In this lab, you will focus on implementing an efficient data structure to handle large volumes of time-series data, such as the synchrophasor data received by power grid load dispatch centers. This data is critical for maintaining real-time situational awareness of the power grid, with a data volume that can reach up to 2 billion data points per second.

You will be working with voltage data streams from synchrophasor devices deployed in multiple cities like Mumbai, Delhi, Kharagpur, and Chennai. Each data stream is independent and consists of timestamp and float value pairs.

The primary goal is to store these data streams in a way that allows for efficient retrieval of simple statistics (sum, mean, min, max) over a range of values, reducing the time complexity compared to conventional search methods.

The focus should be on optimizing search time for statistical queries on the data streams.