* **Intersection of Sets :**
* The **intersection** of two or more sets contains all the elements that are in all sets.
* For sets ***A***, ***B***, their ***intersection A*∩*B*** is the set containing all elements that are simultaneously in ***A* and (“∧”) in *B*.**
* Formally**, ∀*A*, *B*: *A*∩*B*≡{*x* | *x* ∈ *A*∧*x*∈*B*}**.
* **Note** that ***A*∩*B***is a subset of ***A*****and** it is a subset of ***B***:   
  **∀*A*, *B*: (*A*∩*B* ⊆*A*) ∧ (*A*∩*B* ⊆*B*).**
* Formal definition for the intersection of two sets: **A** ∩ **B = { *x* | *x* ∈ A and *x* ∈ B }.**
* **Further Examples**
* {1, 2, 3} **∩** {3, 4, 5} = **{3}.**
* {New York, Washington} ∩ {3, 4} = **∅**. No elements in common
* {1, 2} ∩ ∅ = **∅**  Any set intersection with the empty set yields the empty set
* **Properties of the intersection operation**
* **A ∩ *U* = A Identity law**
* **A ∩ ∅ = ∅ Domination law**
* **A ∩ A = A Idempotent law**
* **A ∩ B = B ∩ A Commutative law**
* **A ∩ (B ∩ C) = (A ∩ B) ∩ C Associative law**
* **Disjoint of Sets:**
* Two sets are disjoint if they have **NO** elements in common
* Formally, two sets are disjoint if their intersection is the empty set
* **Formal definition for disjoint sets: Two sets are disjoint if their intersection is the Empty set.**
* **Further Examples**
* {1, 2, 3} and {3, 4, 5} are not disjoint
* {New York, Washington} and {3, 4} are disjoint
* {1, 2} and ∅ are disjoint
* Their intersection is the empty set ∅ **and** ∅ are disjoint! Their intersection is the empty set
* Two sets ***A***, ***B*** are called ***disjoint*** (*i.e.*, enjoined)   
  if their intersection is empty. **(*A* ∩ *B* = ∅)**
* Example: the set of even integers is disjoint with the set of odd integers.