COMP4418: Knowledge Representation and Reasoning

Introduction to Prolog IV

Controlling Execution

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The Cut Operator (!)

- Sometimes we need a way of preventing Prolog finding all solutions
- The \textit{cut} operator is a built-in predicate that prevents backtracking
- It violates the declarative reading of a Prolog program
- Use it \textit{VERY} sparingly!!
Backtracking

lectures(adnan, Subject), studies(Student, Subject)?

Subject = 4418
Student = jane

Subject = 9518
Student = jack

lectures(adnan, Subject), studies(Student, Subject)?
Cut Prunes the Search

- Prevents backtracking to goals left of the cut by throwing away remaining choice points

\[ \text{lectures(adnan, Subject), !, studies(Student, Subject)}? \]

- \text{lectures(adnan, 9414)}
- \text{lectures(adnan, 9518)}
- \text{studies(jane, 9414)}
- \text{studies(jack, 9518)}
Example

overdue(Today, Title, CatNo, MemFamily) :-
    loan(CatNo, MemNo, _, DueDate),
    later(Today, DueDate), !,
    book(CatNo, Title, _),
    member(MemNo, name(MemFamily, _), _).
Controlling Execution

■ Some methods for controlling execution in Prolog:
  ► Ordering of clauses (facts and rules)
  ► Ordering of subgoals within a rule
  ► Cut (!) operator

■ Use each with care