Sets and Operations

A set is a collection of objects without repetition.

A={1,2,4,5}

A={x/x is integer $2 \leq x \geq 20$}

Empty set → Ø

A= {1, 2, 3, ……, 20} → **Finite set**

N= { 1,2 ,3 , ……..} → **Infinite set**

Binary operations

1. AU B**, union** of A and B, is { x / x is in A or x is in B}

2. A∩ B, the **intersection** of A and B, is { x / x is in A and x is in B}

3. A / B, the **difference** of A and B, is { x / x is in A and x is not in B}

4. A x B, the **Cartesian product** of A and B, is the set of ordered pairs (a, b) such that a is in A and b is in B.

5. 2^A , the **power set** of A, is the set of all subsets of A.

6. Equality

A= B , iff

A⊆ B

B⊆ A

Example:

Let A={1, 2}, B={2, 3} then

A U B = {1, 2, 3}

A ∩ B = {2}

A / B = {1} OR Sometimes this is also written as A-B

A x B = { (1, 2), (1, 3), (2, 2), (2, 3) }

And 2^A = {Ø, {1}, {2}, {1, 2}}

Note:

If A and B have n, m members respectively, then A x B has nm members and 2^A has 2^n members.

Remark:

We can construct a new language by using any one of the above operations.