

**function** ALPHA-BETA-SEARCH( $state$ ) **returns** an action

$v \leftarrow \text{MAX-VALUE}(state, -\infty, +\infty)$

**return** the action in  $\text{ACTIONS}(state)$  with value  $v$

**function** MAX-VALUE( $state, \alpha, \beta$ ) **returns** a utility value

**if**  $\text{TERMINAL-TEST}(state)$  **then return**  $\text{UTILITY}(state)$

$v \leftarrow -\infty$

**for each**  $a$  **in**  $\text{ACTIONS}(state)$  **do**

$v \leftarrow \text{MAX}(v, \text{MIN-VALUE}(\text{RESULT}(state, a), \alpha, \beta))$

**if**  $v \geq \beta$  **then return**  $v$

$\alpha \leftarrow \text{MAX}(\alpha, v)$

**return**  $v$

**function** MIN-VALUE( $state, \alpha, \beta$ ) **returns** a utility value

**if**  $\text{TERMINAL-TEST}(state)$  **then return**  $\text{UTILITY}(state)$

$v \leftarrow +\infty$

**for each**  $a$  **in**  $\text{ACTIONS}(state)$  **do**

$v \leftarrow \text{MIN}(v, \text{MAX-VALUE}(\text{RESULT}(state, a), \alpha, \beta))$

**if**  $v \leq \alpha$  **then return**  $v$

$\beta \leftarrow \text{MIN}(\beta, v)$

**return**  $v$