PWr Week 1
*Data Structures and Algorithms*,
Laboratory – **List 1**

There are not spaces after last 'X' in every line.

1. Write a procedure `drawTriangle(int n)` which takes as an input one integer value *n* and then output on console a triangle as on figure below (for example for *n*=5):

```
X
XX
XXX
XXXX
XXXXX
```

2. Write a procedure `drawSquare(int n)` which takes as an input one integer value *n* and then output on console a perimeter of square as on figure below (for example for *n*=5):

```
XXXXX
X   X
X   X
X   X
XXXXX
```

3. Write a procedure `drawPyramid(int n)` which takes as an input one integer value *n* and then output on console a pyramid as on figure below (for example for *n*=4):

```
   X
  XXX
 XXXXX
XXXXXXX
```

4. Write a procedure `drawChristmasTree(int n)` which takes as an input one integer value *n* and then output on console a Christmas tree in which last part height equals *n*. The tree consists of pyramids of heights from 1 to *n*. The shape have to be as presented below (for *n*=4):

```
   X
  XXX
 XXXXX
XXXXXXX
   X
  XXX
 XXXXX
XXXXXXX
   X
  XXX
 XXXXX
XXXXXXX
```

5. The program for exercises 1-4 divide into functions. Use a debugger in your preferred IDE (i.e. MS Visual Studio, Eclipse, Netbeans) for: running the program step by step, stop at chosen line, observing any variables and so on.

**For 10 points present solutions for this list till Week 2.**
**For 8 points present solutions for this list till Week 3.**
**For 5 points present solutions for this list till Week 4.**
**After Week 4 the list is closed.**

There is a next page…
The solution will be automated tested with tests from console of presented below format.

Program start with one line with a string “START”.

If an input line starts from ‘#’ sign or a line is empty, the line have to be ignored.
Else the input line have to be copied to output line with exclamation mark before first character. Then the proper operation have to be done.

If a line has a format:
TR *n*
your program has to call `drawTriangle(n)`. There is 2<=*n*<=20.

If a line has a format:
SQ *n*
your program has to call `drawSquare(n)`. There is 2<=*n*<=20.

If a line has a format:
PY *n*
your program has to call `drawPyramid(n)`. There is 1<=*n*<=20.

If a line has a format:
CT *n*
your program has to call `drawChristmasTree(n)`. There is 1<=*n*<=20.

If a line has a format:
`HA`
your program has to end the execution, writing as the last line “END OF EXECUTION”.
Every test ends with this line.

For example for a test file:

```
TR 3
SQ 3
HA
```

the output has to be:

```
START
!TR 3
X
XX
XXX
!SQ 3
XXX
X X
```

```
XXX
!HA
END OF EXECUTION
```