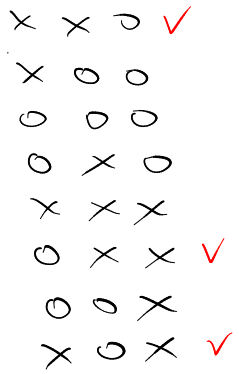
Example



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Example

$R_A \in [0, 100]$ $\quad S = [0, 100]$

$P(10 \le R_A \le 20) = 10/100 = 0.1$

$P(R_A > 60) = 40/100 = 0.4$

Hands-on exercise

1) $A \cap B^c \cap C^c$

2) $A \cap B^c \cap C$

3) $A \cup B \cup C$

4) $A \cap B \cap C$

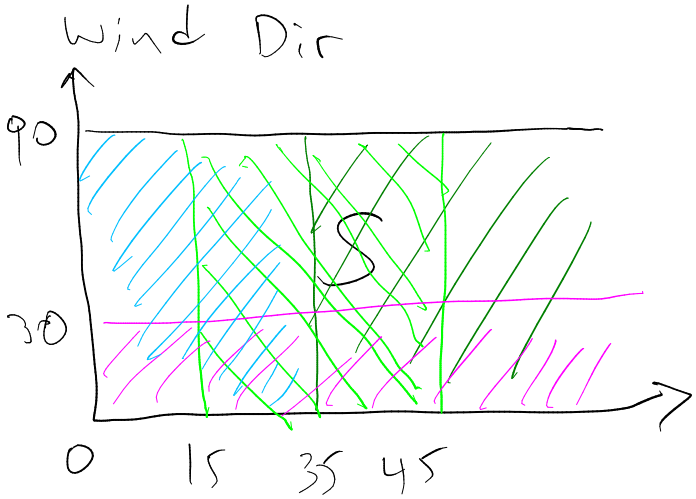
5) $A^c \cap B^c \cap C^c$

6) $(A \cap B^c \cap C^c) \cup (A^c \cap B \cap C^c) \cup (A^c \cap B^c \cap C)$

7) $(A \cap B \cap C^c) \cup (A \cap B^c \cap C)$

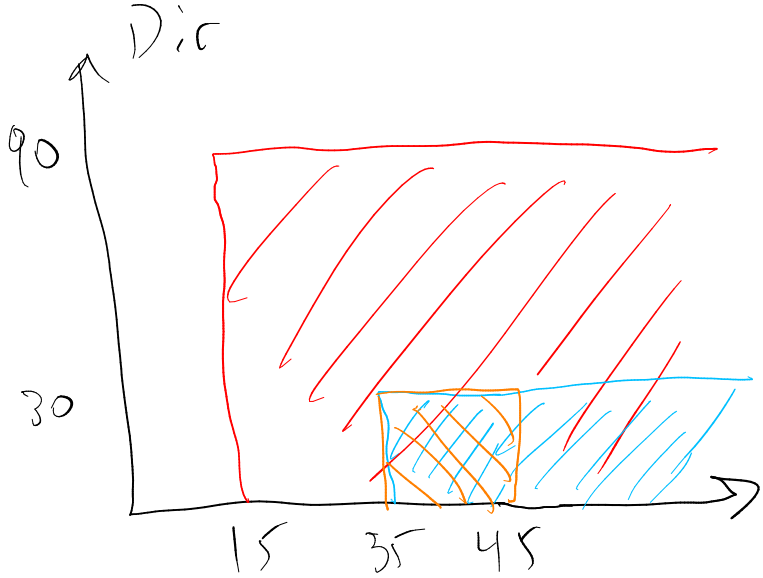
$\cup (A^c \cap B \cap C)$

Problem 1



E_1 E_3

E_2 E_1^c



$A = E_1 \cap E_3$

$B = E_1 \cup E_2$

$C = E_1 \cap E_2 \cap E_3$

Problem 2

Failure of chain $= E_1 \cup E_2$

No failure $= (E_1 \cup E_2)^c$

but also $E_1^c \cap E_2^c$ De Morgan's Law

Problem 3

Shortage in city C $= E_1 \cap E_2 \cup E_3$

No shortage $= (E_1 \cap E_2 \cup E_3)^c =$

$= (E_1 E_2 \cup E_3)^c = (E_1 E_2)^c E_3^c =$

$= (E_1^c \cup E_2^c) E_3^c$

Shortage in D $= E_1 \cap E_2 \cup E_3 \cup E_4$

no shortage $= (E_1 E_2 \cup E_3 \cup E_4)^c =$

$= (E_1 E_2)^c E_3^c E_4^c = (E_1^c \cup E_2^c) E_3^c E_4^c$