

Class 20: Quick Sorting



Queen's University, Belfast, Northern Ireland



CS200: Computer Science
University of Virginia
Computer Science

David Evans
<http://www.cs.virginia.edu/evans>

TuttleSort

```
(define (TuttleSort cf lst)
  (if (null? lst) lst
      (let ((most (find-most cf
                             lst)))
        (cons
         most
         (TuttleSort cf
                    (delete lst
                           most))))))
```

```
(define (find-most cf
                  lst)
  (insert!
   (lambda (c1 c2)
     (if (cf c1 c2) c1 c2))
   lst
  (car lst)))
```

TuttleSort is $\Theta(n^2)$

If we double the length of the list, we amount of work sort does *approximately* quadruples.

Insert Sort

```
(define (insertsort cf lst)
  (if (null? lst)
      null
      (insertel cf
                (car lst)
                (insertsort cf
                           (cdr
                            lst))))))

(define (insertel cf el lst)
  (if (null? lst)
      (list el)
      (if (cf el (car lst))
          (cons el lst)
          (cons (car lst)
                (insertel cf el
                          (cdr
                           lst))))))
```

insertsort is $\Theta(n^2)$