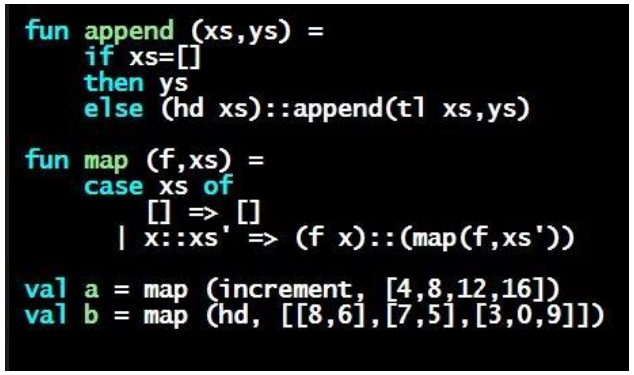

Programming Languages

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Case Expressions

Case

ML combines the two aspects of accessing a one-of value with a *case expression* and *pattern-matching*

- Pattern-matching much more general/powerful (soon!)

Example:

```
fun f x = (* f has type mytype -> int *)
    case x of
        Pizza => 3
      | TwoInts(i1,i2) => i1+i2
      | Str s => String.size s
```

- A multi-branch conditional to pick branch based on variant
- Extracts data and binds to variables local to that branch
- Type-checking: all branches must have same type
- Evaluation: evaluate between case … of and the right branch

Patterns

In general the syntax is:

```
case e0 of
     p1 => e1
   | p2 => e2
     …
   | pn => en
```

For today, each *pattern* is a constructor name followed by the right number of variables (i.e., `C` or `C x` or `C(x,y)` or …)

- Syntactically most patterns (all today) look like expressions
- But patterns are not expressions
  - We do not evaluate them
  - We see if the result of `e0` *matches* them

Why this way is better

0. You can use pattern-matching to write your own testing and data-extractions functions if you must
   - But do not do that on your homework

1. You cannot forget a case (inexhaustive pattern-match warning)
2. You cannot duplicate a case (a type-checking error)
3. You will not forget to test the variant correctly and get an exception (like `hd []`)
4. Pattern-matching can be generalized and made more powerful, leading to elegant and concise code