Iterative DPS - DPS with ever increasing max depth limit
Uniform cost search - put all into priority queue and pick the best
A* - select node with min f:
$f = g\,(cost\ so\ far\ +\ cost\ to\ node)\ +\ h\,(est.\ best\ case\ cost\ to\ finish)$
Greedy BFS - A* with $f = h$
Beam search - evaluate all possible directions and pick the best
Local beam search - evaluate some subset
Hill climbing - always pick the best
Stochastic hill-climbing - pick a random direction and decide whether to go there
Simulated annealing - Stochastic hill-climbing but worse fitness is accepted sometimes
Simple Reflex agent - react to now
Model-based reflex agent - compare now to internal model
Goal-based agents - long term planning
Utility-based agents - like goal… but also optimize for efficiency/utility by measuring it
Learning Agents - learn and adjust
Admissible heuristic - doesn't overestimate the cost
Consistent heuristic - cost so far plus cost to end is more than cost from start to end
Horizon effect - a significant change may exist just outside the depth limit of a game tree
Quiescence - dormancy
Begin min max from max
CNF form: ORs separated by ANDs. Combine by eliminating contradictions

1. $P \rightarrow L \Rightarrow \neg P \vee L$
2. DeMorgan to move negations inward

$$
\begin{aligned}
&Init(At(C_1,\ SFO) \wedge At(C_2,\ JFK) \wedge At(P_1,\ SFO) \wedge At(P_2,\ JFK)\\
&\quad \wedge Cargo(C_1) \wedge Cargo(C_2) \wedge Plane(P_1) \wedge Plane(P_2)\\
&\quad \wedge Airport(JFK) \wedge Airport(SFO))\\
&Goal(At(C_1,\ JFK) \wedge At(C_2,\ SFO))\\
&Action(Load(c,\ p,\ a),\\
&\quad \textsc{Precond}: At(c,\ a) \wedge At(p,\ a) \wedge Cargo(c) \wedge Plane(p) \wedge Airport(a)\\
&\quad \textsc{Effect}: \neg\, At(c,\ a) \wedge In(c,\ p))
\end{aligned}
$$

Agent	Performance measure	Environment	Actuator	Sensor
Automated submarine	Scientific usefulness of the scans	Ocean	Controlled with a remote	Camera (+IR), GPS, pressure sensors

Automated online shopper	Price paid/value received ratio	The great World Wide Web	Sale alerts. New posting alerts	Content of the web page

Agent	Observable	Agents	Deterministic	Episodic	Static	Discrete
Automated submarine	Partially	Single	Stochastic	Sequential	Dynamic	Continuous
Automated online shopper	Fully	Multiple	Deterministic	Episodic	Semi	Discrete

a. Planar map task
   i. States: the state is determined by country boundaries, 4 sets of colored countries (one set for each color) and a set of uncolored countries
   ii. Initial state: initial state is any state in which 4 sets that store colored countries are all empty
   iii. Actions: Each state can color any one country into one of 4 colors
   iv. Transition model: The actions have their expected effects, except each country can only be colored with one color at a time. Repainting of a country shell be permitted if agent can not do backtracking
   v. Goal test: Checks whether all countries are colored and no two neighboring countries have the same color
   vi. Path cost: Each coloring has a cost of 1. Thus, the agent is discouraged from repainting the same country needlessly

DPLL (stolen from Tani):

Step 1: Clauses: $\neg Y$, $\neg Y \vee \neg R$, $Y \vee R$, $Y \vee M$, $R \vee M$, $\neg M \vee H$
Pure: $\neg Y$
Model: Y = False (since $\neg Y$ = True)

Step 2: Clauses: $Y \vee R$, $Y \vee M$, $R \vee H$, $\neg M \vee H$
Since Y = False
R = True, M = True
Model: Y = False, R = True, M = True

Step 3: Clauses: $R \vee H$, $\neg M \vee H$
Since M = True, $\neg M$ = False
H = True
Model: Y = False, R = True, M = True, H = True

$Y =$ False, $R =$ true, $M =$ True, $H =$ True