Exercises: Conditional Statements and loops

Exercise 1:

Write a Python program to construct the following pattern, using a nested for loop. (red: output)

Exercise 2:

Write a Python program that accepts a string and calculates the number of digits and letters. (green: input, red = ouput)

```
Sample Data (input): Python 3.2
Expected Output:
Letters 6
Digits 2
Hints: isdigit(), isalpha() (Book page 188 ff)
'.' or ',' or ' (=Spaces) and so on are not letters!
```

Exercise 3:

Write a Python program to count the number of even and odd numbers from a series of numbers. (green: sample for 'input', red: output for this sample)

Sample numbers:

```
numbers = (11, 12, 13, 14, 15, 16, 17, 18, 19)
Expected Output:
Number of even numbers : 4
Number of odd numbers : 5
```

Exercise 4:

Write a Python program which takes two digits m (row) and n (column) as input and generates a two-dimensional array. The element value in the i-th row and j-th column of the array should be i*j. (green: input, red: output)

Note:

```
i = 0, 1, ..., m-1
j = 0, 1, ..., n-1

Input Test Data - Rows = 3
Input Test Data - Columns = 4

Expected Result: [[0, 0, 0, 0], [0, 1, 2, 3], [0, 2, 4, 6]]
```

Exercise 5:

Write a Python program to find numbers between 200 and 500 (both included) where each digit of a number is an even number. The numbers obtained should be printed in a comma-separated sequence.

Result (red: output):

```
200,202,204,206,208,220,222,224,226,228,240,242,244,246,248,260,262,264,266,26
8,280,282,284,286,288,400,402,404,406,408,420,422,424,426,428,440,442,444,446,
448,460,462,464,466,468,480,482,484,486,488
```

Exercise 6:

Write a Python program to guess a number between 1 to 100.

First: The program "fetches" a random number from a self-defined function ...

then... User is prompted to enter a guess. If the user guesses wrong then the user gets a message "to big" or "to small" on the console prompt and the prompt (user input) appears again until the guess is correct. On a successful guess, user will get a "Well guessed!" message, and the program will exit.

Extension of Exercise 6:

The number of trials should be prompted: "Well done - you have tried it 4 times!"

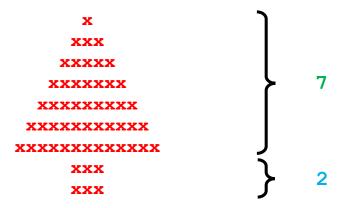
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Exercise 7:

Suppose we wish to draw a **Christmas tree**, and its height (without tree trunk¹!) is provided by the user. (green: input)

```
Christmas tree - desired height: 7
```

A Christmas tree that is seven levels tall² would look like (red: output)



... whereas a four-level tree would look like

Christmas tree - desired height: 4



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¹ trunk = Stamm

² tall = hoch