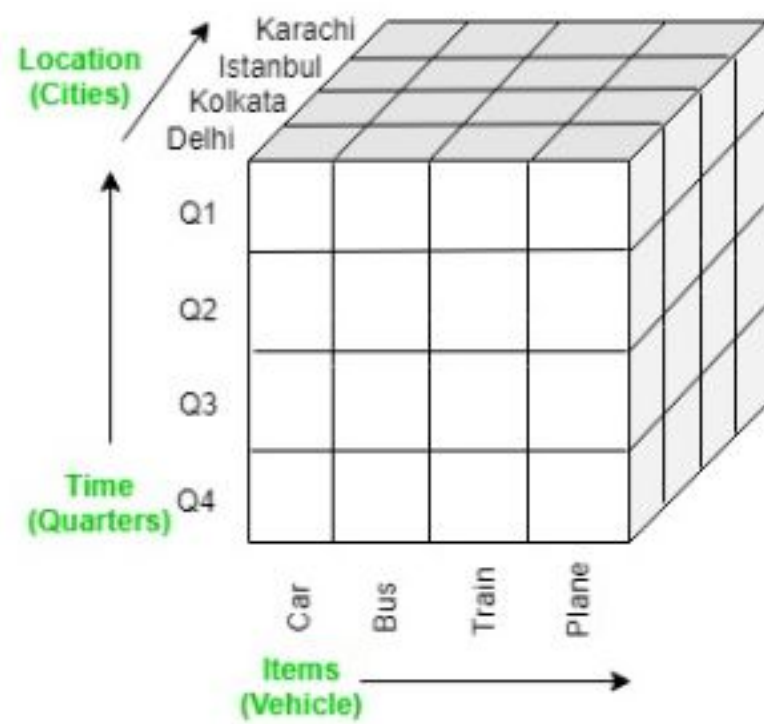


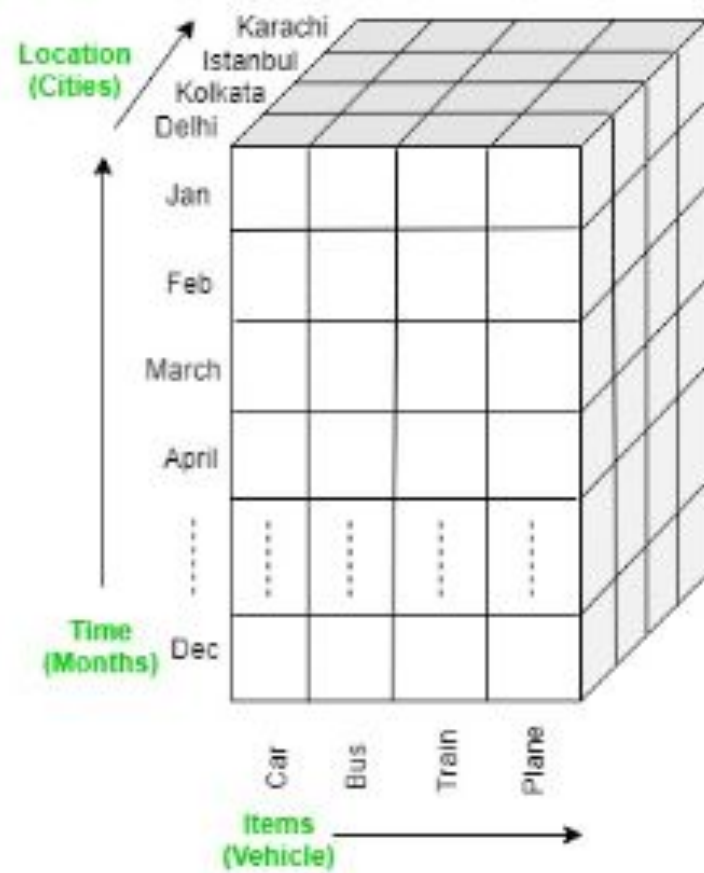
OLAP Operations

- **OLAP** stands for *Online Analytical Processing* Server. It is a software technology that allows users to analyze information from multiple database systems at the same time. It is based on multidimensional data model and allows the user to query on multi-dimensional data (eg. Delhi -> 2018 -> Sales data). OLAP databases are divided into one or more cubes and these cubes are known as *Hyper-cubes*.

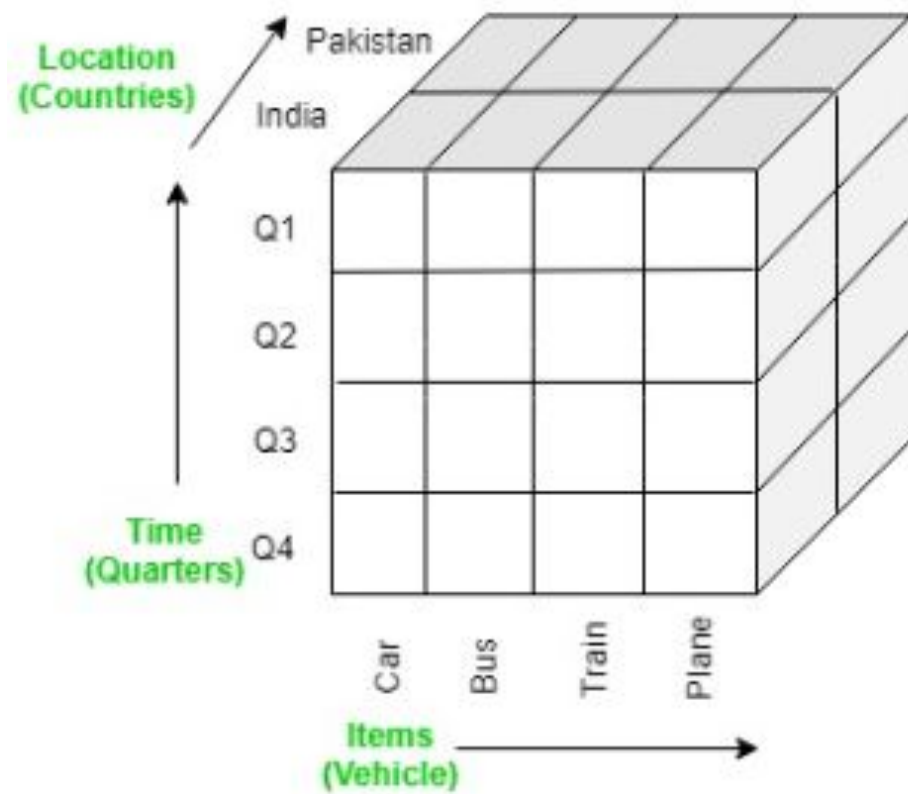


OLAP operations:

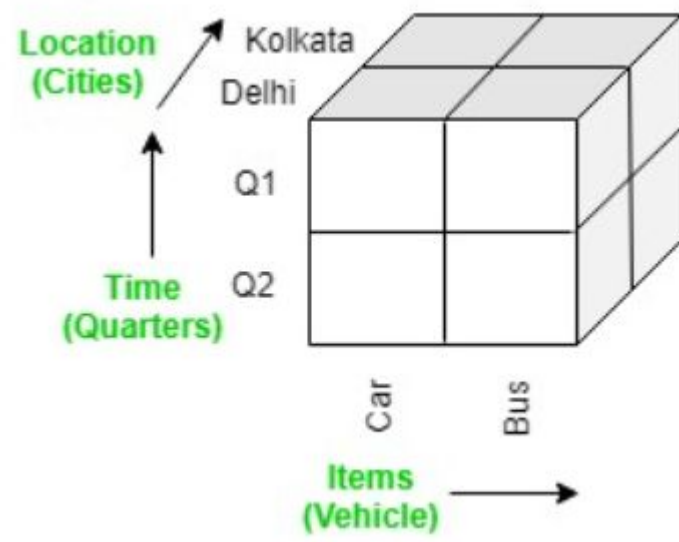
- There are **five basic analytical operations** that can be performed on an OLAP cube:
1. **Drill down:** In drill-down operation, the **less detailed data is converted into highly detailed data**. It can be done by:
 1. Moving down in the concept hierarchy
 2. Adding a new dimension
 2. In the cube given in overview section, the drill down operation is **performed by moving down in the concept hierarchy of *Time* dimension** (Quarter -> Month).



- **2. Roll up:** It is just opposite of the drill-down operation. **It performs aggregation on the OLAP cube.** It can be done by: Climbing up in the concept hierarchy
- Reducing the dimensions
- In the cube given in the overview section, the **roll-up operation is performed by climbing up in the concept hierarchy of *Location* dimension** (City -> Country).



- **3. Dice:** It selects a **sub-cube from the OLAP cube by selecting two or more dimensions**. In the cube given in the overview section, a sub-cube is selected by selecting following dimensions with criteria: Location = “Delhi” or “Kolkata”
- Time = “Q1” or “Q2”
- Item = “Car” or “Bus”



- **4. Slice:** It selects a **single dimension from the OLAP cube which results in a new sub-cube creation.** In the cube given in the overview section, Slice is performed on the dimension Time = “Q1”.

Diagram illustrating a 4x4 grid structure, likely representing a data table or matrix. The rows are labeled with cities, and the columns are labeled with vehicles.

Location (Cities) (indicated by an upward arrow):

- Karachi
- Istanbul
- Kolkata
- Delhi

Items (Vehicle) (indicated by a rightward arrow):

- Car
- Bus
- Train
- Plane

- **5. Pivot:** It is also known as *rotation* operation as it rotates the current view to get a new view of the representation. In the **sub-cube obtained after the slice operation, performing pivot operation gives a new view of it.**

Items (Vehicle)

Car				
Bus				
Train				
Plane				
	Delhi	Kolkata	Istanbul	Karachi

Location (Cities)