Moving the centers farther apart caused spectral clustering, k-means and mean shift to perform roughly the same, with just a few points changing clusters, and the number of clusters staying the same. However with spectral affinity the number of clusters decreased from 93 to 21. It appears most of that was from points that were previously not assigned to a cluster now being a assigned, along with some of the original clusters becoming combined.

When an additional blob was added k-means appeared to perform quite well, roughly identifying where the true blobs were. Spectral clustering stayed at the same number of blobs at 8, and while the true number was 4, it still roughly identified what the true blobs were by combining smaller blobs. Spectral continues to struggle with outliers, assigning points to a cluster where another cluster is directly between the point and what was predicted. Affinity has a large number of clusters but deals better with the outliers than spectral. Mean shift was unable to identify that an additional cluster was added and just combined the outer blob with the closest one of the originals.

Adding and additional blob and moving them farther apart had the biggest impact on affinity, it went from 93 in the original to 238 in this version. Many of the points weren’t assigned to a cluster. K-means performed quite well still identifying roughly were the true blobs were. Mean shift again combined the new blob and closest original.

It appears if you know how many overall groups there are k-means can perform decently well. Spectral can do a good job of identifying general subgroups that you can then combine, but you need to watch out for outliers it misclassifies. Mean shift didn’t deal well with adding another group that was close to another existing group, in both cases it simply combined them. In regards to affinity, when it didn’t create too many clusters seemed to do very well.