CISC280 Spring 2007 Lab 6

In this lab you will use **time** to experimentally test our estimate of big O for union of two unordered sets. Recall that in class we discussed union as

```
;a and b are sets
(define (union a b)
  (accumulate adjoin b a))
```

Use the repeat-proc function from last week to estimate big O. We discussed in class that the procedure was O(nm) for time, and then amended our estimate to $O(n^2 + nm)$, where n is the size of set a, and m is the size of set b. Which of these is correct? Hint: use part of your sequence toolkit to generate big sets, and compare runtime on pairs of sets sized small/large, large/small, large/large. Be sure to use lots of repeats.

Write a linear recursive version of union that does not use accumulate. Determine big O by hand. What do your timing experiments show? Do they agree with your calculation?

Do the two functions differ in time complexity? If so, why?

Bring your results and answers to class Tuesday.

If you need to submit (see syllabus if you are unsure) submit your code file(s) and a script of several well-chosen test cases via MyCourses (due Thursday midnight) and on paper (to your TA's mailbox Friday by 1 p.m.) to receive full credit.

When you use MyCourses, remember that you can "upload" files multiple times, but you only click "submit" once.

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