CSE488: Big Data Analytics
[SPRING 2023]

Lab-4 Offline Task
Computing Average and Performance Comparison

Submitted by:

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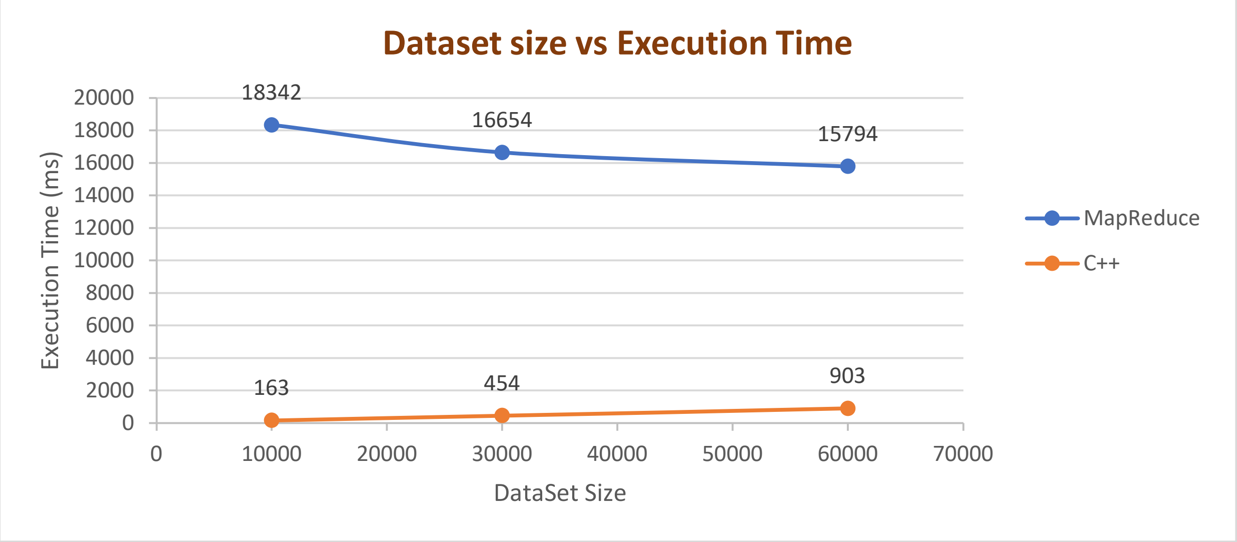
# Comparison between Hadoop MapReduce program with HDFS and C++ Program in LFS

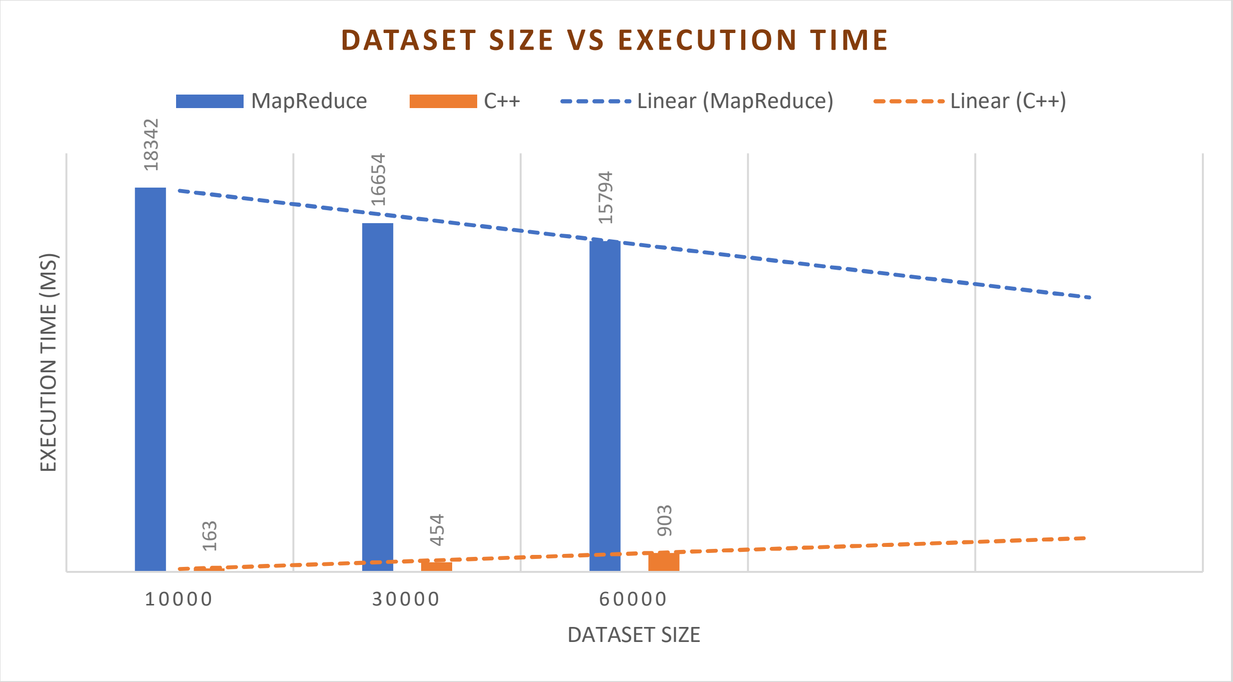
Execution timetable is given bellow:

Random Dataset Size	Map Time (M) (millisecond)	Reduce Time (R) (millisecond)	Total (M+P) Time (millisecond)	C++ Time (millisecond)
10000	7485	10857	18342	163
30000	8499	8155	16654	454
60000	7690	8104	15794	903

# Scatter Plotting:



# Bar Chart:



Basic knowledge:

Hadoop is a distributed computing framework that is designed to handle large-scale data processing tasks, particularly those involving Big Data. Hadoop is optimized for handling large data sets and for distributing the processing of those data sets across multiple machines in a cluster. This distributed processing capability makes Hadoop well-suited for handling large-scale data processing tasks that require high scalability and fault tolerance.

On the other hand, C++ is a programming language that is well-suited for building high-performance, low-latency applications. C++ can be used to implement algorithms that are optimized for specific hardware architectures, which can result in very fast execution times for certain tasks.

Observation:

If you are performing a simple average calculation operation on a small data set, then C++ become faster than Hadoop, since the overhead of setting up a Hadoop cluster and distributing the processing across multiple machines may outweigh the benefits of parallel processing. However, if you are working with a large data set or if you need to perform complex data processing tasks, then Hadoop becomes faster than C++, since it can distribute the processing across multiple machines and scale up as needed.

Based on the information presented in the **scatter plot and bar chart** diagrams, it appears that as the size of the dataset increases, the performance of C++ worsens, while the performance of Hadoop improves with an increasing number of datasets. This observation is consistent with the general characteristics of C++ and Hadoop, where C++ may be limited by the resources of a single machine, whereas Hadoop's distributed processing capability allows for better scalability and potentially faster processing times.