

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

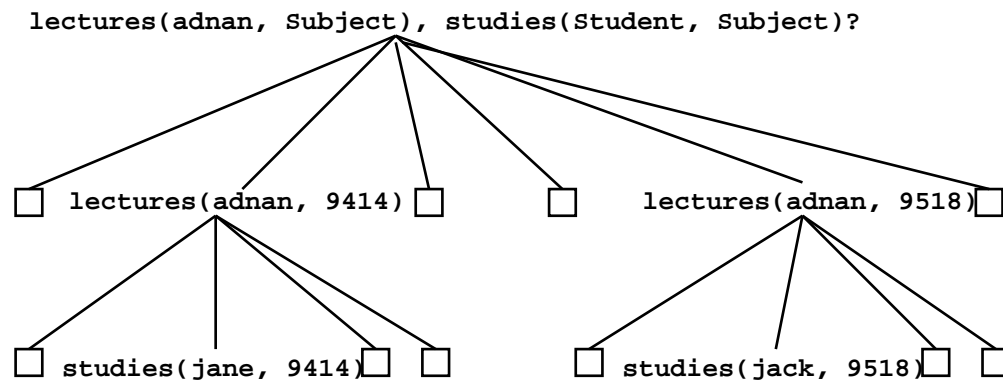
`lectures(adnan, Subject), studies(Student, Subject)?`

`Subject = 4418`

`Student = jane`

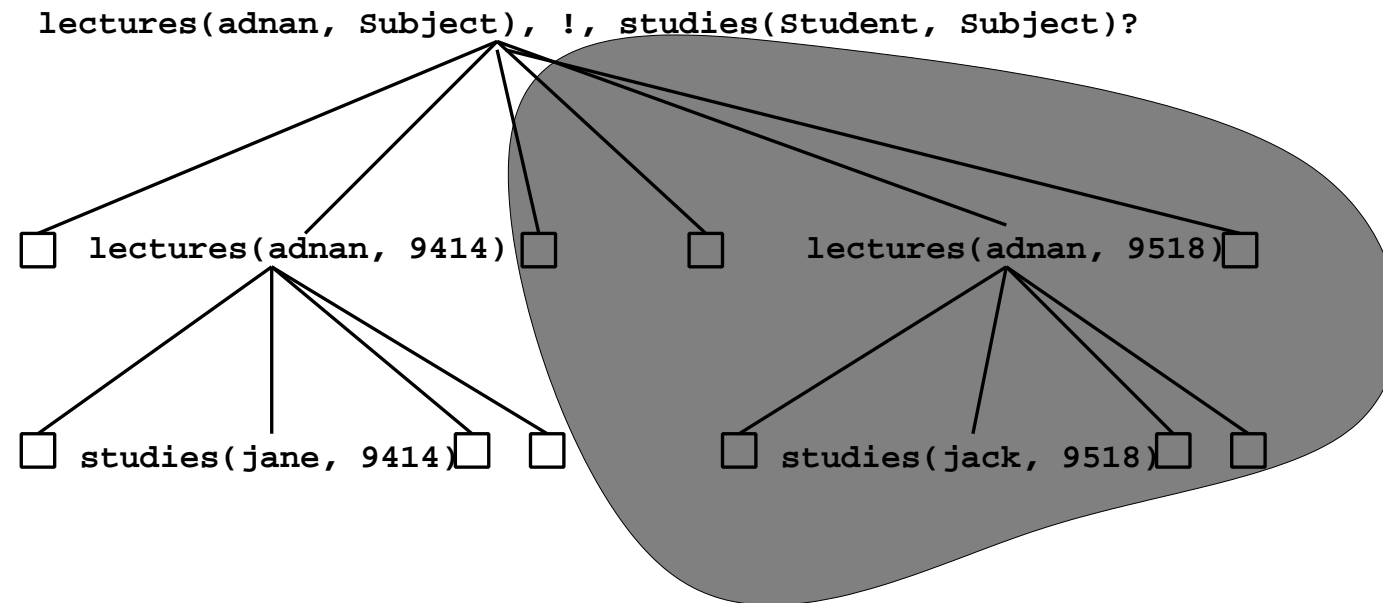
`Subject = 9518`

`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