Section 2 – CSE341

Type Synonyms

What if I want to call `int * int * int` a date?

```
type date = int * int * int
```

Type Synonyms

type vs datatype

Datatype introduces a new type name, distinct from all existing types

```
datatype suit = Club | Diamond | Heart | Spade
datatype rank =
      Jack | Queen | King | Ace | Num of int
```

Type is just another name

```
type card = suit * rank
```

Type Synonym

Why?

For now, just for convenience.

It doesn't let us do anything new.

Later in the course we will see another use related to modularity.

Type Generality

Write a function that appends two string lists…

Type Generality

We expected

```
string list * string list -> string list
```

But the type checker says

```
'a list * 'a list -> 'a list
```

Why is this okay?

Type Generality

The type 'a is more general

More general types "can be used" as any less general type.

Type Generality

The "more general" rule

A type *t1* is <u>more general</u> than the type *t2* if you can take *t1*, <u>replace its type variables consistently</u>, and get *t2*

Equality Types

Write a contains function…

Equality Types

Double quotes arise from use of the '=' operator

We can only use '=' on types that can be compared

Generality rules work the same, except substitution must be some type which can be compared with '='

Syntactic Sugar

If-then-else is just a case statement in disguise…

Syntactic Sugar

Pattern matching…