Assignment 1

Question 1:

Define a function is_palindrome() that recognizes palindromes (i.e. words that look the same written backwards). For example, is_palindrome("radar") should return True.

Question 2:

"99 Bottles of Beer" is a traditional song in the United States and Canada. It is popular to sing on long trips, as it has a very repetitive format which is easy to memorize, and can take a long time to sing. The song's simple lyrics are as follows:

99 bottles of beer on the wall, 99 bottles of beer.

Take one down, pass it around, 98 bottles of beer on the wall.

The same verse is repeated, each time with one fewer bottle. The song is completed when the singer or singers reach zero.

Your task here is write a Python program capable of generating all the verses of the song.

Question 3:

The International Civil Aviation Organization (ICAO) alphabet assigns code words to the letters of the English alphabet acrophonically (Alfa for A, Bravo for B, etc.) so that critical combinations of letters (and numbers) can be pronounced and understood by those who transmit and receive voice messages by radio or telephone regardless of their native language, especially when the safety of navigation or persons is essential. Here is a Python dictionary covering one version of the ICAO alphabet:

```
d = {'a':'alfa', 'b':'bravo', 'c':'charlie', 'd':'delta', 'e':'echo', 'f':'foxtrot',
    'g':'golf', 'h':'hotel', 'i':'India', 'j':'juliett', 'k':'kilo', 'l':'lima',
    'm':'mike', 'n':'november', 'o':'oscar', 'p':'papa', 'q':'quebec', 'r':'romeo',
    's':'sierra', 't':'tango', 'u':'uniform', 'v':'victor', 'w':'whiskey',
    'x':'x-ray', 'y':'yankee', 'z':'zulu'}
```

Write a function that will return the acrophonically version of a word supplied to it.

Question 4:

Write a program that accepts a sequence of whitespace separated words as input and prints the words after removing all duplicate words and sorting them alphanumerically.

Suppose the following input is supplied to the program:

hello world and practice makes perfect and hello world again

Then, the output should be:

again and hello makes perfect practice world

Question 5:

Write a function translate() that will translate a text into "rövarspråket" (Swedish for "robber's language"). That is, double every consonant and place an occurrence of "o" in between. For example, translate("this is fun") should return the string "tothohisos isos fofunon".

Question 6:

In cryptography, a Caesar cipher is a very simple encryption techniques in which each letter in the plain text is replaced by a letter some fixed number of positions down the alphabet. For example, with a shift of 3, A would be replaced by D, B would become E, and so on. The method is named after Julius Caesar,

who used it to communicate with his generals. ROT-13 ("rotate by 13 places") is a widely used example of a Caesar cipher where the shift is 13. In Python, the key for ROT-13 may be represented by means of the following dictionary:

```
key = {'a':'n', 'b':'o', 'c':'p', 'd':'q', 'e':'r', 'f':'s', 'g':'t', 'h':'u',
    'i':'v', 'j':'w', 'k':'x', 'l':'y', 'm':'z', 'n':'a', 'o':'b', 'p':'c',
    'q':'d', 'r':'e', 's':'f', 't':'g', 'u':'h', 'v':'i', 'w':'j', 'x':'k',
    'y':'l', 'z':'m', 'A':'N', 'B':'O', 'C':'P', 'D':'Q', 'E':'R', 'F':'S',
    'G':'T', 'H':'U', 'I':'V', 'J':'W', 'K':'X', 'L':'Y', 'M':'Z', 'N':'A',
    'O':'B', 'P':'C', 'Q':'D', 'R':'E', 'S':'F', 'T':'G', 'U':'H', 'V':'I',
    'W':'J', 'X':'K', 'Y':'L', 'Z':'M'}
```

(Sample encrypted text -- Pnrfne pvcure? V zhpu cersre Pnrfne fnynq!)
Your task in this exercise is to implement an encoder and decoder of ROT-13. (Writ 2 separate functions:
Will take a sentence as input and give the encrypted sentence as output
Will take the encrypted sentence as input and give original sentence as out-put.

Question 7:
Write a program that will ask the user to think of a number between 1-100 and will try to guessing the number. It will ask the user if the guess is low / high / correct and accordingly try modifying the answer.
Sample output:
Please guess a number
Is your guess 50? (0 means it's too low, 1 means it's your guess and 2 means it's too high) 2
Is your guess 24? (0 means it's too low, 1 means it's your guess and 2 means it's too high) 2
Is your guess 11? (0 means it's too low, 1 means it's your guess and 2 means it's too high) 0
Is your guess 17? (0 means it's too low, 1 means it's your guess and 2 means it's too high) 0
Is your guess 20? (0 means it's too low, 1 means it's your guess and 2 means it's too high) 2
Is your guess 18? (0 means it's too low, 1 means it's your guess and 2 means it's too high) 0
Is your guess 19? (0 means it's too low, 1 means it's your guess and 2 means it's too high) 1
It took 8 times to guess your number

Question 8:
A website requires the users to input username and password to register. Write a program to check the validity of password input by users.
Following are the criteria for checking the password:
1. At least 1 letter between [a-z]
2. At least 1 number between [0-9]
1. At least 1 letter between [A-Z]
3. At least 1 character from [$#@]
4. Minimum length of transaction password: 6
5. Maximum length of transaction password: 12
Your program should accept a sequence of comma separated passwords and will check them according to the above criteria. Passwords that match the criteria are to be printed, each separated by a comma.
Example
If the following passwords are given as input to the program:
ABd1234@1,a F1#,2w3E*,2We3345
Then, the output of the program should be:
ABd1234@1