ST102   Week 3

Def. (Set operations)
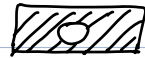
  i) Intersection

  ii) Union

  iii) Complement

Prop. (Some laws)

  Commutative : $A \cap B = B \cap A$, $A \cup B = B \cup A$

  Associative : $A \cap (B \cap C) = (A \cap B) \cap C$

               $A \cup (B \cup C) = (A \cup B) \cup C$

  Distributive : $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$

              $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

Def. (Partition)

  $\{B_i\}_1^m$ of A s.t.   i) $\sum_{i=1}^{m} B_i = A$

                   ii) $B_i \cap B_j = \phi$, $\forall i \neq j$

Some interesting facts:

1) $(A \cap B) \cup (A \cap C) \supset (A \cap B) \cap (A \cap C)$

             $= A \cap B \cap A \cap C = (A \cap A) \cap (B \cap C)$

             $= A \cap (B \cap C) = A \cap B \cap C$

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

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

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

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