



Additive



Semi-Additive



Non-Additive Facts

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# Additive, Semi-Additive, Non-Additive Facts



## Additive Facts

Definition:

- Additive facts are those that can be summed across all dimensions.
- They are the simplest type of facts and are fully additive.

Example:

Consider a sales fact table:

Date	Product_ID	Store_ID	Sales_Amount	QuantitySold
2024-07-20	101	10	200.00	5
2024-07-20	102	10	150.00	3
2024-07-21	101	11	300.00	7

- SalesAmount and QuantitySold are additive facts because they can be summed across all dimensions (e.g., total sales amount, total quantity sold across different dates, products, and stores).

## Business Use Case:

Imagine you're running a retail chain and you want to know your total sales. The amount of money made from sales (e.g., \$1,000) is an additive fact because you can sum up sales across different stores, dates, or products to get a meaningful total. For example, if Store A made \$500 on Monday and Store B made \$500 on the same day, you can add them up to get a total of \$1,000.



## Semi-Additive Facts

### Definition:

- Semi-additive facts are those that can be summed across some dimensions but not all.
- Typically, these facts cannot be summed across time dimensions.

### Example:

Consider an inventory fact table capturing the inventory level of products:

Date	Product_ID	Store_ID	InventoryLevel
2024-07-20	101	10	50
2024-07-20	102	10	30
2024-07-21	101	11	60

- InventoryLevel is semi-additive. It can be summed across products or stores to get the total inventory level on a specific date but cannot be summed across dates to get meaningful results (e.g., summing inventory levels over multiple dates does not provide a useful metric).

## Business Use Case:

Let's say you're a bank and you're looking at account balances. Account balance is a semi-additive fact. You can sum the balances of different accounts on the same day (e.g., all customers' balances at the end of the day), but you cannot sum balances across time. For example, adding up the account balance from January and February to get a total balance doesn't make sense because it would double-count the same money.



## Non-Additive Facts

Definition:

- Non-additive facts are those that cannot be summed across any dimensions.
- These facts often require different aggregation techniques, such as averaging or counting.

Example:

Consider a table capturing the unit price of products:

Date	Product_ID	Store_ID	UnitPrice
2024-07-20	101	10	20.00
2024-07-20	102	10	50.00
2024-07-21	101	11	25.00

- UnitPrice is non-additive. Summing unit prices across products, stores, or dates does not provide a useful result. Instead, you might calculate an average unit price or use other statistical measures.

## Business Use Case:

Consider a retail company that is tracking customer satisfaction ratings, which are scored from 1 to 5. These ratings are non-additive facts. You can't simply add up customer satisfaction scores to get an overall rating. For example, if one customer rates their experience a 4 and another rates it a 5, adding these together ( $4 + 5 = 9$ ) does not provide meaningful insight. Instead, you would typically calculate an average to understand overall satisfaction.

