Basic Concepts of Probability

Probability: a measure that is associated with how certain we are of outcomes of a particular experiment or activity

Experiment: a planned operation carried out under controlled conditions

Chance Experiment: an experiment whose result is not predetermined

Outcome: a result of an experiment

Sample Space: the list of all the possible outcomes of an experiment

Ways to Represent a Sample Space:

1. List the possible outcomes
2. Create a tree diagram
3. Create a Venn diagram

Event: any combination of outcomes

Equally likely: each outcome of an experiment occurs with equal probability

Practice Exercises

A. Write the sample space for each experiment.

1. A toss of a coin and a die.
2. A coin tossed three times.
3. A toss of two coins once.
4. A vowel of the English alphabet picked at random from a box.
5. A roll of a die and tossing a coin.

B. Do as directed in each of the following.

1. Let a coin and a die be tossed. Give the elements of the following events.
   a. A = {head or tail and an odd number}
   b. B = {an outcome with a number less than 4}
   c. C = {tails and an even number}
   d. D = {heads and a number less than 5}
   e. E = {an outcome with a number at most 4}
2. A pair of dice is rolled. Write the elements of each event.
   a. G = {the largest of one of the two numbers is 3}
   b. H = {the two numbers whose sum is at most 5}
   c. I = {the pair of numbers have an even sum}
   d. J = {the pair of numbers whose sum is 6 but none of the two is even}

Problem Set

A. Write the sample space for each experiment.

1. A toss of a die and a coin.
2. A coin tossed two times.
3. A toss of three coins once.
4. A day of the week picked at random from a box.

B. Do as directed in each of the following.

1. Let a die and a coin be tossed. Give the elements of the following events.
   a. A = {an even number and a head or tail }
   b. B = {an outcome with a number greater than 4}
   c. C = {an odd number and tails }
   d. D = {a number less than 3 and heads }
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