Homework 10 (Max Points:100) **Due Date: April 23 by 11:59 pm EST**

Instructions: Each response should be in a .py file. Submit all your code to https://submitty.cs.rpi.edu

Answer the following questions:

1. Create a function that takes an integer as an argument and generates a dictionary that contains the numbers (between 1 and n) in the form (x, x*x). (**10 points**)
   Sample Dictionary (n = 5) :
   Expected Output : {1: 1, 2: 4, 3: 9, 4: 16, 5: 25}
2. Given the dictionary (from Question 1): squares = {1:1, 2:4, 3:9, 4:16, 5:25}. Do the following operations (without using any built-in methods) (**10 points**):
   a. Remove the item with key = 4
   b. Update squares to include square of 6
3. Create a phonebook that has names of your friends and their corresponding numbers with at least 3 or more entries. For example phonebook = {sam: 999122222, tom: 111222222, harry:123333333}. Write a program that takes the name of a friend as input and parses through the phonebook. If the name is in the phonebook, print the number of that friend otherwise print 'Not Found'. (**10 points**)
4. You are given the following data in the form of a Nested Python dictionary:

```
student_data = {'id1':
   {'name': ['Sara'],
    'class': ['V'],
    'subject_integration': ['english, math, science']
   },
 'id2':
  {'name': ['David'],
    'class': ['V'],
    'subject_integration': ['english, math, science']
   },
 'id3':
    {'name': ['Sara'],
    'class': ['V'],
    'subject_integration': ['english, math, science']
   },
 'id4':
   {'name': ['Surya'],
    'class': ['V'],
    'subject_integration': ['english, math, science']
   },
'id5':
   {'name': ['Dan'],
    'class': ['V'],
```

```
    'subject_integration': ['english, math, science']
   },
'id6':
   {'name': ['Dan'],
    'class': ['V'],
    'subject_integration': ['english, math, science']
   }
}
```

Our primary identifier for a record is the name of the student. As is evident from the data, there are certain records repeating. Write a program that removes these duplicate values from the student data. Your program must create a new dictionary OR update the existing one with no repeated records. (**30 points**)

5. Given a dictionary, my_dict ={"java":100, "python":112, "c":11, “R”: 131}. Write a python program/function that takes a number as an input and returns the corresponding key as the output from my_dict. If the input value does not exist, then the program must return ‘Key does not exist’. (**10 points**)
   Test Cases: get_key(100) : java
   get_key(131) : R
   get_key(140): Key does not exist
6. Create a Python program to match key values in two different dictionaries. (**20 points**)
   Test Cases: x = {'key1': 1, 'key2': 3, 'key3': 2}
   y = {'key1': 1, 'key2': 2}
   Result: key1: 1 is present in both x and y
7. Given a dictionary dict = {'Alex': ['subj1', 'subj2', 'subj3'], 'David': ['subj1', 'subj2']} , write a python program that returns the number of values for all keys. Fr example for dict the answer is 5 because total values in both lists is 5. (**10 points**)