

Backtrack to the first column and try a different queen position

This is called "backtracking search with branch and bound".

- **Backtracking:** if you don't find a solution down one path, backtrack to the last place you had another option and try that path.
- **Branch and bound:** don't go down any paths from a partial state where you know you cannot get to a solution

Exhaustive search: is state a solution? (true/false)

What do we need to ask for branch and bound?

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Exhaustive search: is state a solution? (true/false)

Branch and bound search: ask questions about *partial states/solutions*.

			q
		q	

What different values could we have for a partial configuration?

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PENDING	<table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td></td><td></td><td></td><td>q</td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td>q</td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </table>				q							q						No problems yet. Solutions <i>could</i> include this partial configuration
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CORRECT	<table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td></td><td></td><td>q</td><td></td></tr> <tr><td>q</td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td>q</td></tr> <tr><td></td><td>q</td><td></td><td></td></tr> </table>			q		q							q		q			Solution!
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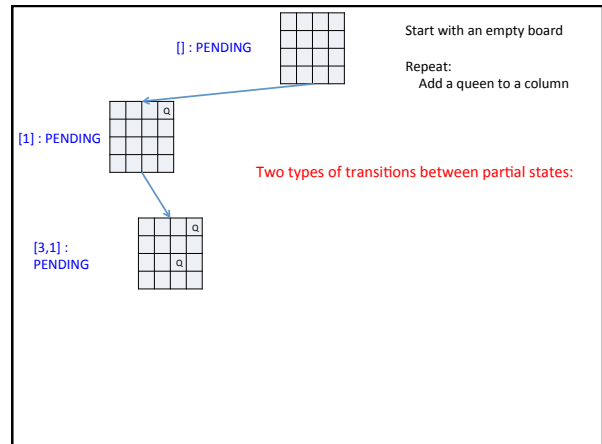
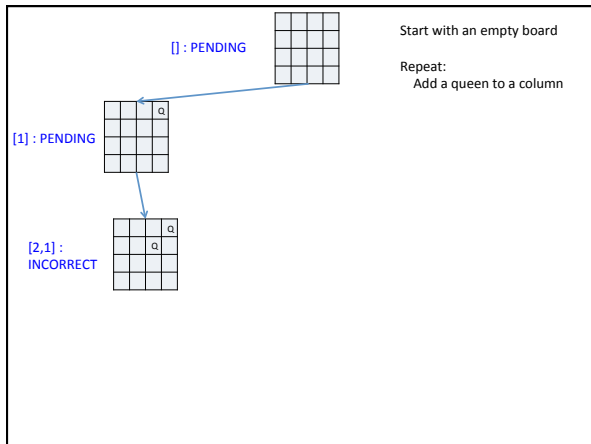
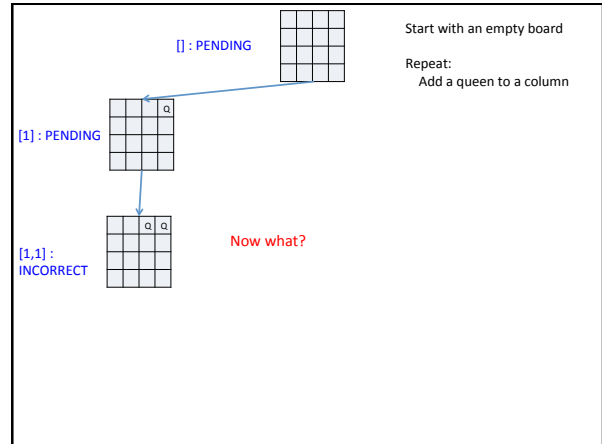
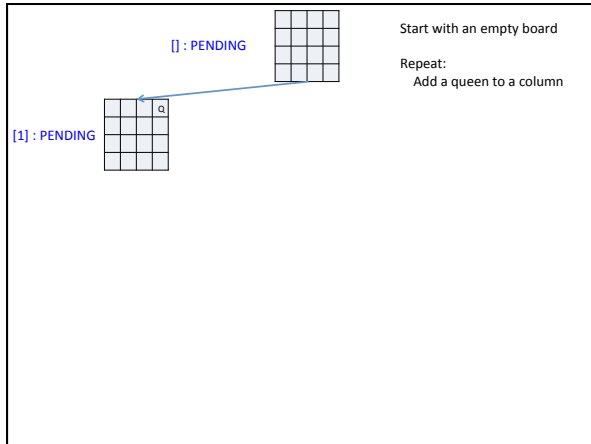
Exhaustive search: next state function transitions from one *complete* state to another *complete* state

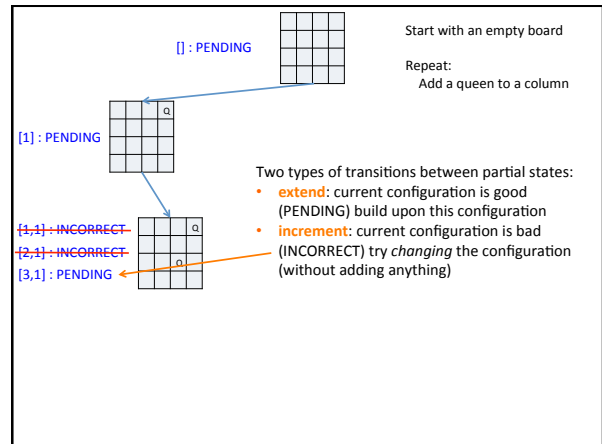
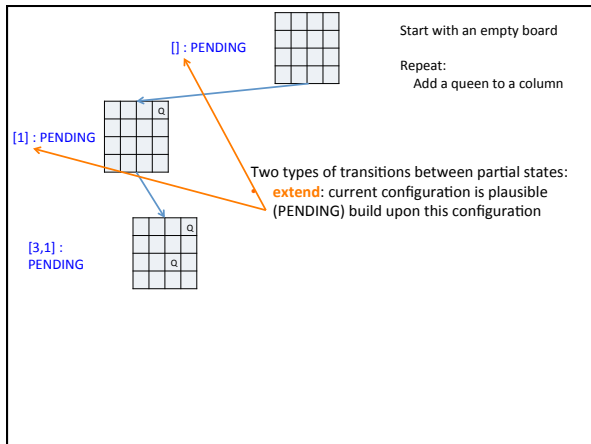
What do we do for backtracking (w/ branch and bound)?

[] : PENDING

Start with an empty board

Repeat:
Add a queen to a column





To the code!



<http://atomicwanderers.com/2013/12/05/gotham-city-14-miles-and-the-hotmobile-parachute-pickup-service/>