CSC104 tutorial exercises #9
best before Wednesday, November 20th

This exercise will give you more experience with **recursion**. Ask your instructor (Danny) or TA about anything that stumps you. If you find this concept challenging, you may need to begin working on this before the evening of November 20th. Here are your tasks:

1. Make sure you have easy access to a computer running DrRacket, either your own machine or a workstation at CDF.

2. Watch the racket video on flatten recursion.

3. Read the following code. (cons? L) produces true if L is a list, false otherwise.

```
; flatten : list -> list
(define (flatten L)
  (cond
    [(cons? L) (apply append (map flatten L))]
    [else (list L)]))

; predict what (flatten 3) does

; predict what (flatten (list 3)) does

; predict what (flatten (list 1 2 (list 3))) does
```

4. Now try to make the following predictions **before** you type the commands into DrRacket. Again, read the definition replacing the placeholder L by the appropriate value — 3 or (list 3 4) or (list 3 4 (list 5 6)). Read the previous question to find out what (cons? L) does.

```
; depth : list -> number
(define (depth L)
  (cond
    [(cons? L) (+ 1 (apply max (map depth L)))]
    [else 0]))

; predict what (depth 3) does

; predict what (depth (list 3 4)) does

; predict what (depth (list 3 4 (list 5 6))) does
```

To help you complete your assignment, course TAs will be in computer labs BA3175, BA3185, and BA3195 on Wednesday from 8:10 p.m. to 8:45 to answer questions. If you have a laptop with DrRacket on it, you may also ask me questions before and (briefly) after lecture, in the lecture hall. You may ask any of our TAs, not just the one for your section, for help. At 8:45, you will move to your own tutorial room (see the chart below) to write a brief quiz, closely based on the videos.

Resources you may find useful:

My office hour: Thursdays 2–3 pm, in BA4270 (Bahen 4270)

Your tutorial: Select Wednesdays 8:10. **Tutorials start in BA3175–BA3195** at 8:10, and then move to individual tutorial rooms for a quiz in the last 10 minutes. Tutorial sections are as follows:

Surname	Room	TA
Abdel–Deng	BA3008	Shems
Ding–Khaybullina	BA3012	Brent
Kim–Luke	BA2159	Oscar
Ma–Shamrock	BA2165	Ryan
Shemet–Wolfgramm	BA2175	Siamak
Wu–Z	BA2195	Nahla

DCS Help Centre: Monday–Thursday, 4–6 pm in BA2230, see Help Centre page.