**Working Procedure**

In Hadoop, MapReduce is a computation that decomposes large manipulation jobs into individual tasks that can be executed in parallel cross a cluster of servers. The results of tasks can be joined together to compute final results.

MapReduce consists of 2 steps:

1. **Map Function –**It takes a set of data and converts it into another set of data, where individual elements are broken down into tuples (Key-Value pair).

**Example –**(Map function in Word Count)

|  |  |  |
| --- | --- | --- |
| **Input** | Set of data | Bus, Car, bus,  car, train, car, bus, car, train, bus, TRAIN,BUS, buS, caR, CAR, car, BUS, TRAIN |
| **Output** | Convert into another set of data  (Key,Value) | (Bus,1), (Car,1), (bus,1), (car,1), (train,1),  (car,1), (bus,1), (car,1), (train,1), (bus,1),  (TRAIN,1),(BUS,1), (buS,1), (caR,1), (CAR,1),  (car,1), (BUS,1), (TRAIN,1) |

1. **Reduce Function –**Takes the output from Map as an input and combines those data tuples into a smaller set of tuples.

**Example –**(Reduce function in Word Count)

|  |  |  |
| --- | --- | --- |
| **Input**  **(output of Map function)** | Set of Tuples | (Bus,1), (Car,1), (bus,1), (car,1), (train,1),  (car,1), (bus,1), (car,1), (train,1), (bus,1),  (TRAIN,1),(BUS,1), (buS,1), (caR,1), (CAR,1),  (car,1), (BUS,1), (TRAIN,1) |
| **Output** | Converts into smaller set of tuples | (BUS,7),  (CAR,7),  (TRAIN,4) |

Workflow of MapReduce consists of 5 steps

1. **Splitting** – The splitting parameter can be anything, e.g. splitting by space, comma, semicolon, or even by a new line (‘\n’).
2. **Mapping** – as explained above
3. **Intermediate splitting** – the entire process in parallel on different clusters. In order to group them in “Reduce Phase” the similar KEY data should be on same cluster.
4. **Reduce** – it is nothing but mostly group by phase
5. **Combining** – The last phase where all the data (individual result set from each cluster) is combine together to form a Result