**Lab 8: Dictionaries**

Learning Outcomes:

* Get familiar with using dictionary data type.
* Get to solve problems using dictionary.

Instructions:

* Suggest that you create a working folder **is111\lab8** in your **C** or **D** drive. Store all your solutions in this working folder.
* Challenging questions are marked with \*.

To submit:

* Please submit your working solutions via your assignment Dropbox in eLearn **within 1 week**. The Dropbox will be closed after the due date.
* Zip up all your source files into a single zip file called **<your email ID>\_lab8.zip** (e.g. **ahlian.lim.2011\_lab8.zip**). You should only submit a single zip file for each lab.

1. [\*] In a file named **lab8\_1.py**, copy the code shown below that shows the price of items in a mart at line 02. The code also shows list of items along with the quantity bought by 2 customers at lines 17 and 18.

Complete the function compute\_bill in the file that takes in a dictionary of items purchased by the customer, and price of items and returns the amount to be paid.

|  |  |
| --- | --- |
| 01  02  03  04  05  06  07  08  09  10  11  12  13  14  15  16  17  18  19  20  21  22 | price\_info = {'pencil':0.80, 'pen':1.20, 'eraser':0.50 }  #complete this function  def compute\_bill(cart, pricing):  jane\_items = {'pen':10, 'eraser':2} eric\_items = {'pencil':12, 'eraser':5, 'pen':2}  print("Jane's bill amount $", compute\_bill(jane\_items, price\_info))  print("Eric's bill amount $", compute\_bill(eric\_items, price\_info)) |

Here is the output when **lab8\_1** is run (with the given test data):

|  |
| --- |
| D:\is111\lab8>**python lab8\_1.py**  Jane's bill amount $ 13.0  Eric's bill amount $ 14.500000000000002 |

To submit**: lab8\_1.py**

1. [\*] In a file named **lab8\_2.py**, write a program to read the file “capitals.txt” (adapted from the book “Starting out with Python by Tony Gaddis”, Page 434, Problem 2). Every line in “capitals.txt” consists of 2 parts, capital and country separated by a colon. Sample of the format in the text file is shown below

Singapore:Singapore

Thailand:Bangkok

…

The program should quiz the user 10 times by randomly displaying the country’s name and asking for the capital. The program should keep count of the correct responses and display the result.   
Optional: Ensure that no two questions quizzed on are the same.

(Careless in positioning of parameters in function)

E.g. def abc(para1, para2)

abc(para2,para1)

Here is the output when **lab8\_2** is run (with the given capitals.txt file):

|  |
| --- |
| D:\is111\lab8>**python lab8\_2.py**  1.What is the capital of Switzerland? Bern  Correct!  2.What is the capital of North Korea? pyongyang  Correct!  3.What is the capital of Pakistan? islamnad  Incorrect  … *some questions not shown for brevity*  9.What is the capital of Zambia?  Incorrect  10.What is the capital of Portugal? lisbon  Correct!  You got 6 / 10 correct |

To submit**: lab8\_2.py**

1. [\*\*]In a file named **lab8\_3.py**, write a program to read from the file called “tempest.txt”. The program is supposed to read words in the file and print the number of words beginning with every unique alphabet in the .txt file

Note: When you think of designing the solution for the program think of solving simple problems that could be tested first before you can put them together. For example, you could write function to read the file and create word list in one function.   
Test this function before you write another function that takes in a list of words and assists to count the number of words starting with every different beginning letter. You may want to use dictionary to hold these count!

Here is the output when **lab8\_3** is run (with the given tempest.txt file):

|  |
| --- |
| D:\is111\lab8>**python lab8\_3.py**  Words beginning with b : 1  Words beginning with n : 3  Words beginning with a : 12  Words beginning with t : 11  Words beginning with i : 8  Words beginning with f : 1  Words beginning with o : 2  Words beginning with s : 7  Words beginning with g : 1  Words beginning with d : 4  … *rest not shown for brevity* |

To submit**: lab8\_3.py**

1. [\*\*]In a file named **lab8\_4.py**, copy the code shown below. Write a function called reverse\_dict in the file that takes in a dictionary and reverses the dictionary. That is, you are supposed to return a new dictionary that creates keys out of values and values out of keys. (tough qn, hint to solve this is to consider iterating either the original dictionary or the new list values)

You can assume that the input to the functions consists of dictionary whose values are list objects.

|  |  |
| --- | --- |
| 01  02  03  04  05  06  07  08  09  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24  25  26  27  28 | #Author: your name here  #write the function  dict1 = reverse\_dict( {"a":[1,2,3], "b":[1,2], "c":[3,4], "d":[5,6]} )  student\_subjects = reverse\_dict({ "Jane":["Economics","Physics","Chemistry"], "Mark":["Literature","Chemistry","Biology"], "Sarah":["Literature","Physics","Chemistry"]} )  print(dict1)  print()  print(student\_subjects) |

Here is the output when **lab8\_4** is run (with the given two test data):

|  |
| --- |
| D:\is111\lab8>**python lab8\_4.py**  {1: ['a', 'b'], 2: ['a', 'b'], 3: ['a', 'c'], 4: ['c'], 5: ['d'], 6: ['d']}  {'Economics': ['Jane'], 'Physics': ['Jane', 'Sarah'], 'Chemistry': ['Jane', 'Mark', 'Sarah'], 'Literature': ['Mark', 'Sarah'], 'Biology': ['Mark']} |

To submit**: lab8\_4.py**

1. [\*\*\*] You are given a file “fifa\_winners.txt” that contains information of winners of FIFA world cup since 1930. In a file named **lab8\_5.py** write code to get the top 3 winners. That is, you are required to print the names of the countries who have won the FIFA world cup most number of times, along with number of times each country has won.

Format of the file is shown below: The first column shows the year, and the second column shows the country that won the world cup the corresponding year. The two columns are separated by 1 tab (\t) character. (check model answer besides using pop() method to get the top 3 answers)  
  
1930 Uruguay

1934 Italy

Here is the output when **lab8\_5** is run:

|  |
| --- |
| D:\is111\lab8>**python lab8\_5.py**  Brazil 5  Italy 4  West Germany 3 |

To submit**: lab8\_5.py**