

Scheme Tutorial Exercises

Fall 2002

Introduction

Here are the exercises to complement the Scheme tutorial sessions for cs173. Many are taken directly from How to Design Programs (<http://www.htdp.org/>). We depart from the book in one major way. Instead of using `define-struct` and `cond` for compound data and variants, we use **`define-datatype`** and **`cases`**. Documentation for these constructs can be found in DrScheme's Help Desk.

Example

```
(define-datatype vehicle vehicle?
  [taxi]
  [bus (seats number?)
       (hand-holds number?)
       (color string?)]
  [subway (cars number?)
          (seats-per-car number?)
          (line symbol?)])

(define (max-occupants v)
  (cases vehicle v
    [taxi () 4]
    [bus (seats handholds color) (+ seats hand-holds)]
    [subway (cars seats-per-car line) (* cars seats-per-car)]))

(max-occupants (subway 10 25 'green))
> 250
```

DrScheme

We will be using DrScheme version 202 with a language level for cs173 that includes **`define-datatype`** and **`cases`**.

To run DrScheme on the CS network:

1. Type `/pro/plt/plt/Linux.unknown/v202/plt/bin/drscheme`

To run DrScheme at home:

1. Download DrScheme v202 from <http://www.drscheme.org/>
2. Install DrScheme v202 on your home machine.
3. Download the package cs173.plt from the course web site
<http://www.cs.brown.edu/courses/cs173/2002/cs173.plt>
4. Install the cs173.plt package on your home machine.