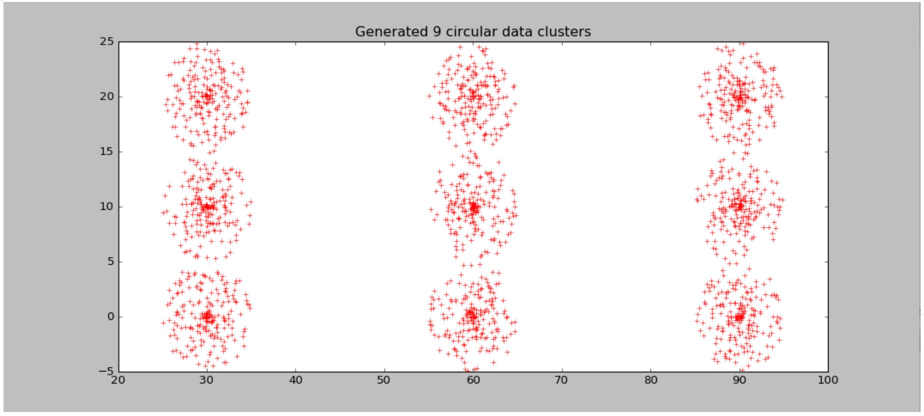
1 Dataset generation

To generate dataset I used the same method as in the previous assignment. This time I combined 9 circular dataset, with centers in a 3 x 3 grid. I looked like this:



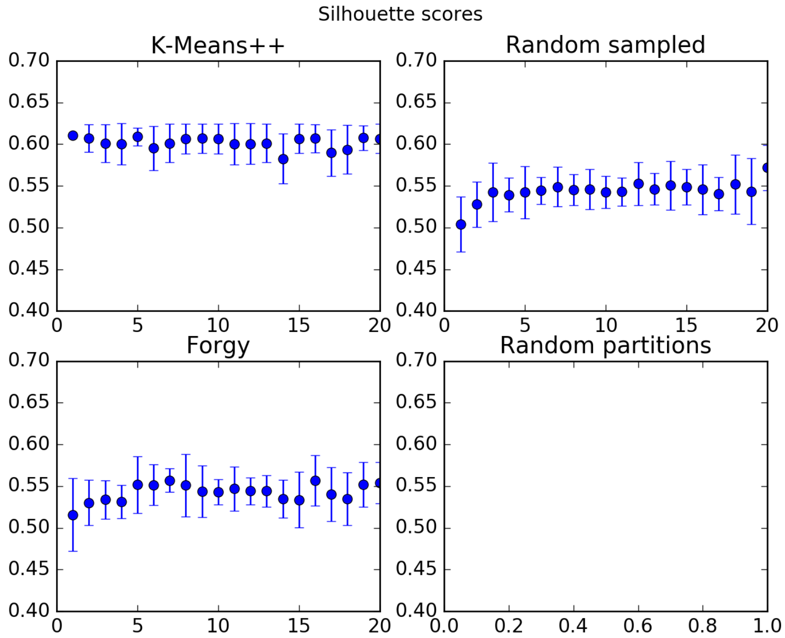
2 Initilization methods

Then I ran k-means algorithm with four different initialization methods :

- Fully random
- Forgy
- Random partition
- k-means++

3 Results

To measure the quality of the algorithm (with different initialization methods) I decided to use silhouette score as a metric. I chose it because it is already convenently imlemented in sklearn.metrics module. Generally the higher silhouette score the better performed the clustering method.



4 Discussion

The results show clearly that the k-means++ has the best score. It seams that both forgy and random initializations yield perform nearly the same, but random init has greater variance between runs. It was expected since Forgy uses only points existing in dataset as initial cluster centers, while in random the whole space is available.