

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

player \leftarrow *game*.TO-MOVE(*state*)

value, *move* \leftarrow MAX-VALUE(*game*, *state*, $-\infty$, $+\infty$)

return *move*

function MAX-VALUE(*game*, *state*, α , β) **returns** a (*utility*, *move*) pair

if *game*.IS-TERMINAL(*state*) **then return** *game*.UTILITY(*state*, *player*), null

v \leftarrow $-\infty$

for each *a* **in** *game*.ACTIONS(*state*) **do**

v2, *a2* \leftarrow MIN-VALUE(*game*, *game*.RESULT(*state*, *a*), α , β)

if *v2* $>$ *v* **then**

v, *move* \leftarrow *v2*, *a*

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

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

return *v*, *move*

function MIN-VALUE(*game*, *state*, α , β) **returns** a (*utility*, *move*) pair

if *game*.IS-TERMINAL(*state*) **then return** *game*.UTILITY(*state*, *player*), null

v $\leftarrow +\infty$

for each *a* **in** *game*.ACTIONS(*state*) **do**

v2, *a2* \leftarrow MAX-VALUE(*game*, *game*.RESULT(*state*, *a*), α , β)

if *v2* $< v$ **then**

v, *move* \leftarrow *v2*, *a*

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

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

return *v*, *move*