

# EIGHTH 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 (8 points)

(a) (5 points) Fill in the body of the function below according to its docstring. The function `len()` returns the length of a list.

```
def average(L: 'list of prices') -> float:
    """ Return the average of the input list """
```

(b) (3 points) Rewrite your definition from part (a) below so that it prevents division by zero (and just returns a zero in that case). (If you already did this in your answer to part (a), you don't have to do anything else here.)

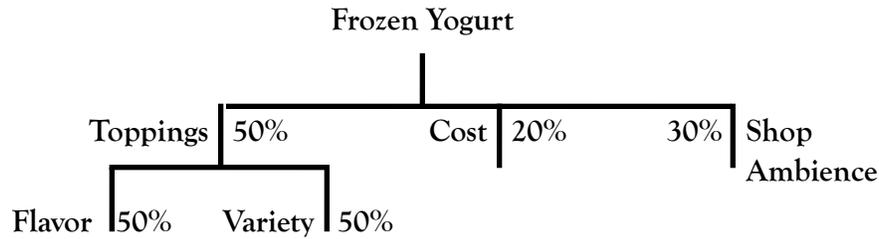
## Problem 2 (5 points)

Which of the following are accurate statements about sorting algorithms and the film *Sorting out Sorting*? (Answer true or false.)

- \_\_\_\_\_ All the algorithms shown in the film were either  $O(n \log n)$  or  $O(n^2)$ .
- \_\_\_\_\_ We sometimes distinguish comparisons from data movements because comparisons are slower.
- \_\_\_\_\_ Using a tree-based sort guarantees you at least  $O(n \log n)$  performance.
- \_\_\_\_\_ Exchange sorts swap values' positions to bring them closer to the correct order.
- \_\_\_\_\_ With some  $O(n^2)$  sorting algorithms, as  $n$  gets larger, the amount of time required levels off.

**Problem 3** (5 points)

Below is a relevance tree for frozen yogurt shops.



Overall relevance  
of each node:

\_\_\_\_\_

Alt. 1: Bear Pinky's      4                  8                  2                  10                  \_\_\_\_\_

Alt. 2: Ink Cherry's      6                  4                  8                  8                  \_\_\_\_\_

*Ratings of  
alternatives*

(a) (4 points) Fill in the six blanks to calculate the ratings of each alternative. Showing your work might increase your chances of getting partial credit if your arithmetic is wrong (but it should all be easily doable in your head). Finally, according to this relevance tree, which yogurt shop should you choose?

(b) (1/2 point) Which of the two shops has the better ambience?

(c) (1/2 point) Which of the two yogurt shops costs less?

**Problem 4** (2 points)

You run a customer support center where operators receive calls from customers. The customer requests fall into three categories: returning purchased merchandise (“returns”), technical support (“support”), and general information (“info”). Of all the calls, 25% are returns (which take an average of 4 minutes each), 50% are info (which take 2 minutes each), and 25% are support (which take 12 minutes each). What’s the expected length of a customer call (i.e., the expected value of the length of a call, counting all categories)?