Proposition The intersection of an arbitrary collection of σ-fields on S is a σ-field on S
Proof: Exercise

Corollary Given a set S and a set $\mathcal{B}$ of subsets of S, there exists a least σ-field $(S, \Sigma_{\mathcal{B}})$ containing $\mathcal{B}$

We call $\mathcal{B}$ *base* of $(S, \Sigma_{\mathcal{B}})$ and we say that $(S, \Sigma_{\mathcal{B}})$ *is generated by* $\mathcal{B}$