

SECOND 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 (4 points)

Evaluate each of the following expressions. (That is, what does DrScheme display in the interactions window when you enter the expression or click Run?)

(a) `(define decimate
 (lambda (num)
 (- num (/ num 10))))`

`(decimate 200)`

`(decimate 400)`

(b) `(define letter-grade ; not necessarily for this class`

```
  (lambda (score)
    (cond
      ((>= score 98) 'A+ )
      ((>= score 93) 'A  )
      ((>= score 90) 'A- )
      ((>= score 88) 'B+ )
      ((>= score 83) 'B  )
      ((>= score 80) 'B- )
      (else 'lower ))))
```

`(letter-grade 85)`

`(letter-grade 90)`

(c) `(+`

`(* 5 (- 10 2))`

`(/ (+ 20 30) (* 2 5)))`

Problem 2 (5 points)

We define a restaurant as a structure

```
(define-struct rrant (name cuisine phone dish price))
```

where name, phone, and dish are strings, cuisine is a symbol, and price is a number.

(a) (2 points) Fill in the blanks to create the French restaurant named Taillevent whose phone number is 01-45-61-14-09; their best dish is Viennoise de sole, which costs \$48.

`(make-rrant _____ "01-45-61-14-09"`

`"Viennoise de sole" _____)`

(b) (1 point) What is the name of the selector function that takes a `rrant` structure and returns the `rrant`'s price?

(c) (2 points) Fill in the body of the function defined below.

```
;; discount-price: rant -> number
;; Take a restaurant as input; return the price of its best dish, reduced by 50%
(define discount-price
  (lambda ( R )
```

Problem 3 (11 points)

Write the function `restaurant-bill` that takes three inputs (numbers representing the prices of a diner's first course, main course, and dessert) and returns the total bill for the diner, including sales tax at the rate of 7.75% (for which we have already defined a constant below).

Write a contract, a brief purpose statement, the Scheme function definition, and two tests in the form of boolean expressions that should return true if the function works correctly. (It will help you to write the examples before you define the function; for this quiz you aren't required to write examples separately from the tests.)

```
(define SALES-TAX-RATE 0.0775)
```