AI Programming (CB2001103-059) HW03

Note

For the following problems, write a program to solve the problem and display the answer. A possible output is shown in a example I/O section and responses to input statements appear **green**. Make sure you run scripts using Python 3.

Submission format

HW03_(NAME)**.zip** included:

- HW03_A_(NAME)**.py – CODE** for Problem A and sufficient **COMMENTS.**
- HW03_B_(NAME)**.py – CODE** for Problem B and sufficient **COMMENTS**.
- HW03_(NAME)**.pdf - SCREEN SHOT** of terminal that run example case.

Homework Policy

Late penalty: 20 points per 12 hours

Any cheating → 0 point for anyone involved

- Copying from a fellow student
- Copying from the Web or ChatGPT/ChatGPT-like apps.
- Working together with a group of students on this non-group assignment.
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Problem A. File of Names [50 points]

Problem

The file **Names.txt** contains a list of first names in alphabetical order. Write a program that requests a name from the user and inserts the name into the file in its proper location. If the name is already in the file, it should not be inserted. The data received from the file must be stored as a set data type.

Functions

readSetFromFile(): read set from Names.txt. If the file does not exist, exit.
inputName(): input the name from the terminal.
insertSet(mySet, name): insert the name into set.
writeToFile(modifiedSet): write set to Names.txt.

Restrictions

You should use **set operations** in your program.
Use **os.path.isfile** method and **exit** function in readSetFromFile().
Do not modify main function.

Skeleton Code

```
Import os.path

def readSetFromFile():        #implement functions
def inputName():
def insertSet(mySet, name):
def writeToFile(modifiedSet):

def main():
    mySet = readSetFromFile()
    name = InputName()
    modifiedSet = insertSet(mySet, name)
    writeToFile(modifiedSet)

main()
```

Example I/O

	Terminal	Names.txt (before)	Names.txt (After)
Case 1	Enter a first name to be included: Grape Grape is added in Names.txt	Apple Orange	Apple Grape Orange
Case 2	Enter a first name to be included: Grape Grape is already in Names.txt	Apple Grape Orange	Apple Grape Orange
Case 3	Name.txt does not exist. Terminate program.	-	-

Submit format

HW03_A_(NAME).py

Problem B. Unit Conversions [50 points]

Problem

The following table contains some lengths in terms of feet. Write a program that requests the unit to convert from, the unit to convert to, and the quantity to be converted; and then displays the converted quantity. Use the file **Units.txt** to create a dictionary that provides the number of feet for a given unit of length.

Equivalent lengths.

1 inch = .083333 foot	1 rod = 16.5 feet
1 yard = 3 feet	1 furlong = 660 feet
1 meter = 3.28155 feet	1 kilometer = 3281.5 feet
1 fathom = 6 feet	1 mile = 5280 feet

Functions

populateDictionary(): create dictionary from Units.txt to convert units.

getInput(): Input units and length from the terminal.

Restrictions

You should use **dictionary operations** in your program.

Do not modify main function.

Skeleton Code

```
def populateDictionary():        #implement functions
def getInput():

def main():
    feet = populateDictionary()
    orig, dest, length = getInput()
    answer = length * feet[orig] / feet[dest]
    print("Length in {0}: {1:,.4f}".format(dest, answer))

main()
```

Example I/O

```
Unit to convert from: yard
Unit to convert to: mile
Enter length in yard: 555
Length in mile: 0.3153
```

```
Unit to convert from: meter
Unit to convert to: rod
Enter length in meter: 190000
Length in rod: 37,787.5455
```

Submit format

HW03_B_(NAME).py