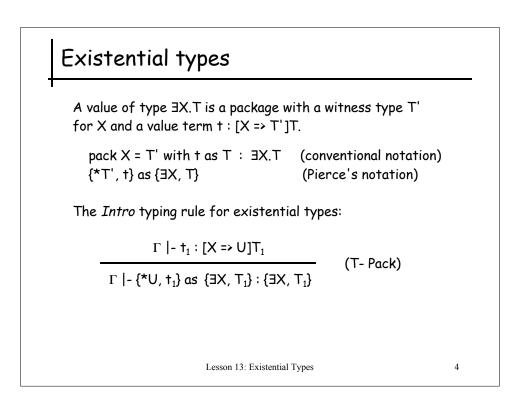


Existential t	ypes	
Existential types:		
XE =:: T	(.Т	
	ternative, nonstandard notation {3X, T} ne existential value is a mixed type-value	1
	Lesson 13: Existential Types	3

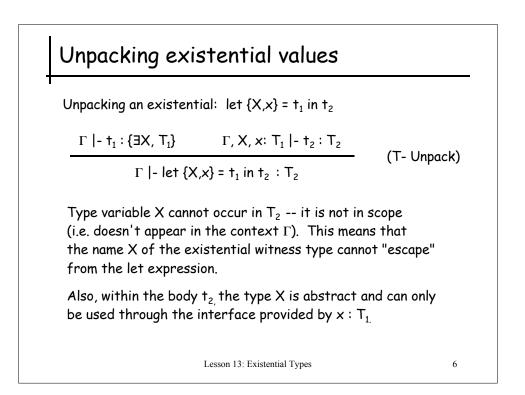


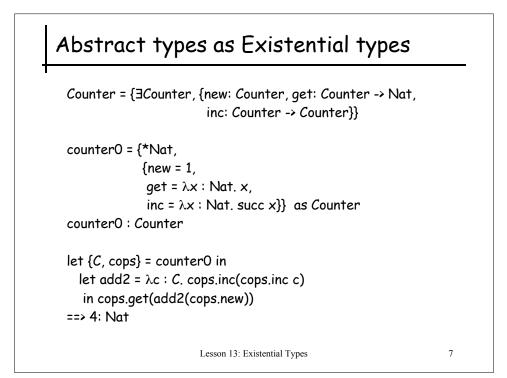
Examples of Existential types

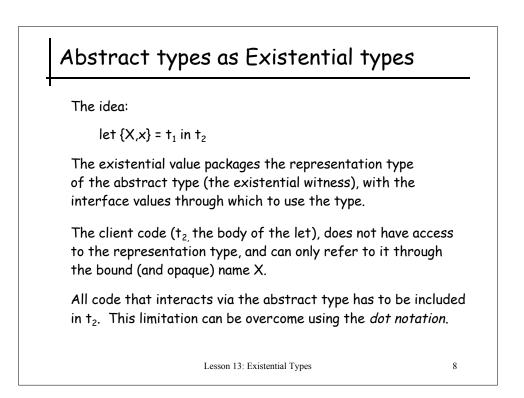
{*Nat, 3} as { $\exists X, X$ } : { $\exists X, X$ } {*Bool, true} as { $\exists X, X$ } : { $\exists X, X$ } $p = {*Nat, {a = 5, f = <math>\lambda x$: Nat. succ x}} as { $\exists X, {a : X, f : X \rightarrow Nat$ }} $p : {<math>\exists X, {a : X, f : X \rightarrow Nat$ }} $q = {*Bool, {a = true, f = <math>\lambda x$: Bool. 0}} as { $\exists X, {a : X, f : X \rightarrow Nat$ }} $q : {<math>\exists X, {a : X, f : X \rightarrow Nat$ }} The type part is hidden (opaque, abstract), and the value part provides an interface for *interpreting* the hidden type.

Lesson 13: Existential Types

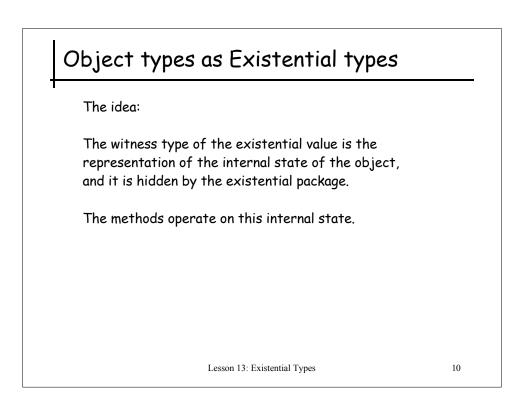
5







```
Object types as Existential types
$
function of the set of th
```



```
\begin{aligned} \text{Encoding Existentials with Universals} \\ \text{Figure} \\ \text{Figur
```