Readme

Group Members: Rashi Madnani, Gunjan Sharma, Hridyansh Gupta, Minghao Fang.
Group No: 9
Course: BUDT703

Data Sources:

We randomly generated values using a Random Generator from the Internet to feed them into our database.

References:

1. https://transportation.umd.edu/parking/maps/umd-campus-parking-map
2. https://www.thehotelumd.com/2021/08/20/umd-parking-9-places-for-visitors-to-park-on-and-around-campus/
3. https://parkmobile.io/parking-solutions/
4. https://press.farm/parking-management-everything-you-need-to-know/
5. https://www.shino.de/parkcalc/

Testing project with screenshots:

1. Determine which days have the highest volume of traffic.

   Query:

```
--  Determine which days have the highest volume of traffic.
SELECT p.pmtDay, COUNT(p.pmtDay) AS 'Volume of Traffic'
FROM [UMDParking.Permit] p
GROUP BY p.pmtDay
```

   Output:

	pmtDay	Volume of Traffic
1	Weekday	78
2	Weekend	52

2. Determine the most heavily congested parking lot.

   Query:

```
-- Determine the most heavily congested parking lot.
SELECT l.lotName,COUNT(t.ticketNo) AS 'Cars parked per lot'
FROM [UMDParking.Lots] l, [UMDParking.Ticket] t, [UMDParking.Buy] b
WHERE t.ticketNo = b.ticketNo
AND b.lotId = l.lotId
GROUP BY
l.lotName
```

Output:

	lotName	Cars parked per lot
1	Downtown	10
2	Mowatt	10
3	Regents	10
4	Smith	10
5	Union	10

3. Assess if parking lots are adequate for regular commuters comprising students, faculty and staff.

Query:

```
-- Assess if parking lots are adequate for regular commuters comprising students, faculty, and staff.
SELECT c.custType, COUNT(c.custType) AS 'Customers per Customer Type'
FROM [UMDParking.Customer] c
GROUP BY c.custType
```

Output:

	custType	Customers per Customer Type
1	Faculty	10
2	Guest	20
3	Student	20

4. Analyze the volume of traffic on different game days.

Query:

```
--Analyze the volume of traffic on different game days.
SELECT t.ticketDate, COUNT(c.custId) AS 'Volume of Traffic on Gameday'
FROM    [UMDParking.Customer] c,
        [UMDParking.Permit] p,
        [UMDParking.Slots] sl,
        [UMDParking.Surge] s,
        [UMDParking.Buy] b,
        [UMDParking.Ticket] t
WHERE   c.custId = b.custId
    AND s.ticketNo = b.ticketNo
    AND sl.sltId = b.sltId
    AND sl.sltId = p.sltId
    AND t.ticketNo = b.ticketNo
    AND s.srgFlag = 'Y'
GROUP BY t.ticketDate
```

Output:

	ticketDate	Volume of Traffic on Gameday
1	2022-06-25	1
2	2022-06-26	2
3	2022-06-27	1
4	2022-06-28	1
5	2022-07-11	1
6	2022-07-26	4
7	2022-07-27	1
8	2022-08-11	2
9	2022-08-23	2
10	2022-08-24	2
11	2022-08-25	2
12	2022-08-26	8
13	2022-09-24	1
14	2022-09-26	2

5. Examine if providing a discount to a customer helps the University increase revenue.

   Query:

```
-- Examine if providing a discount to a customer helps the University increase revenue.
SELECT  SUM(student.Ticket_Price) AS 'Student Ticket Total' ,
        SUM(guest.Ticket_Price ) AS 'Guest Ticket Total',
        SUM(faculty.Ticket_Price) AS 'Faculty Ticket Total'
FROM
(SELECT c.custId,
        c.custFirstName,
        c.custLastName,
        c.custType,
        p.pmtHrs,
        p.pmtDay,
        t.ticketBaseCost,
        d.custDiscount,
        s.srgCharge,
        sl.sltName,
        (t.ticketBaseCost+ 1.50*(p.pmtHrs-1)-d.custDiscount+s.srgCharge) AS 'Ticket_Price'
FROM    [UMDParking.Customer] c,
        [UMDParking.Ticket] t,
        [UMDParking.Apply] a,
        [UMDParking.Buy] b,
        [UMDParking.Discount] d,
        [UMDParking.Surge] s,
        [UMDParking.Permit] p,
        [UMDParking.Slots] sl
WHERE   c.custType = 'Student'
    AND c.custId = a.custId
    AND c.custId = b.custId
    AND t.ticketNo = a.ticketNo
    AND t.ticketNo = b.ticketNo
    AND sl.sltId = b.sltId
    AND sl.sltId = p.sltId
    AND d.custDiscountId = a.custDiscountId
    AND s.ticketNo = t.ticketNo
    ) AS student,
```

```
(SELECT c.custId,
        c.custFirstName,
        c.custLastName,
        c.custType,
        p.pmtHrs,
        p.pmtDay,
        t.ticketBaseCost,
        d.custDiscount,
        s.srgCharge,
        sl.sltName,
        (t.ticketBaseCost+ 1.50*(p.pmtHrs-1)-d.custDiscount+s.srgCharge) AS 'Ticket_Price'
FROM    [UMDParking.Customer] c,
        [UMDParking.Ticket] t,
        [UMDParking.Apply] a,
        [UMDParking.Buy] b,
        [UMDParking.Discount] d,
        [UMDParking.Surge] s,
        [UMDParking.Permit] p,
        [UMDParking.Slots] sl
WHERE   c.custType = 'Guest'
    AND c.custId = a.custId
    AND c.custId = b.custId
    AND t.ticketNo = a.ticketNo
    AND t.ticketNo = b.ticketNo
    AND sl.sltId = b.sltId
    AND sl.sltId = p.sltId
    AND d.custDiscountId = a.custDiscountId
    AND s.ticketNo = t.ticketNo
) AS guest,
```

```
(SELECT c.custId,
        c.custFirstName,
        c.custLastName,
        c.custType,
        p.pmtHrs,
        p.pmtDay,
        t.ticketBaseCost,
        d.custDiscount,
        s.srgCharge,
        sl.sltName,
        (t.ticketBaseCost+ 1.50*(p.pmtHrs-1)-d.custDiscount+s.srgCharge) AS 'Ticket_Price'
FROM    [UMDParking.Customer] c,
        [UMDParking.Ticket] t,
        [UMDParking.Apply] a,
        [UMDParking.Buy] b,
        [UMDParking.Discount] d,
        [UMDParking.Surge] s,
        [UMDParking.Permit] p,
        [UMDParking.Slots] sl
WHERE   c.custType = 'Faculty'
    AND c.custId = a.custId
    AND c.custId = b.custId
    AND t.ticketNo = a.ticketNo
    AND t.ticketNo = b.ticketNo
    AND sl.sltId = b.sltId
    AND sl.sltId = p.sltId
    AND d.custDiscountId = a.custDiscountId
    AND s.ticketNo = t.ticketNo
    ) AS faculty

WHERE 1=1
    AND student.pmtHrs = guest.pmtHrs
    AND faculty.pmtHrs = student.pmtHrs
```

Output:

	Student Ticket Total	Guest Ticket Total	Faculty Ticket Total
1	2748.25	3487.75	1542

Business Transactions:

1. What are the different types of customers that come in the parking lot?

   Query:

```
--1.    What are the different types of customers that come in the parking lot.
SELECT DISTINCT c.custType
FROM [UMDParking.Customer] c
```

   Output:

	custType
1	Faculty
2	Guest
3	Student

2. Calculate the number of cars parked in each lot.

   Query:

```
--2.    Calculate the number of cars parked in each lot.
SELECT l.lotName, COUNT(t.ticketNo) AS 'Cars Parked in a Lot'
FROM [UMDParking.Lots] l, [UMDParking.Ticket] t, [UMDParking.Buy] b
WHERE   b.lotId = l.lotId
    AND t.ticketNo = b.ticketNo
GROUP BY  l.lotName
```

   Output:

	lotName	Cars Parked in a Lot
1	Downtown	10
2	Mowatt	10
3	Regents	10
4	Smith	10
5	Union	10

3. Display the parking lot number and the name of the manager in charge.

   Query:

```
--3.    Display the parking lot number and the name of the manager in charge.
SELECT DISTINCT m.*, l.lotName
FROM [UMDParking.Lots] l, [UMDParking.Manager] m, [UMDParking.Buy] b
WHERE l.lotId = b.lotId
    AND m.lotId = l.lotId
```

   Output:

	mngrId	mngrFirstName	mngrLastName	mngrPhoneNo	mngrEmailId	lotId	lotName
1	5000000001	Masashi	Kishimoto	2401115555	mk@gmail.com	1000000001	Regents
2	5000000002	Ashlynn	Rae	2401115556	ar@gmail.com	1000000002	Smith
3	5000000003	Marta	Nohemi	2401115557	mn@gmail.com	1000000003	Union
4	5000000004	Gjord	Hesiod	2401115558	gh@gmail.com	1000000004	Mowatt
5	5000000005	Eren	Yeager	2401115559	ey@gmail.com	1000000005	Downtown

4. What will be the ticket price for a customer on a normal weekday, weekend for a certain amount of time?

Query:

```
-- 4.   What will be the ticket price for a customer on a normal weekday, weekend for a certain amount of time?
SELECT DISTINCT c.custId,
                c.custFirstName,
                c.custLastName,
                c.custType,
                t.ticketNo,
                t.ticketDate,
                p.pmtDay,
                p.pmtHrs,
                s.srgCharge,
                s.srgFlag,
                lv.lvlName,
                lv.lvlId,
                sl.sltName,
                (t.ticketBaseCost+ 1.50*(p.pmtHrs-1)-d.custDiscount+s.srgCharge) AS 'Ticket_Price'
FROM [UMDParking.Permit] p,
        [UMDParking.Ticket] t,
        [UMDParking.Surge] s,
        [UMDParking.Customer] c,
        [UMDParking.Buy] b,
        [UMDParking.Lots] l,
        [UMDParking.Levels] lv,
        [UMDParking.Apply] a,
        [UMDParking.Discount] d,
        [UMDParking.Slots] sl
WHERE c.custId = b.custId
AND t.ticketNo = b.ticketNo
AND l.lotId = b.lotId
AND lv.lvlId = b.lvlId
AND b.sltId = sl.sltId
AND lv.lvlId = sl.lvlId
AND l.lotId = sl.lotId
AND sl.sltId = p.sltId
AND c.custId = a.custId
AND t.ticketNo = a.ticketNo
AND d.custDiscountId = a.custDiscountId
AND t.ticketNo = s.ticketNo
AND p.pmtHrs = 3
```

Output:

	custId	custFirstName	custLastName	custType	ticketNo	ticketDate	pmtDay	pmtHrs	srgCharge	srgFlag	lvlName	lvlId	sltName	Ticket_Price
1	4000000003	Hiruzen	Sarutobi	Guest	0000000003	2022-08-11	Weekend	3	5.00	Y	RA	2100000001	RAC	10
2	4000000008	Aurel	Sandra	Guest	0000000008	2022-08-26	Weekend	3	0.00	N	RC	2100000003	RCR	6
3	4000000012	Honous	Finn	Faculty	0000000012	2022-08-25	Weekend	3	0.00	N	SA	2200000001	SAB	5.25
4	4000000017	Filomena	Orrin	Faculty	0000000017	2022-08-24	Weekend	3	0.00	N	SC	2200000003	SCQ	4.25
5	4000000024	Livia	Borna	Student	0000000024	2022-07-26	Weekend	3	5.00	Y	UA	2300000001	UAF	9.5
6	4000000036	Valdemar	Kori	Student	0000000036	2022-07-27	Weekend	3	5.00	Y	MB	2400000002	MBO	9.5
7	4000000038	Claudine	Azaziah	Guest	0000000038	2022-09-26	Weekend	3	0.00	N	MC	2400000003	MCT	6
8	4000000040	Hristina	Gnaeus	Guest	0000000040	2022-09-26	Weekend	3	5.00	Y	MD	2400000004	MDY	10
9	4000000044	Barclay	Suad	Student	0000000044	2022-08-26	Weekend	3	5.00	Y	DA	2500000001	DAD	8.5

5. What will be the cost of ticket on gameday weekday and gameday weekend?

Query:

```
-- 6.   What will be the cost of ticket on gameday weekday and gameday weekend?
SELECT DISTINCT c.custId,
                c.custFirstName,
                c.custLastName,
                c.custType,
                t.ticketNo,
                t.ticketDate,
                p.pmtDay,
                p.pmtHrs,
                s.srgCharge,
                s.srgFlag,
                lv.lvlName,
                lv.lvlId,
                sl.sltName,
                (t.ticketBaseCost+ 1.50*(p.pmtHrs-1)-d.custDiscount+s.srgCharge) AS 'Ticket_Price'
FROM [UMDParking.Permit] p,
       [UMDParking.Ticket] t,
       [UMDParking.Surge] s,
       [UMDParking.Customer] c,
       [UMDParking.Buy] b,
       [UMDParking.Lots] l,
       [UMDParking.Levels] lv,
       [UMDParking.Apply] a,
       [UMDParking.Discount] d,
       [UMDParking.Slots] sl
WHERE c.custId = b.custId
AND t.ticketNo = b.ticketNo
AND l.lotId = b.lotId
AND lv.lvlId = b.lvlId
AND b.sltId = sl.sltId
AND lv.lvlId = sl.lvlId
AND l.lotId = sl.lotId
AND sl.sltId = p.sltId
AND c.custId = a.custId
AND t.ticketNo = a.ticketNo
AND d.custDiscountId = a.custDiscountId
AND t.ticketNo = s.ticketNo
AND s.srgFlag = 'Y' ---denotes gameday irrespective of weekday weekend
```

Output:

	custId	custFirstName	custLastName	custType	ticketNo	ticketDate	pmtDay	pmtHrs	srgCharge	srgFlag	lvlName	lvlId	sltName	Ticket_Price
1	4000000003	Hiruzen	Sarutobi	Guest	0000000003	2022-08-11	Weekend	3	5.00	Y	RA	2100000001	RAC	10
2	4000000004	Sasuke	Uchiha	Student	0000000004	2022-08-11	Weekend	1	5.00	Y	RA	2100000001	RAD	6.5
3	4000000005	Itachi	Uchiha	Guest	0000000005	2022-07-11	Weekday	2.5	5.00	Y	RB	2100000002	RBK	10.25
4	4000000006	Metztli	Clarity	Student	0000000006	2022-08-26	Weekday	1.5	5.00	Y	RB	2100000002	RBL	7.25
5	4000000009	Tena	Alevtina	Student	0000000009	2022-07-26	Weekend	1	5.00	Y	RD	2100000004	RDX	6.5
6	4000000010	Onora	Annetta	Guest	0000000010	2022-08-24	Weekday	2.5	5.00	Y	RD	2100000004	RDY	9.25
7	4000000013	Humbert	Achan	Guest	0000000013	2022-06-27	Weekend	1	5.00	Y	SA	2200000001	SAC	7
8	4000000014	Torben	Enheduna	Student	0000000014	2022-08-23	Weekday	2.5	5.00	Y	SA	2200000001	SAD	8.75
9	4000000015	Ulrik	Paftiy	Guest	0000000015	2022-08-26	Weekday	2.5	5.00	Y	SB	2200000002	SBJ	10.25
10	4000000016	Gislenus	Gloria	Student	0000000016	2022-07-26	Weekday	1.5	5.00	Y	SB	2200000002	SBK	7.25
11	4000000019	Yadira	Ambrozy	Student	0000000019	2022-06-28	Weekday	2.5	5.00	Y	SD	2200000004	SDX	8.75
12	4000000023	Neelam	Ferdowsi	Guest	0000000023	2022-08-26	Weekday	1.5	5.00	Y	UA	2300000001	UAE	8.75
13	4000000024	Livia	Borna	Student	0000000024	2022-07-26	Weekend	3	5.00	Y	UA	2300000001	UAF	9.5
14	4000000025	Clement	Mille	Guest	0000000025	2022-08-25	Weekend	1	5.00	Y	UB	2300000002	UBL	7
15	4000000026	Alina	Kennet	Student	0000000026	2022-09-26	Weekday	2.5	5.00	Y	UB	2300000002	UBM	8.75
16	4000000029	Carrol	Vespasian	Student	0000000029	2022-08-26	Weekday	2.5	5.00	Y	UD	2300000004	UDW	7.75
17	4000000030	Margarita	Bohuslava	Guest	0000000030	2022-08-26	Weekday	2.5	5.00	Y	UD	2300000004	UDX	10.25
18	4000000033	Vihtori	Cai	Guest	0000000033	2022-08-26	Weekday	2.5	5.00	Y	MA	2400000001	MAC	10.25
19	4000000034	Szabolcs	Honoria	Student	0000000034	2022-06-25	Weekday	1.5	5.00	Y	MA	2400000001	MAD	7.25
20	4000000035	Mesud	Virgilius	Guest	0000000035	2022-08-26	Weekday	1.5	5.00	Y	MB	2400000002	MBN	7.75
21	4000000036	Valdemar	Kori	Student	0000000036	2022-07-27	Weekend	3	5.00	Y	MB	2400000002	MBO	9.5
22	4000000039	Helmut	Raisa	Student	0000000039	2022-09-24	Weekday	1.5	5.00	Y	MD	2400000004	MDX	7.25
23	4000000040	Hristina	Gnaeus	Guest	0000000040	2022-09-26	Weekend	3	5.00	Y	MD	2400000004	MDY	10
24	4000000043	Severin	Ragna	Guest	0000000043	2022-07-26	Weekday	1.5	5.00	Y	DA	2500000001	DAC	8.75
25	4000000044	Barclay	Suad	Student	0000000044	2022-08-26	Weekend	3	5.00	Y	DA	2500000001	DAD	8.5
26	4000000045	Anton	Connla	Guest	0000000045	2022-08-25	Weekday	2.5	5.00	Y	DB	2500000002	DBK	9.25
27	4000000046	Tshofelo	Mikhail	Student	0000000046	2022-06-26	Weekday	2.5	5.00	Y	DB	2500000002	DBL	7.75
28	4000000049	Hildbrand	Nikole	Student	0000000049	2022-06-26	Weekend	1	5.00	Y	DD	2500000004	DDY	5.5