Review

• String
  +, *, index, slices, immutable
• if
  if, elif, else
• for
  – Iterating over the items of any sequences
• range
  – will be explained again
Range

- Immutable sequence
- commonly used for looping a specific number of times in for loops

```python
>>> list(range(10))
```

```python
>>> for i in range(10):
    print(i)
```
Problem 1

• Write a source code for printing multiplication tables
  1) Printing all tables
  2) Printing a specified table for the user inputted number
Data Structures

1. List
2. Tuple
3. Set
4. Dictionary

stack, queue and etc.

http://docs.python.org/3.3/library/stdtypes.html
http://docs.python.org/3.3/tutorial/datastructures.html
List

• Mutable sequence

```python
>>> li1 = []               ← empty list
>>> li1 = list()
>>> li2 = [1,2,3]          ← 3 items in the list
>>> li2[0] = 4
>>> li3 = [[1,2],[3]]     ← 2 items in the list, 2\textsuperscript{nd} item is a LIST
>>> li4 = [[1,2],3]        ← 2 items in the list
```
List (cont.)

>>> li3.append(li4)
>>> li3.insert(3,3)
>>> li3
**Tuple**

- Immutable sequence

```python
>>> tu1 = ()  # empty tuple
>>> tu1 = tuple()
>>> tu2 = (1,2,3)  # 3 items in the tuple
>>> tu3 = ([1,2],3)  # 2 items in the tuple
>>> tu3[0][0] = 4
>>> tu3
([4,2],3)
```
List vs. Tuple

• Differences
  – Mutable vs. Immutable
Ex)
a = (1,2,3)
a[1] = 3 ← ERROR
b = [1,2,3]
b[1] = 3 ← OK
Set

• unordered collection of distinct objects

```python
>>> set1 = set()  # empty set
>>> set1.add(1)  # add 1 to set1
>>> set1.add("1")  # add "1" to set1
>>> set1.add(1)  # adding 1 again makes no difference
>>> set2 = set([1,2,3,4,1,2,3,4])
```
Dictionary

• Mapping keys to values
• Keys need to be immutable objects

```python
>>> ma1 = {} ← empty dictionary
>>> ma2 = dict() ← empty dictionary
>>> ma3 = {'one':1, 'two':2, 'three':3}
>>> ma3.keys()
'one', 'two', 'three'
>>> ma3.values()
```
Dictionary (cont.)

```python
>>> ma3['four'] = 4
>>> ma3
{'one': 1, 'two': 2, 'three': 3, 'four': 4}
>>> del ma3['one']
>>> ma3
{'two': 2, 'three': 3, 'four': 4}
```
Initialization Examples

>>> st = '1,2,3,3,2,1'
>>> tuple1 = eval(st)
>>> tuple2 = tuple(st)
>>> list1 = list(tuple1)
>>> list2 = list(st)
>>> set1 = set(st)
>>> set2 = set(tuple1)
>>> set3 = set(list1)
>>> map1 = dict(tuple1)
Problem 2

• Write a program that finds the largest number among three numbers using ‘if’ statement.

  – 3 number are input from keyboard separated by comma(,)
  – Example
    • Input 3 numbers : 10, 15, 14
    • Answer is : 15
  – HINT

    ```python
    nums = eval(input('Input 3 numbers : '))
    ```
Problem 3
-
숫자를 세어보아요!
-

쉼표로 구분된 수열을 입력 받아보세요.

1. 수열의 길이는 얼마인가요?
2. 수열이 몇 개의 수로 구성되어 있나요?
3. 각 숫자는 수열에서 몇 번씩 등장하나요?
>>> ====== RESTART ======

Enter a sequence: 2,5,6,3,2,6,2,4
----- Sequence Analyzed ----- 
Length : 8 
Number of Numbers : 5 – \{2,3,4,5,6\} 
Number of Each Number :
2 - 3
3 - 1
4 - 1
5 - 1
6 - 2
>>>