Answer the questions:

1. **What is the second principal component of PCA tell us about?**

The second principal component is the direction which maximizes variance among all directions orthogonal to the first component.

1. **What is the disadvantage of PCA?**

**Linearity** : PCA assumes that the principle components are a linear combination of the original features. If this is not true, PCA will not give you sensible results.

**Large variance implies more structure** : PCA uses variance as themeasure of how important a particular dimension is. So, high variance axes are treated as principle components, while low variance axes are treated as noise.

**Orthogonality** : PCA assumes that the principle components are orthogonal.

1. **When we use the L1 vs L2 regularization**

when only one variable is significantly important, the others are not, use l1, when multiple are important, use l2.