Symbolic Programming - Chapter 1 - Facts, Rules, Queries

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These notes follow the online coursebook Learn Prolog Now.

Facts, Queries, Rules

A collection of facts and rules is called a knowledge base.

Prolog programs are simply knowledge bases which describe some collection of relationships.

We use a prolog program by posing queries; that is, by asking questions about the information stored in the knowledge base.

Facts are used to state things that are unconditionally true of some situation.

e.g: Knowledge Base 1

woman(mia).
woman(jody).
woman(yolanda).
playsAirGuitar(Jody).
party.
?- woman(mia).

Prolog will answer yes because this is one of our stated facts

?- playsAirGuitar(mia).

Prolog will answer no.

?- party.

Yes

e.g: Knowledge Base 2

happy(yolanda). This is a fact.

happy(mia). This is a fact.

listens2Music(yolanda):- happy(yolanda). This is a rule. It depends on the condition after :- (if)

playsAirGuitar(yolanda):- listens2Music(yolanda).

playsAirGuitar(mia):- happy(mia).

The facts and rules contained in a knowledge base are called clauses.

Knowledge base 2 contains 2 facts and 3 rules. We also say it has 3 predicates happy, listens2Music and playsAirGuitar.

The happy predicate is defined using a single clause (a fact). The playsAirGuitar predicate is defined using two clauses (one ruke and one fact).

We can also define a rule with two items in the body i.e. two conditions

conjunction:

playsAirGuitar(vincent):- listens2Music(vincent), happy(vincent).

Vincent plays air guitar if he listens to music and is happy

disjunction:

playsAirGuitar(vincent):- listens2Music(vincent); happy(vincent).

Vincent plays air guitar if he listens to music or is happy

e.g.: Knowledge Base 3

woman(mia).

woman(jody).

woman(yolanda).

loves(vincent,mia).

loves(marsellus,mia).

loves(pumpkin,honey_bunny).

loves(honey_bunny,pumpkin).

?- woman(X).

X is a variable. Any word beginning with upper case letter is a variable. This query says: tell me which of the individuals you know about is a woman.

e.g.: Knowledge Base 4 loves(vincent,mia).

loves(marsellus,mia).

loves(pumpkin,honey_bunny).

loves(honey_bunny,pumpkin).

jealous(X,Y):- loves(X,Z), loves(Y,Z).