Lab 05 - Hashing

Before you come to the lab

1. Read this document carefully to properly prepare for the lab and turn in your lab solution (i.e., your lab report as per the instructions presented here).
2. Read Sections 5.5 to 5.5.4

Prelude

You will be creating test cases for this lab. Therefore, as per the guidelines provided in the testing in Python website (https://realpython.com/python-testing/), create the following folder for your lab05:

```
lab05/
│
├── hashing/
│   └── __init__.py
├── report.ipynb
└── test.py
```

- `__init__.py` should contain the Python code you have developed as solutions for the exercises in this lab assignment.
- `test.py` will contain your tests
- `report.ipynb` is your Jupyter Notebook report file

Exercise 1

In the hash table map implementation provided in Active code 1 of Section 5.5.3 of the textbook, the hash table size was chosen to be 11.

Re-implement the `put` method so that the table will automatically resize itself when the loading factor reaches a predetermined value (you can decide the value based on your assessment of load versus performance). Set your initial table size to 11.

Lab report

In your report, profide specific answers to the following questions:

1. Why did you choose a particular resizing method? How much does your table grow at each resize operation?
2. What loading factor threshold have used for the resizing the table and why that particular choice?

Unit testing

Create test cases that test putting key-data pairs in the table before table resizing, and then getting that data after table resizing.

Preparing to submit your report

1. Ensure you have structured your `lab05` folder as indicated in Section Prelude above.
2. Ensure you have properly created your unit tests in `test.py` in your `lab05` folder.
3. Ensure you have inserted your jupyter notebook report in your `lab05` folder, as required in Exercise 1 above.
4. Create a zip file of your `lab05` folder.

What to submit

At the Lab web page in D2L, click on `Lab Solution Submission`, then attach and submit **only the zip** file you have created as per the instructions above.