

LECTURE 1

Solution to homework one

Sec 4.2 problem 4,8

4: Use T for tails and H for heads.

(a): the sample space is $\{(H, H, H), (H, H, T), (H, T, H), (H, T, T), (T, H, H), (T, H, T), (T, T, H), (T, T, T)\}$

(b): The events include $\{(H, T, T), T, H, T), (T, T, H), (T, T, T)\}$.

8:

(a): The outcomes are $\{(Chicken, pasta, icecream), (Chicken, pasta, gelatin), (Chicken, pasta, apple pie), (Chicken, rice, ice cream), (Chicken, rice, gelatin), (Chicken, rice, apple pie), (Chicken, potatoes, ice cream), (Chicken, potatoes, gelatin), (Chicken, potatoes, apple pie), (roast beef, pasta, icecream), (roast beef, pasta, gelatin), (roast beef, pasta, apple pie), (roast beef, rice, ice cream), (roast beef, rice, gelatin), (roast beef, rice, apple pie), (roast beef, potatoes, ice cream), (roast beef, potatoes, gelatin), (roast beef, potatoes, apple pie)\}$.

(b): $A = \{(Chicken, pasta, icecream), (Chicken, rice, ice cream), (Chicken, potatoes, ice cream), (roast beef, pasta, icecream), (roast beef, rice, ice cream), (roast beef, potatoes, ice cream)\}$.

(c): $B = \{(Chicken, pasta, icecream), (Chicken, pasta, gelatin), (Chicken, pasta, apple pie), (Chicken, rice, ice cream), (Chicken, rice, gelatin), (Chicken, rice, apple pie), (Chicken, potatoes, ice cream), (Chicken, potatoes, gelatin), (Chicken, potatoes, apple pie)\}$.

(d): $A \cap B = \{(Chicken, pasta, icecream), (Chicken, rice, ice cream), (Chicken, potatoes, ice cream), \}$.

(e): $C = \{(Chicken, rice, ice cream), (Chicken, rice, gelatin), (Chicken, rice, apple pie), (roast beef, rice, ice cream), (roast beef, rice, gelatin), (roast beef, rice, apple pie)\}$.

(f): $A \cap B \cap C = \{(Chicken, rice, ice cream)\}$.

Sec 4.3 problem 4,5,7,9,11,15,16

4

(a): Answer = $P(1 \text{ red light}) + P(2 \text{ red lights}) + P(3 \text{ red lights}) = 0.86$

(b): Answer = $P(3 \text{ red lights}) = 0.16$.

5

If A, B disjoint, then $P(A) + P(B) = P(A \cup B) \leq 1.0$, so answer is NO.

if A, B not disjoint, this is possible, take $A=B$, and $P(A)=0.6$.

7

(a): Answer = $0.2 + 0.03 + 0.4 + 0.01 = 1.0$

(b): Answer = $0.3 + 0.4 + 0.1 = 0.8$.

(c): Answer = $0.4 + 0.1 = 0.5$.

(b): Answer = 0.1.

9

(a): Answer = $0.2 + 0.35 + 0.25 + 0.15 = 0.95$.

(b): Answer = $0.2 + 0.35 + 0.25 = 0.8$.

(c): Answer = 0.2.

11: $P(\text{cloudy Or rainy})=P(\text{cloudy})+P(\text{rainy})-P(\text{both cloudy and rainy})=0.7$, so 70 percent of being canceled.

15: $P(\text{Neither suit nor tie})=1-P(\text{suit Or tie})=1-P(\text{suit})-P(\text{tie})+P(\text{suit and tie})=0.6$.

16

(a): $P(\text{NOT A in statistics Or physics})=1-P(\text{A in both statistics and physics})=1-P(\text{A in statistics})-P(\text{A in physics})+P(\text{A in either statistics or physics})=0.86$

(b): $P(\text{A in both statistics and physics})=P(\text{A in statistics})+P(\text{A in physics})-P(\text{A in either statistics or physics})=0.14$.

Sec4.4 problem 1,6

1: Answer $=1-128/216=0.407$.

6: assuming there are N pennies, then there are $4N$ dimes, so the probability that it is a dime $=4N/(4N + N) = 0.8$.