Probability Worksheet (Tree Diagrams)

1. In a laboratory experiment, three mice will be placed in a simple maze that has just 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 he chooses is recorded. The same is done for the second and the third mouse.

a) Draw a tree diagram where the first stage represents the decision made by the first mouse, the second stage represents the decision made by the second mouse, and so on. Determine all eight possible outcomes of the decisions for the three mice.

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

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c) If the researchers conducting the experiment add food in the simple maze such that the probability of each mouse turning left is now 0.7. Draw a tree diagram to find what is the probability that only one of the three mice will turn left?

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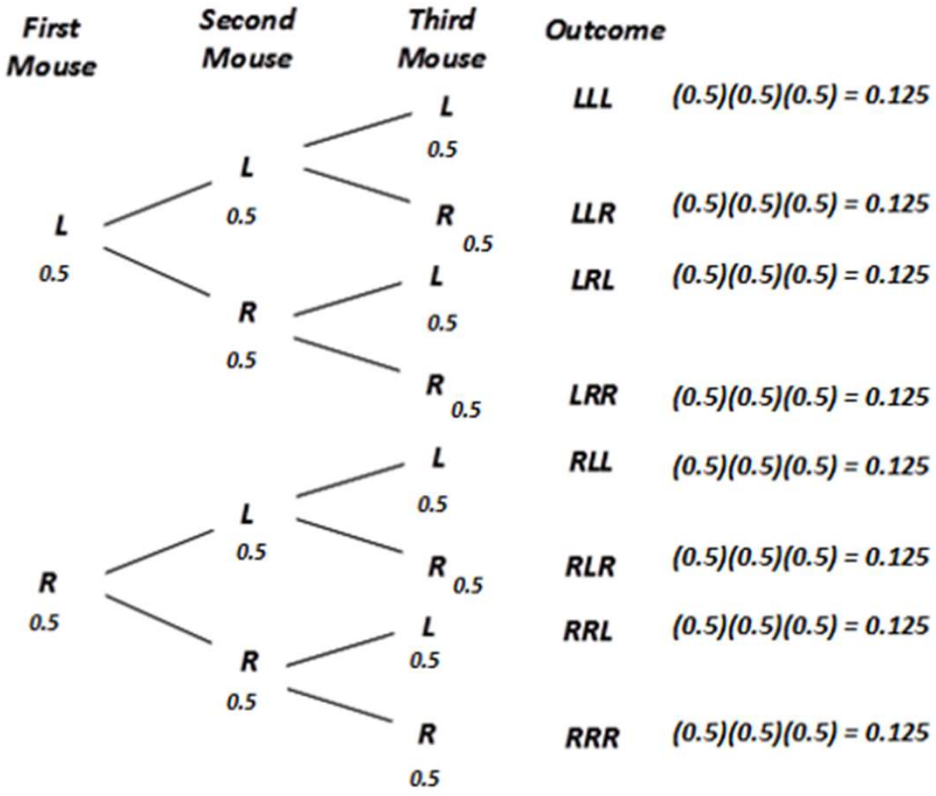

b). If, for each mouse, the probability of turning left is 0.5 and the probability of turning right is 0.5, what is the probability that only one of the three mice will turn left?

There are three outcomes that have exactly one mouse turning left: LRR, RLR, and RRL. Each has a probability of 0.125*, so the probability of having only one of the three mice turn left is* 0.375.

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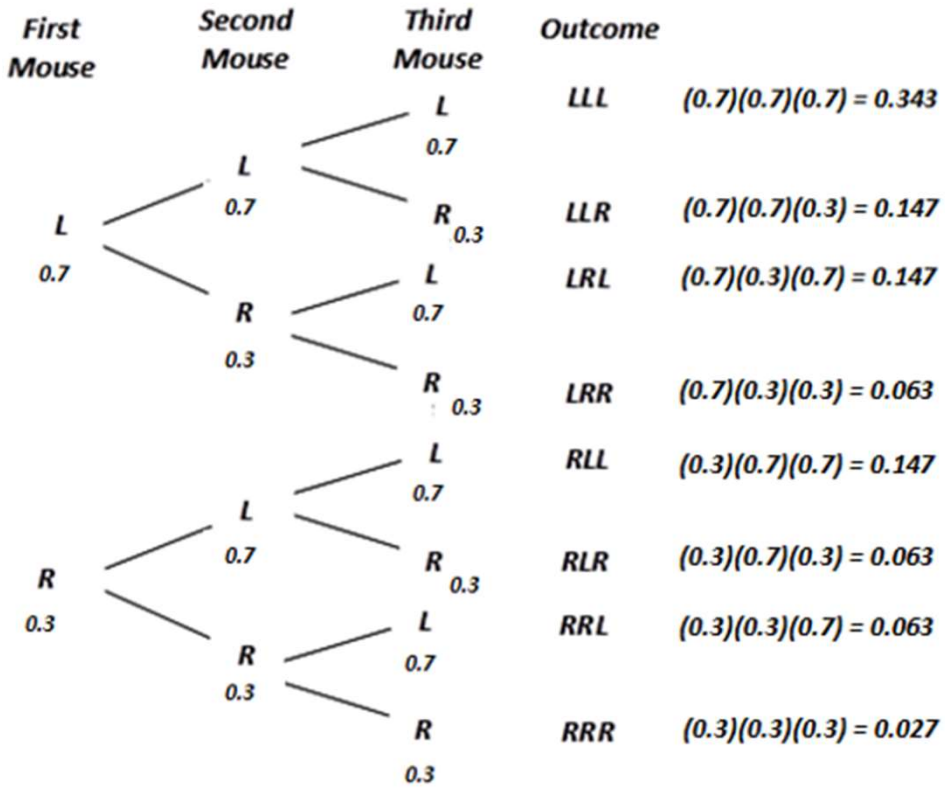
c) If the researchers conducting the experiment add food in the simple maze such that the probability of each mouse turning left is now 0.7. Draw a tree diagram to find what is the probability that only one of the three mice will turn left?



There are three outcomes that have exactly one mouse turning left: LRR, RLR, and RRL. However, with the adjustment made by the researcher, each of the three outcomes now has a probability of 0.063. *So now, the probability of having only one of the three mice turn left is the sum of three equally likely outcomes of* 0.063, *or* $0.063(3) = 0.189$.