

## TCSS141 - SPRING 2021 - FINAL EXAM practice

FINAL EXAM: date 6/09/2021, time 3:40 - 5:40

### Problem #1 - functions

Write following functions:

- A void function `string_work` with three parameters representing three strings, which creates and displays a list, where each element represents the number of characters in each strings from the parameters.
- A value returning function `digits_3_5` with a parameter representing a number, which returns two values - the number of digits 3 and the number of digits 5 in the number.
- A value returning function `list_dig_sum` with a parameter representing a list of integers (integers can be positive, 0 or negative), which returns:
  - the sum of all digits in all integers,
  - the number of non-negative integers in the list,
  - the number of negative integers in the list.
- A value returning function `no_end_digit` with a parameter representing a list, which returns a list with all elements from the "parameter" list, except of elements ending with a digit.  
Example: if the input list is `[12,'yes','best 5','Arthut']`, the returned list is `['yes','Arthur']`.

## Problem #2 - program with functions

### STEP 1:

Write following functions:

- The value returning function `gen_list` which creates and returns a list of 10 random integers from 100,000 to 600,000, including these integers.
- The value returning function `num_7` with a parameter representing a list of positive integers, which counts and returns two values: the number of digit '7' in all integers in the parameter list, and the number of integers with at least two digits '7' in all integers in the parameter list.
- The value returning function `num_stars` with a parameter representing a list of positive integers, which returns a list numbers from the parameter list such way that digits of numbers are separated by the symbol '\*'.
- The value returning function `two_lists` with a parameter representing a list of positive integers, which returns two lists: the list of even integers from the parameter list, and the list of odd integers from the parameter list.
- The value returning function `number` with a parameter representing a list of positive integers, which returns a new number created from the first digits of integers in the parameter list

### STEP 2:

Use the created function to write the following program. In the program the `main` function calls the written functions.

Write a program which:

- A) Generates and displays a list of 10 random integers from 100,000 to 600,000 (including these integers. This list will be used in the following work and will be called `rand_list`.
- B) Displays info about the number of the digit '7' in the `rand_list`, and the number of integers with at least two digits '7' in.
- C) Displays the integers from the `rand_list` in the "star" form.
- D) Displays two lists created from the `rand_list`: the list of even integers and the list of odd integers.
- E) Displays a number created from the first digits of integers in the `rand_list`.

**The example of the program output (the seed 22 was used in the program):**

```
A): This is the list of generated random numbers:
[575719, 173593, 227201, 112381, 421434, 334426, 196601, 468026, 163224, 487759]

B) The digit "7" is in the generated list 6 times.
   In the generated list are 2 integers with at least two digits "7" in.

C) This is the list of "star" numbers:
['5*7*5*7*1*9', '1*7*3*5*9*3', '2*2*7*2*0*1', '1*1*2*3*8*1', '4*2*1*4*3*4', '3*3*4*4*2*6', '1
*9*6*6*0*1', '4*6*8*0*2*6', '1*6*3*2*2*4', '4*8*7*7*5*9']

D) This is the list of even random integers:
[421434, 334426, 468026, 163224]
   This is the list of odd random integers:
[575719, 173593, 227201, 112381, 196601, 487759]

E) This is the created number: 5121431414
>>>
```