22 CST 蒋祥翔

No.

Date

概率统计 Probability and Statistics

Homework 02

Section 2.1

Ex. 2

a) $A = \{RRR, LLL, SSS\}$

b) $B = \{RLS, RSL, LRS, LSR, SRL, SLR\}$

c) $C = \{RRL, RRS, RLR, RSR, LRR, SRR\}$

d) $D = \{RRL, RRS, RLR, RSR, LRR, SRR,$
$LLR, LLS, LRL, LSL, RLL, SLL,$
$SSR, SSL, SRS, SLS, RSS, LSS,\}$

e. $C \cup D = D$, because $C \subseteq D$

$C \cap D = C$, the same reason as above.

$D' = \{RRR, LLL, SSS, RLS, RSL, LRS, LSR, SRL, SLR\}$

Ex. 4

a) $S = \{FFFF, VVVV, FVFF, FFVF, FFFV, FVVF, FVFV, FFVV, FVVV,$
$VFFF, VFFV, VVFF, VFVF, VVVF, VFVV, VVFV,\}$

b) $\{FVFF, FFVF, FFFV, VFFF\}$

c) $\{FFFF, VVVV\}$

d) $\{FVFF, FFVF, FFFV, VFFF, FFFF\}$

e) $c \cup d = \{FVFF, FFVF, FFFV, VFFF, FFFF, VVVV\}$

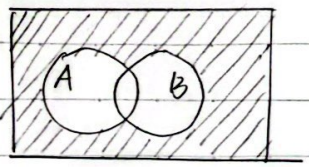
$c \cap d = \{FFFF\}$

f) $b \cup c = \{FVFF, FFVF, FFFV, VFFF, FFFF, VVVV\}$

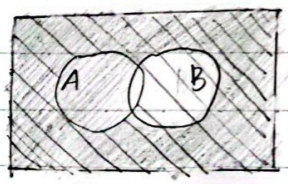
$b \cap c = \phi$

Ex. 7

a)

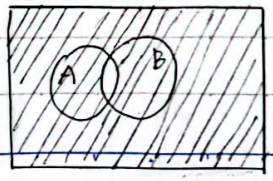



$(A \cup B)'$

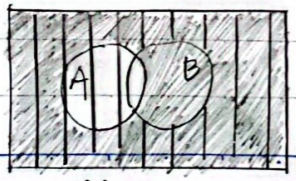



$A' \cap B'$

b)




$(A \cap B)'$




$A' \cup B'$

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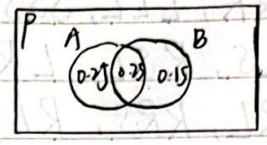
Ex.17

a) $P(A\cup B) = P(A) + P(B) - P(A\cap B) = 0.5 + 0.4 - 0.25 = 0.65$

b) $P(A'\cap B') = P[(A\cup B)'] = 1 - P(A\cup B) = 0.35$

c) describe: $A\cap B'$, by drawing Venn diagram:




$P(A\cap B') = 0.25$

Ex.18

Let event A be "the first one is not 75 W bulb"

$P(A) = \frac{6+5}{6+5+4} = \frac{11}{15}$

Ex.27

a) $P(A) = \frac{1}{C_5^2} = \frac{1}{10} = 0.1$

b) $P(B) = \frac{C_2^1 \cdot C_3^1 + 1}{C_5^2} = \frac{7}{10} = 0.7$

c) $P(C) = \frac{6}{C_5^2} = \frac{6}{10} = 0.6$

Ex.30

a) $A_8^3 = 8\times 7\times 6 = 336$

b) $C_{30}^6 = \frac{30!}{(30-6)!} = 593775$

c) $C_8^2 \cdot C_{10}^2 \cdot C_{12}^2 = \frac{8!}{(8-2)!}\cdot\frac{10!}{(10-2)!}\cdot\frac{12!}{(12-2)!} = 83160$

d) $\frac{83160}{593775} = 0.14$

e.) $\frac{C_8^6 + C_{10}^6 + C_{12}^6}{C_{30}^6} = \frac{11162}{593775}$

Ex.38

a.) $\frac{C_6^2 \cdot C_9^1}{C_{15}^3} = \frac{135}{455} \approx 0.297$

b.) $\frac{C_4^3 + C_5^3 + C_6^3}{C_{15}^3} = \frac{34}{455} \approx 0.075$

c). $\frac{C_4^1 \cdot C_5^1 \cdot C_6^1}{C_{15}^3} = \frac{120}{455} \approx 0.264$

d.) $\frac{C_9^5}{C_{15}^5} = \frac{126}{3003} \approx 0.042$

Ex.40.

a) with subscripts: $12!$

without A's subscripts: $12! - 9! C_{10}^3$

b) $\frac{A_4^4}{\frac{12!}{6^4}} = \frac{24}{369600}$