Definition

Let $(F,+,\cdot,<)$ is an order field, then $(F,+,\cdot,<)$ is called complete order field if every subset $E \subseteq F$ which is bounded above and has Least upper bound (L.u.b) in $F$.

Example:-

The real number is complete order Field.

Completnees - property of $\mathbb{R}$ :

Every non-empty set of real number which is bounded above has least upper bound in $\mathbb{R}$.

Example:

The rational number is not complet order Field.

sol:- Consider the ball set

$S = \{ x \in \mathbb{Q} : x^2 < 2 \}$.

3 is upper bound of $S \Rightarrow S$ is bounded above

But $S$ does not least upper bound in $\mathbb{Q}$.

$\therefore (\mathbb{Q},+,\cdot,<)$ is not complete order Field.