CS 3753 & 5163 Data Science
Homework 1 (100 points)

Submission:
1. Submit a single python script (abc123_hw1.ipynb or abc123_hw1.py) through blackboard.
2. You should have the instruction of running your code at the beginning of your code. It should run successfully either in the basic Python3 environment or in Jupyter Notebook. There is a limit of half points max if the code cannot run. This is based on your code can output the correct result if it can run.
3. Do not compress your files and make sure all your files are in the same folder.
4. The late submission will lose 15% points and the compressed files will get a warning at the first time and will lose 10% points later.
5. You can submit your homework 3 times before the deadline.

Questions
1. String (20 points)
1. Creating a string "Welcome to Python Programming"
str = "Welcome to Python Programming"
or str = 'Welcome to Python Programming'
2. Output the string using the function Print
print(str)

3. Output the substring from indexes 11 to 16.
print(str[11:17])

4. Output the substring of the last 5 characters
print(str[-5:])

5. Concatenate the string '!!!' to the end of the string *str*
str = str + '!!!'
6. Output the string *str*
print(str)

2. List (32 points)
1. Create an empty list
ls = []

2. Add elements 1, 2, 3, 4 into the list one by one and output the list after all additions.
ls.append(1)
ls.append(2)
ls.append(3)

ls.append(4)
print(ls)

3. Add the tuple (5, 6) as an element to the end of the list and output the list.
ls.append((5, 6))
print(ls)

4. Add the list ['perfect', 'wonderful'] as an element to the end of the list and output the list.
ls.append(['perfect', 'wonderful'])
print(ls)

5. Concatenate the list [[7, 8], [9, 10]] into the list and output the list.
ls.extend([[7, 8], [9, 10]]) or ls += [[7, 8], [9, 10]]
 print(ls)

6. Add the multiple elements 8.5, 7, 'code', 'software' to the end of the list at once and output the list.
ls.extend([8.5, 7, 'code', 'software'])
print(ls)

7. Output the last 5 elements in the list
print(ls[-5:])

8. Remove the elements from indexes 3 to 6 and output the list.
del ls[3:7]
print(ls)

3. Tuple (16 points)

1. Create a tuple Tuple1 using the list with elements 1, 2, 3, 4 and output the tuple. (Note: there are many ways to create a tuple. You use the list to create the tuple here.)
Tuple1 = tuple([1,2,3,4]). Note: use the list [1,2,3,4]
print(Tuple1)

2. Create another tuple Tuple2 using elements 'Python', 'for', and 'kids' directly, and then output the tuple
Tuple2 = ('Python', 'for', 'kids').   Note: use the elements directly. No list here.
print(Tuple2)

3. Concatenate the tuple Tuple2 to the end of Tuple1 and assign the resulted tuple to Tuple1. Then output the tuple Tuple1.
Tuple1 = Tuple1 + Tuple2
print(Tuple1)

4. Output elements from index 3 to the end
print(Tuple1[3:])

4. Dictionary (32 points)

1. Creating an empty dictionary Dict
Dict = {}

2. Adding elements 0: 'Python', 1: 'Programming', 2: 'Funny' one by one and then output the dictionary.
Dict[0] = 'Python'
Dict[1] = 'Programming'
Dict[2] = 'Funny'
print(Dict)

3. Update the key 1's value to 'is very' and output the dictionary.
Dict[1] = 'is very'
print(Dict)

4. Output all the keys
print(Dict.keys())

5. Output all the values
print(Dict.values())

6. Delete the element with the key *2* and output the dictionary. (Note: you should delete the entire element with the key and value).
del Dict[2]
print(Dict)

7. Check for existence of key *2*
2 in Dict or 2 in Dict.keys()

8. Convert the dictionary Dict to a list. Only the values of the dictionary are in the list. Then, output the list.
print(list(Dict)) or print(list(Dict.values()))