

FOURTH QUIZ

You have 15 minutes from the start of class to complete this quiz. Read the questions with care; work with deliberate speed. Don't give us more than we ask for. The usual instructions apply. Good luck!

Problem 1 (7 points)

Along with this quiz we have distributed a copy of the POS Inventory problem we have been constructing together in class. In this problem, a customer's visit to the store is represented with two lines in the input:

```
Arnold Anteater
$ 20 333444    1 555666    3 778899
```

The first line is the customer's name; the second has a character to indicate cash or credit, followed by pairs of numbers representing the quantity bought and the product's item number. The lines above say that Arnold Anteater bought (for cash) 20 of item number 333444, one of item 555666, and three 778899s.

Please answer each of these questions about the code. In each case, just a few words will do.

(a) The function `buildVisit` takes two arguments: the name and a single string holding the whole second line.

(a.1) (1 point) In terms of coding style and documentation, what is missing as the first line of this function that some of the other functions in this program have?

(a.2) (1 point) What does the line `purchases = purchases[1:]` do?

(a.3) (2 points) Given the data above, what is the value of `ListOfPurchaseNumbers` after its assignment in line 9 of `buildVisit`?

(b) (3 points) The function `buildVisit` returns a `StoreVisit` object with three fields: the customer's name, a string indicating cash or credit, and a list. For the data above, what is the value of the third (list) field of the `StoreVisit` object that `buildList` returns?

Problem 2 (10 points)

We can organize a parking lot in various ways:

(a) A conventional flat parking lot has a separate parking space for each car, with the spaces arranged in rows. The driver can choose a particular row and a particular space within that row, regardless of how many other cars are parked in the lot. Is this kind of parking lot more like an array, a stack, a queue, a linked list, or a tree? [Answer with the data structure whose most important characteristics most closely match the situation.]

(b) At the Hollywood Bowl, the parking lot is one long driveway snaking up a hillside. Cars drive in and park right behind the car in front of them, one behind another (behind another behind another ...). A car can't leave until all the cars in front of it have left. Is the Hollywood Bowl parking lot more like an array, a stack, a queue, a linked list, or a tree?

(c) Joe lives a block away from a sports stadium; his house has a long driveway that extends straight from the street and ends at his garage. On game days, Joe sells parking spaces in his driveway for \$25 each. Each car that arrives drives as far down the driveway as possible; after the game, that car can't leave until all the cars behind it have left. Is Joe's driveway more like an array, a stack, a queue, a linked list, or a tree?

(d) Which of the above parking lot arrangements ((a), (b), or (c)) is most efficient in terms of the drivers' time (and, in a couple of words, why)?

(e) Which of the above parking lot arrangements ((a), (b), or (c)) is *least* efficient in terms of the space required by the lot (and, in a couple of words, why)?

Problem 3 (3 points)

What fundamental characteristic(s) of vectors (arrays) provides constant-time access to any element given the element's index (subscript)?