PROGRAMMING FOR ALL – SPRING 2021 - WEEK #7 – 210510 & 210512

Topics for the week: Functions

- Introduction to functions

- Definition and calling a void function

- Designing a program to use functions

- Passing arguments to functions

- Local and global variables

Class Exercises:

Void functions

> ### Digits function

❖ Write a function `even_odd_digits` that ask a user to enter an integer and displays the number of even digits and number of odd digits in the integer.

> ### Name function

❖ Write a function `first_name` that asks the user to enter his/her name and displays the first name of the entered name.

Example:

If the entered string is "Ingrid Horakova" the displayed name is Ingrid".

> ### String modification

❖ Write a void function `vowels_up` which prompts the user to enter a string and modifies it such way that all vowels are displayed in upper form.

The string of vowels: 'aeiou'

Functions in programs

> ### Vowels in strings

Write a program that asks a user how many strings wants to enter and then uses the function `vowels_up` to display up-dated strings.

Functions with parameters

Rewrite the following functions such way that the input from the user will be represented by a parameter in the function.

- ➢ **Digits function**

    - ❖ Write a function `even_odd_digits` with a parameter representing an integer and displays the number of even digits and number of odd digits in an integer.

- ➢ **Name function**

    - ❖ Write a function `first_name` with a parameter representing a name and displays the first name of the name.

        Example:

        If the entered string is "Ingrid Horakova" the displayed name is Ingrid".

- ➢ **String modification**

    - ❖ Write a void function `vowels_up` with a parameter representing a string which modifies the string such way that all vowels are displayed in upper form.

        The string of vowels: 'aeiou'

- ➢ **String validation**

    - ❖ Write a void function `valid_str` with a parameter representing a string which displays whether the entered string is in a valid form.

        Valid forms are: string followed by space followed by an integer.

        Examples of valid strings: Athens 12000; Paris 5000, Amsterdam 12500

Functions with parameters in programs

> **Even odd digits**

Write a program that uses the function `even_odd_digits` with a parameter representing an integer that displays number of even and odd digits in entered integer.

Up-dated program: The user can enter integers repeatedly, by entering '%' end the program.

> **Sum of First n Numbers Function with a parameter**

Write a void function `total_n` with a parameter `n` representing the last value in the sum calculating and displaying the sum of first n positive integers.

Example: if n=7 the program displays the sum 1+2+3+4+5+6+7=28

Use this function in a program where the user provides a positive integer n and the program displays the sum of first n positive integers.

The user can enter the value of n repeatedly, when the user enters 0 or a negative integer, the program ends and displays the number of displayed sums.

Functions with more parameters

> **Average of two**

❖ Write a function `ave_two` with two parameters representing two real numbers which displays the average value of these numbers.

Functions with more parameters in programs

> ➢ **Grading**

>> ❖ Write a void function `grade`, which takes as arguments three exam scores (in percentage) and displays the average score and the received grade.

Ave score in %	Letter Grade
90–100	A
80–89	B
70–79	C
60–69	D
Below 60	F

Then use the function in a program which prompts a user to enter his/her three scores (in percentage), and displays the average score and the grade.

➢ **Insurance charge**

A financial office calculates insurance charges for an overseas moving company. The company moves items of customers in containers and the value of insurance charge depends on the size of the container and the value of the moving items.

The financial office receives the info about a moving case in the form: size-value (it is called a label).
Example: LG-25000 means a large container with value $25,000 (the value of a container is rounded to dollars.)

The office calculates a cost of each moving based on the following table:

Size of the container	Value of shipment: not more than $10,000 flat insurance charge	Value of shipment: more than $10,000 insurance charge is a percentage of the value
SMALL (SM)	$50	0.5%
LARGE (LG)	$90	0.9%

STEP 1:

Write a void function `info` which displays an info about the program.

Write a void function `premium` with a parameter representing a label to calculate the insurance charge for the container.
If the label is not in a valid form, the function displays: "not a valid label."

STEP 2:

Use the functions `info` and `premium` to create a program which calculates insurance charges for multiple containers. If the user enters "END" for the label, the program terminates.

Example of a possible output:

```
This program displays a charge for an insurance.
The valid label is in the form size-value.
To end the program enter "END" for the label.

Enter a container label: sm-15000
The insurance charge is $ 75.00

Enter a container label: lg45890
Not a valid label!

Enter a container label: sm-9500
The insurance charge is $ 50.00

Enter a container label: lg-10000
The insurance charge is $ 90.00

Enter a container label: lg-500000
The insurance charge is $ 4,500.00

Enter a container label: end

Thank you for using my program!
>>>
```