

PROGRAMMING FOR ALL - SPRING 2021 - WEEK #5 - LAB - 210428**GENERAL LAB RULES:**

1. Every student has to join lab sessions.
2. A goal of lab assignments is to practice topics covered in class during each week. Each lab has two parts: Theory & Programming.
3. In the theory part, you are expected to read pieces of codes and to predict outputs of these codes. You should not use Python for these predictions; you should test your skills to understand codes. When everyone is ready, TA displays correct outputs.
4. In the programming part, you are expected to make programs for assigned problems. You are expected to make all programs during the lab time, however, only one specified program should be submitted to CANVAS.
5. TA has to check your lab work for the full lab credit.

**THIS WEEK TOPICS:**

REPETITION STRUCTURE - while loop

**PART I: THEORY** - for this part take a piece of paper or open an empty file and write down expected outputs without using Python. AFTER this prediction verify your answer using Python or wait for TA to display the answer.

**#1**

```
value=4
while value<10:
    print('value is: ',value)
    value+=2
```

**#2**

```
value=20
while value!=10:
    print('value is: ',value)
    value-=2
```

**#3**

```
initial=5
while initial<10:
    print('I am happy!')
    initial+=1
```

**#4**

```
maybe=True
count=0
while maybe:
    print(count**2)
    if count>3:
        maybe=False
    count+=1
```

**#5**

```
value_1=2
value_2=7
while value_1<10 and value_2>4:
    print(value_1*value_2)
    value_1+=2
    value_2-=1
```

**#6**

```
value=10
start=1
count=0
while start<=value:
    print(start)
    count+=1
    start+=3
print('count=',count)
```

**#7**

```
word='MAYBE'
end=len(word)
count=0
while end>0:
    print(word[:end])
    count+=1
    end-=2
print('There were',count,'printings.')
```

**#8**

```
word_in='ABRACADABRA'
word_out=''
index=0
while word_in[index]!='C':
    word_out+=word_in[index]
    index+=1
print(word_out)
```

**PART II. PROGRAMMING****Note:**

**In all programs you can use only methods and tools already introduced in the class.**

**PROGRAM #1: "a" in strings - must be submitted to CANVAS as lab5.py.**

**Start the program with: `# your name.`**

❖ This program counts the number of letters "a" in strings.

Write a program that asks the user to enter a string and displays the number of "a"-s in it.

The user can enter strings repeatedly. By entering the symbol '%' he/she ends the program.

At the end, the program displays the number of entered strings and the total number of "a"-s in all strings.

A possible output:

This program displays a number of "a" in strings.  
To end the program enter "%" for the string,

```
Enter a string: aquamarine
There are 3 "a"-s in the string.
Enter the next string: less
There are 0 "a"-s in the string.
Enter the next string: abracadabra
There are 5 "a"-s in the string.
Enter the next string: awful
There are 1 "a"-s in the string.
Enter the next string: %
You entered 4 strings.
There were 9 "a"-s in these strings.
```

**PROGRAM #2:****Problem: String conversion**

- ❖ This program converts entered strings to new strings.

Write a program that asks a user to enter a string and displays an encoded form of the string.

Rules of conversion:

- If the entered string has an even number of characters, the encoded string is created by doubling each character in the entered string.
- If the entered string has an odd number of characters and more than 6, the encoded string is created by exchanging the first two characters with the last two characters; all other characters stay as they are.
- If the entered string has an odd number of characters but less than 6, the encoded string is created such way that the middle character is tripled and all other characters stay as they are.

The user can enter multiple strings. For ending the program you can use a sentinel or a question. In the example is used a sentinel - the string '!'.  
At the end the program displays the number of entered strings.

```
This program converts strings.
To end the program enter "!" for the string.

Enter a string: ADAM
The encoded string is: AADDAAMM
Enter the next string: ANYWHERE
The encoded string is: AANNYYWWHHEERREE
Enter the next string: PRINCIPLE
The encoded string is: LEINCIPPR
Enter the next string: WEDNESDAY
The encoded string is: AYDNESDWE
Enter the next string: APPLE
The encoded string is: APPPPLE
Enter the next string: MAYBE
The encoded string is: MAYYYBE
Enter the next string: YES
The encoded string is: YEEES
Enter the next string: !
You entered 7 strings.
```