Spring 2019
Computer Science I
Section 4 – TU-TH – 9:00AM – Fulton 250
Section 5 – TU-TH - 10:30AM – Fulton 250
Office Hours Monday and-Friday -10:00AM – 12:00AM
St Mary - CS Department – Of. 281.

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Midterm 2

General Instructions

Create a folder named ***LASTNAME_FIRSTNAME***. You will populate the folder with **ALL** of the .py files you write for this homework. To submit the midterm, verify the folder includes all your .py files, compress (zip) the folder then upload to Canvas. Remember to include the following comments at the **top of each** of your .py files:

```
# author:
# question number (number and letter):
```

What to submit in Canvas?

Make sure all your files are saved in the folder LASTNAME_FIRSTNAME, then compress (zip) the folder and upload to Canvas.

If you encounter any problems in completing the assignment or in the submission process, please don't hesitate to ask for help. The sooner, the better!

IMPORTANT

Now that you are already familiar with functions, almost all your code must be inside functions! Points will be taken if you put too many line of codes outside functions.

Don’t forget, if your game **does not run** and shows errors when we try to evaluate and correct, you will have an **automatic 0. No arguing, no complaints!!!**

This midterm has three questions, each question has two options A and B. You will need to do ONE letter (A or B) for each question.

Question 1 - Recursion

Option A

Write a function called **one_digit** that receives a number as a parameter and returns the sum of its digits. But the sum of its digits must be equal or smaller than 9. If you remember in Midterm1 you did this exercise but for just two digits, now I want the same thing using recursion and working with generic numbers. **This function must be RECURSIVE. If you do a non-recursive function you have an automatic 0 on the question.**

Example:

one_digit (16) returns 7,
one_digit (76) returns 4.
one_digit(7688) returns 2,
one_digit (161616) returns 3.

Option B

Create a function called **last_digits** that receives an integer number x as parameter. This function must take out the first digit of a number and return all the other digits. **This function must be RECURSIVE. If you do a non-recursive function you have an automatic 0 on the question**

Example:

last_digits (5372) = 372
last_digits (1224) = 224
last_digits (2017) = 17

Question 2 – File and Dictionaries

Consider information about food preferences that is stored in a file in the following format.

Each line represents information about one person, one food and their preference in order. We don't have the whole file, so do not expect to have all the preference for everyone. For each line, there are three pieces of information and two separators (in this order): the name of the person, two points (:), the food or beverage they choose, the money symbol ($), and the order of this food or beverage in their preference list. Note that preferences are an integer.

Shown below is a sample file. In the first line the customer is "Bradley Atkinson", he has said "Shushi" is his preference number "1". The real file is compressed with the midterm instructions and is called "test.txt".

```
Bradley Atkinson:Sushi$1
Gini Carlson:Cafe$1
Ming Lao Zhang:Ice Cream$2
Gini Carlson:Dippers$9
Ming Lao Zhang:Dippers$1
Emily Sue Lynn Moon:Pizza$2
Bala Yavatkar:Shakes$1
```

Option A

Read the file and create a dictionary where the name of people is the key. Their food preference and its order are values that need to be stored as list of values.

Example:

```
{'Bradley Atkinson': [['Sushi', 1], ['Dippers', 2]],
'Gini Carlson': [['Cafe', 1], ['Dippers', 9], ['Tacos', 3], ['Pizza', 2]],
'Ming Lao Zhang': [['Ice Cream', 2], ['Dippers', 1], ['Shakes', 3], ['Pretzels', 4]],
'Emily Sue Lynn Moon': [['Pizza', 2], ['Dippers', 1], ['Tacos', 5], ['Pretzels', 4]],
'Bala Yavatkar': [['Shakes', 1], ['Tacos', 2], ['Dippers', 4], ['Pretzels', 3], ['Pizza', 5]]}
```

Option B

Read the file and create a dictionary where the food is the key. The name and the preference must be a list (values of the dictionary key).

Example:

```
{'Sushi': [['Bradley Atkinson', 1]],
'Cafe': [['Gini Carlson', 1]],
'Ice Cream': [['Ming Lao Zhang', 2]],
'Dippers': [['Gini Carlson', 9], ['Ming Lao Zhang', 1], ['Bradley Atkinson', 2], ['Emily Sue Lynn Moon', 1], ['Bala Yavatkar', 4]],
'Pizza': [['Emily Sue Lynn Moon', 2], ['Gini Carlson', 2], ['Bala Yavatkar', 5]],
'Shakes': [['Bala Yavatkar', 1], ['Ming Lao Zhang', 3]],
'Tacos': [['Bala Yavatkar', 2], ['Gini Carlson', 3], ['Emily Sue Lynn Moon', 5]],
'Pretzels': [['Ming Lao Zhang', 4], ['Bala Yavatkar', 3], ['Emily Sue Lynn Moon', 4]]}
```

Question 3 – Dictionaries and Lists

Option A

Someone wants to know who are the people that has Tacos in their list. Create a function to do that. So, assume you have a dictionary as mentioned in Question 2A and create a list of names with everyone that loves Tacos in order of preference. If you can do it your answer should be (In this exact order):

```
['Bala Yavatkar', 'Gini Carlson', 'Emily Sue Lynn Moon']
```

Option B

Someone want to know which person is that we had more information about it. So you may assume that you have the dictionary from Question 2 A and you just need to create a function that reads this dictionary and prints out who is the person that has more options in the dictionary and print its name and his/her options. If you can do it your answer should be:

```
Bala Yavatkar
[['Shakes', 1], ['Tacos', 2], ['Dippers', 4], ['Pretzels', 3], ['Pizza', 5]]
```