# 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.

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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:

|  |  |
| --- | --- |
| Text  Description automatically generated | 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:

|  |  |
| --- | --- |
| A picture containing graphical user interface  Description automatically generated |  |
| A picture containing text, cup, drink, food  Description automatically generated |  |
| Table  Description automatically generated |  |

**Good Luck ☺**