INTRODUCTION TO PROBABILITY MODELS

Lecture 4

Qi Wang, Department of Statistics

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REMINDERS

1. The first quiz will be on this **Wednesday**
2. The first homework is posted on the course website and due on **Sep 7**

EXAMPLE 1

Drew is a risk taker. On any given weekend, Drew takes risks with or without monetary compensation. He gets paid 20% of the time he takes risks. The risks involved are to either drink something weird (like garlic butter) or do something silly (like shave his head into a mohawk). Drew gets paid and drinks something weird 16% of the time. Drew does not get paid and drinks something weird 72% of the time.

1. What is the probability Drew drinks something weird?
2. What is the probability he does something silly?

EXAMPLE 2

You are previewing movies for your young nephew. You have 1284 movies available to view, 272 of which are G-rated. Your nephew enjoys movies with puppets, which make up 94 of your G-rated movies. There are only 30 movies with puppets that are not G-rated. if you happen to pick a movie that has puppets, what is the probability that it is G-rated?

MULTIPLICATION RULE

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- $P(A|B) = \frac{P(A \cap B)}{P(B)}$
- $P(A \cap B) = P(B) \times P(A|B) = P(A) \times P(B|A)$
- The probability that Events A and B both occur is equal to the probability that Event B occurs times the probability that Event A occurs, given that B has occurred

EXAMPLE 3

Three cards are dealt successively at random and without replacement from a standard deck of 52 playing cards. What is the probability of receiving, in order, a king, a queen, and a jack?