Lab 1: Printing patterns

Due date: Monday February 1st

Assignment

The main task in this lab is to practice while and for loops, and if statements. Write a computer program in Python3 that can print out the following patterns; I assume that you will use the lecture 1-3 material as guidance.

```
Solid square with size 5
*****
*****
*****
*****
*****

Solid triangle with size 10

*
**
***
****
*****
******
*******
********
*********

checkerboard square with size 8
  *   *   *   *
*   *   *   *
  *   *   *   *
*   *   *   *
  *   *   *   *
*   *   *   *
  *   *   *   *
*   *   *   *
```

```
Solid square with size 5
XXXXX
XXXXX
XXXXX
XXXXX
XXXXX

Solid triangle with size 10

X
XX
XXX
XXXX
XXXXX
XXXXXX
XXXXXXX
XXXXXXXX
XXXXXXXXX

checkerboard square with size 8
  X   X   X   X
X   X   X   X
  X   X   X   X
X   X   X   X
  X   X   X   X
X   X   X   X
  X   X   X   X
X   X   X   X
```

```
an empty square with size 8
*------------------*
|                  |
|                  |
|                  |
|                  |
|                  |
|                  |
|                  |
|                  |
|                  |
|                  |
|                  |
|                  |
|                  |
*------------------*
```

I suggest to use variables to hold the pattern element and also use variables for the size of the 'graphs'. Use the following skeleton to write your code.

1. Using **For** loops
   (a) print a square of size $n = 5$
   (b) print a triangle of size $n = 9$
   (c) print a checkerboard of size $n = 8$, observe that we have white and '*' cells
2. Using **While** loops
   (a) print a square of size $n = 5$
   (b) print a triangle of size $n = 9$
   (c) print a checkerboard of size $n = 8$, observe that we have white and '*' cells
3. Print a square of size $n = 20$, for vertical boundaries use '|', for horizontal boundaries use '-', and for corners use '*'

upload the program code to canvas, Marjan will then run python yourfile.py on her computer, ad nw expect that the result looks similar to the example above, your code does NOT need to reproduce the 3 column layout above, one after another is what we expect.

```
#!/usr/bin/env python
# (c) your name
# printing different patterns using a generator cell
################ using for loops
pattern='*'

#solid square with size n
n = 5
print("Solid square with size",n)
###for loops to generate the solid square

#solid triangle with size n
n = 10
### for loop to print the solid triangle

#checkerboard with size n
n = 8
start = 0
x=0
y=0
print("checkerboard square with size",n)
### for loops with if statements to generate a checkerboard pattern

################ using while loops
pattern='X'

#solid square with size n
n = 5
print("Solid square with size",n)
### while loops to generate sold square

#solid triangle with size n
n = 10
print("Solid triangle with size",n)
### while loops to generate solid triangle

#checkerboard with size n
n = 8
start = 0
x=0
y=0
print("checkerboard square with size",n)
###while loops to generate a checkerboard

print("an empty square with size",n)
corner='*'
vertical='|'
horizontal='-'
n=20
### code to print a square with boundaries
```