2

Basics of Counting

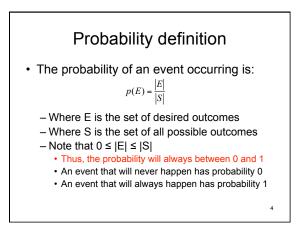
CS231 Dianna Xu

Tossing two coins

• What is the probability of getting two heads? one head? no heads?

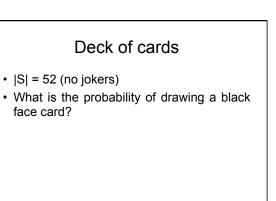
Terminology

- Experiment
 - A repeatable procedure that yields one of a given set of outcomes
 - Roll a die
- Sample space
 - The range of outcomes possible
 - For a die, that would be values 1 to 6
- Event
 - Subset of the sample space
 - Rolling for 5 or above



Dice probability

- What is the probability of getting "snakeeyes" (two 1's) on two six-sided dice?
 - Probability of getting a 1 on a 6-sided die is 1/6
 - Only one possible combination (1,1): |E| = 1
 - |S| = ?
 - Thus, it' s 1/36
- What is the probability of getting a 7 by rolling two dice?
 - There are six combinations that can yield 7: (1,6), (2,5), (3,4), (4,3), (5,2), (6,1)
- Thus, |E| = 6, |S| = 36, P(E) = 6/36 = 1/6



6

What's behind door number 3?

- Three doors A, B and C
- You pick A
- One of the other two is shown empty
- Should you switch to the third?

Elements of a list

- Number of integers between m and n, where $m \le n$ is n-m+1
- How many 4-digit integers are divisible by 7?
 - 1001 = 7*143

7

- 9996 = 7*1428
- (1428-143)+1 = 1286
- What is the probability that a randomly chosen 4-digit integer is divisible by 7?