1. Average search time for LSH and linear search.

Runtime comparison between linear search and LSH based search of top 10 nearest neighbors.
The LSH based search is much **faster than the linear search** which is bit strange as I thought Linear search will faster but it took 12.48 for single iteration where as LSH took 11.05

2. Plots for error value vs. L and error value vs. K, and brief comments for each plot (*for my understanding I have taken L values from 10 to 24)*
error value vs. L Inferences are:
1. Here error is decreasing with increasing hash table L value
2. Reason: Actual nearest neighbor is falling with increasing query point so error is decreasing

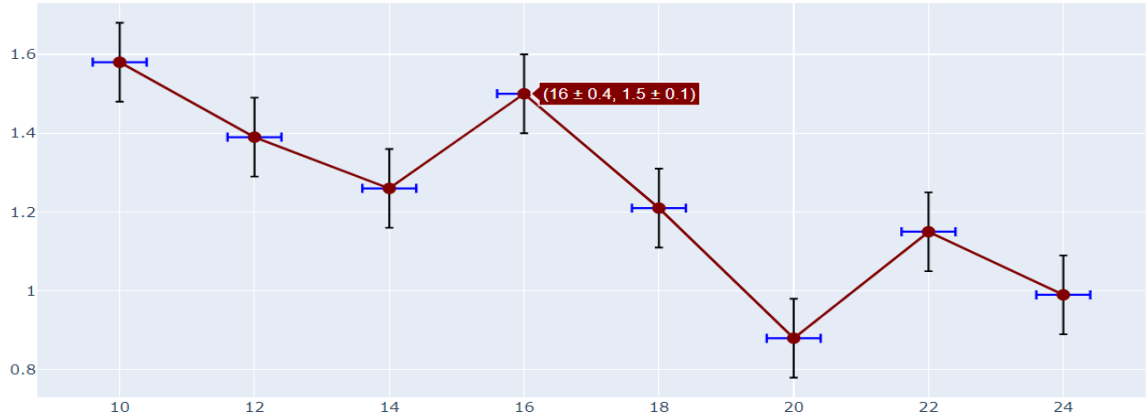


Fig 1. Error value vs L

error value vs. K

I have taken K values from 14 to 24 with 2 point increment for better visualization and pattern finding.

Inference:

1. 1. While increasing K value with 2points total number of buckets increases

2. 2. Chances of falling all True neighbours in a bucket decreases as query point is also decreases.

3. 3. Due to the above reasons the error may be increasing

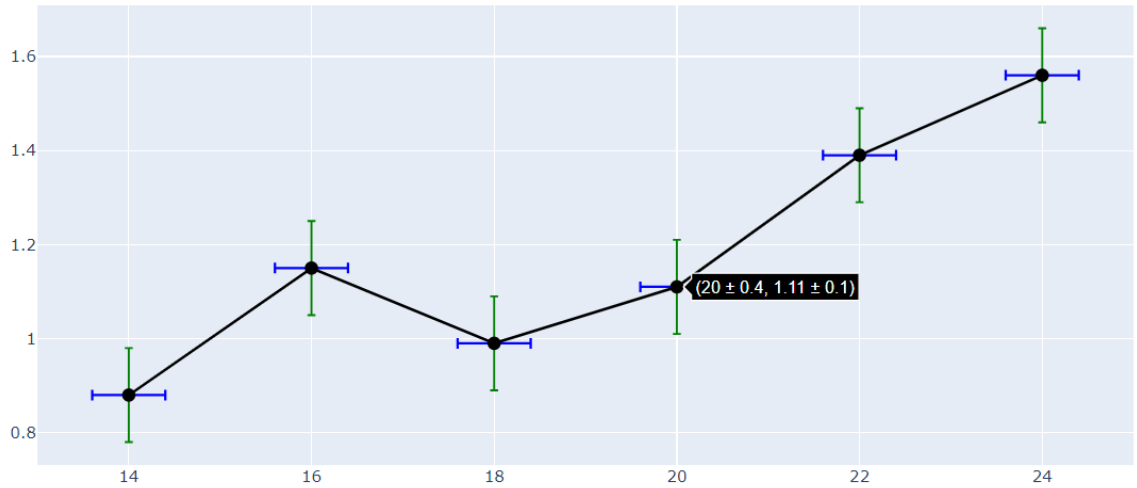
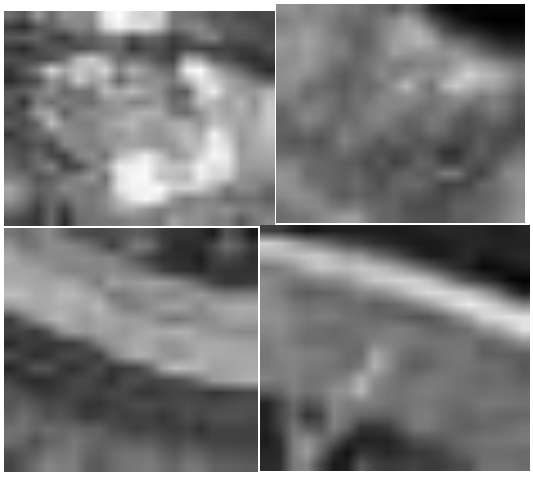


Fig 2. Error value vs K

3. Plot of 10 nearest neighbors found by the two methods (also include the original image) and brief visual comparison

Actual nearest neighbor



Based on neural net

Comparison of Both methods actual top 10 and neighbours obtained by LSH

$$\sum 1 = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$

$$\sum 2 = \begin{pmatrix} 1.2 & 0.9 \\ 0.9 & 1.2 \end{pmatrix}$$