

Построение дерева вывода

Указания

Исходный текст программы

domains

list=symbol*

predicates

nondeterm transition(symbol, symbol, symbol)
nondeterm accessible(symbol, list, symbol)

clauses

transition(b1, x1, b2).
transition(b2, x1, b3).
transition(b3, x1, b4).
transition(b4, x1, b1).
transition(b1, x2, b4).
transition(b2, x2, b3).
transition(b3, x2, b2).
transition(b4, x2, b1).
accessible(B1, [X], B2) :- transition(B1, X, B2).
accessible(B1, [X| Rest], B2) :- transition(B1, X, B3), accessible(B3, [Rest], B2).

goal

accessible(b1, [X1, X1, X1], b4).

Обозначение списка

- $[x_1, x_2, x_3]$ – список из трех элементов
- $[x_1]$ – список из одного элемента
- $[]$ – пустой список
- При подстановке $[x_1, x_2, x_3] \rightarrow [H | Tail]$ будет $H = x_1$, $Tail = [x_2, x_3]$.
- При подстановке $[x_1] \rightarrow [H | Tail]$ будет $H = x_1$, $Tail = []$.

Разделы программы

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goal

accessible(b1, [X1, X1, X1], b4).

Виды аксиом

- **Факт:**

transition(b1, x1, b2).

| | |

transition(b1, x1, b2) = ИСТИНА

- **Правило:**

accessible(B1, [X | Rest], B2) :- transition(B1, X, B3), accessible(B3, [Rest], B2).

| | |

accessible(B1, [X | Rest], B2) ← transition(B1, X, B3) & accessible(B3, [Rest], B2)

Целевая формула

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accessible(B1, [X], B2) :- transition(B1, X, B2).  
accessible(B1, [X| Rest], B2) :- transition(B1, X, B3), accessible(B3, [Rest], B2).
```

goal

```
accessible(b1, [X1, X1, X1], b4).
```

Шаг 0



accessible(b1, [X1, X1, X1], b4)

Поиск подходящего правила

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transition(b4, x1, b1).  
transition(b1, x2, b4).  
transition(b2, x2, b3).  
transition(b3, x2, b2).  
transition(b4, x2, b1).
```

```
accessible(B1, [X], B2) :- transition(B1, X, B2).
```

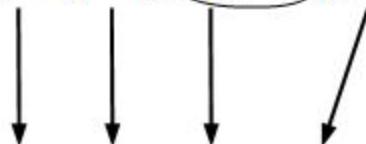
```
accessible(B1, [X | Rest], B2) :- transition(B1, X, B3), accessible(B3, [Rest], B2).
```

goal

```
accessible(b1, [X1, X1, X1], b4).
```

Шаг 1: Конкретизация

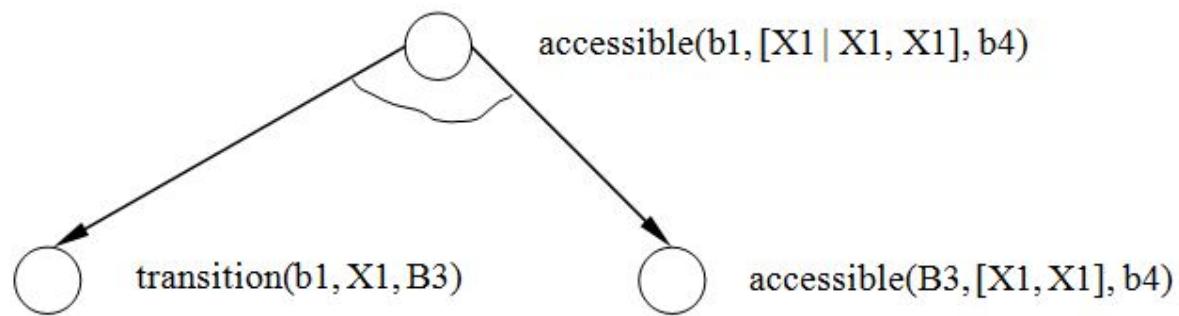
accessible(b1, [X1, X1, X1], b4)



accessible(B1, [X | Rest], B2) :- transition(B1, X, B3), accessible(B3, Rest, B2).

accessible(b1, [X1 | X1, X1], b4) :- transition(b1, X1, B3), accessible(B3, [X1, X1], b4).

Шаг 1



Поиск подходящего правила

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```

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clauses

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transition(b3, x1, b4).
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transition(b4, x1, b1).
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transition(b1, x2, b4).
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transition(b4, x2, b1).
```

```
accessible(B1, [X], B2) :- transition(B1, X, B2).
```

```
accessible(B1, [X| Rest], B2) :- transition(B1, X, B3), accessible(B3, [Rest], B2).
```

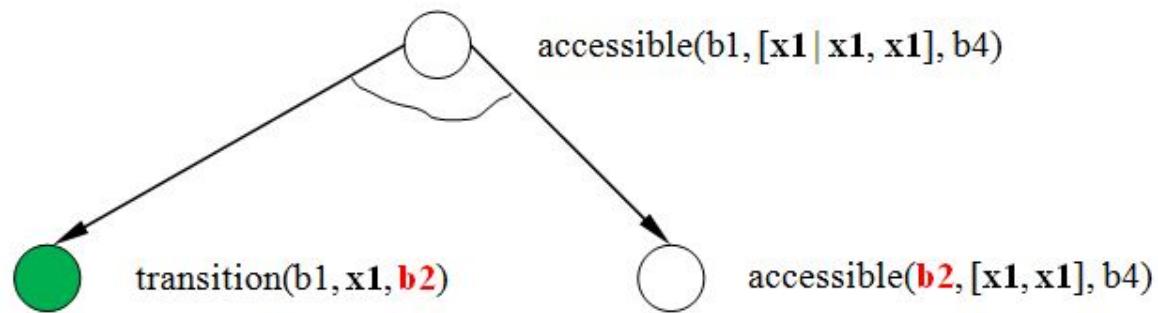
goal

```
accessible(b1, [X1, X1, X1], b4).
```

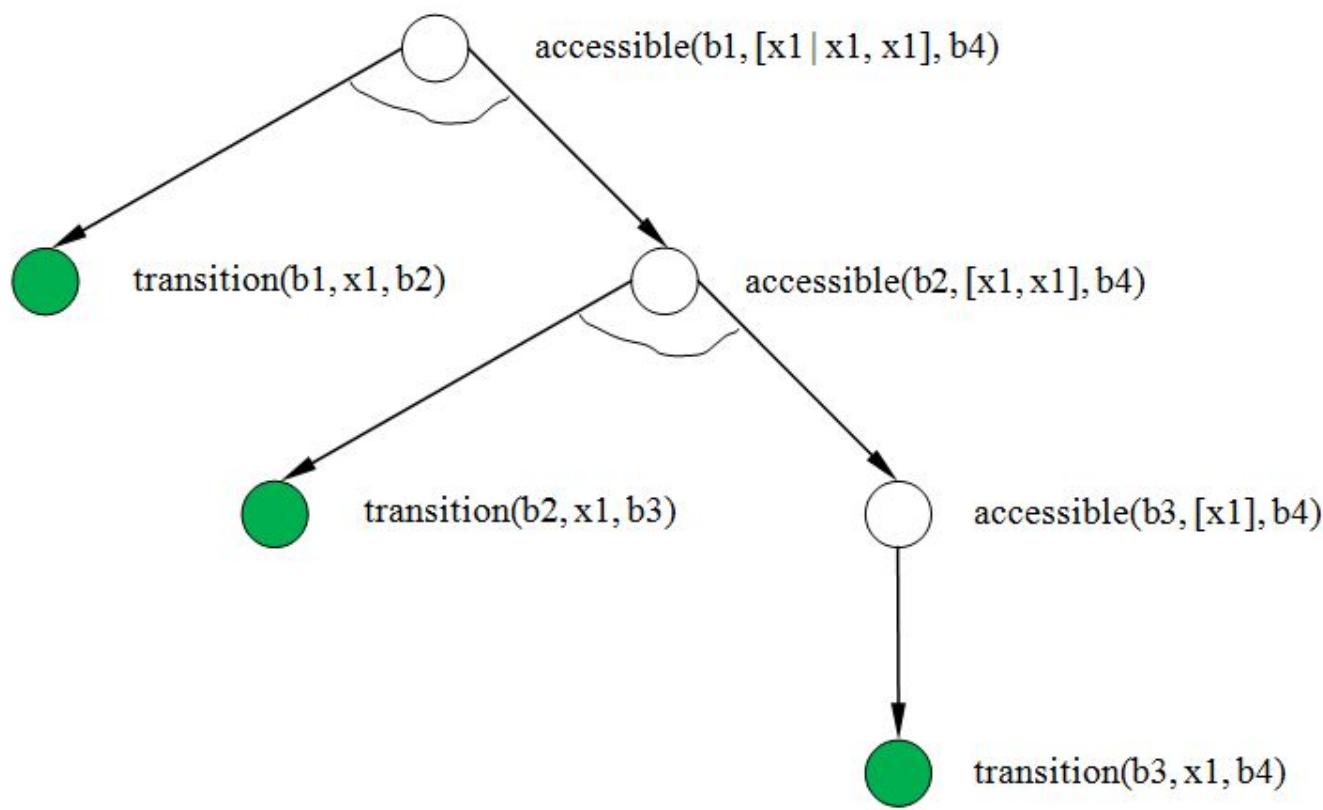
Шаг 2: Конкретизация

transition(b1, X1, B3)
↑ ↑
transition(b1, x1, b2). – истина!

Шаг 2



Шаг последний



Решение

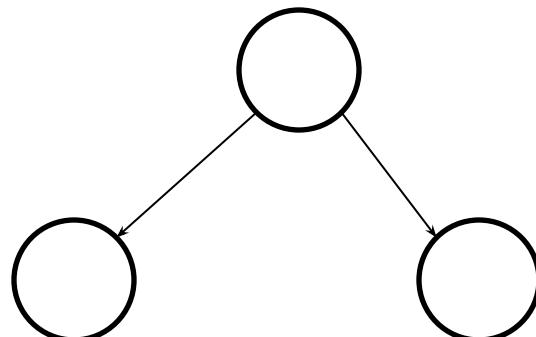
- Целевая формула
 $\text{accessible}(\text{b1}, [\text{X1}, \text{X1}, \text{X1}], \text{b4})$
- доказана в виде
 $\text{accessible}(\text{b1}, [\text{x1}, \text{x1}, \text{x1}], \text{b4}),$
- значит, решение:
 $\text{X1} = \text{x1}.$

Составная цель

goal

transition(B1, X, B2), B1 = B2.

transition(B1, X, B2), B1 = B2.



transition(B1, X, B2) B1 = B2

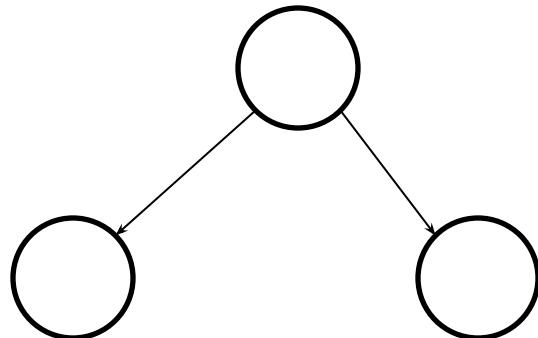
Альтернативные цели

goal

`transition(B1, x1, B2), B1 = B2;`

`transition(B1, x2, B2), B1 <> B2.`

`transition(B1, x1, B2), B1 = B2.`

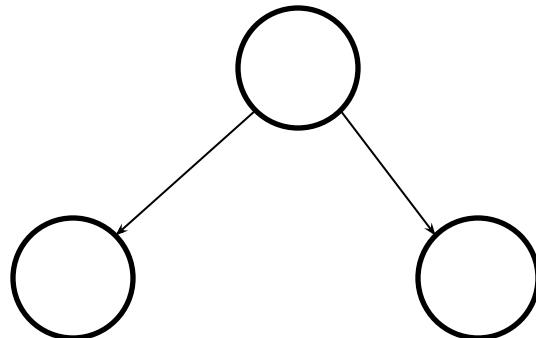


`transition(B1, x1, B2)`

`B1 = B2`

`transition(B1, x2, B2), B1 <> B2.`

или



`transition(B1, x2, B2)`

`B1 <> B2`