Programming assignment unit 7

**Code:**

def invert(d):

print("Original dictionary:\n",d, "\n")

reversed\_dict = dict()

for student, courses in d.items():

for course in courses:

if course in reversed\_dict:

reversed\_dict[course].append(student)

else:

reversed\_dict[course] = [student]

print("Reversed dictionary:")

return reversed\_dict

student\_info ={

'Stud1': ['CS1101', 'CS2402', 'CS2001'],

'Stud2': ['CS2402','CS2001','CS1102']

}

a = invert(student\_info)

print(a)

Explain:

Our program contains one function *invert()* that takes one parameter *d*. First thing the function does is to print the dictionary we want to invert. After that, it defines local dictionary *reversed\_dict* using *dict()* built-in function, later on, we will store the reversed version of the original dictionary in it. Now, since the value of the dictionary we want to invert is a list, we need to loop twice, first loop in the dictionary itself, then loop through the lists, which are the values.

In the first loop, we used tuple assignment, then we used the method *items()* to convert the dictionary into a list of tuples, each tuple contains two elements, the key and its corresponding value. Finally, we stored these elements in the two local variables, *student*, and *courses* we defined them with tuple assignment. *Student* represents the keys ‘*Stud1*’, ‘*Stud2*’, and *courses* represents the lists.

In the nested loop we traverse through the lists represent by local variable *courses* and store each element in the local variable *course* (without ‘s’). Inside this loop, we check if this *course* is already representing key in *reversed\_dict*, if so, we append to it the key of the original dictionary which stored in the variable *student* as a value. Else, if the *course* doesn’t exist in *reversed\_dict*, we use it as key and give it a value of type *list*, and inside this list we store the original dictionary keys student as elements. Finally, we return the *reversed\_dict*.

**Output:**

Given the dictionary:

student\_info ={

'Stud1': ['CS1101', 'CS2402', 'CS2001'],

'Stud2': ['CS2402','CS2001','CS1102']

}

The output is:

Original dictionary:

{'Stud1': ['CS1101', 'CS2402', 'CS2001'], 'Stud2': ['CS2402', 'CS2001', 'CS1102']}

Reversed dictionary:

{'CS1101': ['Stud1'], 'CS2402': ['Stud1', 'Stud2'], 'CS2001': ['Stud1', 'Stud2'], 'CS1102': ['Stud2']}

As the output shows, the function took the dictionary *student\_info* as a parameter, and reverse it.

Thanks.

**Reference**

Downey, A. (2015). <https://greenteapress.com/thinkpython2/thinkpython2.pdf>