

FIFTH QUIZ

You have 15 minutes from the start of class to complete this quiz. Read the problems 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 binary tree is either empty or (make-node value left right), where value is a rrant and left and right are binary trees. Complete the function definitions below. All the parentheses are in the correct places and each blank should be filled by exactly one item: symbol, function name, or constant. Restaurants are defined as usual:

```
(define-struct rrant (name cuisine phone dish price))
;; match-cuisine?: rrant string -> Boolean
;; Return true if the input restaurant's cuisine matches the input string
(define match-cuisine?
  (lambda (R C)
    (string=? _____ (rrant-cuisine R))))
;; sum-selected-prices: binary-tree-of-rrants string -> number
;; Return the sum of the prices of each restaurant that serves the specified cuisine.
(define sum-selected-prices
  (lambda (T foodtype)
    (cond
      ((_____ T) _____)

      (else (_____
                (_____ (_____ T) _____)
                (cond
                  ((_____ (_____ T) _____) (_____ (_____ T)))

                  (else _____))
                (_____ (_____ T) _____))))))
```

Problem 2 (12 points)

Along with this exam is a copy of the Restaurants program. This version includes erasing the collection, adjusting prices, and a collection implemented using a binary search tree.

(a) (3 points) Which function(s) make up the “model” portion of this program (as opposed to the “view” and “controller” portions)? List their names below.

(b) (1 points) Which function(s) implement insertion into a binary search tree?

(c) (2 points) Which function(s) traverse the binary search tree?

(d) (3 points) Does this program implement lazy deletion or conventional deletion? In one brief English sentence, how can you tell (i.e., what parts of the code answer this question)?

(e) (3 points) Why does the restaurant collection include the function `collection->list`? In other words, what's the use or need for converting the BST into a list?

That's the end of the quiz. This line is here mainly so you don't fill the page with your answers.