Columbia College
Vancouver, Canada

Introduction to Computer Science and Programming 1
CSCI120

Chapter9: Dictionary + Set

Lab

Note: This document has been designed and developed as part of an initiative for creating an OER (Open Education Resource) package for the course CSCI 120 at Columbia College.

Please contact Alireza.davoodi@gmail.com for any comment, modification, and questions.

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# of Students in the Group:		
Student 1	*First name, last name*	*Student-ID*
Student 2	*First name, last name*	*Student-ID*
Student 3	*First name, last name*	*Student-ID*
Student 4	*First name, last name*	*Student-ID*

-Problem1

- Write a function that receives a positive integer number, line N, and creates a dictionary with the following format, prints and returns it. In this dictionary the keys are numbers from 1 to N and the values are the square of the keys.
- Example: If N=5 then the function should create and return the following dictionary:
- {1:1, 2:4, 3:9, 4:16, 5:25}

-Problem2

- Write a function that receives a dictionary as its input parameter. The dictionary is in form {Integer : Integer} The function will create a set which contain all keys of the dictionary, prints and returns the list.

-Problem3

- Define and implement a function which receives a list of dictionaries and combine the dictionaries and return the result.
- Note1: In all the dictionaries in the list, the key is an Integer and the value is String.
- Note2: The dictionary that is returned from the function is from Integer to list of String
- Example:
  - [{1:"A", 6:"B", 5:"D"},{5:"C", 2:"F"},{5:"C", 7:"G", 6:"B"}]
  - The function will combine these three items and returns:
  - {1:["A"], 6:["B", "B"], 5:["D","C","C"] , 2:["F"], 7:["G"]}

-Problem4

- Problem 2 is exactly similar to Problem1, the only difference is that the function will return a dictionary from Int to Set. Other than that everything is similar to Problem1.
- Example:

-
  - [{1:"A", 6:"B", 5:"D"},{5:"C", 2:"F"},{5:"C", 7:"G", 6:"B"}]
  - The function will combine these three items and returns:
  - {1:["A"], 6:["B"], 5:["D","C"] , 2:["F"], 7:["G"]}

-Problem5

- Design and develop a function which receives the names of several students and their grades in CSCI120 course. Your function should calculate and returns what percentage of students have received a grade more than the average of all grades.

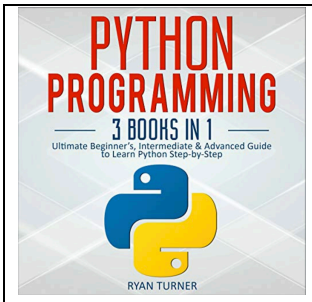
- For instance, imagine the following information is given

Student Name	Grade in Python Course
Malik	67
Jack	81
Peter	75
Susan	81
Rose	66
Amna	73
Sarah	90

- In this table, the average is: 76.14
- There are 3 grades (81, 81, 90) higher than the average (76.14)
- There are 7 students in total in this class and 3 of them have received a grade higher than average which means (3/7)*100 = 43% of students have received a higher than average grade. Your function should return 43 if the above information is given to it as its argument.
- Note: Use dictionary to represent the students and their corresponding grades.

-Problem6

- If you have to write a Python program and need to define variables to represent the following objects, how would you use dictionaries to represent the information.
- Example:

	Answer: I can use a variable and assign it to a dictionary like the following: Book = {"Title": "PYTHON PROGRAMMING", "SubTitle": "3 Boos in I", "Description": Ultimate …", "Author":"RYAN TURNER"}

- Define a variable for each of the item below to save the information shown in each item:

Example Business Name or Business Owner
123 Example Business Address
Boston, MA 02135

INVOICE

Example Customer Name
456 Example Customer Address
Boston, MA 02135

Invoice #	123456
Invoice Date	08/19/2020
Due Date	09/19/2020

Item	Description	Unit Price	Quantity	Amount
Service	Example of service in industry	25.00	4.00	100.00
Product	Example of product in industry	500.00	1.00	500.00
Discount	Example of discount in industry	-100.00	1.00	-100.00

NOTES: Provide a concise, professional description of the services, product, and discount listed above.

Subtotal	600.00
Total	500.00
Amount Paid	0.00
Balance Due	$500.00

Good Luck ☺