**Things you need to import**

* Import random for a math.random, number=random.random()
* Import re for regex expressions

**Dictionaries**

* A  **Dictionary** is another  mutable container type that can store any number of Python objects, including other container types. Dictionaries consist of pairs (called items) of keys and their corresponding values. Python dictionaries are also known as associative arrays or hash tables.
* The following is a general summary of the characteristics of a Python dictionary:
  + A dictionary is an unordered collection of objects.
  + Values are accessed using a key.
  + A dictionary can shrink or grow as needed.
  + The contents of dictionaries can be modified.
  + Dictionaries can be nested.
  + Sequence operations such as slice cannot be used with dictionaries.
  + Each key in a dictionary must be unique
* Ways you can create a dictionary
  + weekend = { "Sun": "Sunday", "Mon": "Monday" } #literal notation
  + vals = dict(one=1, two=2) # dict() function
  + capitals = {} #create an empty dictionary then add values
  + capitals["svk"] = "Bratislava"
  + capitals["deu"] = "Berlin"
  + capitals["dnk"] = "Copenhagen"
  + d = { i: object() for i in range(4) } #dictionary comprehension
* Dictionary example: **ex = {‘name’: ‘John’, ‘age’: 35}**
* Accessing values:
  + Print ex[‘name’] would print John
* Using for loops to access Keys and values
  + For data in ex:
    - Print data this would print all the keys: name, age
  + For key in ex.iterkeys():
    - Print key also prints all keys, just another way: name,age
  + For val in ex.itervalues():
    - Print val this would print all the values: John, 35
  + For key,data in ex.items():
    - Print key, ‘=’, data this would print all keys and values: name = John, age = 35
* cpm(dict1, dict2) – compares elements of both dictionaries
* len(ex) - gives the total length of the dictionary: 2
* str(ex) – produces a printable string representation of a dictionary.
* type(ex) – returns the type of the passed variable. If passed variable is a dictionary, it will then return the dictionary type.
* .clear() – removes all elements from the dictionary
* .copy() – returns a shallow copy of dictionary
* .fromkeys(sequenc,[value]) – create a new dictionary with keys from sequence and values set to value.
* .get(key, default=None) – for key *key*, returns value or default if key is not in dictionary
* .has\_key(key) – returns true if a given key available in the dictionary, otherwise it returns false
* .items() – returns a list of dictionary’s (key,value) tuple pairs
* .keys() – return a list of dictionary keys
* .setdefault(key, default = none) – similar to get(), but will set dict[key]=default if key is not already in dictionary.
* .update(ex) – adds dictionary dict2’s key-values pairs to an existing dictionary
* .values() – returns list of dictionary values.