School of Information Systems
Academic Year 2019/20
Term I

IS111: Introduction to Programming

Lab Exercise 06: Tuples and Parameter Passing

Optional submission deadline: **Sun 29 Sep 2019 @ 2359 hrs**

INSTRUCTIONS

You are expected to read through the accompanying lesson 06 notes before attempting lab exercise 06. You should attempt the questions using **Visual Studio Code**. Each question should be submitted on a different file.

Do not submit Level 1 questions; use the discussion forum for that.

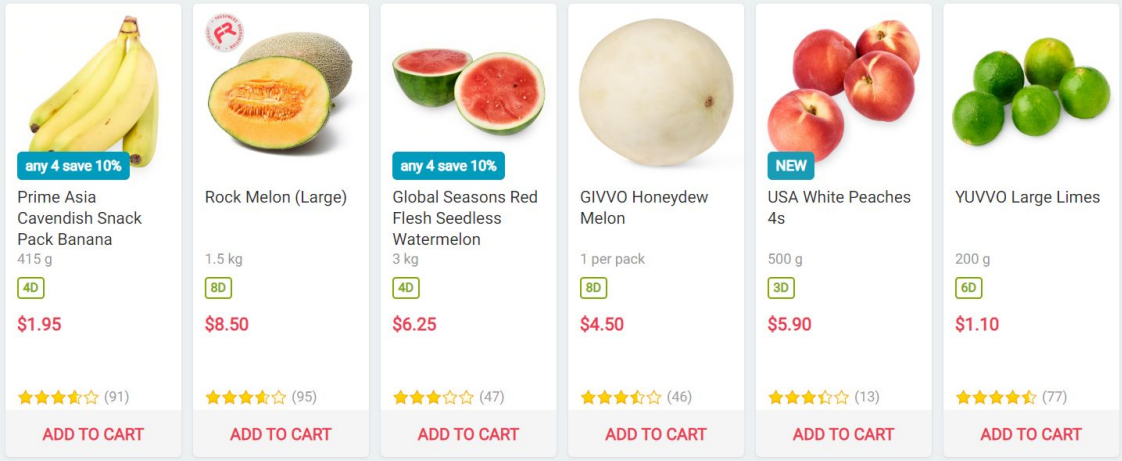
To submit, you should:

1. Name your 2 files as **week6-qn2-1.py** and **week6-qn3-1.py**.
2. Submit the 2 .py files to **eLearn → Assignments** by the stipulated deadline.

Level 1 Questions (no submission required; use the discussion forum)

1.1 Fruits

Redmart sells different types of fruits, such as bananas, rock melons, and so on.



Write a Python function `get_cheapest_fruit` that takes in a single list parameter `price_list` that contains a list of tuples of the price of each fruit. The tuple is in the form `(fruit_name, price)`, for example `('banana',1.95)`.

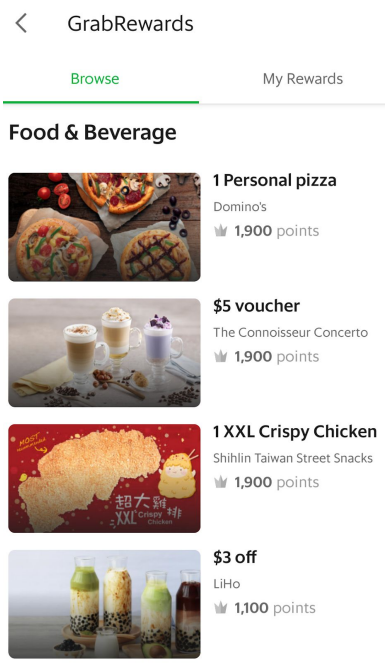
The function should return the fruit that has the cheapest price. You may assume that all the fruits have different prices and hence, you only need to return one fruit.

You can use the following code snippet to test your code:

```
# the following statements should return True
print(get_cheapest_fruit([('banana',1.95), ('rockmelon',8.50),
('watermelon',6.25), ('melon',4.50), ('peach',5.90), ('limes',1.10)])
== 'limes')
print(get_cheapest_fruit([('lemons',4.05), ('apples',4.00),
('oranges',3.75)]) == 'oranges')
```

1.2 Grab Rewards

After considerable effort, you have now managed to earn enough Grab points to redeem some items from GrabRewards. You open the Grab app and decide that you want to use *all* your points to redeem the '$3 off' vouchers from LiHo, so that you can buy lots of bubble tea to drink while working on your IS111 lab exercises.



Write a Python function `get_rewards` that takes in two integer parameters `total_points` and `points_required`, which represent the total points that you currently have, and the points required to redeem the item that you want, respectively.

Your function should return a tuple in the form `(max_rewards, remaining_points)`, which represent the maximum number of rewards that you can redeem, and the remaining points that you have after redeeming those rewards.

You can use the following code snippet to test your code:

```
# the following statements should return True
print(get_rewards(4300,1100) == (3,1000))
print(get_rewards(20540,360) == (57,20))
print(get_rewards(2300,3000) == (0,2300))
```

Level 2 Questions

2.1 Shopping Cart

You have decided to purchase some fruits on Redmart. The fruits that you have decided to purchase are given as a list of tuples, where each tuple is in the format `(fruit_name, price, quantity)`. For example, the tuple `('banana',1.95,4)` means that you have decided to purchase 4 bananas, each of which costs $1.95.

Write a Python function `compute_shopping_cart`, which takes in a single list parameter `shopping_list` that contains the list of tuples of the fruits that you have decided to purchase. The function returns the total amount of the shopping cart (i.e., total amount of money you have to pay for all the fruits that you have decided to purchase).

You can use the following code snippet to test your code:

```
# the following statements should return True
print(compute_shopping_cart([('banana',1.95,1), ('rockmelon',8.50,3),
('watermelon',6.25,2), ('melon',4.50,1), ('peach',5.90,0),
('limes',1.10,6)]) == 51.05)
print(compute_shopping_cart([('lemons',4.05,4), ('apples',4.00,2),
('oranges',3.75,3)]) == 35.45)
```

3 Brownie Points 🍪

3.1 Tic-Tac-Toe Checker

In the game of Tic-Tac-Toe, two players (*X* and *O*) take turns to mark spaces in a 3x3 grid. The player who succeeds in placing three of his/her marks in a horizontal, vertical, or diagonal row wins the game. Each of the 9 spaces in the Tic-Tac-Toe may be marked with *X*, *O* or `-` (which means un-marked). Write a Python function `tic_tac_toe_checker` which takes in a single input parameter `marked_play`, and returns either:

- *X*, if player *X* has won;
- *O*, if player *O* has won; or
- *D*, if the game is a *D*raw.

You may assume that the list `marked_play` contains 9 elements, which can be *X*, *O* or -. For instance, if `marked_list = ['X', 'X', 'O', '-', 'X', 'O', '-', 'O', 'O']`, this represents:

X	X	O
-	X	O
-	O	O

You may also assume that the usual rules of Tic-Tac-Toe apply. For instance, there can only be one winner at any one time. You can use the following code snippet to test your code:

```
# the following statements should print True
print(tic_tac_toe_checker(['X', 'X', 'O', '-', 'X', 'O', '-', 'O',
'O']) == 'O')
print(tic_tac_toe_checker(['X', 'X', 'O', 'O', 'X', 'O', '-', 'O',
'X']) == 'X')
print(tic_tac_toe_checker(['X', 'X', 'O', 'O', 'O', 'X', 'X', 'X',
'O']) == 'D')
```

💬 **This question was part of lab test 2 last year.**

💾 16 Sep 2019