Making Decisions Exercises

* 16.2
  + Chris considers four used cars before buying the one with the maximum expected utility.. Pat considers 10 cars and does the same. All other things being equal, which one is more likely to have the better car? Which is more likely to be disappointed with their car’s quality? By how much? (in terms of expected quality)
    - Chris is more likely to have the Better Car by 15%
      * He looks at 4 Cars which Means he is 75% likely to be disappointed but 25% likely to be happy with his choice
    - Pat is more likely to be disappointed
      * He looks at 10 Cars which means he is 90% likely to be disappointed and 10% likely to be happy with his choice
* 17.17
  + In the children’s game of rock-paper-scissors each player reveals at the same time a choice of rock, paper, or scissors. Paper wraps rock, rock blunts scissors, and scissors cuts paper. In the extended version rock-paper-scissors-fire-water, fire beats rock, paper, and scissors; Rock, paper, and scissors beat water; and water beats fire. Write out the payoff matrix and find a mixed-strategy solution to this game.
    - Win(w) = 1, Loss(l) = -1, Tie(t) = 0

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | rock | paper | scissors | fire | water |
| rock | 0,0 | -1,1 | 1,-1 | -1,1 | 1,-1 |
| paper | 1,-1 | 0,0 | -1,1 | -1,1 | 1,-1 |
| scissors | -1,1 | 1,-1 | 0,0 | -1,1 | 1,-1 |
| fire | 1,-1 | 1,-1 | 1,-1 | 0,0 | -1,1 |
| water | -1,1 | -1,1 | -1,1 | 1,-1 | 0,0 |

* + - Mixed Strategy Solution
    - rock wins : 2/5
    - paper wins : 2/5
    - scissors wins: 2/5
    - fire wins : 3/5
    - water wins 1/5
      * [0.3, fire; 0.2, rock; 0.2, scissors; 0.2, paper; 0.1, water]