Probability Worksheet (Tree Diagrams)

1. In a laboratory experiment, two mice will be placed in a simple maze with one decision point where a mouse can turn either left (L) or right (R). When the first mouse arrives at the decision point, the direction it chooses is recorded. Then, the process is repeated for the second mouse.

a) Draw a tree diagram where the first stage represents the decision made by the first mouse and the second stage represents the decision made by the second mouse. Determine all four possible decision outcomes for the two mice.

b) If the probability of turning left is 0.5 and the probability of turning right is 0.5 for each mouse, what is the probability that only one of the two mice will turn left?

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c) If the researchers add food in the simple maze such that the probability of each mouse turning left is now 0.7, draw another tree diagram to find what is the probability that only one of the two mice will turn left?

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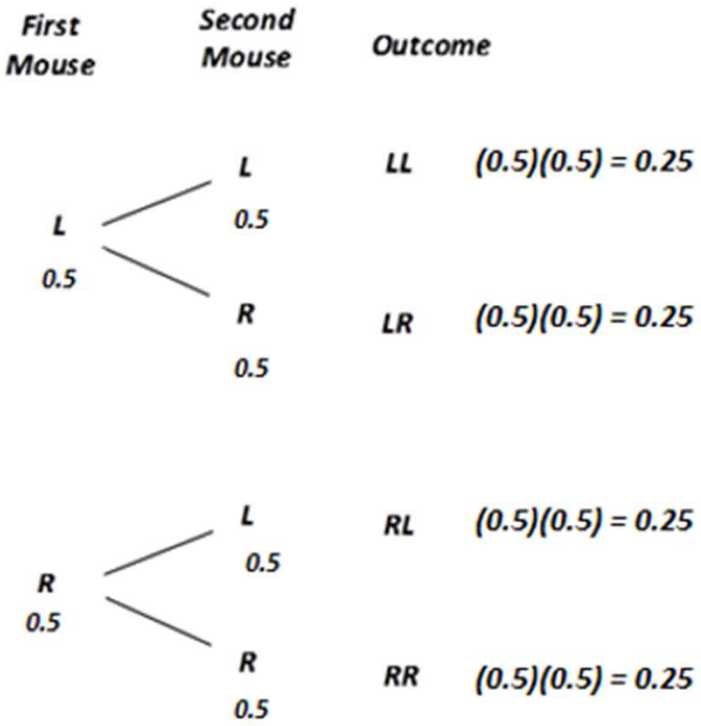

b) If the probability of turning left is 0.5 and the probability of turning right is 0.5 for each mouse, what is the probability that only one of the two mice will turn left?

There are two outcomes that have exactly one mouse turning left: LR and RL. Each has a probability of 0.25*, so the probability of only one of the two mice turning left is* $0.25 + 0.25 = 0.5$.

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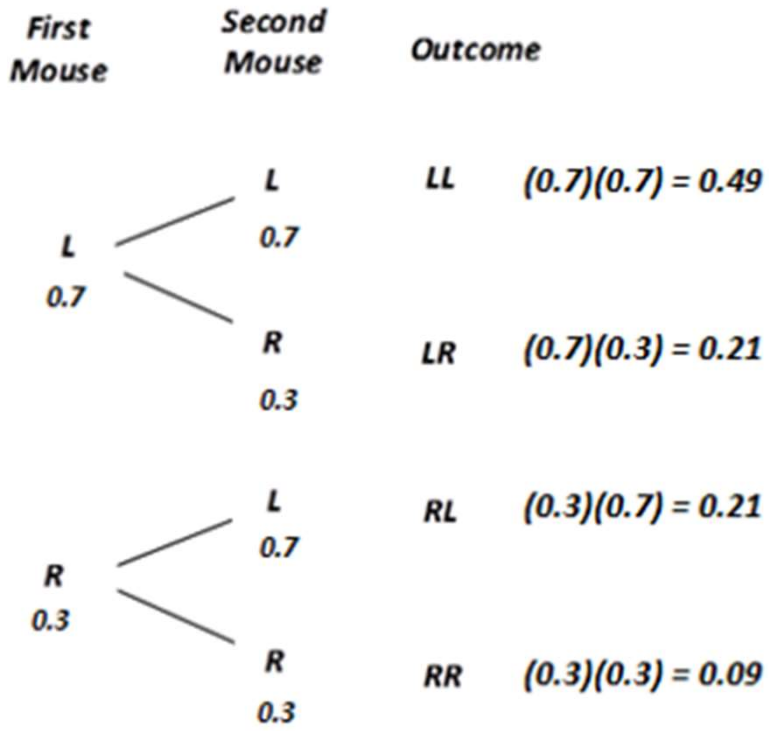
c) If the researchers add food in the simple maze such that the probability of each mouse turning left is now 0.7, draw another tree diagram to find what is the probability that only one of the two mice will turn left?



As in Problem 2, there are two outcomes that have exactly one mouse turning left: LR and RL. However, with the adjustment made by the researcher, each of these outcomes now has a probability of 0.21. *So now, the probability of only one of the two mice turning left is* $0.21 + 0.21 = 0.42$.