Comments:

As a general remark we note that by running the map-reduce code for json files in single-node mode, the reducer started running after the mapper process was over, while in the multi-nodemode the mapper and reducer ran their processes simultaneously. We then observe that in both modes of operation the more reducers we use then the elapsed time increases accordingly. Also in single-nodemode we observe that all times are much longer in elapsed time than multi-nodemode. More specifically:

- In Average map time it is not affected by the difference in the mode of operation, single-node or cluster, nor by the number of reducers.
- In Average reduce time there are no big differences between the times in the execution of the single-node and the cluster as the difference of the times has to do with the number of reducers. We observe that when we double the number of reducers in execution the time is doubled.
- In the Average shuffle time it is observed that in the cluster the times are multiple in relation to the single-node. It was also observed that during the execution there was quite a visible delay at this time and in relation to the rest, we believe due to some lag network or the overloaded use of the ocean servers.
- Finally in Average merge time it is observed that the single-node is slower than the cluster.