COMP4418: Knowledge Representation and Reasoning

Introduction to Prolog IV

Controlling Execution

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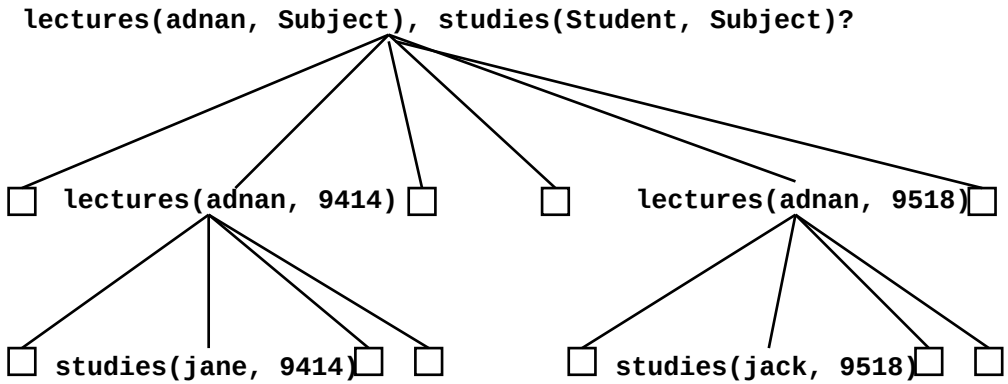
Reference: Ivan Bratko, Prolog Programming for Artificial Intelligence, Addison-Wesley, 2001. Chapter 6.

The Cut Operator (!)

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

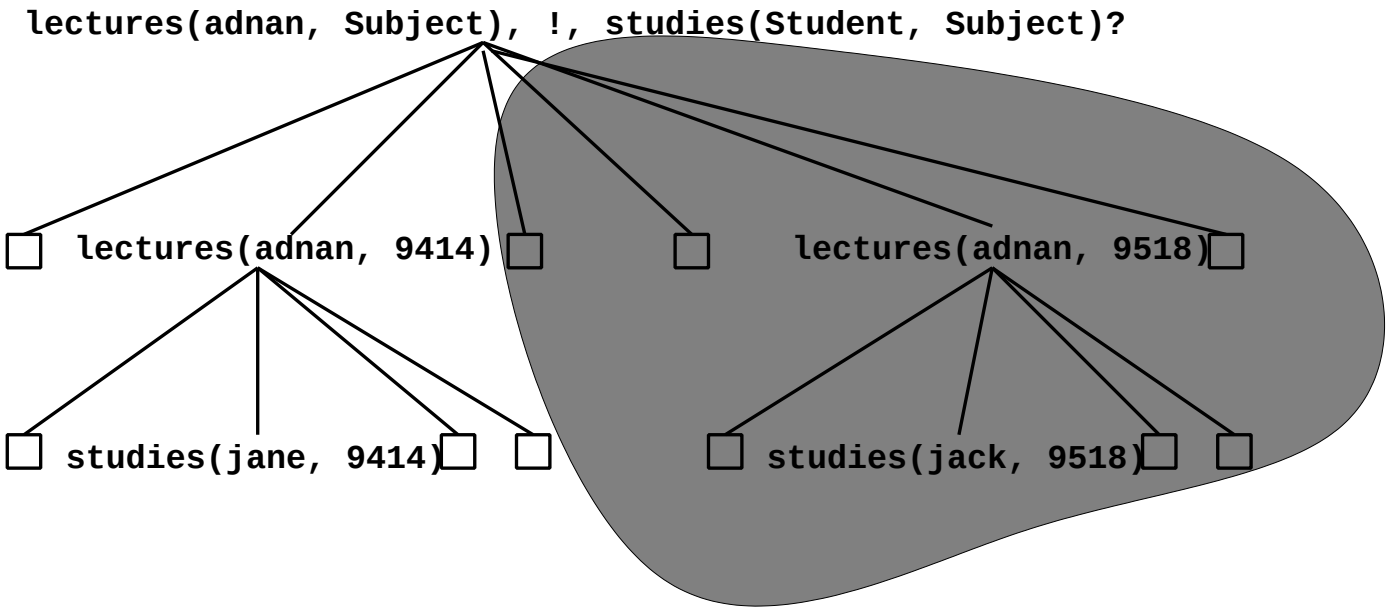
Backtracking

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

Subject = 4418
Student = jane

Subject = 9518
Student = jack
```



Cut Prunes the Search

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



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

