

**Arizona State university**  
**CSE 494 Spring-2019**

**Lab 1 Exercise: (10 points)**

**Due date: January 31, 2019**

1. Write a function to return the index of the nearest cluster given a sample. Your method should take use of the previously implemented clusters. What is the index of the nearest cluster obtained for “Arizona State University Main campus” ? (3 points)
2. When using an optimization algorithm like gradient descent, there is an error that it tries to minimize. While k-means does not explicitly try to minimize some error, we still have a way to measure error. It's called *inertia*. Inertia is the sum of square distances of samples to their closest cluster center. The smaller the inertia, the better.

What is the value of inertia using k=4, random initialization and after 10 iterations? (4 points)

3. Report the silhouette score for the clustering using k=4, random initialization and after 10 iterations. (3 points)