**Solution**

**1/ What are the capacity usage patterns?**

Capacity usage patterns tell us about the **slot usage** by the query at a given timestamp.

**2/ What do you infer from the missing timestamps?**

We can infer from the missing timestamps that no computations are being performed at that timestamp [ i.e the system is idle].

**3/ How would you solve this optimization problem - wherein at some times we’re overusing the capacity, and at other times, we’re under-using. How do we cut down on the extra costs that we end up paying either way?**

Similar to [Capacity Strategy Algorithm](https://www.atlantis-press.com/proceedings/ccis-13/9901),

we can infer from the Capacity Strategy Algorithm, which is used for planning capacity of products and services [majorly used in Marketing]. Basically we use this algorithm to determine the capacity or the rate of production of products.

Now the similar conditions arises:-

**Idle condition(Underflow)** - When the customers are not buying the available stock in the market.

**Overflow** - When the customer demand of the product is higher than the stock present in the market.

**The capacity decisions:-**

Impact the ability of the organization to meet the future demands.

Going to affect the operating cost.

Are a major determinant of initial cost.

Often involves long-term commitment of resources.

Can affect competitiveness.

Affect the ease of management.

Need to be planned in advance due to their consumption of financial and other resources.

**So, the strategies are typically based on the assumptions and predictions about:-**

* + 1. i) Long-term demand pattern
    2. ii) Technological change
    3. iii) Competitive behavior

**After analyzing and observing the given problem few things which our solution should provide while choosing a value for “X” are-**

Effectiveness

Efficiency

Utilization

We can find an Optimal operating level by analyzing previous Capacity usage patterns and find an average value for the fixed slot value.

Based on our analysis we will assume that the upcoming Capacity usage values will not be much higher or lower than this average value. In this way it will provide the optimization to our system and we will cut down the extra price that we were paying.

