

STAR VS SNOWFLAKE SCHEMA

Feature	Star Schema	Snowflake Schema
Structure	Denormalized	Normalized
Joins	Fewer joins	More joins
Query Performance	Faster (due to fewer joins)	Slower (due to multiple joins)
Storage Space	Requires more storage (duplicate data)	More efficient storage (less redundancy)
Complexity	Simple and straightforward	More complex due to multiple related tables
Use Case	Best for fast, simple reporting	Best for complex queries with large datasets
Maintenance	Easier to maintain	Requires more effort to manage relationships
Dimension Tables	Single-level, wide tables	Multi-level, with sub-dimensions (e.g., city > state > country)
Example	Sales dashboard: customer, product, date, store	Financial reports with country > region > store location

STAR SCHEMA

```
4
5  -- 1. Dimension Table: Date
6  -- =====
7  CREATE OR REPLACE TABLE dim_date (
8      date_id INT PRIMARY KEY,
9      date DATE,
10     month VARCHAR(10),
11     quarter VARCHAR(10),
12     year INT
13 );
14
15 INSERT INTO dim_date VALUES
16 (1, '2025-01-15', 'January', 'Q1', 2025),
17 (2, '2025-03-12', 'March', 'Q1', 2025),
18 (3, '2025-06-20', 'June', 'Q2', 2025),
19 (4, '2025-09-01', 'September', 'Q3', 2025),
20 (5, '2025-12-25', 'December', 'Q4', 2025);
21
22 SELECT * FROM dim_date;
23
```

Results Chart

	# DATE_ID	🕒 DATE	<u>A</u> MONTH	<u>A</u> QUARTER	# YEAR
1	1	2025-01-15	January	Q1	2025
2	2	2025-03-12	March	Q1	2025
3	3	2025-06-20	June	Q2	2025
4	4	2025-09-01	September	Q3	2025
5	5	2025-12-25	December	Q4	2025

```
-- =====
-- 2. Dimension Table: Customer
-- =====
CREATE OR REPLACE TABLE dim_customer (
    customer_id INT PRIMARY KEY,
    name VARCHAR(100),
    gender VARCHAR(10),
    age INT,
    city VARCHAR(50)
);

INSERT INTO dim_customer VALUES
(101, 'Ayesha', 'Female', 28, 'Hubli'),
(102, 'Karan', 'Male', 33, 'Pune'),
(103, 'Zara', 'Female', 24, 'Chennai'),
(104, 'Rohit', 'Male', 39, 'Delhi'),
(105, 'Fatima', 'Female', 30, 'Hyderabad');

SELECT * FROM dim_customer;
```

	# CUSTOMER_ID	A NAME	A GENDER	# AGE	A CITY
1	101	Ayesha	Female	28	Hubli
2	102	Karan	Male	33	Pune
3	103	Zara	Female	24	Chennai
4	104	Rohit	Male	39	Delhi
5	105	Fatima	Female	30	Hyderabad

```
-- =====
-- 3. Dimension Table: Product
-- =====
CREATE OR REPLACE TABLE dim_product (
    product_id INT PRIMARY KEY,
    product_name VARCHAR(100),
    category VARCHAR(50),
    brand VARCHAR(50),
    price NUMBER(10,2)
);

INSERT INTO dim_product VALUES
(201, 'LED TV', 'Electronics', 'Sony', 32000),
(202, 'Refrigerator', 'Appliances', 'Whirlpool', 22000),
(203, 'Saree', 'Clothing', 'Biba', 2500),
(204, 'Wrist Watch', 'Accessories', 'Fossil', 8000),
(205, 'Smartphone', 'Electronics', 'Redmi', 18000);

SELECT * FROM dim_product;
```

	# PRODUCT_ID	A PRODUCT_NAME	A CATEGORY	A BRAND	# PRICE
1	201	LED TV	Electronics	Sony	32000.00
2	202	Refrigerator	Appliances	Whirlpool	22000.00
3	203	Saree	Clothing	Biba	2500.00
4	204	Wrist Watch	Accessories	Fossil	8000.00
5	205	Smartphone	Electronics	Redmi	18000.00

```
-- =====
-- 4. Dimension Table: Store
-- =====
CREATE OR REPLACE TABLE dim_store (
    store_id INT PRIMARY KEY,
    store_name VARCHAR(100),
    location VARCHAR(100),
    region VARCHAR(50)
);

INSERT INTO dim_store VALUES
(301, 'Fmall Hubli', 'Hubli', 'Karnataka'),
(302, 'Fmall Dharwad', 'Dharwad', 'Karnataka'),
(303, 'Fmall Pune', 'Pune', 'Maharashtra'),
(304, 'Fmall Chennai', 'Chennai', 'Tamil Nadu'),
(305, 'Fmall Hyderabad', 'Hyderabad', 'Telangana');

SELECT * FROM dim_store;
```

	# STORE_ID	A STORE_NAME	A LOCATION	A REGION
1	301	Fmall Hubli	Hubli	Karnataka
2	302	Fmall Dharwad	Dharwad	Karnataka
3	303	Fmall Pune	Pune	Maharashtra
4	304	Fmall Chennai	Chennai	Tamil Nadu
5	305	Fmall Hyderabad	Hyderabad	Telangana

```
-- =====
-- 5. Fact Table: Sales
-- =====
CREATE OR REPLACE TABLE fact_sales (
    sale_id INT PRIMARY KEY,
    date_id INT,
    customer_id INT,
    product_id INT,
    store_id INT,
    quantity INT,
    total_amount NUMBER(10,2),
    FOREIGN KEY (date_id) REFERENCES dim_date(date_id),
    FOREIGN KEY (customer_id) REFERENCES dim_customer(customer_id),
    FOREIGN KEY (product_id) REFERENCES dim_product(product_id),
    FOREIGN KEY (store_id) REFERENCES dim_store(store_id)
);

INSERT INTO fact_sales VALUES
(401, 1, 101, 201, 301, 1, 32000),
(402, 2, 102, 202, 302, 1, 22000),
(403, 3, 103, 203, 303, 2, 5000),
(404, 4, 104, 204, 304, 1, 8000),
(405, 5, 105, 205, 305, 1, 18000);
```

```

106
107 | SELECT * FROM fact_sales;
108

```

Results Chart

	# SALE_ID	# DATE_ID	# CUSTOMER_ID	# PRODUCT_ID	# STORE_ID	# QUANTITY	# TOTAL_AMOUNT
1	401	1	101	201	301	1	32000.00
2	402	2	102	202	302	1	22000.00
3	403	3	103	203	303	2	5000.00
4	404	4	104	204	304	1	8000.00
5	405	5	105	205	305	1	18000.00

```

109 --TOTAL SALES BY REGION
110 SELECT s.region, SUM(f.total_amount) AS total_sales|
111 FROM fact_sales f
112 JOIN dim_store s
113 ON f.store_id = s.store_id
114 GROUP BY s.region;
115

```

Results Chart

	REGION	# TOTAL_SALES
1	Karnataka	54000.00
2	Maharashtra	5000.00
3	Tamil Nadu	8000.00
4	Telangana	18000.00

```

116 --TOTAL SALES BY PRODUCT CATEGORY
117 SELECT p.category, SUM(f.total_amount) AS total_sales
118 FROM fact_sales f
119 JOIN dim_product p
120 ON p.product_id = f.product_id
121 GROUP BY p.category;
122

```

Results Chart

	CATEGORY	# TOTAL_SALES
1	Electronics	50000.00
2	Clothing	5000.00
3	Accessories	8000.00
4	Appliances	22000.00


```

.23 --MONTHLY SALES SUMMARY
.24 SELECT d.month, d.year, SUM(f.total_amount) AS monthly_sales
.25 FROM fact_sales f
.26 JOIN dim_date d
.27 ON d.date_id = f.date_id
.28 GROUP BY d.month, d.year
.29 ORDER BY d.year, d.month;
.30

```

→ Results ~ Chart

A MONTH	# YEAR	# MONTHLY_SALES
December	2025	18000.00
January	2025	32000.00
June	2025	5000.00
March	2025	22000.00
September	2025	8000.00

```

.131 --TOP CUSTOMERS BY PURCHASE
.132 SELECT c.name, SUM(f.total_amount) AS total_spent
.133 FROM fact_sales f
.134 JOIN dim_customer c
.135 ON c.customer_id = f.customer_id
.136 GROUP BY c.name
.137 ORDER BY total_spent DESC LIMIT 5;
.138

```

→ Results ~ Chart

	A NAME	# TOTAL_SPENT
1	Ayesha	32000.00
2	Karan	22000.00
3	Fatima	18000.00
4	Rohit	8000.00
5	Zara	5000.00

```

139 --SALES BY PRODUCT AND REGION
140 SELECT p.product_name, s.region, SUM(f.total_amount) AS sales
141 FROM fact_sales f
142 JOIN dim_product p
143 ON p.product_id = f.product_id
144 JOIN dim_store s
145 ON s.store_id = f.store_id
146 GROUP BY p.product_name, s.region;
147

```

Results Chart

	PRODUCT_NAME	REGION	# SALES
1	LED TV	Karnataka	32000.00
2	Refrigerator	Karnataka	22000.00
3	Saree	Maharashtra	5000.00
4	Wrist Watch	Tamil Nadu	8000.00
5	Smartphone	Telangana	18000.00

```

8 --SALES BY MALE FEMALE %
9 SELECT
10     c.gender,
11     SUM(f.total_amount) AS total_sales,
12     ROUND(SUM(f.total_amount) * 100.0 / (SELECT SUM(total_amount) FROM fact_sales), 2) AS percentage
13 FROM fact_sales f
14 JOIN dim_customer c ON f.customer_id = c.customer_id
15 GROUP BY c.gender;
16

```

Results Chart

GENDER	# TOTAL_SALES	# PERCENTAGE
Female	55000.00	64.71
Male	30000.00	35.29

SNOWFLAKE SCHEMA

```

-----
-- 1. Create Sub-dimension: Quarter
-- -----
CREATE OR REPLACE TABLE dim_quarter (
    quarter_id INT PRIMARY KEY,
    quarter_name VARCHAR(10)
);

INSERT INTO dim_quarter VALUES
(1, 'Q1'),
(2, 'Q2'),
(3, 'Q3'),
(4, 'Q4'),
(5, 'Year-End');

SELECT * FROM dim_quarter;

```

178 | SELECT * FROM dim_quarter;
179

Results			Chart
#	QUARTER_ID	QUARTER_NAME	
1	1	Q1	
2	2	Q2	
3	3	Q3	
4	4	Q4	
5	5	Year-End	

```
-- =====  
-- 2. Normalized Date Dimension  
-- =====  
CREATE OR REPLACE TABLE dim_date (  
    date_id INT PRIMARY KEY,  
    full_date DATE,  
    month_name VARCHAR(10),  
    year INT,  
    quarter_id INT,  
    FOREIGN KEY (quarter_id) REFERENCES dim_quarter(quarter_id)  
);  
  
INSERT INTO dim_date VALUES  
(1, '2025-01-12', 'January', 2025, 1),  
(2, '2025-03-05', 'March', 2025, 1),  
(3, '2025-06-15', 'June', 2025, 2),  
(4, '2025-09-21', 'September', 2025, 3),  
(5, '2025-12-31', 'December', 2025, 4);  
  
-- =====
```

199 | SELECT * FROM dim_date;
200

Results						Chart
#	DATE_ID	FULL_DATE	MONTH_NAME	YEAR	QUARTER_ID	
1	1	2025-01-12	January	2025	1	
2	2	2025-03-05	March	2025	1	
3	3	2025-06-15	June	2025	2	
4	4	2025-09-21	September	2025	3	
5	5	2025-12-31	December	2025	4	


```

201  -- =====
202  -- 3. Sub-dimension: Region
203  -- =====
204  CREATE OR REPLACE TABLE dim_region (
205      region_id INT PRIMARY KEY,
206      region_name VARCHAR(50)
207  );
208
209  INSERT INTO dim_region VALUES
210  (1, 'Karnataka'),
211  (2, 'Telangana'),
212  (3, 'Maharashtra'),
213  (4, 'Goa'),
214  (5, 'Tamil Nadu');
215
216  -- =====

```

```

216  SELECT * FROM dim_region;
217

```

Results Chart

	# REGION_ID		A REGION_NAME
1		1	Karnataka
2		2	Telangana
3		3	Maharashtra
4		4	Goa
5		5	Tamil Nadu

```

-- =====
-- 4. Normalized Store Dimension
-- =====
CREATE OR REPLACE TABLE dim_store (
    store_id INT PRIMARY KEY,
    store_name VARCHAR(100),
    location VARCHAR(100),
    region_id INT,
    FOREIGN KEY (region_id) REFERENCES dim_region(region_id)
);

INSERT INTO dim_store VALUES
(101, 'Mega Hubli', 'Hubli', 1),
(102, 'Bel Circle', 'Belgaum', 1),
(103, 'Techno Park', 'Hyderabad', 2),
(104, 'Ocean Mall', 'Panaji', 4),
(105, 'Market Square', 'Chennai', 5);

```

```
6 | SELECT * FROM dim_store;
7
```

Results  Chart

# STORE_ID	A STORE_NAME	A LOCATION	# REGION_ID
101	Mega Hubli	Hubli	1
102	Bel Circle	Belgaum	1
103	Techno Park	Hyderabad	2
104	Ocean Mall	Panaji	4
105	Market Square	Chennai	5

```
-- =====
-- 5. Customer Dimension
-- =====
CREATE OR REPLACE TABLE dim_customer (
  customer_id INT PRIMARY KEY,
  name VARCHAR(100),
  gender VARCHAR(10),
  age INT,
  city VARCHAR(50)
);

INSERT INTO dim_customer VALUES
(201, 'Amit', 'Male', 27, 'Hubli'),
(202, 'Sana', 'Female', 31, 'Delhi'),
(203, 'Raj', 'Male', 29, 'Goa'),
(204, 'Neha', 'Female', 22, 'Mumbai'),
(205, 'Faizan', 'Male', 35, 'Bangalore');
```

```
| SELECT * FROM dim_customer;
```

Results  Chart

# CUSTOMER_ID	A NAME	A GENDER	# AGE	A CITY
201	Amit	Male	27	Hubli
202	Sana	Female	31	Delhi
203	Raj	Male	29	Goa
204	Neha	Female	22	Mumbai
205	Faizan	Male	35	Bangalore

```
-- =====
-- 6. Product Dimension
-- =====
CREATE OR REPLACE TABLE dim_product (
  product_id INT PRIMARY KEY,
  product_name VARCHAR(100),
  category VARCHAR(50),
  brand VARCHAR(50),
  price NUMBER(10,2)
);

INSERT INTO dim_product VALUES
(301, 'Smart TV', 'Electronics', 'Samsung', 24000),
(302, 'Fridge', 'Electronics', 'LG', 15000),
(303, 'Lipstick', 'Cosmetics', 'Lakme', 500),
(304, 'Shoes', 'Footwear', 'Nike', 4500),
(305, 'Headphones', 'Electronics', 'Boat', 1900);

-- =====
```

```
SELECT * FROM dim_product;
```

Results

Chart

# PRODUCT_ID	A PRODUCT_NAME	A CATEGORY	A BRAND	# PRICE
301	Smart TV	Electronics	Samsung	24000.00
302	Fridge	Electronics	LG	15000.00
303	Lipstick	Cosmetics	Lakme	500.00
304	Shoes	Footwear	Nike	4500.00
305	Headphones	Electronics	Boat	1900.00

```

-- =====
-- 7. Fact Table
-- =====
CREATE OR REPLACE TABLE fact_sales (
  sale_id INT PRIMARY KEY,
  date_id INT,
  customer_id INT,
  product_id INT,
  store_id INT,
  quantity INT,
  total_amount NUMBER(10,2),
  FOREIGN KEY (date_id) REFERENCES dim_date(date_id),
  FOREIGN KEY (customer_id) REFERENCES dim_customer(customer_id),
  FOREIGN KEY (product_id) REFERENCES dim_product(product_id),
  FOREIGN KEY (store_id) REFERENCES dim_store(store_id)
);

INSERT INTO fact_sales VALUES
(401, 1, 201, 301, 101, 2, 48000),
(402, 2, 202, 302, 102, 1, 15000),
(403, 3, 203, 304, 103, 2, 9000),
(404, 4, 204, 303, 104, 3, 1500),
(405, 5, 205, 305, 105, 1, 1900);

```

```

302 | select * from fact_sales;
303

```

[Results](#)
[Chart](#)

	# SALE_ID	# DATE_ID	# CUSTOMER_ID	# PRODUCT_ID	# STORE_ID	# QUANTITY	# TOTAL_AMOUNT
1	401	1	201	301	101	2	48000.00
2	402	2	202	302	102	1	15000.00
3	403	3	203	304	103	2	9000.00
4	404	4	204	303	104	3	1500.00
5	405	5	205	305	105	1	1900.00