5. The infinite set
$S_2 = \{x : 0 < x < 1 ; x \in \mathbb{R}\}$ is bounded with supremum 1 and infimum zero, both of which donot belong to S_2.

6. The infinite set
$S_3 = \{x : 0 \le x \le 1 ; x \in \mathbb{R}\}$ is bounded

with supremum 1 and infimum 0, both of which are members of S_3.

7. The set $S_4 = \left\{\frac{1}{n} : n \in \mathbb{N}\right\}$ is bounded

The supremum 1 belong to S_4 while infimum 0 does not.

(8) Each of the following intervals is bounded:

$$[a,b],\ (a,b],\ [a,b),\ (a,b).$$

Example (3): Prove that the greatest member of a set, if it exists, is the supremum (l.u.b) of the set.
(solution see after two pages)

Sol: Let G be the greatest member of the set
clearly TS:- G = sup S.

(i) $x \le G, \ \forall x \in S.$

so that G is an upper bound of S

(ii) Again, no number less than G can be