

```
fun append (xs,ys) =  
  if xs=[]  
  then ys  
  else (hd xs)::append(tl xs,ys)  
  
fun map (f,xs) =  
  case xs of  
    [] => []  
  | x::xs' => (f x)::(map(f,xs'))  
  
val a = map (increment, [4,8,12,16])  
val b = map (hd, [[8,6],[7,5],[3,0,9]])
```

Programming Languages

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Cond

Better style

Avoid nested if-expressions when you can use cond-expressions instead

- Can think of one as sugar for the other

General syntax: `(cond [e1a e1b]
[e2a e2b]
...
[eNa eNb])`

- Good style: `eNa` should be `#t`

Example

```
(define (sum xs)
  (cond [(null? xs) 0]
        [(number? (car xs))
         (+ (car xs) (sum (cdr xs)))]
        [#t (+ (sum (car xs)) (sum (cdr xs)))]))
```

A variation

As before, we could change our spec to say instead of errors on non-numbers, we should just ignore them

So this version can work for any list (or just a number)

- Compare carefully, we did *not* just add a branch

```
(define (sum xs)
  (cond [(null? xs) 0]
        [(number? xs) xs]
        [(list? (car xs))
         (+ (sum (car xs)) (sum (cdr xs)))]
        [#t (sum (cdr xs))]))
```

What is true?

For both `if` and `cond`, test expression can evaluate to anything

- It is not an error if the result is not `#t` or `#f`
- (Apologies for the double-negative 😊)

Semantics of `if` and `cond`:

- “Treat anything other than `#f` as true”
- (In some languages, other things are false, not in Racket)

This feature makes no sense in a statically typed language

Some consider using this feature poor style, but it can be convenient