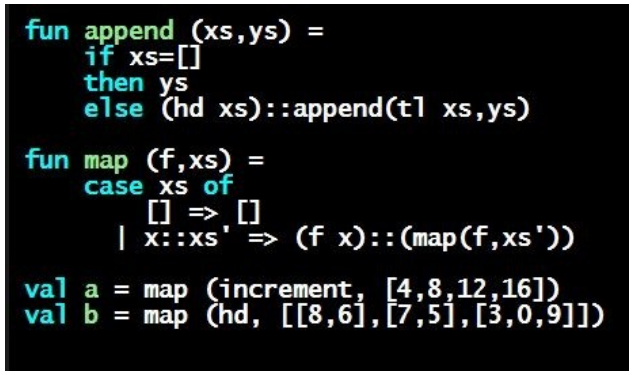

Programming Languages

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Nested Patterns Precisely

(Most of) the full definition

The semantics for pattern-matching takes a pattern *p* and a value *v* and decides (1) does it match and (2) if so, what variable bindings are introduced.

Since patterns can nest, the definition is elegantly recursive, with a separate rule for each kind of pattern. Some of the rules:

- If *p* is a variable *x*, the match succeeds and *x* is bound to *v*
- If *p* is _, the match succeeds and no bindings are introduced
- If *p* is *(p1,…,pn)* and *v* is *(v1,…,vn)*, the match succeeds if and only if *p1* matches *v1*, …, *pn* matches *vn*. The bindings are the union of all bindings from the submatches
- If *p* is *C p1*, the match succeeds if *v* is *C v1* (i.e., the same constructor) and *p1* matches *v1*. The bindings are the bindings from the submatch.
- … (there are several other similar forms of patterns)

Examples

- Pattern `a::b::c::d` matches all lists with >= 3 elements
- Pattern `a::b::c::[]` matches all lists with 3 elements
- Pattern `((a,b),(c,d))::e` matches all non-empty lists of pairs of pairs