Python – Lab exercise 3

For all the questions below:

- Use meaningful names for variables and functions
- Write input-output examples corresponding to special situations as discussed in class
- Call the functions defined for all the input-output scenarios.
- Trace them on python tutor

1. Write a function to solve the quadratic equation $ax^2+bx+c=0$. The function should receive a,b and c as input parameters and
   A. Prints the roots
   B. Return the roots (familiarization with tuples)

2. A certain sport has the requirement that any female participant must be a major (age at least 18 years); for males the lower limit for age is only 10 years. The application procedure filters out any applications from candidates below 10 years of age at the very beginning. However, the constraint for females is checked by a software at a later stage. Write a function that receives as input the gender and date of birth (day, month and year separately) of an applicant and returns True if the candidate is eligible, False if not (assume that the initial step of ensuring that age is >= 10 years has already been done). This function calls another function to check if a candidate is a major based on the day, month and year of birth.

3. Write a function that computes and prints the average score of 4 students (2 boys and 2 girls). This function calls from within two separate functions, one of which receives from the user the scores of two boys and returns their sum, and the other one does the same for girls.

Q 4 and 5 are based on the concept of local and global variables discussed in class.

4. Consider the following snippet of code:

```
def func1():
    x = n+1
    n = n+2

n=3
```

```
func1()
print(n)
```

What do you think would be printed when the above code is run? Verify your guess. Is the output the same as what you had expected? If yes, explain, else explore and figure out the reason.

5. What do you think would be the output when the following code is run. Run it and verify your guess. Explain your observations.

```
def func1():
    x=5
    print("Inside func1, before calling func2: ",x)
    func2()
    print("Inside func1, after calling func2: ",x)

def func2():
    global x
    x=x*2

x=10
print("Initial: ",x)
func1()
print("After func1: ",x)
func2()
print("After func2: ",x)
```

Now comment out the statement x=5 in func1. Guess the output, verify it and explain.