CSE 101 - Computer Engineering Concepts & Algorithms (2020 Fall)

LAB#3

data types, operators

1. Create a list with 2 names as strings. Then create another list with 3 names as strings. Concatenate (+) two lists and create a third list. Then create a fourth list by repetition (*) by 3.

```
sgoren@ubuntu:~/CSE101-Python$ ./q1.py
['berk', 'zorbey']
['ayşe', 'mehmet', 'ugur']
['berk', 'zorbey', 'ayşe', 'mehmet', 'ugur']
['berk', 'zorbey', 'ayşe', 'mehmet', 'ugur', 'berk', 'zor
bey', 'ayşe', 'mehmet', 'ugur', 'berk', 'zorbey', 'ayşe',
 'mehmet', 'ugur']
```

2. Try to change the elements of the lists in part 1. Did it work?

3. Create an empty list, tuple, and dictionary. Show.

4. Create a tuple with 2 names. Then create another tuple with 3 names. Concatenate (+) two tuples and create a third tuple. Then create a fourth tuple by repetition (*) by 3. Did it work? If not explain why.

5. Create a dictionary of student names (strings) and ids (integers) where the keys are student names. Retrieve student id by the student name. Show me all the keys. Show me all the values.

```
sgoren@ubuntu:~/CSE101-Python$ ./q5.py
{'berk': 1234, 'fatih': 7680, 'sezer': 3456}
dict_keys(['berk', 'fatih', 'sezer'])
dict_values([1234, 7680, 3456])
Enter the key: fatih
7680
```

6. Convert any entered integer in binary, octal and hexadecimal into decimal using int(). Print the result.

```
sgoren@ubuntu:~/CSE101-Python$ ./q6.py
Please enter a number in base 2 : 101
5
Please enter a number in octal : 231
153
Please enter a number in hexadecimal : ADE3F7
11396087
sgoren@ubuntu:~/CSE101-Python$
```

7. Convert an entered string into a list. Print the list.

```
sgoren@ubuntu:~/CSE101-Python$ ./q7.py
Please enter a word: Çanakkale
Here is the character list
['Ç', 'a', 'n', 'a', 'k', 'k', 'a', 'l', 'e']
```

8. Write a Python script to add, subtract, multiply, take exponent divide, take modulus, and do floor division for entered integers.

```
sgoren@ubuntu:~/CSE101-Python$ ./q8.py
a = 34
b = 3
a+b= 37
a-b= 31
a*b= 102
a/b= 11.333333333333334
a%b= 1
a**b= 39304
a//b= 11
```

9. Write a Python script to check whether the first entered integer is equal to, not equal to, greater than, less than, greater than or equal to, less than or equal to the second entered integer. Print the result.

```
sgoren@ubuntu:~/CSE101-Python$ ./q9.py
a = 22
b = 5
(a==b) is  False
(a!=b) is  True
(a>b) is  True
(a<b) is  False
(a<=b) is  False
(a>=b) is  True
```

10. Write a Python script that tests operators: assign, add/multiply/divide/modules/subtract/floor divide AND assign two entered integers.

```
sgoren@ubuntu:~/CSE101-Python$ ./q10.py
a = 34
b = 2
After a=b, a= 2
After a+=b, a= 36
After a-=b, a= 32
After a*=b, a= 68
After a/=b, a= 17.0
After a%=b, a= 0
After a//=b, a= 17
```

11. Write a Python script that tests bitwise operators. Note that bin(x) converts an integer x into a binary string.

```
sgoren@ubuntu:~/CSE101-Python$ ./q11.py
Enter a binary number. a = 0101
Enter a binary number. b = 0110
a&b is  0b100
a|b is  0b111
a^b is  0b11
~a is  -0b110
~b is  -0b111
a<<b is  0b101000000
a>>b is  0b0
```

12. Write a Python script to test logical operators. Ask user to enter 3 integers a, b, and c. Evaluate conditions such as a>b, b==c, b!=c . Then use logical operators to evaluate the combinations of these conditions.

```
sgoren@ubuntu:~/CSE101-Python$ ./q12.py
Enter an integer. a = 12
Enter an integer. b = 15
Enter an integer. c = 7
a>b is  False
b==c is  False
b!=c is  True
((a>b) and (b==c)) is  False
((a>b) or (b==c)) is  True
The reverse logical state of b!=c is  False
```

13. Write a Python script. Create a list of integers. Ask user to enter an integer. Check it whether it is in the list or not.

```
sgoren@ubuntu:~/CSE101-Python$ ./q13.py
mylist=  [1, 2, 3, 56, 708, 501]
Enter a number which is not in the list=  6
6 in mylist False
6 not in mylist True
```

14. Evaluate the following to understand the operator precedence. Tell me the order of precedence.

```
sgoren@ubuntu:~/CSE101-Python$ ./q14.py
Enter an integer. a= 11
Enter an integer. b= 2
Enter an integer. c= 4
Enter an integer. d= 2
Enter an integer. e= 5
Enter an integer. f= 6
a**b-c*d+e-f=  112
```