

Self-Practice Exercises - A

Ex 3.1 (Basic Python operations)

Using a Python interpreter (e.g. IDLE3), enter each of the following Python code statements/expressions in the sequence as shown. Make sure you understand each of the code operation by observing its respective output.

```
c = 10
7 = a
a = d
a = c + 1
a + c = c
3 + a
7up = 10
import = 1003
b = math.pi * c

int = 500

a ** 3
a,b,c = c,1,a
b,c,a = a,b
c = b = a = 7
print( A )
print( "b*b + a*a = c*c" )
print( 'A' )
print( "c" = 1 )

3 < 3 and 3/0 > 0
3/0 > 3 and 3 < 0
3 > 0 or 3/0 != 1
5 < 6 > 3

a, b, c = 4, -1, 11
c, b, a = a//2, int(c/3), b+c
print(a,b,c)
```

Ex 3.2 (Basic Python program)

Write a Python program that requests the number of hours one worked in a month and then prints out the gross pay, taxes, and net pay. Assume that the pay structure and tax rate are as follow:

- Basic pay rate = \$10.00 per hour
- Overtime (>160 hours) = one and a half time of the basic pay rate
- Tax rate = 10% for first \$1000, 20% for next \$500, and 30% for the rest

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Ex 3.3 (Looping with Pattern Recognition)

Write a Python program that reads an integer from the user that indicates the width of the pattern as shown below, and then prints out the pattern.

Hint: `print(" ",end="")`.

Please enter pattern width: 5

```
*  
**  
***  
****  
*****  
****  
***  
**  
*
```

Ex 4.1 (Use of string's built in functions)

You are running your own on-line business that requires your customers to first choose a password in order to create their online accounts.

There are certain requirements to improve the strength of a password. Develop a Python program that tests if a string satisfies some appropriate criteria for a strong password. (Hint: check individual character of password using string built in functions)

Ex 4.2 (Use of list's built in functions)

Given two lists of grades (list of integers) from two classes as shown below, write a Python program that will check which class has the highest average score and the highest maximum score.

```
scores1 = [10, 11, 15, 20, 55, 76, 90, 84]
```

```
scores2 = [4, 9, 12, 98, 35, 42, 4, 5, 10]
```

Ex 4.3 (Use of List comprehension)

Write a Python program, in the fewest number of lines possible, which creates a list of all the square numbers: x^2 (where $1 \leq x \leq 100$) that are divisible by 3.

Self-Practice Exercises - A**Ex 4.4 (Use of Dictionary)**

Consider a system for storing anonymous grades of the course with three lab groups as shown below. Each corresponding person in each group can have an ID number starting from 1 (to 4 in the example) that is used to access his/her grade.

Group	Student ID	Grade
FS1	1	45
FS1	2	75
FS1	3	25
FS1	4	65
FS2	1	85
FS2	2	40
FS2	3	70
FS2	4	80
FS3	1	80
FS3	2	70
FS3	3	45
FS3	4	60

- Write a Python program that allows the user to query for the individual score based on entering the student's Group (e.g., FS1) and student's ID (e.g., 2). You should use an appropriate data structure that will help to simplify the program logic of your design.
- Add the code that will print out the highest average score between the three groups, and the highest individual score among all the groups.
Hint: See Ex 4.3 and 4.2