Concepts of programming languages

Prolog

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Proof Search

- ▶ The manner in which a query is handled
- ▶ Knowledge Database is read from top to bottom
- ▶ Tries to unify with facts and heads of rules
- ▶ At first valid encounter, unification is carried out
- ▶ Variables are replaced by internal variables (e.g. _G2145)
- ▶ A search is done in a depth first fashion in a tree-shaped structure

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A simple example (1)

Knowledge database:

```
u(a).
u(b).
v(a).
v(b).
w(b).
z(X):-u(X),v(X),w(X).
```

Figure 1: Knowledge database

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A more complicated example (1)

Knowledge database:

```
loves(henk, maria).
loves(theo, maria).
jealous(X,Y):-loves(X,Z),loves(Y,Z).
```

Figure 2: Knowledge database

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A more complicated example (3)

- ► Results are not always as expected
- ► jealous(X,Y):

```
3 ?- jealous(X,Y)
X = Y, Y = henk ;
X = henk,
Y = theo ;
X = theo,
Y = henk ;
X = Y, Y = theo.
```

Figure 3: jealous(X,Y)

- ► jealous(X,X)

```
1 ?- jealous(X,X)
|    .
X = henk ;
X = theo.
```