The Grassmann manifold, $\text{Gr}(n,k)$, is a geometric object whose points parametrize the $k$-dimensional vector spaces lying in a fixed $n$-dimensional vector space. Flag manifolds are a more general class of geometric objects whose points parametrize flags, i.e. nested sequences of vector spaces. This talk will illustrate, through a collection of examples, how the Grassmann and Flag manifolds can be used to uncover structure in a dataset.