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T1 space

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Classification	msc 54D10
Synonym	T1
Related topic	T0Space
Related topic	T2Space
Related topic	T3Space
Related topic	RegularSpace
Related topic	ASpaceIsT1IfAndOnlyIfEverySubsetAIsTheIntersectionOfAllOpenSetsContainingA
Related topic	SierpinskiSpace
Related topic	PropertyThatCompactSetsInASpaceAreClosedLiesStrictlyBetweenT1AndT2

A topological space  $(X, \tau)$  is said to be  $T_1$  (or said to hold the  $T_1$  axiom) if for all distinct points  $x, y \in X$  ( $x \neq y$ ), there exists an open set  $U \in \tau$  such that  $x \in U$  and  $y \notin U$ .

A space being  $T_1$  is equivalent to the following statements:

- For every  $x \in X$ , the set  $\{x\}$  is closed.
- Every subset of  $X$  is equal to the intersection of all the open sets that contain it.
- Distinct points are separated.