

Funcons-beta: Booleans *

The P_LanCompS Project

Booleans.cbs | PLAIN | PRETTY

Booleans

```
[ Datatype booleans
  Alias bools
  Funcon true
  Funcon false
  Funcon not
  Funcon implies
  Funcon and
  Funcon or
  Funcon exclusive-or
  Alias xor ]
```

```
Datatype booleans ::= true | false
```

```
Alias bools = booleans
```

```
Funcon not(_ : booleans) : ⇒ booleans
```

`not(B)` is logical negation.

```
Rule not(false) ⇔ true
```

```
Rule not(true) ⇔ false
```

```
Funcon implies(_ : booleans, _ : booleans) : ⇒ booleans
```

`implies(B_1 , B_2)` is logical implication.

```
Rule implies(false, false) ⇔ true
```

```
Rule implies(false, true) ⇔ true
```

```
Rule implies(true, true) ⇔ true
```

```
Rule implies(true, false) ⇔ false
```

```
Funcon and(_ : booleans*) : ⇒ booleans
```

*Suggestions for improvement: plancomps@gmail.com.
Reports of issues: <https://github.com/plancomps/CBS-beta/issues>.

$\text{and}(B, \dots)$ is logical conjunction of any number of Boolean values.

Rule $\text{and}() \rightsquigarrow \text{true}$

Rule $\text{and}(\text{false}, * : \text{booleans}^*) \rightsquigarrow \text{false}$

Rule $\text{and}(\text{true}, B^* : \text{booleans}^*) \rightsquigarrow \text{and}(B^*)$

Funcon $\text{or}(_ : \text{booleans}^*) : \Rightarrow \text{booleans}$

$\text{or}(B, \dots)$ is logical disjunction of any number of Boolean values.

Rule $\text{or}() \rightsquigarrow \text{false}$

Rule $\text{or}(\text{true}, * : \text{booleans}^*) \rightsquigarrow \text{true}$

Rule $\text{or}(\text{false}, B^* : \text{booleans}^*) \rightsquigarrow \text{or}(B^*)$

Funcon $\text{exclusive-or}(_ : \text{booleans}, _ : \text{booleans}) : \Rightarrow \text{booleans}$

Alias $\text{xor} = \text{exclusive-or}$

$\text{exclusive-or}(B_1, B_2)$ is exclusive disjunction.

Rule $\text{exclusive-or}(\text{false}, \text{false}) \rightsquigarrow \text{false}$

Rule $\text{exclusive-or}(\text{false}, \text{true}) \rightsquigarrow \text{true}$

Rule $\text{exclusive-or}(\text{true}, \text{false}) \rightsquigarrow \text{true}$

Rule $\text{exclusive-or}(\text{true}, \text{true}) \rightsquigarrow \text{false}$