MinimaxValue	
Inputs	game tree Γ_x rooted at x
Output	minimax value

1. if $x \in T$, **return** v
2. if $l(x) = \textsc{Max}$, **return** $\textsc{MaxValue}(\Gamma_x)$
3. if $l(x) = \textsc{Min}$, **return** $\textsc{MinValue}(\Gamma_x)$

MaxValue	
Inputs	game tree Γ_x rooted at x
Output	minimax value

1. $v = -\infty$
2. for all $y \in \mathcal{T}(x)$
   (a) $v = \max\{v, \textsc{MinimaxValue}(\Gamma_y)\}$
3. **return** v

MinValue	
Inputs	game tree Γ_x rooted at x
Output	minimax value

1. $v = +\infty$
2. for all $y \in \mathcal{T}(x)$
   (a) $v = \min\{v, \textsc{MinimaxValue}(\Gamma_y)\}$
3. **return** v

Table 1: Algorithm for computing the minimax value of a game.

$\alpha\beta$PRUNING

Inputs game tree Γ_x rooted at x
α: the best known value for MAX along an alternative path
β: the best known value for MIN along an alternative path

Output minimax value

1. if $x \in T$, **return** v
2. if $l(x) = \text{MAX}$, **return** MAXVALUE$(\Gamma_x, \alpha, \beta)$
3. if $l(x) = \text{MIN}$, **return** MINVALUE$(\Gamma_x, \alpha, \beta)$

MAXVALUE

Inputs game tree Γ_x rooted at x

Output minimax value

1. $v = -\infty$
2. for all $y \in \mathcal{T}(x)$
   (a) $v = \max\{v, \alpha\beta\text{PRUNING}(\Gamma_y, \alpha, \beta)\}$
   (b) if $v \geq \beta$, return v
   (c) $\alpha = \max\{\alpha, v\}$
3. **return** v

MINVALUE

Inputs game tree Γ_x rooted at x

Output minimax value

1. $v = +\infty$
2. for all $y \in \mathcal{T}(x)$
   (a) $v = \min\{v, \alpha\beta\text{PRUNING}(\Gamma_y, \alpha, \beta)\}$
   (b) if $v \leq \alpha$, return v
   (c) $\beta = \min\{\beta, v\}$
3. **return** v

MINIMAXVALUE
Inputs game tree Γ_x rooted at x
Output minimax value

1. if $x \in T$, **return** v
2. if $l(x) = \text{MAX}$, **return** MAXVALUE(Γ_x)
3. if $l(x) = \text{MIN}$, **return** MINVALUE(Γ_x)

MAXVALUE
Inputs game tree Γ_x rooted at x
Output minimax value

1. $v = -\infty$
2. for all $y \in \mathcal{T}(x)$
   (a) $v = \max\{v, \text{MINIMAXVALUE}(\Gamma_y)\}$
3. **return** v

MINVALUE
Inputs game tree Γ_x rooted at x
Output minimax value

1. $v = +\infty$
2. for all $y \in \mathcal{T}(x)$
   (a) $v = \min\{v, \text{MINIMAXVALUE}(\Gamma_y)\}$
3. **return** v

Table 1: Algorithm for computing the minimax v

$\alpha\beta$PRUNING
Inputs game tree Γ_x rooted at x
α: the best known value for MAX along an alternative path
β: the best known value for MIN along an alternative path
Output minimax value

1. if $x \in T$, **return** v
2. if $l(x) = \text{MAX}$, **return** MAXVALUE(Γ_x, α, β)
3. if $l(x) = \text{MIN}$, **return** MINVALUE(Γ_x, α, β)

MAXVALUE
Inputs game tree Γ_x rooted at x
Output minimax value

1. $v = -\infty$
2. for all $y \in \mathcal{T}(x)$
   (a) $v = \max\{v, \alpha\beta\text{PRUNING}(\Gamma_y, \alpha, \beta)\}$
   (b) if $v \geq \beta$, return v
   (c) $\alpha = \max\{\alpha, v\}$
3. **return** v

MINVALUE
Inputs game tree Γ_x rooted at x
Output minimax value

1. $v = +\infty$
2. for all $y \in \mathcal{T}(x)$
   (a) $v = \min\{v, \alpha\beta\text{PRUNING}(\Gamma_y, \alpha, \beta)\}$
   (b) if $v \leq \alpha$, return v
   (c) $\beta = \min\{\beta, v\}$
3. **return** v

Attendance “quiz”

Each answered quiz is worth 1 late day to use on any assignment

Expect 6 throughout the semester

https://forms.gle/JRp5LuELAa8uSZ2Y9