ADDITIONAL TOPICS (3): DIMENSION

Read Section 2.3 of Armstrong's book. We find that a continuous map can map an one dimensional object to a two dimensional plane surjectively. This means that we need to define the dimension of a geometric object carefully.

One of the most important concept in geometry is the notion of a **manifold**. A topological manifold X is a topological space such that there exists an open covering $X = \bigcup_\alpha U_\alpha$ such that each U_α is homeomorphic to $\mathbb{R}^n$. Then n is called the **dimension** of the manifold X. Later in this class, we will prove that $\mathbb{R}^n$ is not homeomorphic to $\mathbb{R}^m$ if $m \neq n$. Therefore, the dimension of a manifold is well-defined.