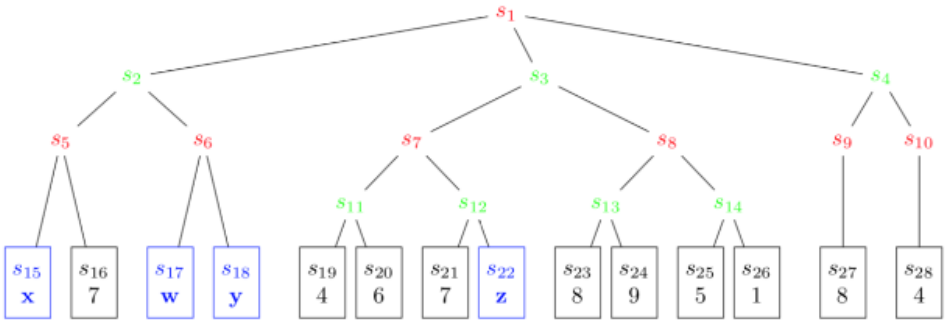


Consider the game-tree above. The maximising player controls red nodes and the minimising player controls the green ones.

For each of the following assignments of values to x, w, y, z decide if under those assignments Alpha-Beta search explores all states of the game-tree.

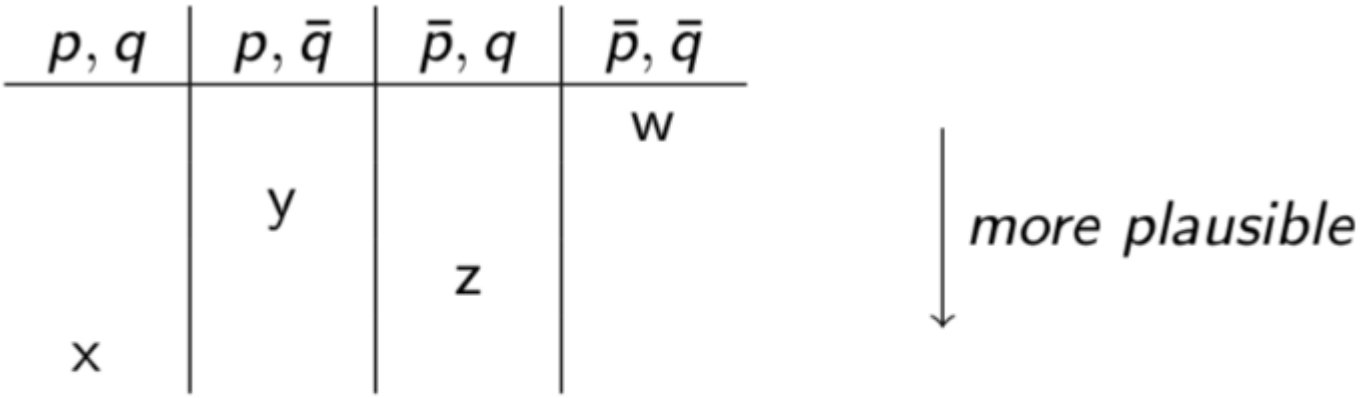
Vælg en svarmulighed på hver linje

	Yes	No
$x := 8, w := 7, y := 9, z := 8$	○	✓
$x := 6, w := 8, y := 5, z := 6$	○	✓
$x := 6, w := 5, y := 6, z := 8$	○	✓

It is known that $MINIMAX(s_1) = 7$. Decide which of the following assignment of values to x, w, y, z are possible in such case.

Vælg en svarmulighed på hver linje

	Yes	No
$x := 8, w := 7, y := 6, z := 8$	✓	○
$x := 6, w := 5, y := 6, z := 8$	✓	○
$x := 6, w := 8, y := 6, z := 5$	✓	○



Which state is most plausible after the revision with $\neg p$?

Vælg én svarmulighed

- [x] z
- [ ] x
- [ ] w
- [ ] y

Which states are most plausible after contraction with p?

Vælg én svarmulighed

- [ ] z and w
- [ ] x and y
- [x] x and z
- [ ] w and x

Propositional Logic

Consider this numbered list of formulas:

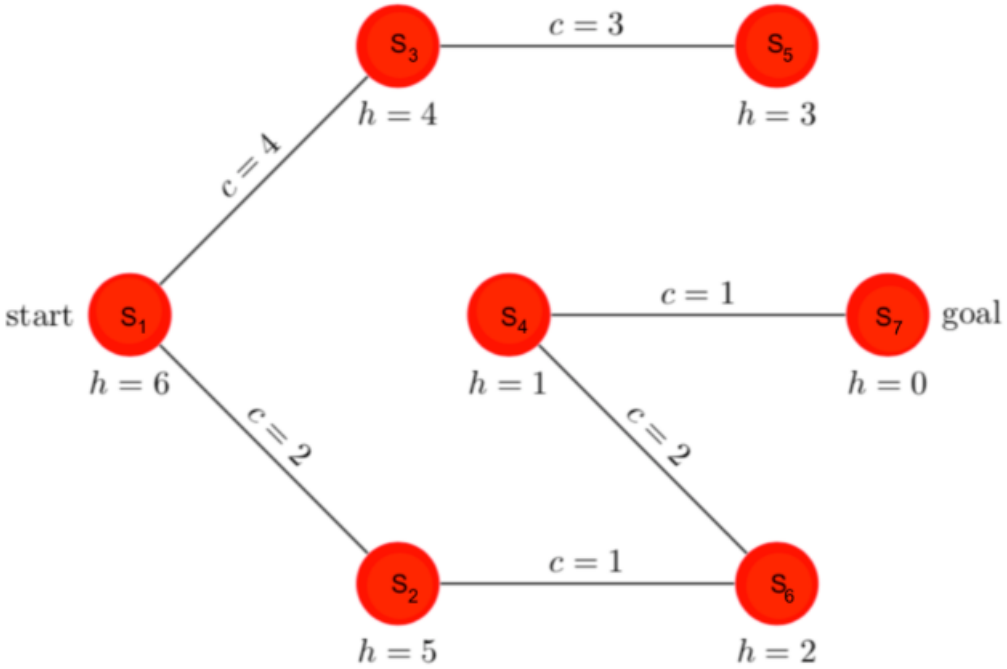
1. $(p \vee q) \wedge (\neg p \vee q)$
2. $(p \vee \neg q) \vee (\neg p \vee q) \vee (p \vee \neg p)$
3. $p \vee p \vee q$
4. $q \wedge \neg q \wedge p$

Which of the above formulas match the following descriptions?

Vælg en svarmulighed på hver linje

	1	2	3	4
valid disjunction of definite clauses	○	●	○	○
result of resolving $\neg r \vee p$ and $p \vee q \vee r$	○	○	●	○
equivalent to q	●	○	○	○
unsatisfiable conjunction of Horn clauses	○	○	○	●

Informed Search



Consider the state space in figure above. Heuristic function for each node is given by h and the step-costs are given by c. All transitions are bidirectional. You are asked to answer questions about the run of various tree and graph search algorithms on this space.

Evaluate the following statement:
Uniform Cost Graph Search expands node s_5.

Vælg én svarmulighed

- ○ True
- ✓ False

Evaluate the following statement:
A^*Graph Search expands node s_3.

Vælg én svarmulighed

- ○ True
- ✓ False

Evaluate the following statement:
Greedy Best-First Tree Search expands node s_6.

Vælg én svarmulighed

- ✓ False
- ○ True

Evaluate the following statement:
Greedy Best-First Graph Search expands node s_2.

Vælg én svarmulighed

- ○ False
- ✓ True

Evaluate the following statement:
Greedy Best-First Tree Search expands node s_4.

Vælg én svarmulighed

- ✓ False
- ○ True

Evaluate the following statement:
Uniform Cost Tree Search expands node s_5.

Vælg én svarmulighed

- ○ True
- ✓ False

Evaluate the following statement:
A^*Tree Search expands node s_3.

Vælg én svarmulighed

- ✓ False
- ○ True

Partially observable domains
Consider the following partially observable domain. An agent is in a room that contains a light bulb and a coin. There are four possible physical states:

- ***light_on_heads_up*** : the light bulb is **on** and the coin is laying **heads up**.
- ***light_on_tails_up***: the light bulb is **on** and the coin is laying **tails up**.
- ***light_off_heads_up*** : the light bulb is **off** and the coin is laying **heads up**.
- ***light_off_tails_up***: the light bulb is **off** and the coin is laying **tails up**.

There is one action available:

- ***turn_light_on*** : the agent can turn the light bulb on, if it is currently off

The ACTIONS and RESULTS functions are defined as follows:

- ACTIONS(***light_off_heads_up***) = ACTIONS(***light_off_tails_up***) = {***turn_light_on***}
- ACTIONS(***light_on_heads_up***) = ACTIONS(***light_on_tails_up***) = { }
- RESULTS(***light_off_heads_up***, ***turn_light_on***) = {***light_on_heads_up***}
- RESULTS(***light_off_tails_up***, ***turn_light_on***) = {***light_on_tails_up***}

The agent can only see whether the coin is laying heads up or tails up, if the light is currently on. Formally, the PERCEPT function is as follows:

- PERCEPT(***light_on_heads_up***) = ***heads_up_visible***
- PERCEPT(***light_on_tails_up***) = ***tails_up_visible***
- PERCEPT(***light_off_heads_up***) = PERCEPT(***light_off_tails_up***) = *null*

Suppose that the agent's initial belief state is *b* = {***light_off_heads_up***, ***light_off_tails_up***}.

What is $\text{POSSIBLE-PERCEPTS}(\bigcup_{s \in b} \text{RESULTS}(s, turn\_light\_on))$?

Vælg én svarmulighed

- ○ {*null*, ***heads_up_visible,tails_up_visible***}
- ○ {*null* }
- ○ {{*null* }, {***heads_up_visible,tails_up_visible*** }}
- ● {***heads_up_visible, tails_up_visible***}

What is $\bigcup_{s \in b} \text{RESULTS}(s, turn\_light\_on)$?

Vælg én svarmulighed

- ○ {***light_off_heads_up, light_off_tails_up, light_on_heads_up, light_on_tails_up***}
- ● {***light_on_heads_up, light_on_tails_up***}
- ○ { {***light_on_heads_up***}, {***light_on_tails_up***} }
- ○ {***light_on_heads_up***}

What is $\text{RESULTS}'(b, turn\_light\_on)$?

Vælg én svarmulighed

- ○ { {***light_on_heads_up, light_on_tails_up***} }
- ○ { {***light_on_heads_up***}, {***light_on_tails_up***} }
- ○ ***light_on_heads_up***
- ● {***light_on_heads_up, light_on_tails_up*** }
- ○ {***light_off_heads_up, light_off_tails_up, light_on_heads_up, light_on_tails_up*** }

Belief Revision: AGM
Answer the following questions about belief revision.

Let $A = \{p, q, \neg(\neg p \wedge \neg q), p \rightarrow q, \neg p \rightarrow q\}$be a belief base. Which of the following sets are in $A \perp q$?

Vælg en svarmulighed på hver linje

	Yes	No
$\{p, \neg q, p \vee q, \neg p \rightarrow q\}$	○	✓
$\{p, \neg(\neg p \wedge \neg q)\}$	○	✓
$\{p, \neg(\neg p \wedge \neg q), p \rightarrow q, \neg p \rightarrow q\}$	○	✓
$\{\neg(\neg p \wedge \neg q), p \rightarrow q, \neg p \rightarrow q\}$	○	✓
$\{p, \neg(\neg p \wedge \neg q), \neg p \rightarrow q\}$	✓	○

Is it the case that $\neg p \vee p \in Cn(\{q, p \wedge \neg q\})$?

Vælg én svarmulighed

- ○ No
- ✓ Yes