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pseudocompact space

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A topological space X is said to be *pseudocompact* if every continuous function $f: X \rightarrow \mathbb{R}$ has bounded image.

All countably compact spaces (which includes all compact spaces and all sequentially compact spaces) are pseudocompact. A metric space is pseudocompact if and only if it is compact. A Hausdorff normal space is pseudocompact if and only if it is countably compact.