```sql
1 •     use project_purchase_pattern_analysis;
2 •     show tables;
3 •     select * from mytable;
4
5
```

Limit to 1000 rows

Result Grid | Filter Rows: | Export: | Wrap Cell Content: | Fetch rows:

BillNo	Itemname	Quantity	Present_Date	Price	CustomerID	Country
536365	WHITE HANGING HEART T-LIGHT HOLDER	6	01-12-2010 08:26	2.550	17850	United Kingdom
536365	WHITE METAL LANTERN	6	01-12-2010 08:26	3.390	17850	United Kingdom
536365	CREAM CUPID HEARTS COAT HANGER	8	01-12-2010 08:26	2.750	17850	United Kingdom
536365	KNITTED UNION FLAG HOT WATER BOTTLE	6	01-12-2010 08:26	3.390	17850	United Kingdom
536365	RED WOOLLY HOTTIE WHITE HEART.	6	01-12-2010 08:26	3.390	17850	United Kingdom
536365	SET 7 BABUSHKA NESTING BOXES	2	01-12-2010 08:26	7.650	17850	United Kingdom
536365	GLASS STAR FROSTED T-LIGHT HOLDER	6	01-12-2010 08:26	4.250	17850	United Kingdom
536366	HAND WARMER UNION JACK	6	01-12-2010 08:28	1.850	17850	United Kingdom
536366	HAND WARMER RED POLKA DOT	6	01-12-2010 08:28	1.850	17850	United Kingdom
536367	ASSORTED COLOUR BIRD ORNAMENT	32	01-12-2010 08:34	1.690	13047	United Kingdom
536367	POPPY'S PLAYHOUSE BEDROOM	6	01-12-2010 08:34	2.100	13047	United Kingdom
536367	POPPY'S PLAYHOUSE KITCHEN	6	01-12-2010 08:34	2.100	13047	United Kingdom
536367	FELTCRAFT PRINCESS CHARLOTTE DOLL	8	01-12-2010 08:34	3.750	13047	United Kingdom
536367	IVORY KNITTED MUG COSY	6	01-12-2010 08:34	1.650	13047	United Kingdom
536367	BOX OF 6 ASSORTED COLOUR TEASPOONS	6	01-12-2010 08:34	4.250	13047	United Kingdom
536367	BOX OF VINTAGE JIGSAW BLOCKS	3	01-12-2010 08:34	4.950	13047	United Kingdom
536367	BOX OF VINTAGE ALPHABET BLOCKS	2	01-12-2010 08:34	9.950	13047	United Kingdom
536367	HOME BUILDING BLOCK WORD	3	01-12-2010 08:34	5.950	13047	United Kingdom
536367	LOVE BUILDING BLOCK WORD	3	01-12-2010 08:34	5.950	13047	United Kingdom
536367	RECIPE BOX WITH METAL HEART	4	01-12-2010 08:34	7.950	13047	United Kingdom

```sql
5
6      -- remove rows with nulls
7  •   SELECT *
8      FROM mytable
9      WHERE BillNo IS NOT NULL
10       AND Itemname IS NOT NULL
11       AND Quantity IS NOT NULL
12       AND Price IS NOT NULL;
13
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: $\overline{\text{IA}}$ | Fetch rows:

BillNo	Itemname	Quantity	Present_Date	Price	CustomerID	Country
536365	WHITE HANGING HEART T-LIGHT HOLDER	6	01-12-2010 08:26	2.550	17850	United Kingdom
536365	WHITE METAL LANTERN	6	01-12-2010 08:26	3.390	17850	United Kingdom
536365	CREAM CUPID HEARTS COAT HANGER	8	01-12-2010 08:26	2.750	17850	United Kingdom
536365	KNITTED UNION FLAG HOT WATER BOTTLE	6	01-12-2010 08:26	3.390	17850	United Kingdom
536365	RED WOOLLY HOTTIE WHITE HEART.	6	01-12-2010 08:26	3.390	17850	United Kingdom
536365	SET 7 BABUSHKA NESTING BOXES	2	01-12-2010 08:26	7.650	17850	United Kingdom
536365	GLASS STAR FROSTED T-LIGHT HOLDER	6	01-12-2010 08:26	4.250	17850	United Kingdom
536366	HAND WARMER UNION JACK	6	01-12-2010 08:28	1.850	17850	United Kingdom
536366	HAND WARMER RED POLKA DOT	6	01-12-2010 08:28	1.850	17850	United Kingdom
536367	ASSORTED COLOUR BIRD ORNAMENT	32	01-12-2010 08:34	1.690	13047	United Kingdom
536367	POPPY'S PLAYHOUSE BEDROOM	6	01-12-2010 08:34	2.100	13047	United Kingdom
536367	POPPY'S PLAYHOUSE KITCHEN	6	01-12-2010 08:34	2.100	13047	United Kingdom
536367	FELTCRAFT PRINCESS CHARLOTTE DOLL	8	01-12-2010 08:34	3.750	13047	United Kingdom

```sql
14        -- Replace NULLs dynamically
15  •     SELECT
16            BillNo,
17            COALESCE(Itemname, 'Unknown') AS Itemname,
18            COALESCE(Quantity, 0) AS Quantity,
19            COALESCE(Price, 0) AS Price,
20            CustomerID,
21            Present_Date
22        FROM mytable;
23
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: | Fetch rows:

BillNo	Itemname	Quantity	Price	CustomerID	Present_Date
536365	WHITE HANGING HEART T-LIGHT HOLDER	6	2.550	17850	01-12-2010 08:26
536365	WHITE METAL LANTERN	6	3.390	17850	01-12-2010 08:26
536365	CREAM CUPID HEARTS COAT HANGER	8	2.750	17850	01-12-2010 08:26
536365	KNITTED UNION FLAG HOT WATER BOTTLE	6	3.390	17850	01-12-2010 08:26
536365	RED WOOLLY HOTTIE WHITE HEART.	6	3.390	17850	01-12-2010 08:26
536365	SET 7 BABUSHKA NESTING BOXES	2	7.650	17850	01-12-2010 08:26
536365	GLASS STAR FROSTED T-LIGHT HOLDER	6	4.250	17850	01-12-2010 08:26
536366	HAND WARMER UNION JACK	6	1.850	17850	01-12-2010 08:28
536366	HAND WARMER RED POLKA DOT	6	1.850	17850	01-12-2010 08:28
536367	ASSORTED COLOUR BIRD ORNAMENT	32	1.690	13047	01-12-2010 08:34
536367	POPPY'S PLAYHOUSE BEDROOM	6	2.100	13047	01-12-2010 08:34
536367	POPPY'S PLAYHOUSE KITCHEN	6	2.100	13047	01-12-2010 08:34
536367	FELTCRAFT PRINCESS CHARLOTTE DOLL	8	3.750	13047	01-12-2010 08:34

```sql
24      -- Remove Invalid or Negative Values
25 ●    SELECT *
26      FROM mytable
27      WHERE Quantity > 0
28        AND Price > 0;
29
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: | Fetch rows:

BillNo	Itemname	Quantity	Present_Date	Price	CustomerID	Country
536365	WHITE HANGING HEART T-LIGHT HOLDER	6	01-12-2010 08:26	2.550	17850	United Kingdom
536365	WHITE METAL LANTERN	6	01-12-2010 08:26	3.390	17850	United Kingdom
536365	CREAM CUPID HEARTS COAT HANGER	8	01-12-2010 08:26	2.750	17850	United Kingdom
536365	KNITTED UNION FLAG HOT WATER BOTTLE	6	01-12-2010 08:26	3.390	17850	United Kingdom
536365	RED WOOLLY HOTTIE WHITE HEART.	6	01-12-2010 08:26	3.390	17850	United Kingdom
536365	SET 7 BABUSHKA NESTING BOXES	2	01-12-2010 08:26	7.650	17850	United Kingdom
536365	GLASS STAR FROSTED T-LIGHT HOLDER	6	01-12-2010 08:26	4.250	17850	United Kingdom
536366	HAND WARMER UNION JACK	6	01-12-2010 08:28	1.850	17850	United Kingdom
536366	HAND WARMER RED POLKA DOT	6	01-12-2010 08:28	1.850	17850	United Kingdom
536367	ASSORTED COLOUR BIRD ORNAMENT	32	01-12-2010 08:34	1.690	13047	United Kingdom
536367	POPPY'S PLAYHOUSE BEDROOM	6	01-12-2010 08:34	2.100	13047	United Kingdom
536367	POPPY'S PLAYHOUSE KITCHEN	6	01-12-2010 08:34	2.100	13047	United Kingdom
536367	FELTCRAFT PRINCESS CHARLOTTE DOLL	8	01-12-2010 08:34	3.750	13047	United Kingdom

```sql
30        -- Trim Extra Spaces (Data Standardization)
31 •      SELECT
32            TRIM(Itemname) AS Itemname,
33            TRIM(CustomerID) AS CustomerID,
34            BillNo,
35            Quantity,
36            Price,
37            Present_Date
38        FROM mytable;
39
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: IA | Fetch rows:

Itemname	CustomerID	BillNo	Quantity	Price	Present_Date
WHITE HANGING HEART T-LIGHT HOLDER	17850	536365	6	2.550	01-12-2010 08:26
WHITE METAL LANTERN	17850	536365	6	3.390	01-12-2010 08:26
CREAM CUPID HEARTS COAT HANGER	17850	536365	8	2.750	01-12-2010 08:26
KNITTED UNION FLAG HOT WATER BOTTLE	17850	536365	6	3.390	01-12-2010 08:26
RED WOOLLY HOTTIE WHITE HEART.	17850	536365	6	3.390	01-12-2010 08:26
SET 7 BABUSHKA NESTING BOXES	17850	536365	2	7.650	01-12-2010 08:26
GLASS STAR FROSTED T-LIGHT HOLDER	17850	536365	6	4.250	01-12-2010 08:26
HAND WARMER UNION JACK	17850	536366	6	1.850	01-12-2010 08:28
HAND WARMER RED POLKA DOT	17850	536366	6	1.850	01-12-2010 08:28
ASSORTED COLOUR BIRD ORNAMENT	13047	536367	32	1.690	01-12-2010 08:34
POPPY'S PLAYHOUSE BEDROOM	13047	536367	6	2.100	01-12-2010 08:34
POPPY'S PLAYHOUSE KITCHEN	13047	536367	6	2.100	01-12-2010 08:34
FELTCRAFT PRINCESS CHARLOTTE DOLL	13047	536367	8	3.750	01-12-2010 08:34

```sql
40      -- Standardize Date Format
41 ●    SELECT
42          BillNo,
43          Itemname,
44          Quantity,
45          Price,
46          CustomerID,
47          CAST(Present_Date AS DATE) AS Present_Date
48      FROM mytable
49      WHERE Present_Date IS NOT NULL;
```

| | Result Grid | | Filter Rows: | | Export: | Wrap Cell Content: | Fetch rows: | |

BillNo	Itemname	Quantity	Price	CustomerID	Present_Date
►	536365	WHITE HANGING HEART T-LIGHT HOLDER	6	2.550	17850	NULL
	536365	WHITE METAL LANTERN	6	3.390	17850	NULL
	536365	CREAM CUPID HEARTS COAT HANGER	8	2.750	17850	NULL
	536365	KNITTED UNION FLAG HOT WATER BOTTLE	6	3.390	17850	NULL
	536365	RED WOOLLY HOTTIE WHITE HEART.	6	3.390	17850	NULL
	536365	SET 7 BABUSHKA NESTING BOXES	2	7.650	17850	NULL
	536365	GLASS STAR FROSTED T-LIGHT HOLDER	6	4.250	17850	NULL
	536366	HAND WARMER UNION JACK	6	1.850	17850	NULL
	536366	HAND WARMER RED POLKA DOT	6	1.850	17850	NULL
	536367	ASSORTED COLOUR BIRD ORNAMENT	32	1.690	13047	NULL
	536367	POPPY'S PLAYHOUSE BEDROOM	6	2.100	13047	NULL
	536367	POPPY'S PLAYHOUSE KITCHEN	6	2.100	13047	NULL
	536367	FELTCRAFT PRINCESS CHARLOTTE DOLL	8	3.750	13047	NULL

```sql
-- Create a CLEAN VIEW (Recommended for Large Data)
SELECT DISTINCT Present_Date
FROM mytable
WHERE Present_Date IS NOT NULL
LIMIT 10;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Co

Present_Date
01-12-2010 08:26
01-12-2010 08:28
01-12-2010 08:34
01-12-2010 08:35
01-12-2010 08:45
01-12-2010 09:00
01-12-2010 09:01
01-12-2010 09:02
01-12-2010 09:09
01-12-2010 09:32

```sql
91    -- Final Claned Data
92  • SELECT DISTINCT
93        BillNo,
94        TRIM(Itemname) AS Itemname,
95        Quantity,
96        Price,
97        CustomerID,
98        Country,
99        STR_TO_DATE(Present_Date, '%d-%m-%Y %H:%i') AS Present_Date
100   FROM mytable
101   WHERE Quantity > 0
102     AND Price > 0
103     AND Itemname IS NOT NULL
104     AND Present_Date IS NOT NULL;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: IA | Fetch rows:

BillNo	Itemname	Quantity	Price	CustomerID	Country	Present_Date
536365	WHITE HANGING HEART T-LIGHT HOLDER	6	2.550	17850	United Kingdom	2010-12-01 08:26:00
536365	WHITE METAL LANTERN	6	3.390	17850	United Kingdom	2010-12-01 08:26:00
536365	CREAM CUPID HEARTS COAT HANGER	8	2.750	17850	United Kingdom	2010-12-01 08:26:00
536365	KNITTED UNION FLAG HOT WATER BOTTLE	6	3.390	17850	United Kingdom	2010-12-01 08:26:00
536365	RED WOOLLY HOTTIE WHITE HEART.	6	3.390	17850	United Kingdom	2010-12-01 08:26:00
536365	SET 7 BABUSHKA NESTING BOXES	2	7.650	17850	United Kingdom	2010-12-01 08:26:00
536365	GLASS STAR FROSTED T-LIGHT HOLDER	6	4.250	17850	United Kingdom	2010-12-01 08:26:00
536366	HAND WARMER UNION JACK	6	1.850	17850	United Kingdom	2010-12-01 08:28:00

```sql
81  •      SELECT
82             COUNT(*) AS total_rows,
83             SUM(BillNo IS NULL) AS billno_nulls,
84             SUM(Itemname IS NULL) AS itemname_nulls,
85             SUM(Quantity IS NULL) AS quantity_nulls,
86             SUM(Price IS NULL) AS price_nulls,
87             SUM(CustomerID IS NULL) AS customerid_nulls,
88             SUM(Present_Date IS NULL) AS date_nulls
89        FROM mytable;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

total_rows	billno_nulls	itemname_nulls	quantity_nulls	price_nulls	customerid_nulls	date_nulls
522064	0	0	0	0	0	0

```sql
106      -- Top Revenue Generating Products (SAFE VERSION )
107 •    SELECT
108          Itemname,
109          ROUND(SUM(Quantity) * AVG(Price), 2) AS total_revenue
110      FROM mytable
111      WHERE Quantity > 0
112        AND Price > 0
113      GROUP BY Itemname
114      LIMIT 50;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Itemname	total_revenue
*Boombox Ipod Classic	16.98
*USB Office Mirror Ball	16.94
10 COLOUR SPACEBOY PEN	6677.40
12 COLOURED PARTY BALLOONS	1475.46
12 DAISY PEGS IN WOOD BOX	577.92
12 EGG HOUSE PAINTED WOOD	2179.17
12 HANGING EGGS HAND PAINTED	87.36
12 IVORY ROSE PEG PLACE SETTINGS	1637.63

```sql
116        -- Data Quality Check
117  •     SELECT
118            COUNT(*) AS total_rows,
119            COUNT(DISTINCT BillNo) AS total_transactions,
120            COUNT(DISTINCT Itemname) AS unique_products
121        FROM (
122            SELECT BillNo, Itemname
123            FROM mytable
124            LIMIT 100000
125        ) t;
126
```

	total_rows	total_transactions	unique_products
▶	100000	3964	3023

```sql
127         -- Sample-Based Top Products (REAL-WORLD PRACTICE •)
128 •   SELECT
129             Itemname,
130             COUNT(*) AS purchase_count
131     FROM (
132             SELECT Itemname
133             FROM mytable
134             WHERE Itemname IS NOT NULL
135             LIMIT 50000
136     ) t
137     GROUP BY Itemname
138     ORDER BY purchase_count DESC
139     LIMIT 20;
```

| Result Grid | Filter Rows: | Export: | Wrap Cell Content: |

Itemname	purchase_count
▶ WHITE HANGING HEART T-LIGHT HOLDER	280
REGENCY CAKESTAND 3 TIER	206
HAND WARMER BABUSHKA DESIGN	188
SCOTTIE DOG HOT WATER BOTTLE	179
HEART OF WICKER SMALL	177
PAPER CHAIN KIT 50'S CHRISTMAS	177
CHOCOLATE HOT WATER BOTTLE	165
JAM MAKING SET PRINTED	159

```sql
141    -- Sample Revenue Analysis
142  ● SELECT
143        Itemname,
144        SUM(Quantity) * AVG(Price) AS revenue
145  ⊝ FROM (
146        SELECT Itemname, Quantity, Price
147        FROM mytable
148        WHERE Quantity > 0 AND Price > 0
149        LIMIT 50000
150    ) t
151    GROUP BY Itemname
152    LIMIT 20;
153
```

Result Grid | ▦ | ↯ Filter Rows: [_____] | Export: ▦ | Wra

Itemname	revenue
▶ *Boombox Ipod Classic	16.9800000
*USB Office Mirror Ball	16.9400000
10 COLOUR SPACEBOY PEN	787.4413948
12 COLOURED PARTY BALLOONS	45.1825000
12 DAISY PEGS IN WOOD BOX	47.0261538
12 EGG HOUSE PAINTED WOOD	298.2460000
12 IVORY ROSE PEG PLACE SETTINGS	95.2938461
12 MESSAGE CARDS WITH ENVELOPES	546.1616665

```sql
-- Basket Size Analysis (MBA-Related, SAFE)
SELECT
    BillNo,
    COUNT(DISTINCT Itemname) AS basket_size
FROM (
    SELECT BillNo, Itemname
    FROM mytable
    LIMIT 50000
) t
GROUP BY BillNo
LIMIT 20;
```

Result Grid | Filter Rows: | Export: | Wrap

BillNo	basket_size
536365	7
536366	2
536367	12
536368	4
536369	1
536370	20
536371	1
536372	2

```sql
166     -- Customer Activity Sample
167 •   SELECT
168         CustomerID,
169         COUNT(*) AS total_purchases
170     FROM (
171         SELECT CustomerID
172         FROM mytable
173         WHERE CustomerID IS NOT NULL
174         LIMIT 50000
175     ) t
176     GROUP BY CustomerID
177     LIMIT 20;
```

Result Grid | Filter Rows: | Export:

CustomerID	total_purchases
	18568
12347	31
12370	8
12377	43
12383	37
12386	10
12395	31
12413	24

```sql
179     -- Peak Transaction Analysis (Sample-Based)
180 •   SELECT
181         COUNT(*) AS total_transactions
182     FROM (
183         SELECT BillNo
184         FROM mytable
185         WHERE BillNo IS NOT NULL
186         LIMIT 100000
187     ) t;
```

Result Grid | Filter Rows: | Export: | Wrap

total_transactions
100000

```sql
189        -- Product Diversity in Sample Data
190  ●     SELECT
191            COUNT(DISTINCT Itemname) AS unique_products
192  ⊖     FROM (
193            SELECT Itemname
194            FROM mytable
195            WHERE Itemname IS NOT NULL
196            LIMIT 100000
197        ) t;
```

Result Grid | Filter Rows: | Export: | Wrap Ce

unique_products
3023

```sql
198
199         -- Average Quantity per Purchase
200  •      SELECT
201             ROUND(AVG(Quantity), 2) AS avg_quantity
202         FROM (
203             SELECT Quantity
204             FROM mytable
205             WHERE Quantity > 0
206             LIMIT 100000
207         ) t;
```

Result Grid | Filter Rows: | Export: | Wr

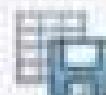| avg_quantity |
|---|
| ▶ 10.08 |

```sql
189        -- Product Diversity in Sample Data
190  •    SELECT
191            COUNT(DISTINCT Itemname) AS unique_products
192  ⊖  FROM (
193            SELECT Itemname
194            FROM mytable
195            WHERE Itemname IS NOT NULL
196            LIMIT 100000
197        ) t;
```

Result Grid | Filter Rows: | Export: | Wrap Ce

unique_products
3023

```
209          -- High-Value Transactions
210  •       SELECT
211              BillNo,
212              Quantity,
213              Price
214          FROM mytable
215          WHERE Quantity > 3
216            AND Price > 100
217          LIMIT 50;
```

Result Grid | Filter Rows: | Ex

	BillNo	Quantity	Price
▶	541426	4	110.000
	556444	60	649.500
	576512	4	110.000