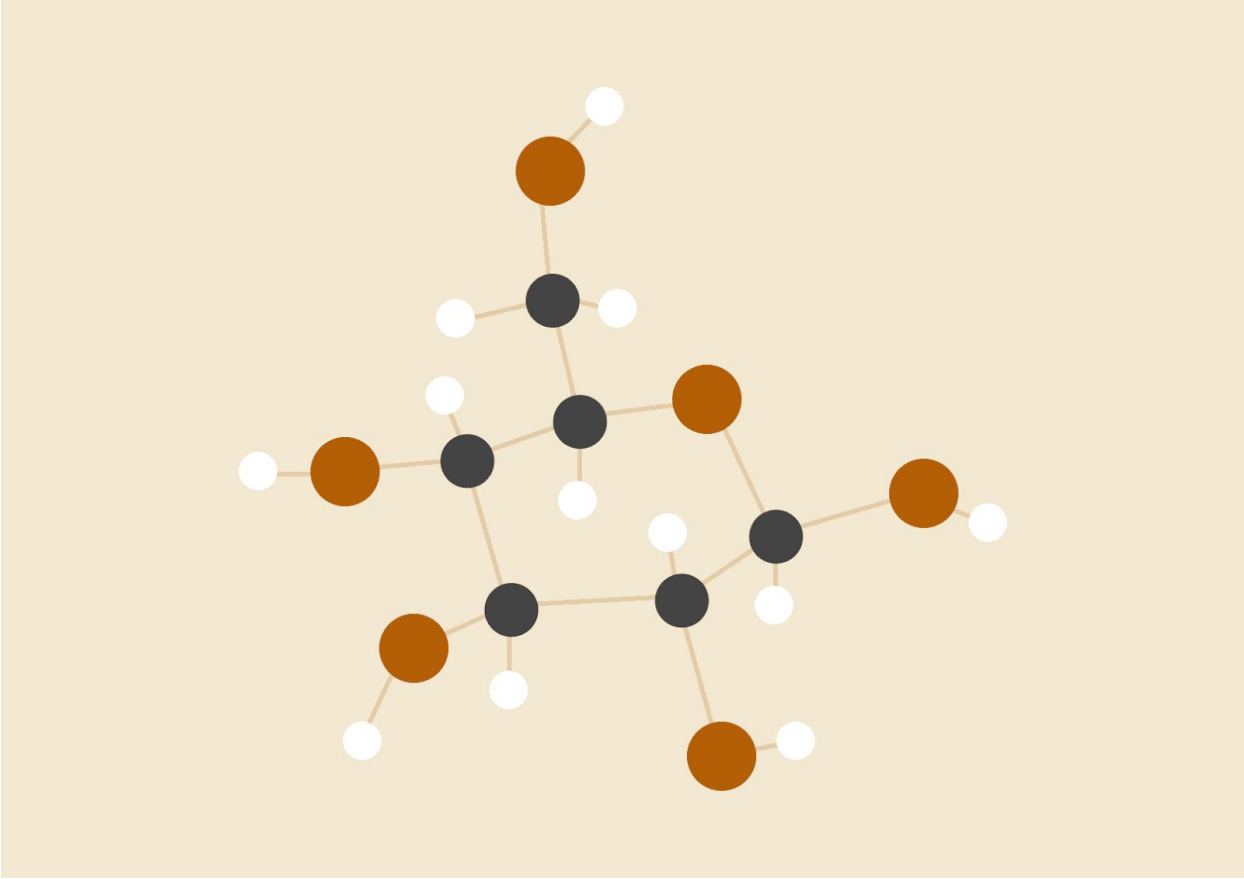
Parallel K-Means using Hadoop



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The unparalleled K-Means pseudo-code.

K-Means Clustering

1. Choose the number of clusters(K) and obtain the data points

2. Place the centroids c_1, c_2, ….. c_k randomly

3. Repeat steps 4 and 5 until convergence or until the end of a fixed number of iterations

4. for each data point x_i:

    - find the nearest centroid(c_1, c_2 .. c_k)

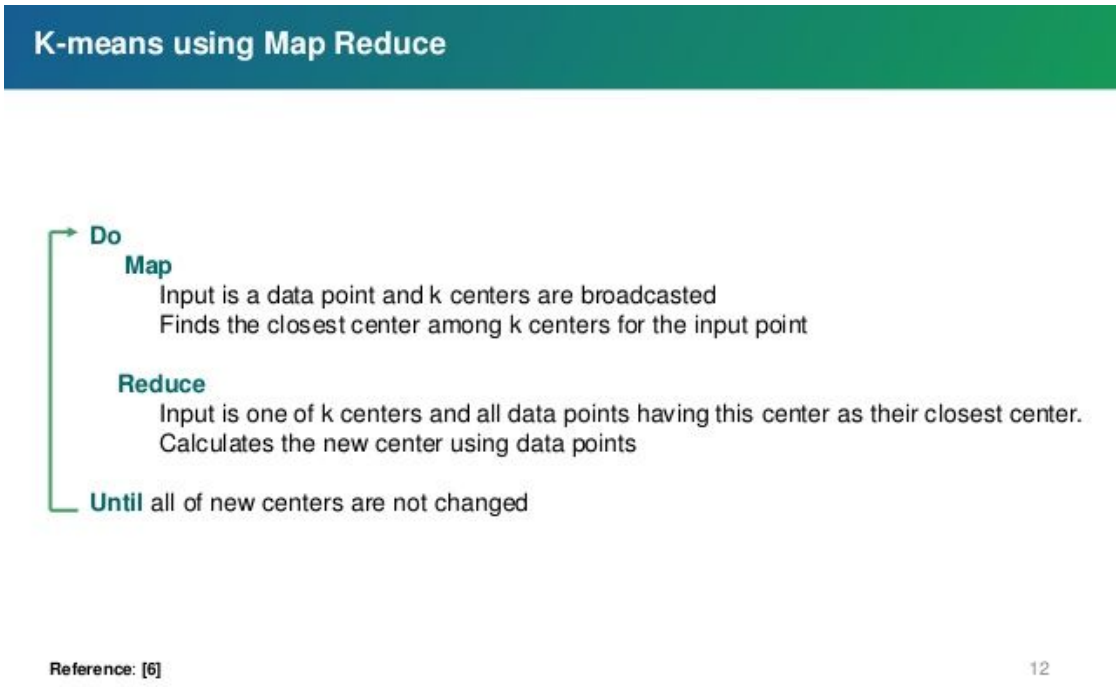
    - assign the point to that cluster

5. for each cluster j = 1..k

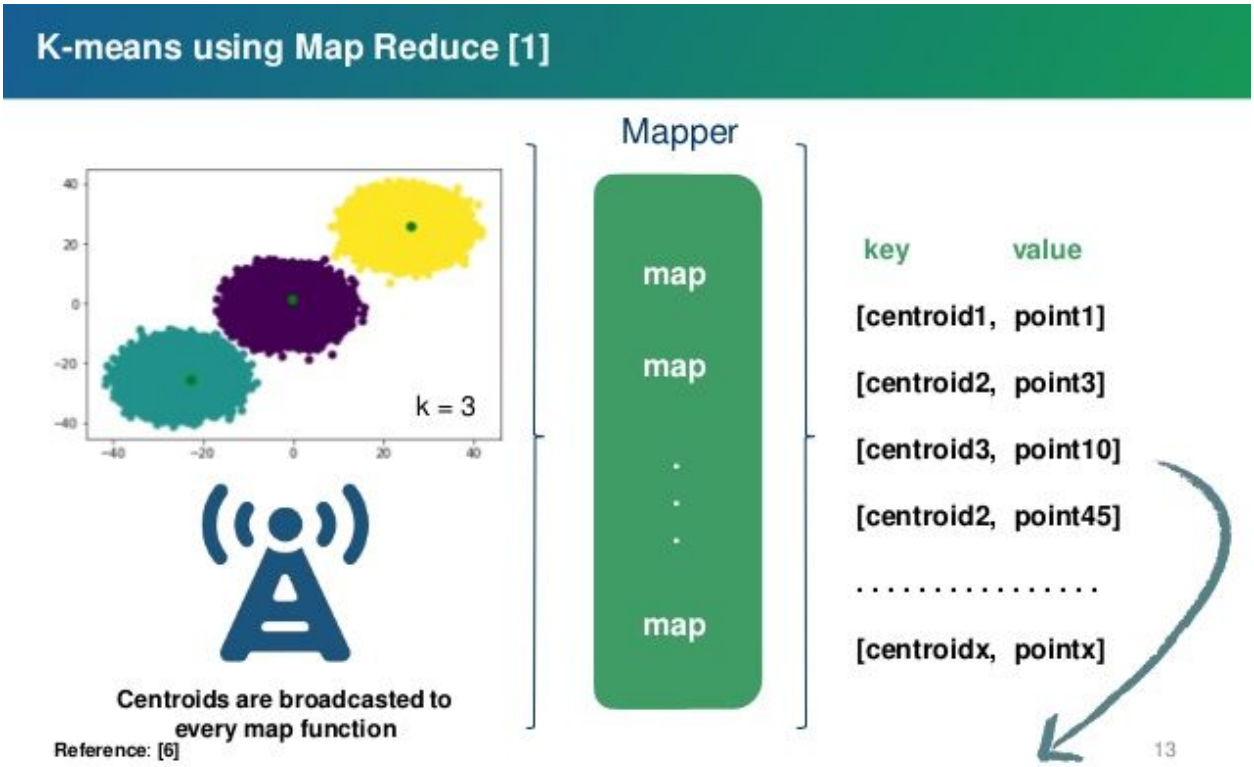
    - new centroid = mean of all points assigned to that cluster

6. End

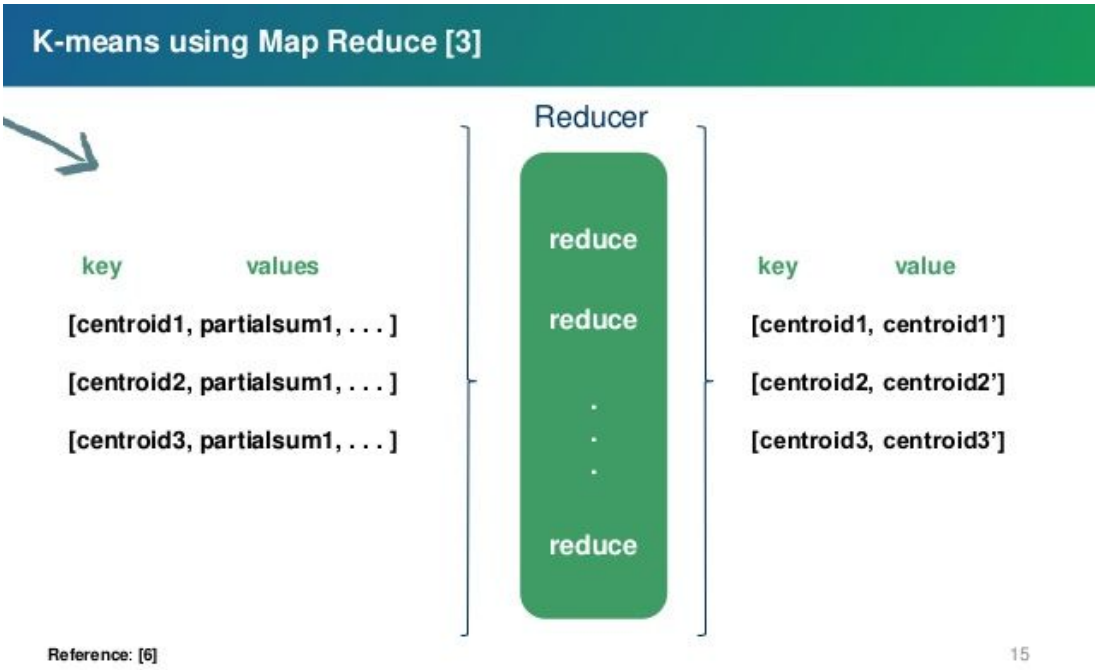
MapReduce K-Means algorithm [1]



1) map function



2) Reduce-function



– The challenges you faced to implement it and how you solved it.

- The namenode needed to be formatted (fixed)
- Update centroids in array in runtime.

– The evaluation results (using a 1 node cluster is enough)

- **Parallel K-Means**

Clusters				
0	**5.006**	**3.418**	**1.464**	**0.24399**
1	**5.88**	**2.741**	**4.388**	**1.43**
2	**6.85**	**3.07**	**5.71**	**2.05**

- **In time: 14.272s with # of Iterations : 13**

[1] Reference to slides which I implemented the code based on it

[slides]