CS 101 Homework #9

Deadline: November 23rd, 9:00 pm.
Save your code as lastname_homework9.py and submit on Edmodo.
Please, run your code before submitting.
If you get an error, try to fix it before submitting your homework.

For this homework, we continue using the data below with some additional information:

Variable	"capital"	"population"	"area"
Unit		"million people"	"million square miles"
Canada	Ottawa	37.6	3.86
Mexico	Mexico City	129.2	0.76
USA	Washington DC	327.2	3.80

Question 1

Previously (see posted homework #8 solution) we had the following code:

```
if v == 1:
    print(f"The capital of {cdata[c][0]} is {cdata[c][1]}")
elif v == 2:
    print(f"The population of {cdata[c][0]} is {cdata[c][2]} million people.")
else:
    print(f"The area of {cdata[c][0]} is {cdata[c][3]} square miles.")
```

This is potentially inefficient. What if we have thousands of variables describing a country?! Can you can get rid of the IF statement and reduce the previous 6 lines of code to just one, which prints essentially:

The <variable> of <country name> is <country & variable data> <variable units>.

The table above should help with this task.

Question 2

On the basis of the information that you already have, generate a new variable, "population density", which is equal to population divided by area (with the corresponding unit "residents per square mile"). Please, do this AFTER cdata is already created. *Append* new data to the existing dataset.

Question 3

Allow the user to add new countries to the dataset if the user types "add country" in the user query. In this case, the user must type a new country name, capital, population, and area. The population density can be found on the basis of the latter two variables. Test your code (for example, you can use data for Brazil: "Brazil", "Brasilia", 209.3, 3.29). Notice that you can ask the user to provide the new country data one variable/entry at a time or all at once; feel free to use the option that you like more. (One entry at a time is probably easier).

Question 4

Allow the user to delete a country (with all of its data) by typing "delete <country name>". For example, if the user types "delete Canada", all information about Canada will be deleted from the dataset. Verify that your code works.

Question 5

For this exercise type:

cn = ["Canada", "Mexico", "USA"]
cn2 = cn
cn_copy = cn.copy()

Now change one of the items in cn and explore how it affected cn2 and cn_copy.

Question 6

For this question use cdata nested list from the homework.
Create a copy of cdata: cdata_copy = cdata.copy()
Change an item in cdata and explore how it affected cdata_copy.

Try the following changes (one at a time):

cdata[0][2] = 999
cdata[0] = 777

What can you conclude on the basis of Questions 5 and 6? (You can type your response using Python comments)