TCSS141 – SPRING 2021 – FINAL EXAM – 06/09/2021 **max: 45 points**

IMPORTANT:

- IN THE PROGRAM YOU CAN USE ONLY METHODS AND TOOLS INTRODUCED IN THIS COURSE BEFORE THIS EXAM. PROGRAMS OR PARTS OF PROGRAMS WHICH ARE NOT USING SUCH METHODS OR TOOLS WILL GET NO POINTS FOR YOUR SCORE.
- THE SUBMITTED PROGRAM HAS TO BE CREATED BY YOU AND YOU CANNOT USE ANY ON-LINE OR OTHER PERSON HELP TO CREATE THE PROGRAM.

SUBMISSION:

- SUBMIT YOUR WORK TO THE CANVAS BEFORE THE DUE TIME.
- THE NAME OF THE FILE: yourlastname_FE.py.
- Start your program with: # your name.

Problem: USING FUNCTIONS

STEP 1:

Write following functions:

- The value returning function `rand_list` which creates and returns a list of 10 random integers from 1,000 to 9,999, including these integers. (**task A**)

- The value returning function `even_odd` with a parameter representing a list of positive integers, which returns the number of even integers and number of odd integers in the parameter list. (**task B**)

- The value returning function `two_lists_info` with two parameters representing a list of integers and a positive integer N. The function returns a Boolean value and two lists. The Boolean value is True if the positive integer N is in the list of integers. The returned lists are lists of integers (from the parameter list) that are smaller than N and larger than N. (**task C**)

- The value returning function `red_blue_white` with a parameter representing a list of positive integers, which returns a list of strings replacing the positive integers following way:

    - If the first and the last digit of the integer is even, the integer is replaced by the string 'RED',

    - If the first and the last digit of the integer is odd, the integer is replaced by the string 'BLUE',

    - If the first and the last digit of the integer are of opposite parity (one is even, one is odd), the integer is replaced by the string 'WHITE'. (**task D**)

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- The value returning function `list_new` with a parameter representing a list of positive integers, which returns a new list. Each element of the new list is a string created from each integer in the parameter list following way: each string is using the first digit of the integer, symbol 'x' and the last digit of the integer. (**task E**)

  Example: the string created from the integer 1245 is 1x5.
  Note: you can expect that all integers in the parameter list are four digit integers.

- The value returning function `multi_x` with a parameter representing a list of strings in the form digitxdigit, which returns a new list. Each element of the new list represents the product of two digits from the each string. (**task F**)

  Example: if the string is '5x6', the element of the created list is the value 30.
  Note: you can expect that all integers in the parameter list are in the form digitxdigit.

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 1,000 to 9,999, including these integers. This list will be used in the following work and will be called `work_list`.

B) Displays the number of even and odd integers in the `work_list`.

C) Prompts a user to enter an integer and displays following:

   a. Info whether the entered integer is in the `work_list`;
   b. A list of `work_list` integers that smaller than the entered integer;
   c. A list of `work_list` integers that are larger than the entered integer;

D) Displays a list of colors assigned for integers in the `work_list` described in the function `red_blue_white`.

E) Displays a list of strings with the symbol 'x' where integers of the `work_list` are modified.

F) Displays a list of products displayed in the previous list (list in the task F).

G) Displays a list of colors assigned for integers in the `work_list` described in the function `red_blue_white`.

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The example of the program output:

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A): This is the list of generated random integers:
[1526, 5288, 3064, 2054, 1091, 7539, 4605, 9992, 1158, 9740]

B)
In the generated list are 7 even integers.
In the generated list are 3 odd integers.

C) Enter a positive integer: 5000

INFO: The integer 5000 is in not the generated list.

 This is the list of smaller integers than the entered value:
[1526, 3064, 2054, 1091, 4605, 1158]

 This is the list of larger integers than the entered value:
[5288, 7539, 9992, 9740]

D) This is the list of colors:
['WHITE', 'WHITE', 'WHITE', 'RED', 'BLUE', 'BLUE', 'WHITE', 'WHITE', 'WHITE', 'WHITE']

E) The "x" list is:
['1x6', '5x8', '3x4', '2x4', '1x1', '7x9', '4x5', '9x2', '1x8', '9x0']

F) The list of multiplications is:
[6, 40, 12, 8, 1, 63, 20, 18, 8, 0]
>>>
```

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