

From “p U q” to a GBA

(using the simple on-the-fly translation)

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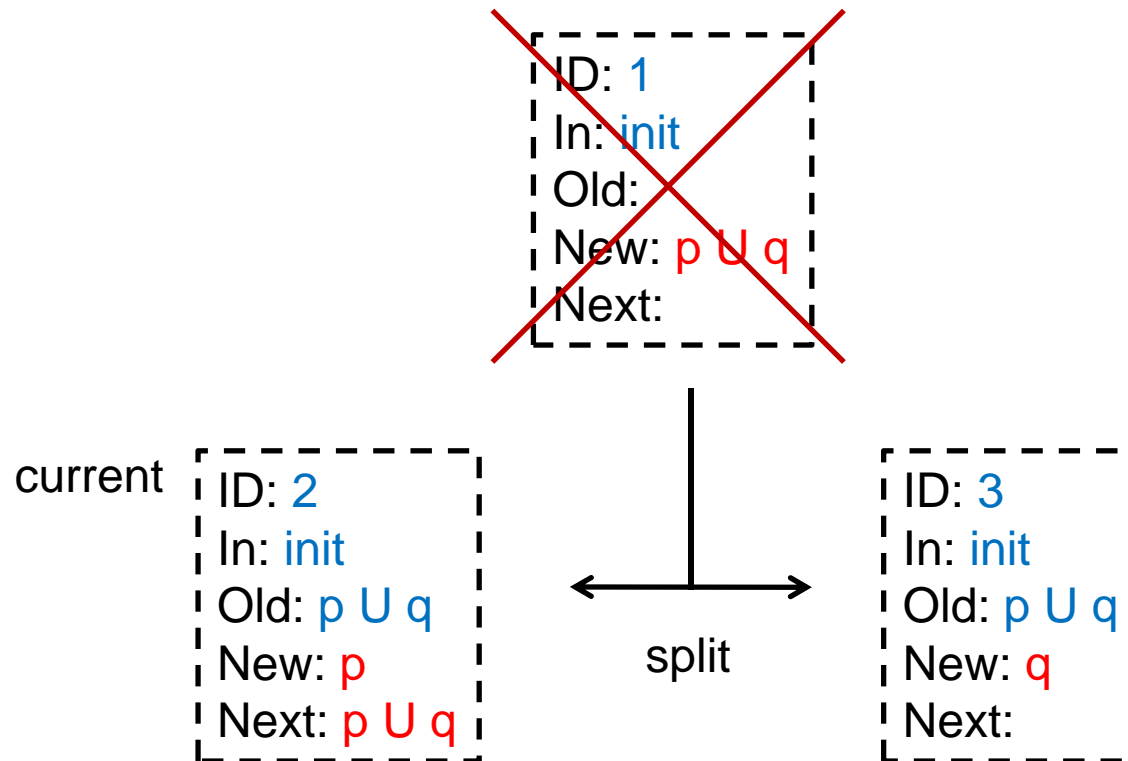
Start with One Node

current

ID: 1
In: <i>init</i>
Old:
New: <i>p U q</i>
Next:

Process the Current Node

Take one formula from *New*; $p \cup q = q \vee (p \wedge X(p \cup q))$; split



Expand Nodes in a DFS Manner

Process the literal p

```
ID: 2
In: init
Old: p U q
New: p
Next: p U q
```

↓ becomes

```
ID: 2
In: init
Old: p U q, p
New:
Next: p U q
```

```
ID: 3
In: init
Old: p U q
New: q
Next:
```

Create a Node for a Formula in *Next*

```

ID: 2
In: init
Old: p U q, p
New:
Next: p U q
  
```

```

ID: 3
In: init
Old: p U q
New: q
Next:
  
```

↓ create a new node

```

ID: 2
In: init
Old: p U q, p
New:
Next: p U q
  
```

```

ID: 4
In: 2
Old:
New: p U q
Next:
  
```

current

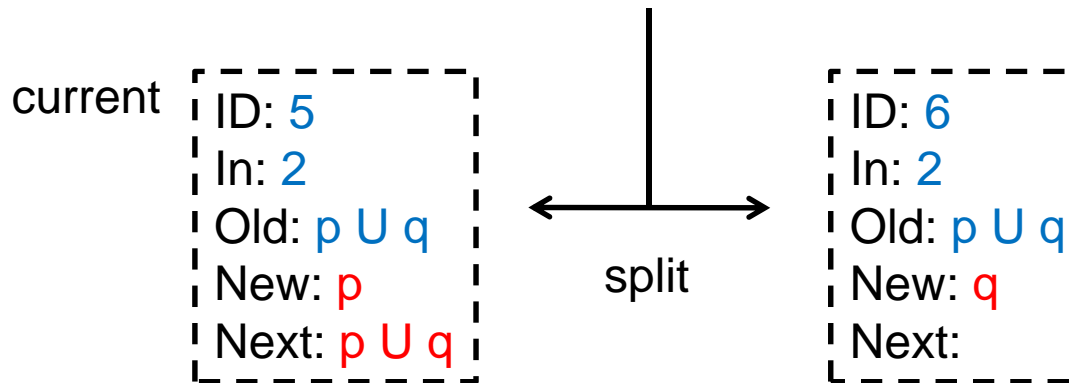
Node 2 is added to the *Nodes* list.

Split (Again) for p U q

ID: 2
 In: *init*
 Old: *p U q, p*
 New:
 Next: *p U q*

~~ID: 4
 In: 2
 Old:
 New: *p U q*
 Next:~~

ID: 3
 In: *init*
 Old: *p U q*
 New: *q*
 Next:



Expand Nodes in a DFS Manner

ID: 2
 In: *init*
 Old: *p U q, p*
 New:
 Next: *p U q*

ID: 5
 In: 2
 Old: *p U q*
 New: *p*
 Next: *p U q*

↓ becomes

ID: 5
 In: 2
 Old: *p U q, p*
 New:
 Next: *p U q*

ID: 6
 In: 2
 Old: *p U q*
 New: *q*
 Next:

ID: 3
 In: *init*
 Old: *p U q*
 New: *q*
 Next:

Expand Nodes in a DFS Manner

ID: 2
 In: *init*
 Old: *p U q, p*
 New:
 Next: *p U q*

merge

~~ID: 5
 In: 2
 Old: *p U q, p*
 New:
 Next: *p U q*~~

ID: 2
 In: *init, 2*
 Old: *p U q, p*
 New:
 Next: *p U q*

ID: 6
 In: 2
 Old: *p U q*
 New: *q*
 Next:

ID: 3
 In: *init*
 Old: *p U q*
 New: *q*
 Next:

Expand Nodes in a DFS Manner

ID: 2
 In: *init*, 2
 Old: p U q, p
 New:
 Next: p U q

ID: 6
 In: 2
 Old: p U q
 New: q
 Next:

ID: 3
 In: *init*
 Old: p U q
 New: q
 Next:

↓ becomes

ID: 6
 In: 2
 Old: p U q, q
 New:
 Next:

Create a Node for *Next*

ID: 2
 In: *init*, 2
 Old: p U q, p
 New:
 Next: p U q

ID: 6
 In: 2
 Old: p U q, q
 New:
 Next:

ID: 3
 In: *init*
 Old: p U q
 New: q
 Next:

↓ create a new node

ID: 6
 In: 2
 Old: p U q, q
 New:
 Next:

ID: 7 current
 In: 6
 Old:
 New:
 Next:

Node 6 is added to the *Nodes* list.

Create a Node Again for *New*

ID: 2
 In: *init*, 2
 Old: p U q, p
 New:
 Next: p U q

ID: 7
 In: 6
 Old:
 New:
 Next:

ID: 3
 In: *init*
 Old: p U q
 New: q
 Next:

ID: 6
 In: 2
 Old: p U q, q
 New:
 Next:

↓ create a new node

ID: 7
 In: 6
 Old:
 New:
 Next:

ID: 8
 In: 7
 Old:
 New:
 Next:

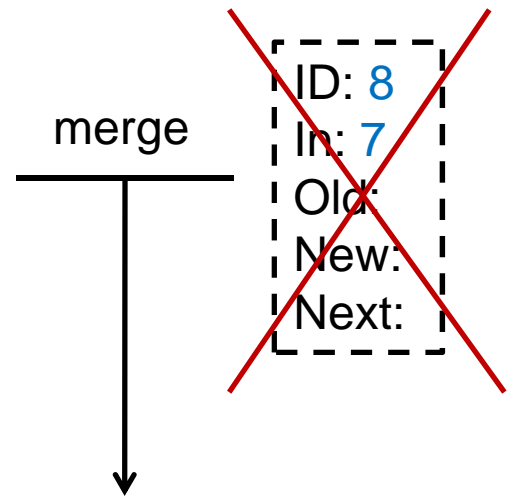
current

Node 7 is added to the *Nodes* list.

Merge into an Existing Node

ID: 2
In: init, 2
Old: p U q, p
New:
Next: p U q

ID: 7
In: 6
Old:
New:
Next:



ID: 3
In: init
Old: p U q
New: q
Next:

ID: 6
In: 2
Old: p U q, q
New:
Next:

ID: 7
In: 6,7
Old:
New:
Next:

Process a Literal

ID: 2
In: *init*, 2
Old: *p U q*, *p*
New:
Next: *p U q*

ID: 6
In: 2
Old: *p U q*, *q*
New:
Next:

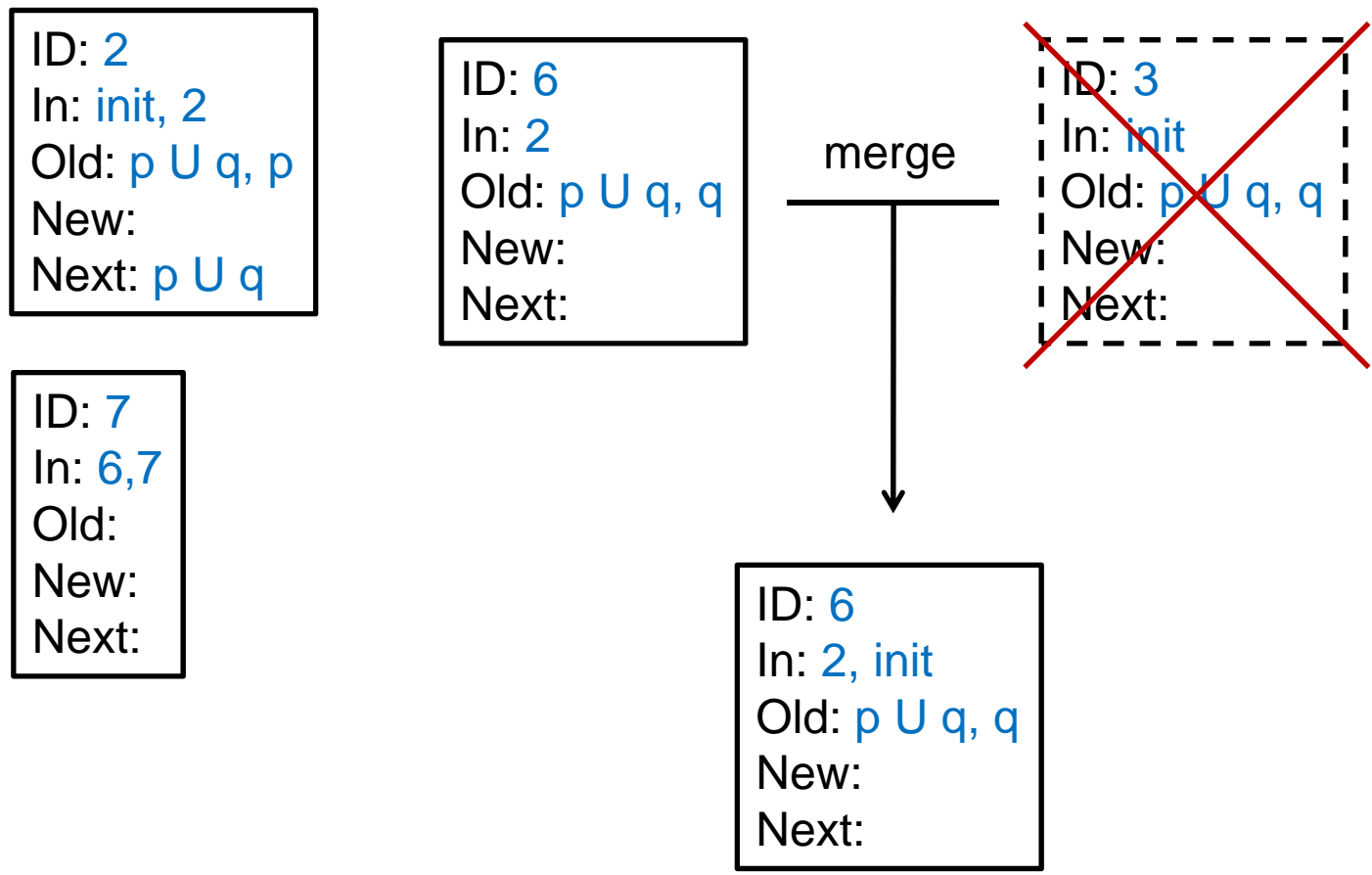
ID: 7
In: 6,7
Old:
New:
Next:

ID: 3
In: *init*
Old: *p U q*
New: *q*
Next:

↓ becomes

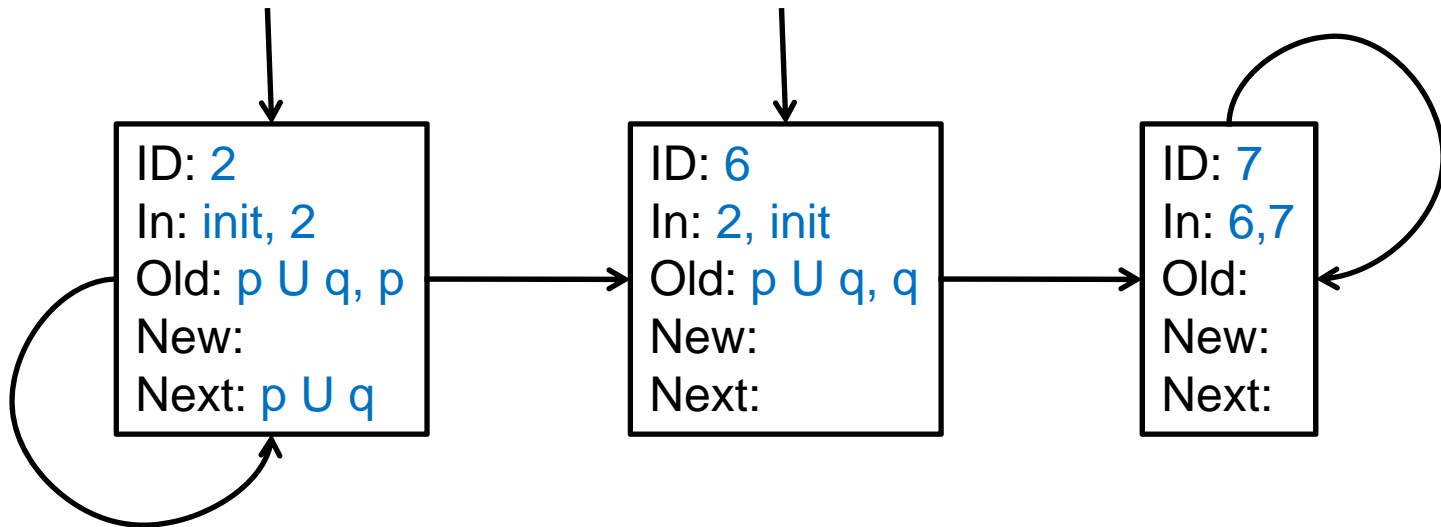
ID: 3
In: *init*
Old: *p U q*, *q*
New:
Next:

Merge into an Existing Node

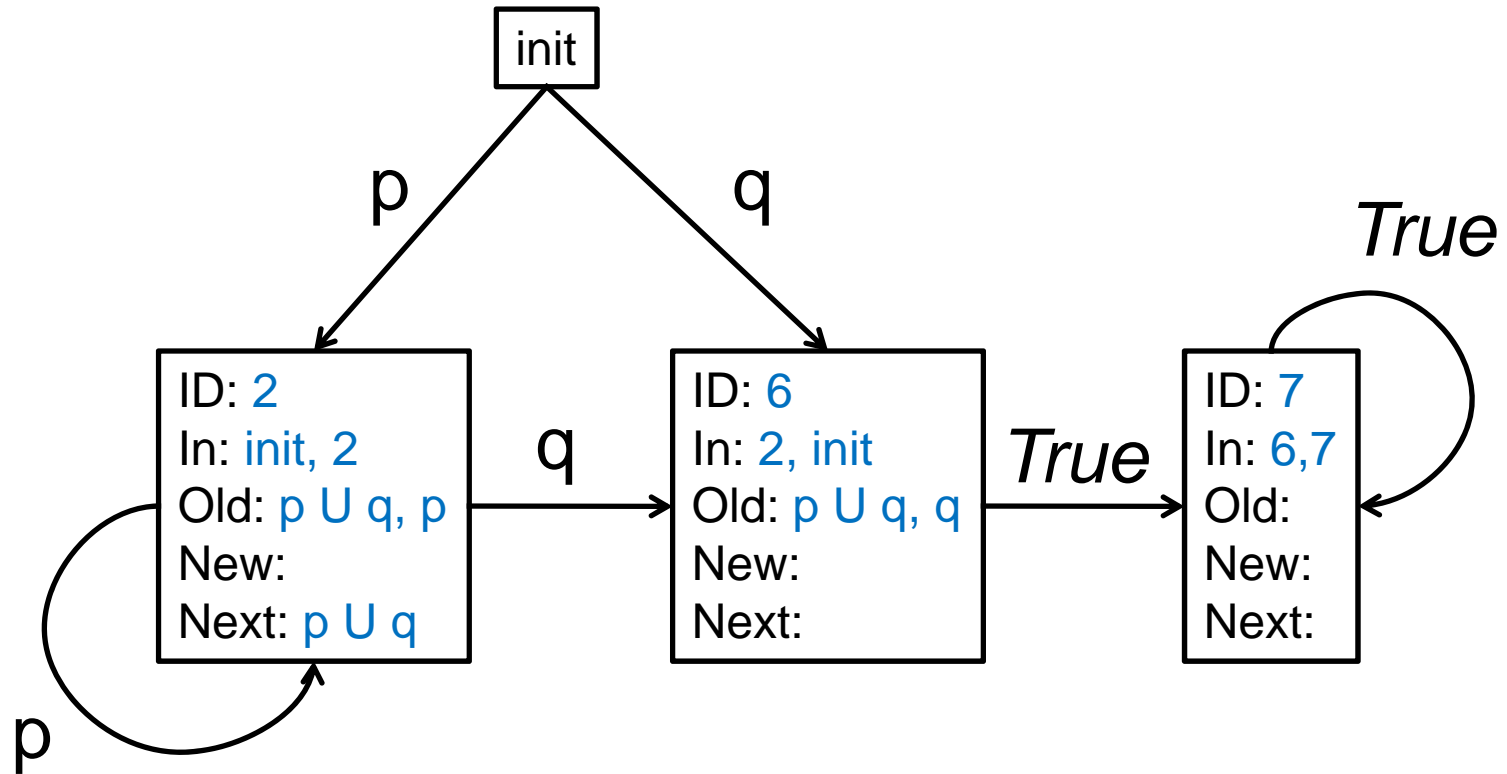


All nodes have been expanded!

Connect the Nodes



Complete the GBA



$$F = \{\{init, 6, 7\}\}$$