taking the first letter of the word, moving it to the end, and adding 'ay'.

Write an user defined function that receives a Pig Latin word and translate back into English and return it. Like this:

Word: athsmay

maths

If the word does not end in ay then do not change anything:

Word: science

science

Ex.2

To redact means to edit or obscure text, sometimes for security or legal reasons.

Write an UDF which redacts Top Secret documents. Your function should read in a string to be redacted, and some text. Your function should print the text, replacing the redacted string with REDACTED.

Here is an example:

Redact: Hercules Mulligan

Text: The spy's name is Hercules Mulligan.

The spy's name is REDACTED.

Your function should only work when the string matches exactly, including case:

Redact: rochambeau

Text: Rochambeau is the code word. When you hear rochambeau it is time to charge the fort.

Rochambeau is the code word. When you hear REDACTED it is time to charge the fort.

Here is an example with multiple replacements. Sometimes the replacements might be a bit strange!

Redact: Fred

Text: His name is Frederick but he goes by Fred.

His name is REDACTEDerick but he goes by REDACTED.

EX. 3

The Caesar cipher is one of the earliest known and simplest ciphers. It is a type of substitution cipher in which each letter in the plaintext is 'shifted' a certain number of places down the alphabet. For example, with a shift of 1, A would be replaced by B, B would become C, and so on. The method is named after Julius Caesar, who apparently used it to communicate with his generals.

Write an user defined function in Python that takes a Text and a Shift as arguments and returns the encrypted text.

Here is a quick example of the encryption with the Caesar cipher. The text we will encrypt is 'defend the east wall of the castle', with a shift of 1.

plaintext: defend the east wall of the castle

ciphertext: efgfoe uif fbtu xbmm pg uif dbtumf

EX.4

In the rental shop system, the BIKEID and time OUT are stored in parallel lists as follows:

	ID	OUT
[1]	ABC	9.55
[2]	DFK	10.11
[3]	XYY	10.23
[4]	...	...
...	...	...
[N]	ZZZ	0.0

The end of the BIKEID list is marked with the rogue value ZZZ. ID is a string list and OUT is a list of real numbers representing times. When a bike is returned, the following operations are needed:

- the ID is looked up in the ID array
- if the ID does not exist an error message is output
- the OUT time is found
- the current time is input and the difference between that and time OUT is output

Write an user defined function in python that receives the ID, OUT and the BIKEID if the returned bike as arguments and perform the above mentioned operations.

EX.5

When an airplane is ready to take off, the pilot calls air traffic control to notify them. The number of the airplane, the time it was due to take off and the time called in are added to a list. When there is a free runway, the first plane on the list is called to take off.

The airplane identifier, call time and due time are stored in three lists, PLANE,DUE and CALL. An entry of ZZZ in the PLANE array indicates that there are no further airplanes waiting. (Due time and call time are both stored as minutes since midnight.)

For example, when there are three planes waiting, the lists could be as follows.

PLANE	DUE	CALL
AF344	956	850
LH543	955	875
BD556	950	860
ZZZ		

Write an user defined procedure that returns the identifier of the next airplane to take off and the number of airplanes left in the list. In addition, the procedure moves the remaining airplanes up the list.