Mandatory

Exercise 1

```
function Expectiminimax-Decision(state) returns an action
      a' ← Nil
      v' ← -∞
      for each a in Actions(state) do
            v ← Change-Value(Result(state, a), Min)
            if v > v' then
                  v' ← v
                  a' ← a
      return a
```

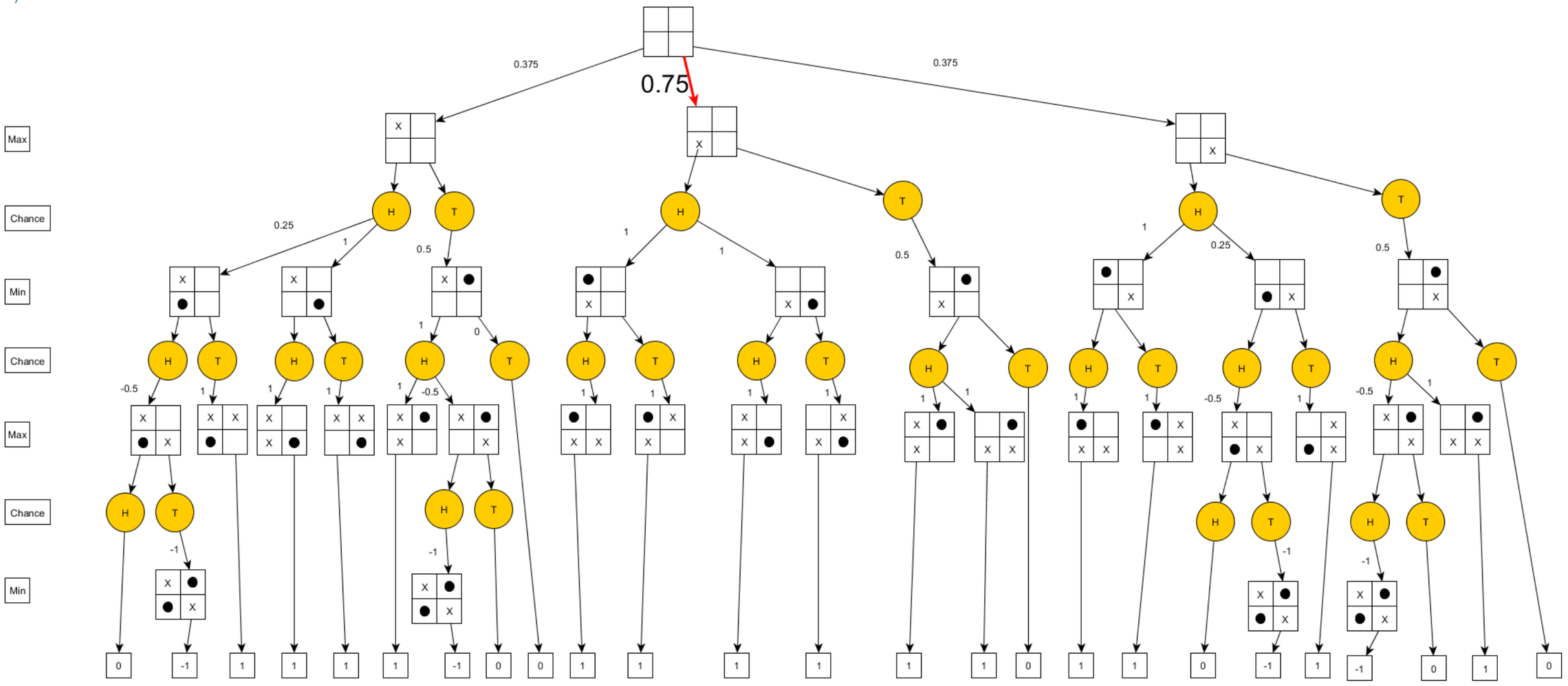
```
function Change-Value(state, nextPlayer) returns a utility value
      v ← 0
      if nextPlayer is Max then
            for each a in Actions(state) do
                  v ← Sum(v, P(a) * Max-Value(Result(state, a))
      else
            for each a in Actions(state) do
                  v ← Sum(v, P(a) * Min-Value(Result(state, a))
      return v
```

```
function Max-Value(state) returns a utility value
      if Terminal-Test(state) then return Utility(state)
      v ← -∞
      for each a in Actions(state) do
            v ← Max(v, Change-Value(Result(state, a), Min))
      return v
```

```
function Min-Value(state) returns a utility value
      if Terminal-Test(state) then return Utility(state)
      v ← ∞
      for each a in Actions(state) do
            v ← Min(v, Change-Value(Result(state, a), Max))
      return v
```

Exercise 2

a)



b)

The best action given a head coin flip is for Max to place his piece in the bottom left corner, which has an expectiminimax value of 0.75.