

# WAL-MART<sup>®</sup>

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Sam's Club<sup>®</sup>

## Sales Assessment Report

UA Sam's Club Database – Microsoft Enterprise Consortium – University of Arkansas  
SQL Server

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# Executive Summary

1. Overall assessment of store sales
  - a. Provide a concise summary of total sales.
  - b. Provide a concise summary of total sales by each store.
  - c. Provide a concise summary of total sales breakdowns:
    - i. By the day of the week.
    - ii. By membership types.
2. Assessment of member buying behavior
  - a. Provide a concise summary of the typical purchase patterns (amount and number of items) by our members per visit.
  - b. Provide a concise summary of member visits breakdowns:
    - i. By the day of the week.
    - ii. By hours during a day.
  - c. Identify the characteristics of the most active (in sales and in frequent visits) members.

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# Data Quality Assessment

Performed data quality assessment for entity integrity, referential integrity, and overall data integrity for all data stored in STORE\_VISITS, MEMBER\_INDEX, and STORE\_INFORMATION tables.

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## Entity Integrity

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Our goal is to assess entity integrity for each table: STORE\_VISITS, MEMBER\_INDEX, STORE\_INFORMATION.

```
USE UA_SAMSClub
GO
select * from STORE_VISITS
select * from MEMBER_INDEX
select * from STORE_INFORMATION
```

### STORE VISITS TABLE

Primary Key does not have any Null values. The STORE\_VISITS table validates entity integrity.

```
select visit_nbr
from store_visits
where visit_nbr is null

select visit_nbr, count(*)
from store_visits
group by visit_nbr
having count(*)>1
```

### MEMBER INDEX TABLE

Primary Key does not have any Null values. The MEMBER\_INDEX table validates entity integrity.

```
select membership_nbr
from member_index
where membership_nbr is null

select membership_nbr, count(*)
from member_index
group by membership_nbr
having count(*)>1
```

### STORE INFORMATION TABLE

Primary Key does not have any Null values. The STORE\_INFORMATION table validates entity integrity.

```
select Store_nbr
from STORE_INFORMATION
where store_nbr is null

Select store_nbr, count(*)
from Store_information
Group by store_nbr
having count(*)>1
```

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# Data Quality Assessment

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## Referential Integrity

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Our goal is to assess referential integrity for the two relationships: STORE\_VISIT and MEMBER\_INDEX, STORE\_VISITS and STORE\_INFORMATION. We want to verify the FK field matches the PK referenced by the FK.

### STORE INFORMATION AND STORE VISITS RELATIONSHIP

The relationship between STORE\_VISITS and STORE\_INFORMATION, each store has many visits. Therefore, store\_nbr in STORE\_VISITS is FK and store\_nbr in STORE\_INFORMATION is the PK. Checking referential integrity, we want to see if there is any store\_nbr that appeared in STORE\_VISITS that are not in STORE\_INFORMATION. This does not violate referential integrity.

```
select store_nbr
from store_visits
where store_nbr not in (select store_nbr from store_information)
```

### MEMBER INDEX AND STORE VISITS RELATIONSHIP

STORE\_VISITS AND MEMBER\_INDEX do violate referential integrity. There are many membership numbers in STORE\_VISITS that are not in the MEMBER\_INDEX table.

```
select membership_nbr
from Store_visits
where membership_nbr not in (select membership_nbr from Member_index)
```

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## Solution

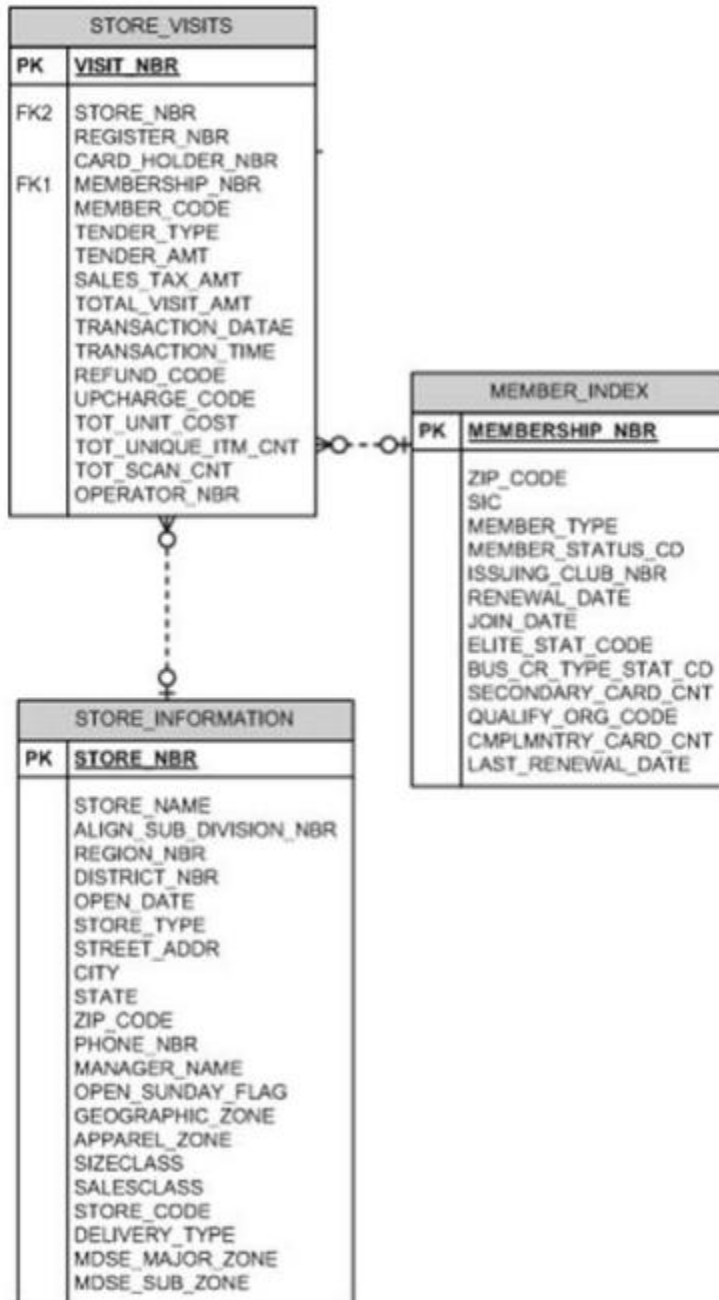
Create a dummy membership\_nbr and update the unknown membership\_nbr in the STORE\_VISITS table with the dummy membership\_nbr.

```
insert into MEMBER_INDEX values (00099, 'zip', 'sic', 'a', 'x', '9', '1900-01-01 00:00:00.000',
'1900-01-01 00:00:00.000', '9', '9', '9', 'none', '9', '1900-01-01 00:00:00.000');
```

```
update STORE_VISITS
set Membership_Nbr=00001
where Membership_Nbr not in (select Membership_Nbr from MEMBER_INDEX);
```

---

# ERD of UA\_SAMSClub



## Store Assessment: Key Performance Indicators

### STATE RANK TOTAL SALES AND MARGIN DOLLARS

State	Total Sales	Total Margin
OH	\$21,291,454.01	\$2,260,659.03
FL	\$13,193,151.85	\$1,449,128.16
TX	\$9,118,112.78	\$1,091,568.47
KS	\$7,924,764.37	\$765,415.76
VA	\$5,625,923.71	\$714,480.88
IL	\$5,406,525.57	\$581,967.33
TN	\$4,970,568.24	\$551,438.69
MO	\$4,155,869.06	\$435,059.44
CO	\$3,958,704.43	\$419,192.21
WI	\$3,351,538.52	\$352,045.75
AK	\$2,898,436.28	\$299,684.48

Figure 1 Query 1 Appendix

### MEMBER TYPE BY VISTS AND SALES

M Type	Total Visits	Total Sales
V	173646	\$30,552,241.12
W	86713	\$23,523,169.70
X	18357	\$9,334,910.25
A	2752	\$867,459.50
E	143	\$223,709.47
D	118	\$57,545.40
Y	55	\$14,744.49
G	128	\$13,809.28
3	6	\$13,346.04
1	13	\$11,798.24
Z	29	\$9,083.03
H	4	\$1,953.13

Figure 2 Query 2 Appendix

### SUMMARY OF TOTAL SALES

Total Sales	Total Unit Cost	Total # Unique Items	Total # items Purchased
\$79,797,751.11	\$71,571,983.40	6106856.00	8428201.00

Figure 3 Query 3 Appendix

Sam's Club total sales are \$79,797,751.11 with a total cost of \$71,571,983.40. Sam's Club sold 8,428,201 items to reach sales numbers with 6,10,6856 unique items. Roughly \$8 ½ million in total profit.

### Total Sales by Each Store

Store NBR	Store Name	Total Sales
18	Extreme Retailers CINCINNATI,	\$6,758,162.43
28	Extreme Retailers DALLAS, TX	\$5,944,160.20
19	Extreme Retailers CINCINNATI,	\$5,722,852.01
15	Extreme Retailers CHESAPEAKE,	\$5,625,923.71
27	Extreme Retailers CRYSTAL LAKE	\$5,406,525.57
24	Extreme Retailers CONCORD, TX	\$5,357,355.17
21	Extreme Retailers CLARKSVILLE,	\$4,970,568.24
22	Extreme Retailers CLEARWATER,	\$4,853,982.81
29	Extreme Retailers DAYTONA BEAC	\$4,331,168.28
16	Extreme Retailers CHESTERFIELD	\$4,155,869.06
20	Extreme Retailers CITY OF INDU	\$4,040,099.87
26	Extreme Retailers CORAL SPRING	\$4,008,000.76
5	Extreme Retailers ARVADA, WI	\$3,958,704.43

17	Extreme Retailers CICERO, TX	\$3,884,664.50
23	Extreme Retailers COLUMBUS, TX	\$3,453,084.40
4	Extreme Retailers APPLETON, WI	\$3,351,538.52
25	Extreme Retailers CONROE, TX	\$3,173,952.58
3	Extreme Retailers ANCHORAGE, W	\$2,898,436.28

Figure 4 Query 4 Appendix

Sam's Club total sales by store\_name, store\_nbr while excluding returns (refunds). Store 18 (Cincinnati) ranks first with total sales of \$6,758,162.43.

### Total Sales and Average Total Sales by Day of the Week

Weekday	Total Sales	Avg. Total Sales
Saturday	\$18,006,711.67	\$85.95
Sunday	\$12,929,256.30	\$85.00
Friday	\$12,025,880.91	\$87.18
Monday	\$11,908,710.87	\$83.59
Thursday	\$9,607,937.68	\$85.75
Wednesday	\$8,710,450.49	\$85.04
Tuesday	\$8,706,100.90	\$83.20

Figure 5 Query 5 Appendix

Saturday ranks first with total sales of \$18,006,711.67 and average total sales of \$85.95.

### Total Sales and Margin by Day of the Week

Weekday	Total Sales	Profit Margin
Saturday	\$18,006,711.67	\$1,972,581.55
Sunday	\$12,929,256.30	\$1,400,341.62
Monday	\$11,908,710.87	\$1,379,288.69
Friday	\$12,025,880.91	\$1,259,297.47
Thursday	\$9,607,937.68	\$1,031,515.82
Tuesday	\$8,706,100.90	\$949,273.97
Wednesday	\$8,710,450.49	\$928,341.08

Figure 6 Query 6 Appendix

Again, Saturday ranks first with total sales of \$18,006,711.67 and a gross margin of \$1,972,581.55.

### Total Sales and Visits by Membership Type

Member Type	Total visits	Total Sales
V	173646	\$30,552,241.12
W	86713	\$23,523,169.70
X	18357	\$9,334,910.25
A	2752	\$867,459.50

E	143	\$223,709.47
D	118	\$57,545.40
Y	55	\$14,744.49
G	128	\$13,809.28
3	6	\$13,346.04
1	13	\$11,798.24
Z	29	\$9,083.03
H	4	\$1,953.13

Figure 7 Query 7 Appendix

Member Type V ranks first with 173,646 visits totaling \$30,552,241.12 in sales.

### Total Sales and Margin by Membership Type

Member Type	Total Sales	Total Profit Margin
V	\$30,552,241.12	\$3,364,185.64
W	\$23,523,169.70	\$2,596,060.62
X	\$9,334,910.25	\$873,788.82
A	\$867,459.50	\$130,791.13
E	\$223,709.47	\$13,161.37
D	\$57,545.40	\$5,557.24
Y	\$14,744.49	\$1,509.84
G	\$13,809.28	\$2,249.91
3	\$13,346.04	\$2,392.68
1	\$11,798.24	\$2,229.72
Z	\$9,083.03	\$523.81
H	\$1,953.13	\$151.15

Figure 8 Query 8 Appendix

Member Type V ranks first with total sales of \$30,552,241.12 and total margin dollars of \$3,364,185.64.

## Member Buying Behavior Assessment

### Typical Purchase Patterns by Amount and Number of Items by Members per Visit

Total visitor	Total Sales	Total Unique Item purchased
375483.00	\$81,895,048.82	6045393.00

Figure 9 Query 9 Appendix

With a total visitor amount of 375,483, total sales reached \$81,895,048.82 and the total number of unique items purchased was 604,5393.



### Member Visits and Total Sales by Day of the Week

Weekday	Total visit	Total Sales
Saturday	217515	\$17,706,294.32
Sunday	159564	\$12,634,820.27
Monday	150659	\$11,518,853.13
Friday	144136	\$11,784,074.24
Thursday	117567	\$9,262,431.10
Tuesday	110580	\$8,412,768.61
Wednesday	107940	\$8,478,509.44

Figure 10 Query 10 Appendix

Saturday is the busiest day of the week with total visits up to 217,515 and total sales reaching \$17,706,294.32.

### Top 10 Total Sales and Member Visits by Hours on Saturday

Transaction Time	Total visit	Total sales
1052	789	\$55,700.54
1059	738	\$52,263.28
1050	725	\$51,638.63
1057	716	\$50,106.33
1446	476	\$41,129.58
1341	455	\$41,073.84
1417	454	\$40,992.19
1355	441	\$40,360.60
1319	438	\$41,003.00
1312	435	\$41,143.05

Figure 11 Query 11 Appendix

Many records returned, top 10 filtered. The busiest hours for Sam's Club on a Saturday are between 11:00am and 2:00pm.

### Top 10 Total Sales and Member Visits by Hours on Sunday

Transaction Time	Total visit	Total sales
1155	741	\$47,667.57
1426	469	\$39,874.01
1414	460	\$39,202.48
1453	449	\$37,570.55
1449	449	\$38,340.35
1447	447	\$38,279.65
1450	437	\$38,507.25
1436	431	\$38,902.02
1338	400	\$37,750.88
1228	385	\$38,925.25

Figure 12 Query 12 Appendix

Many records returned, top 10 filtered. The busiest hours for Sam's Club on a Sunday are between 12:00pm and 2:00pm.

#### Top 10 Busiest Hours of the Day by Member Visits

Transaction Time	Total visit
1101	2330
1155	2190
1419	2053
1310	2050
1333	2028
1332	2026
1334	2026
1341	2009
1234	2006
1302	2006
1327	2006

Figure 13 Query 13 Appendix

Many records returned, top 10 filtered. The busiest hours of the day are between 11:00am and 2:00pm.

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# SQL Appendix

**Figure 1 Query 1**

	state	Store NBR	Store Name	Total Sales	Total Profit Margin
1	OH	18	Extreme Retailers CINCINNATI,	6758162.43	772082.63
2	TX	28	Extreme Retailers DALLAS, TX	5944160.20	752235.92
3	OH	19	Extreme Retailers CINCINNATI,	5722852.01	628790.18
4	VA	15	Extreme Retailers CHESAPEAKE,	5625923.71	714480.88
5	IL	27	Extreme Retailers CRYSTAL LAKE	5406525.57	581967.33
6	OH	24	Extreme Retailers CONCORD, TX	5357355.17	508241.00
7	TN	21	Extreme Retailers CLARKSVILLE,	4970568.24	551438.69
8	FL	22	Extreme Retailers CLEARWATER,	4853982.81	567418.83
9	FL	29	Extreme Retailers DAYTONA BEAC	4331168.28	432279.50
10	MO	16	Extreme Retailers CHESTERFIELD	4155869.06	435059.44
11	KS	20	Extreme Retailers CITY OF INDU	4040099.87	367962.04
12	FL	26	Extreme Retailers CORAL SPRING	4008000.76	449429.83
13	CO	5	Extreme Retailers ARVADA, WI	3958704.43	419192.21
14	KS	17	Extreme Retailers CICERO, TX	3884664.50	397453.72
15	OH	23	Extreme Retailers COLUMBUS, TX	3453084.40	351545.22
16	WI	4	Extreme Retailers APPLETON, WI	3351538.52	352045.75
17	TX	25	Extreme Retailers CONROE, TX	3173952.58	339332.55
18	AK	3	Extreme Retailers ANCHORAGE, W	2898436.28	299684.48

```

select a.state, a.Store_nbr as [Store NBR] , Store_name as [Store Name], sum(total_visit_amt) as
[Total Sales],
Sum(Total_Visit_Amt-Tot_Unit_cost) AS [Total Profit Margin]
from Store_information a join store_visits b on a.store_nbr=b.Store_nbr
where refund_code='0'
Group by store_name , a.store_nbr ,a.State
Order by sum(total_visit_amt) desc
    
```

**Figure 2 Query 2**

	Member Type	Total visits	Total Sales
1	V	173646	30552241.12
2	W	86713	23523169.70
3	X	18357	9334910.25
4	A	2752	867459.50
5	E	143	223709.47
6	D	118	57545.40
7	Y	55	14744.49
8	G	128	13809.28
9	3	6	13346.04
10	1	13	11798.24
11	Z	29	9083.03
12	H	4	1953.13

```

Select a.Member_type as [Member Type ],count(distinct b.membership_nbr) as [Total visits] ,
sum(total_visit_amt) as [Total Sales]
from Member_index a join Store_Visits b on a.MEMBERSHIP_NBR=b.MEMBERSHIP_NBR
Where Refund_Code='0'
Group by Member_type
Order by sum(total_visit_amt) desc
    
```

**Figure 3 Query 3**

	Total Sales	Total Unit Cost	Total Number of Unique Items	Total Number of Items Purchased
1	79797751.11	71571983.40	6106856	8428201

```

select sum(total_visit_amt) as [Total Sales], sum(tot_unit_cost) as [Total Unit Cost],
sum(tot_unique_itm_cnt) as [Total Number of Unique Items], sum(tot_scan_cnt) as [Total Number of
Items Purchased]
from store_visits
    
```

**Figure 4 Query 4**

	Store NBR	Store Name	Total Sales
1	18	Extreme Retailers CINCINNATI,	6758162.43
2	28	Extreme Retailers DALLAS, TX	5944160.20
3	19	Extreme Retailers CINCINNATI,	5722852.01
4	15	Extreme Retailers CHESAPEAKE,	5625923.71
5	27	Extreme Retailers CRYSTAL LAKE	5406525.57
6	24	Extreme Retailers CONCORD, TX	5357355.17
7	21	Extreme Retailers CLARKSVILLE,	4970568.24
8	22	Extreme Retailers CLEARWATER,	4853982.81
9	29	Extreme Retailers DAYTONA BEAC	4331168.28
10	16	Extreme Retailers CHESTERFIELD	4155869.06
11	20	Extreme Retailers CITY OF INDU	4040099.87
12	26	Extreme Retailers CORAL SPRING	4008000.76
13	5	Extreme Retailers ARVADA, WI	3958704.43
14	17	Extreme Retailers CICERO, TX	3884664.50
15	23	Extreme Retailers COLUMBUS, TX	3453084.40
16	4	Extreme Retailers APPLETON, WI	3351538.52
17	25	Extreme Retailers CONROE, TX	3173952.58
18	3	Extreme Retailers ANCHORAGE, W	2898436.28

```

select a.Store_nbr as [ Store NBR] , Store_name as [Store Name], sum(total_visit_amt) as [Total Sales]
from Store_information a join store_visits b on a.store_nbr=b.Store_nbr
where refund_code='0'
Group by store_name , a.store_nbr

Order by sum(total_visit_amt) desc
    
```

**Figure 5 Query 5**

	Weekday	Total Sales	Avg. Total Sales
1	Saturday	18006711.67	85.945147
2	Sunday	12929256.30	85.000501
3	Friday	12025880.91	87.181969
4	Monday	11908710.87	83.592192
5	Thursday	9607937.68	85.753000
6	Wednesday	8710450.49	85.037249
7	Tuesday	8706100.90	83.195735

```

select datename(weekday,transaction_date) as [Weekday], sum(Total_visit_amt) as [Total Sales] ,
AVG(Total_visit_amt) As [ Avg. Total Sales ]
from Store_visits
Where Refund_Code='0'
group by datename(weekday,transaction_date)

Order by sum(total_visit_amt) desc
    
```

**Figure 6 Query 6**

	Weekday	Total Sales	Profit Margin
1	Saturday	18006711.67	1972581.55
2	Sunday	12929256.30	1400341.62
3	Monday	11908710.87	1379288.69
4	Friday	12025880.91	1259297.47
5	Thursday	9607937.68	1031515.82
6	Tuesday	8706100.90	949273.97
7	Wednesday	8710450.49	928341.08

```

Select DATENAME(Weekday, Transaction_Date) as [ Weekday] ,sum(Total_Visit_Amt) as [Total Sales],
sum(total_Visit_amt-tot_unit_cost) as [ Profit Margin]
from Store_visits
where Refund_Code='0'
Group by DATENAME(Weekday, Transaction_Date)
Order by sum(total_Visit_amt-tot_unit_cost) desc
    
```

**Figure 7 Query 7**

	Member Type	Total visits	Total Sales
1	V	173646	30552241.12
2	W	86713	23523169.70
3	X	18357	9334910.25
4	A	2752	867459.50
5	E	143	223709.47
6	D	118	57545.40
7	Y	55	14744.49
8	G	128	13809.28
9	3	6	13346.04
10	1	13	11798.24
11	Z	29	9083.03
12	H	4	1953.13

```

Select a.Member_type as [Member Type ],count(distinct b.membership_nbr) as [Total visits] ,
sum(total_visit_amt) as [Total Sales]
from Member_index a join Store_Visits b on a.MEMBERSHIP_NBR=b.MEMBERSHIP_NBR
Where Refund_Code='0'
Group by Member_type
Order by sum(total_visit_amt) desc
    
```

**Figure 8 Query 8**

	Member Type	Total Sales	Total Profit Margin
1	V	30552241.12	3364185.64
2	W	23523169.70	2596060.62
3	X	9334910.25	873788.82
4	A	867459.50	130791.13
5	E	223709.47	13161.37
6	D	57545.40	5557.24
7	Y	14744.49	1509.84
8	G	13809.28	2249.91
9	3	13346.04	2392.68
10	1	11798.24	2229.72
11	Z	9083.03	523.81
12	H	1953.13	151.15

```

Select a.Member_type as [Total Sales], sum(total_visit_amt) as [Total Sales],
ROUND((sum(total_visit_amt-Tot_unit_cost)),2) as [Total Profit Margin]
from Member_index a join Store_Visits b on a.MEMBERSHIP_NBR=b.MEMBERSHIP_NBR
Where Refund_Code='0'
Group by Member_type
Order by sum(total_visit_amt) desc
    
```

**Figure 9 Query 9**

	Total visitor	Total Sales	Total Unique Item purchased
1	375483	81895048.82	6045393

```

Select Count( distinct Membership_Nbr) as [Total visitor ] , sum(total_visit_amt) as [Total Sales ] , sum(Tot_Unique_Itm_Cnt) as [Total Unique Item purchased]
from store_visits
Where Refund_Code='0'
Order by Count(Membership_Nbr)
    
```

**Figure 10 Query 10**

	Weekday	Total visit	Total Sales
1	Saturday	217515	17706294.32
2	Sunday	159564	12634820.27
3	Monday	150659	11518853.13
4	Friday	144136	11784074.24
5	Thursday	117567	9262431.10
6	Tuesday	110580	8412768.61
7	Wednesday	107940	8478509.44

```

Select datename(Weekday, transaction_date) as [Weekday], count( visit_nbr) as [Total visit] ,sum(total_visit_amt) as [Total Sales ]
from Store_visits
Group by datename(Weekday, transaction_date)
Order by count( visit_nbr) desc
    
```

**Figure 10 Query 10**

	Transaction Time	Total visit
1	1101	2330
2	1155	2190
3	1419	2053
4	1310	2050
5	1333	2028
6	1332	2026
7	1334	2026
8	1341	2009
9	1234	2006
10	1302	2006
11	1327	2006
12	1401	2005
13	1351	2002
14	1415	1998
15	1336	1996
16	1354	1996
17	1421	1995
18	1307	1995
19	1404	1994
20	1428	1994
21	1414	1992

```

Select cast(transaction_time as varchar(8))/10000 as [Transaction Time], count(visit_nbr) as [Total visit]
from Store_visits
    
```

```
group by cast(transaction_time as varchar(8))/10000
Order by count(visit_nbr) desc
```

**Figure 11 Query 11**

	Transaction Time	Total visit	Total total sales
1	1052	789	55700.54
2	1059	738	52263.28
3	1050	725	51638.63
4	1057	716	50106.33
5	1421	488	37046.43
6	1446	476	41129.58
7	1435	471	38761.82
8	1442	469	37428.16
9	1331	467	33338.52
10	1431	465	37558.88

```
Select cast(transaction_time as varchar(8))/10000 as [Transaction Time], count(visit_nbr) as
[Total visit], SUM(total_visit_amt) as [Total sales ]
from Store_visits
Where datename(Weekday, Transaction_Date)='Saturday'
group by cast(transaction_time as varchar(8))/10000
Order by count(visit_nbr) desc
```

**Figure 12 Query 12**

	Transaction Time	Total visit	Total total sales
1	1155	741	47667.57
2	1124	549	36443.47
3	1102	538	35152.04
4	1426	469	39874.01
5	1414	460	39202.48
6	1354	456	35366.88
7	1408	452	32970.32
8	1537	452	32347.80
9	1539	451	32611.47
10	1453	449	37570.55

```
Select cast(transaction_time as varchar(8))/10000 as [Transaction Time], count(visit_nbr) as
[Total visit], SUM(total_visit_amt) as [Total sales ]
from Store_visits
Where datename(Weekday, Transaction_Date)='Sunday'
group by cast(transaction_time as varchar(8))/10000
Order by count(visit_nbr) desc
```



**Figure 13 Query 13**

	Transaction Time	Total visit
1	1101	2330
2	1155	2190
3	1419	2053
4	1310	2050
5	1333	2028
6	1332	2026
7	1334	2026
8	1341	2009
9	1234	2006
10	1302	2006

```
Select cast(transaction_time as varchar(8))/10000 as [Transaction Time], count(visit_nbr) as  
[Total visit]  
from Store_visits  
group by cast(transaction_time as varchar(8))/10000  
Order by count(visit_nbr) desc
```