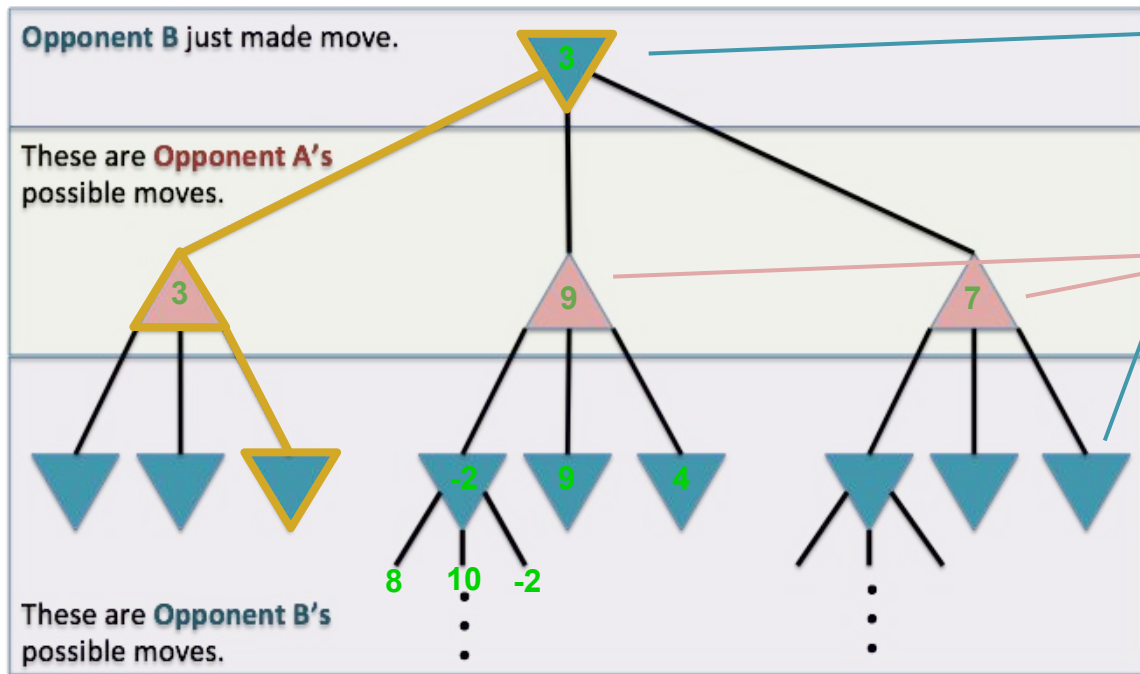


Games

Games

- (Search) problems with **more than one agent**
- Zero-sum games: two or more agents playing against each other with **opposite utilities**
 - Other types of games will just have agents with *different* utilities
- Formulation
 - States
 - Actions
 - Transition function
 - Goal test
 - **Players**
 - **Terminal utilities**
 - **Policy (solution)**

Game Trees



minimizer

maximizer

Minimax: assign values to nodes according to type of node (**minimizer** or **maximizer**) and extract policy directly from node values

Alpha-beta pruning: keep track of the best node option so far for EACH player, to prune paths that we know for a fact will never need to be checked

- α : maximizer's best value so far; init at $-\infty$
 - Compare grandchildren's values v_i with α , prune siblings if $v_i \leq \alpha$
- β : minimizer's best value so far; init at $+\infty$
 - Compare grandchildren's values v_i with β , prune siblings if $v_i \geq \beta$

