Slide 1

The drinkers principle

In every non-empty pub there is one person with the property that everybody drinks if this person drinks.

Slide 2

Is this a tautology in classical logic?

$$(\exists x.\mathrm{True}) \to (\exists x.D(x) \to (\forall x.D(x)))$$

Slide 3

Proof in LEGO

```
Module drinker Import pred;

$[raa : {X|Prop}((X→ False)→ False) → X];

Goal {A:Prop}Or A (not A);
 ...
Save tnd;

Goal {A,B:Prop}(not (And A B))→(Or (not A) (not B));
 ...
Save deMorgan;

Goal {P:Set}{D:P→ Prop}(not {x:P}D x)→(Exists [x:P]not (D x));
 ...
Save deMorgan2;
```

Slide 4

```
[P:Set][D:P→ Prop];
[sb:P];

Goal Exists [x:P](D x)→{z:P}(D z);
 ...
Save drinker;
```