Assignment 3

Unit 5 - Week 3

Assignment

1. In the English language, directional movements can be?
   - Prepositions, adverbs, and adjectives
   - Nouns, verbs, and adjectives
   - Verbs, adverbs, and adjectives
   - Adjectives only

2. How many different sentences are there in the following text?
   - She, him, girls, girl, mouse
   - She, him, girls, girl, mice
   - She, him, girls, girl, mouse
   - She, him, girls, girl, mice

3. Which of the following words can be considered as both adjectives and adverbs?
   - Happy
   - Kind
   - Smart
   - Clever

4. Consider the following State Transition diagram with three states: Sunny, Fuzzy, & Merry. If the state transition probabilities are as shown:

   - Merry → Sunny: 0.5
   - Merry → Fuzzy: 0.3
   - Sunny → Fuzzy: 0.2
   - Fuzzy → Merry: 0.4

   a. What is the probability of transitioning from Sunny to Fuzzy?
   b. What is the probability of transitioning from Fuzzy to Sunny?

5. You are supposed to be locked in a room for several days, and you are asked about the window outside. You say that no one has been able to get you out, and that the sun is shining outside. You are asked how many times the sun has risen since the last time you saw it. You say that you can't remember how many times it has risen, but that the total number of times it has risen is 50. If the probability of the sun rising on any given day is 0.5, what is the expected number of times it has risen?

6. You are trying to paint a picture, and you want to ensure that the colors are balanced. You have three colors: Red, Green, and Blue. If you want to ensure that each color is used at least once, what is the probability of each color being chosen?

7. Given the following Venn diagram on Artificial Intelligence:

   - Which category best describes the following concepts:
     - Expert Systems
     - Machine Learning
     - Data Mining
   - What is the relationship between these categories?