

### Binomial Probability:

- Repeated independent trials
- Only two possible outcomes: **Success** & **Failure**.
- $P(\text{Success})=s$  and  $P(\text{Failure})=f \rightarrow s + f = 1$

Probability of  $x$  successes in  $n$  trials:

$${}_nC_x \cdot s^x \cdot f^{(n-x)}$$

A fast food restaurant attaches prize cards to every one of its soft drink cups. They award free drinks as prizes on three out of four cards. Suppose you buy three drinks. Find the probability that you will win exactly one drink.

$$P(\text{Success}) = .75 \quad P(\text{Failure}) = .25$$

$\frac{3}{4} \qquad \frac{1}{4}$

$${}_3C_1 (.75)^1 (.25)^2 = 14.06\%$$

When it rains there is a 70% chance that practice will be cancelled. If it rains for the next three days, what is the probability that practice will be cancelled at least once?

$$P(\text{Success}) = .70 \quad P(\text{Failure}) = .30$$

$$\begin{array}{l} 1 \\ \text{or} \\ 2 \\ \text{or} \\ 3 \end{array} \quad \begin{array}{l} {}_3C_1 (.70)^1 (.30)^2 = 18.9\% \\ {}_3C_2 (.70)^2 (.30)^1 = 44.1\% \\ {}_3C_3 (.70)^3 = 34.3\% \\ \hline 97.3\% \end{array}$$

$$\begin{array}{l} (\text{No Cancellations}) = 100\% - 97.3\% \\ \text{or} \\ {}_3C_0 (.70)^0 (.30)^3 \end{array} \} = 2.7\%$$

In an job interview only 10% applicants qualify. If a group of 4 applicants have applied, find the probability that at most one student will qualify?

$$P(\text{Success}) = .10 \quad P(\text{Failure}) = .90$$

$$\begin{array}{l} 0 \\ \text{or} \\ 1 \end{array} \quad \begin{array}{l} {}_4C_0 (.10)^0 (.90)^4 = 65.61\% \\ {}_4C_1 (.10)^1 (.90)^3 = 29.16\% \\ \hline 94.77\% \end{array}$$

You can now finish Hwk #17: Sec 12-6  
Page 689.

Problems: 4, 5, 15-19, 22, 25a

use binomial probability not a tree diagram

A serial number on the back of a TV has 5 numbers and 3 letters. How many different serial numbers are possible if:

1. Letters and numbers can repeat?

10 10 10 10 10 26 26 26

2. Letters can't repeat and you can't use the letter 'O' but numbers can repeat.

10 10 10 10 10 25 24 23

The next few sections we will be discussing  
relate to STATISTICS.

### Some Statistics Vocabulary:

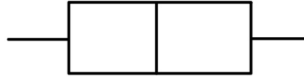
Measures of Central Tendency (the 3 M's):

- Mean
- Median
- Mode

Gives an indication of where the  
"middle" of the data is.

## Box-and-Whisker Plot:

- Quartiles
- Extremes
- Median
- Upper 25%
- Lower 25%
- Middle 50%



Other statistics we will discuss are:

- Outlier
- Percentiles