Mandatory Assignment 2

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Task 1

The major difference between minimax and expectiminimax is the difference in how the reward is calculated:

```
function EXPECTMINIMAX-SEARCH(game,state) returns an action
    value, move ← MAX-VALUE(game,state)
return move

function MAX-VALUE(game,state) returns (utility,move)
    if game.IS-TERMINAL(state) then
        return game.UTILITY(state,MAX), null
    v ← -∞
    for each a in game.ACTIONS(state) do
        v2,a2 ← MIN-VALUE(game, CHANCE-VALUE(false, game.RESULT(state,a)))
        if v2 > v then
    v,move ← v2,a
return v,move

function MIN-VALUE(game,state) returns (utility,move)
    if game.IS-TERMINAL(state) then
        return game.UTILITY(state,MAX), null
    v ← +∞
    for each a in game.ACTIONS(state) do
        v2,a2 ← MAX-VALUE(game, CHANCE-VALUE(true, game.RESULT(state,a)))
        if v2 < v then
            v,move ← v2,a
return v,move

function CHANCE-VALUE(isMinVal, result) returns ExpectedReward
    if isMinVal then
        // To show 50% probability, we randomize either 0 or 1, and depending on
the result, we update the game
        probability = RANDOM(0, 1)
        if(probability = 0) then
            result.RESULT(-1, result.RESULT.action)
        else then
            result.RESULT(0, result.RESULT.action)
    else isMinVal then
        probability = RANDOM(0, 1)
        if(probability = 0) then
            result.RESULT(0, result.RESULT.action)
```
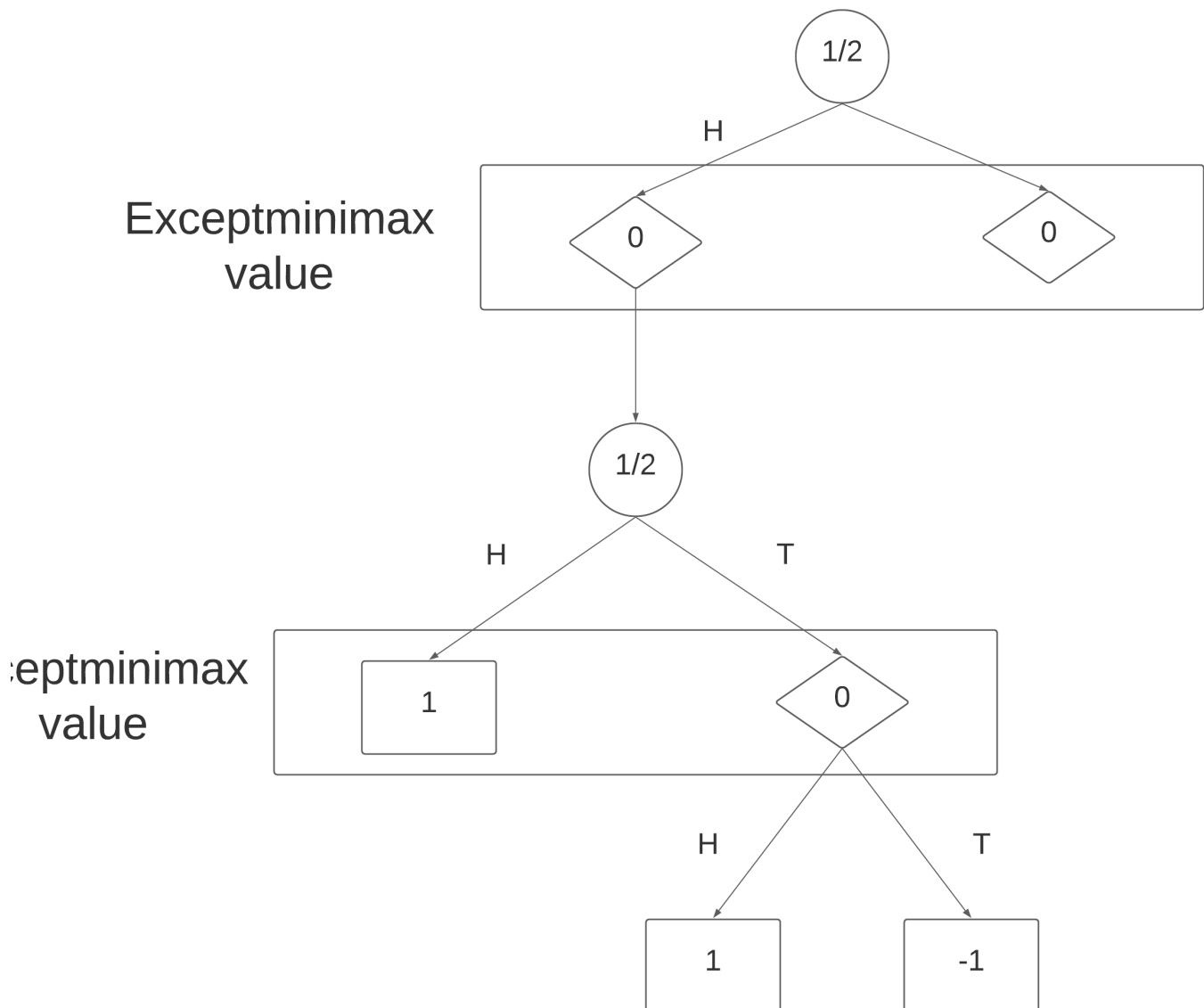
```
        else then
            result.RESULT(-1, result.RESULT.action)
```

Task 2

Task 2A and task 2B

Task 2C

The exceptminimax would be head head and then win.