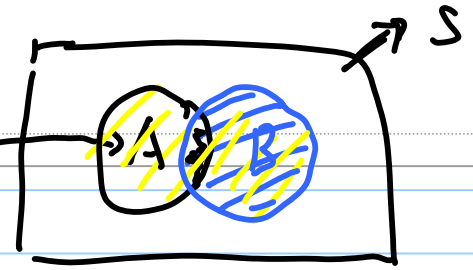
CDA6530, lecture 1 (08/21/13)

No

8/21/2013

- $P(A \cup B) = P(A) + P(B) - P(A \cap B)$



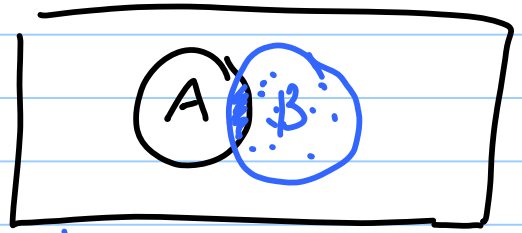
$p(A \cup B) = p(B) + p(A \cap B^c)$

$p(A \cap B^c) \stackrel{?}{=} p(A) - p(A \cap B)$

$p(A \cap B^c) + p(A \cap B) \stackrel{?}{=} p(A)$

- $P(A|B) = P(AB)/P(B)$

$$\frac{\#\text{ of sample in } A \cap B}{S} \Big/ \frac{\#\text{ of samples in } B}{S}$$



# of sample points in B = $0.1 \times 1000 + 4000 \times 0.05 = 300$

$P(B) = \frac{300}{5000} = 6\%$

$P(AB) = \frac{100}{5000} = 2\%$

- A="chip is from X", B="chip is defective"

$P(A|B) = \frac{100}{300} = 1/3$

$P(A|B) = \frac{P(AB)}{P(B)} = \frac{2\%}{6\%} = 1/3$

- $P(AB) = P(A)P(B)$

$P(A|B) = P(A) \quad \cdots \quad P(B|A) = P(B)$

$P(A|B) = \frac{P(AB)}{P(B)} = P(A)$

$\Rightarrow P(AB) = P(A) \cdot P(B)$