# homotopy extension property

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Let $X$ be a topological space and $A$ a subspace of $X$. Suppose there is a continuous map $f : X \to Y$ and a homotopy of maps $F : A \times I \to Y$. The inclusion map $i : A \to X$ is said to have the *homotopy extension property* if there exists a continuous map $F'$ such that the following diagram commutes:

$$
\begin{array}{ccc}
A & \xrightarrow{\ i_0\ } & A \times I \\
\downarrow{\scriptstyle i} & & \downarrow{\scriptstyle F} \\
X & \xrightarrow{\ f\ } & Y
\end{array}
$$

Here, $i_0 = (x, 0)$ for all $x \in X$.