



## Database Analysis & Design INF10002

### High Distinction Task S1 2022

Student ID: 103181157

Student Name: Nguyen Nam Tung

#### Part 1 – Business Narrative

TANDT Automobile Rental is one of Melbourne's most reputable car rental companies. Young and energetic entrepreneur Nguyen Nam Tung founded this company in 2000 on Elizabeth Street in Melbourne's central business district. Several months ago, after the Covid-19 pandemic, Australian quarantine rules were removed, and many Australian nationals and international students have returned to the country for employment and education, increasing the demand for transportation. As a result, in order to meet this growing demand, several car rental locations have opened across Melbourne. However, managing many staff and locations can be challenging. Hence, an Access database can be utilised for more effective data management, resulting in better decision-making in the future.

Each branch has a unique ID, name, location, and customer service telephone number. There are a certain number of employees at each branch. A worker can only work in a single branch. Each employee has an ID, a name, and a phone number. Each location offers car rental services. Each car has a code, branch, manufacturing year, and colour. Some automobiles require maintenance before the renting process. However, a vehicle can only belong to one branch.

Customers can rent a car by contacting the branch. When a consumer wants to make a contract, they must provide their name, phone number, email address, and they will be assigned a unique identifier. The contract has a start date, an end date, and a weekly fee that must be paid.

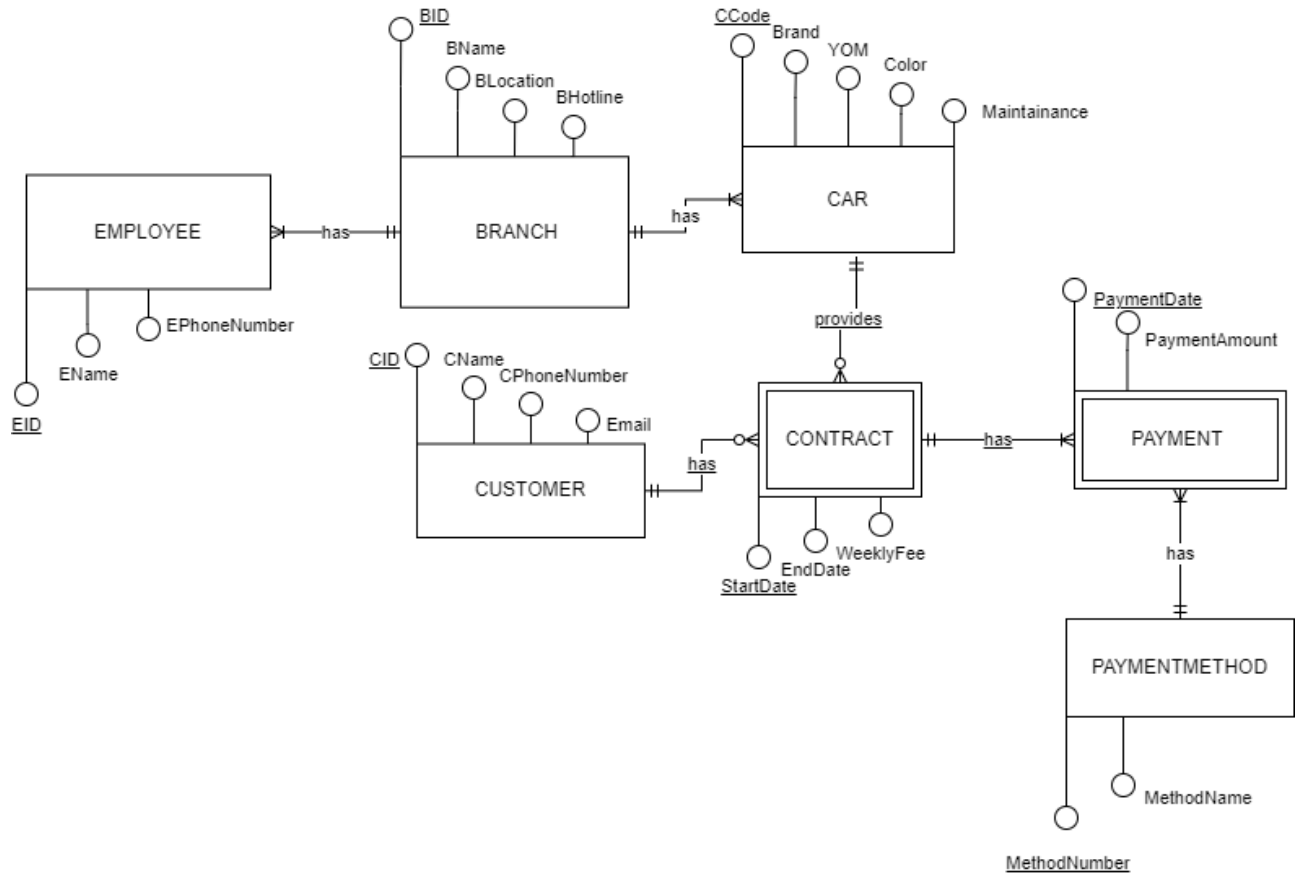
The customer pays the service fees weekly until the contract expires. For each customer payment, the date and amount of the transaction are recorded. However, this service accepts only a limited number of payment methods, identified by method number and name (for example 1- Credit Card)

Several queries and visualisations can be utilised when creating a database, including:

- Which location has the greatest number of employees
- Which cars have the most sales
- Total Revenue per car brand
- Which payment method is the most popular

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## Part 2 – ERDs and Relational Schema



EMPLOYEE (EID, EName, EPhoneNumber, BID)

PK (EID)

FK (BID) REFERENCES BRANCH

BRANCH (BID, BName, BLocation, BHotline)

PK (BID)

CAR (CCode, Brand, YOM, Color, Maintanance, BID)

PK (CCode)

FK (BID) REFERENCES BRANCH

CUSTOMER (CID, CName, CPhoneNumber, Email)

PK (CID)

CONTRACT (CCode, CID, StartDate, EndDate, WeeklyFee)

PK (CCode, CID, StartDate)

FK (CCode) REFERENCES CAR

FK (CID) REFERENCES CUSTOMER

PAYMENT (CCode, CID, StartDate, PaymentDate, PaymentAmount, MethodNumber)

PK (CCode, CID, StartDate, PaymentDate)

FK (CCode, CID, StartDate) REFERENCES CONTRACT

FK ( MethodNumber) REFERENCES PAYMENTMETHOD

PAYMENTMETHOD (MethodNumber, MethodName)

PK ( MethodNumber)

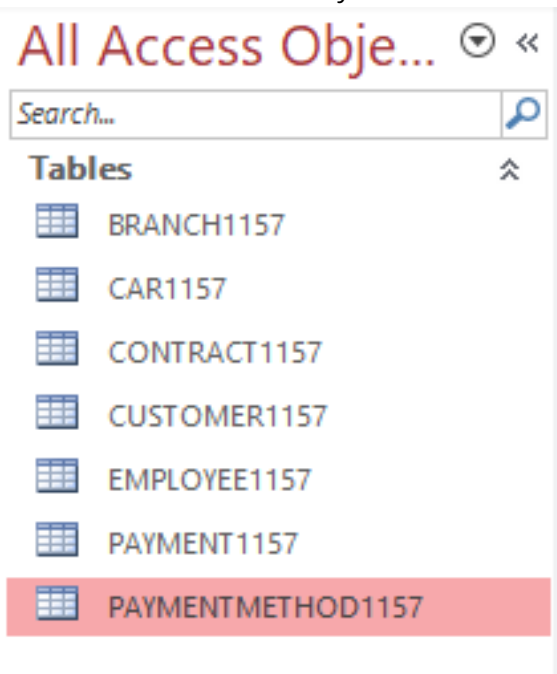
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### Part 3 – DB Solution (If using Access then file is to be uploaded to Canvas)

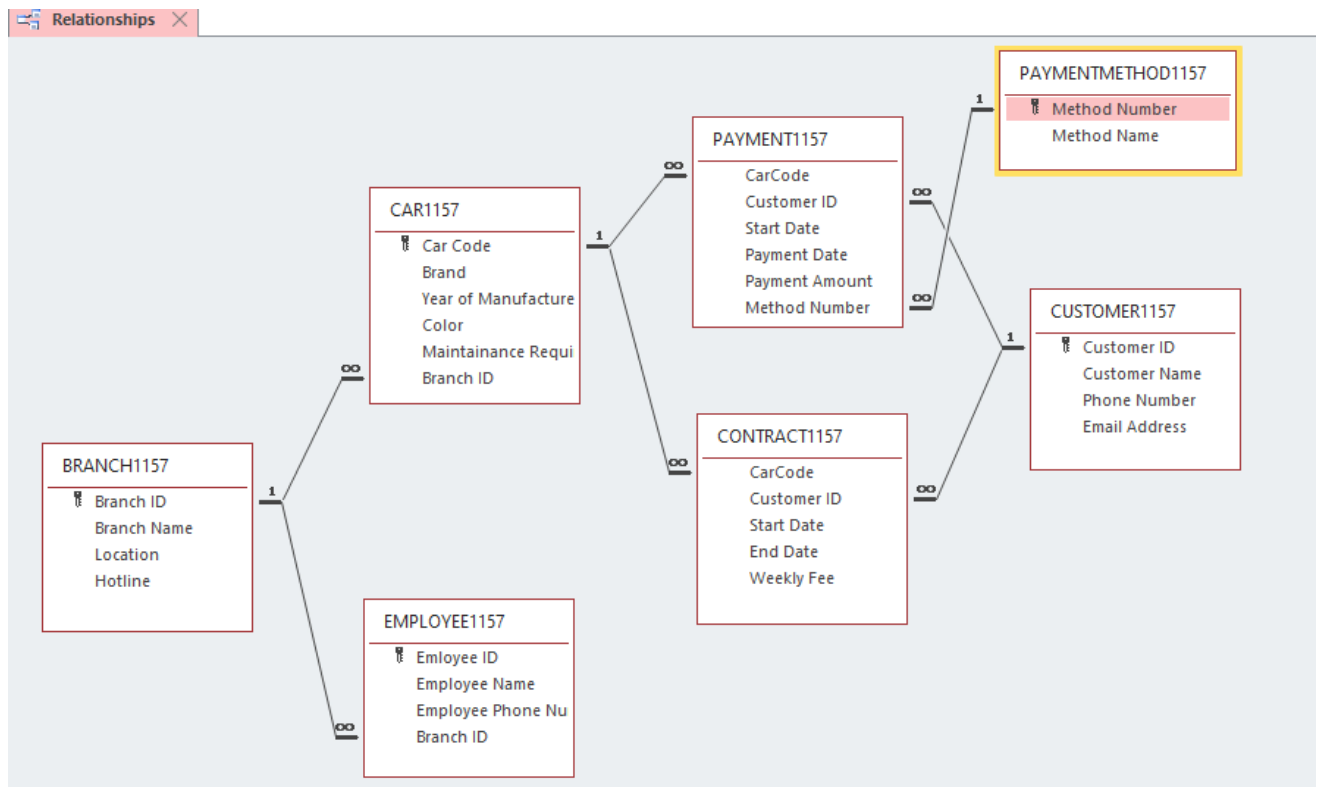
(If using SQL then Drop Table, Create Table, Insert Statements are pasted here)

Paste here.

Here are all the tables in my Access database



Here are the relationships between the tables



#### Part 4 – Test Data (Diagram and/or Statements)

Design Views/Datasheet views or Sql scripts - Paste here.

##### **CUSTOMER1157 TABLE:**

This is the table that contains my name and student ID, my tutor and convenor, a male and a female world leader

CUSTOMER1157	
Field Name	Data Type
Customer ID	Number
Customer Name	Short Text
Phone Number	Short Text
Email Address	Short Text

CUSTOMER1157				
	Customer ID	Customer Name	Phone Number	Email Address
+	101221212	Joe Biden	0435378787	joe Biden133@gmail.com
+	102121212	Nguyen Dang Khanh Toan	0453423212	dangkhanhtoan@gmail.com
+	102123433	Ben Nathan	0432377734	nathanguy2104@gmail.com
+	102233999	Ella Warren	0443880400	ellathebest@gmail.com
+	102323678	Julia Gillard	0455656656	juliag2002@gmail.com
+	103181157	Nguyen Nam Tung	0405335420	nguyennamtung123@gmail.com
+	103232323	Maria Theresa	0421384840	theresamaria@gmail.com
+	103232332	Coco Channel	0432390999	cocochannle1234@gmail.com
+	103234467	Robert Tipping	0422338299	robtipping0404@gmail.com
+	103236566	Harry Styles	0423289895	stylenahnd@gmail.com
+	103324367	Danh Kevin	0422839329	danhkevin2456@gmail.com
+	105454556	Joshua Wright	0434390030	joshuaishandome@gmail.com
+	108767344	Paul Darbyshire	0438293800	pauldabysire098@gmail.com
+	108987878	Binh Mike	0400001232	mikebinh345@gmail.com
+	108989888	Andrew Tate	0454095940	tateandrewzzz@gmail.com
+	108998967	Smith Daniel	0434390901	dansmith3923@gmail.com
+	109774332	Nguyen Tran Thanh	0434343111	thanhtran7003@gmail.com
+	109867676	Michael Kenny	0423392991	kennymike943@gmail.com

BRANCH1157 TABLE

BRANCH1157	
Field Name	Data Type
Branch ID	Short Text
Branch Name	Short Text
Location	Short Text
Hotline	Short Text

BRANCH1157				
	Branch ID	Branch Name	Location	Hotline
+	B01	TANDT Power	Hawthorn	0411111111
+	B02	TANDT Victoria	Richmond	0422222222
+	B03	TANDT Watt	Sunshine	0433333333
+	B04	TANDT Elizabeth	Melbourne CBD	0444444444
+	B05	TANDT Station	Box Hill	0455555555
+	B06	TANDT Queen Bridge	Southbank	0466666666
+	B07	TANDT Packard	Keilor Down	0477777777
+	B08	TANDT Swan	Burnley	0488888888
+	B09	TANDT Harold	Camberwell	0499999999




CAR1157 TABLE

CAR1157						
Field Name	Data Type					
Car Code	Short Text					
Brand	Short Text					
Year of Manufacture	Number					
Color	Short Text					
Maintainance Required	Short Text					
Branch ID	Short Text					

CAR1157						
Car Code	Brand	Year of Manufacture	Color	Maintainance Required	Branch ID	
C01	Roll Royce	2009	Black	Yes	B01	
C02	Roll Royce	2011	White	Yes	B01	
C03	Toyota	2010	Black	Yes	B01	
C04	Toyota	2004	White	No	B01	
C05	Toyota	2008	Blue	No	B01	
C06	Maserati	2006	Black	No	B02	
C07	Roll Royce	2011	Black	Yes	B02	
C08	Toyota	2017	Black	No	B02	
C09	Tesla	2019	Red	Yes	B02	
C10	Tesla	2020	Blue	No	B03	
C11	Toyota	2010	Red	Yes	B03	
C12	Roll Royce	2017	Black	No	B03	
C13	Toyota	2009	Blue	Yes	B04	
C14	Toyota	2010	Black	Yes	B04	
C15	Roll Royce	2016	White	No	B04	
C16	Tesla	2018	Black	No	B04	
C17	Tesla	2015	Red	No	B04	
C18	Tesla	2018	Black	No	B04	
C19	Lamborghini	2007	Blue	No	B04	
C20	Audi	2015	Red	Yes	B04	
C21	Tesla	2011	Red	Yes	B05	
C22	Range Rover	2014	Black	Yes	B05	
C23	Toyota	2016	White	No	B06	
C24	Range Rover	2018	Blue	No	B06	
C25	Tesla	2019	Blue	Yes	B07	
C26	Audi	2009	Black	Yes	B07	
C27	Audi	2011	Red	No	B08	
C28	Toyota	2012	Red	Yes	B08	
C29	Toyota	2012	White	Yes	B08	
C30	Maserati	2018	Black	No	B08	
C31	Bugatti	2018	Grey	Yes	B09	
C32	Toyota	2019	White	No	B09	
C33	Huyndai	2009	Black	Yes	B09	
C34	Tesla	2019	Grey	Yes	B09	
C35	Audi	2022	Grey	No	B09	
C36	Roll Royce	2010	Black	No	B09	

CONTRACT1157 TABLE

 CONTRACT1157 	
 Field Name	Data Type
CarCode	Short Text
Customer ID	Number
Start Date	Date/Time
End Date	Date/Time
Weekly Fee	Currency

CONTRACT1157					
CarCode	Customer ID	Start Date	End Date	Weekly Fee	
C01	101221212	1/01/2022	15/01/2022	\$180.00	
C01	102123433	2/02/2022	9/02/2022	\$200.00	
C02	102323678	11/02/2022	18/02/2022	\$350.00	
C03	103324367	11/02/2022	25/02/2022	\$900.00	
C04	102233999	12/02/2022	19/02/2022	\$800.00	
C05	105454556	13/03/2022	20/03/2022	\$930.00	
C05	108987878	18/03/2022	25/03/2022	\$390.00	
C05	108989888	21/03/2022	28/03/2022	\$490.00	
C06	108989888	24/03/2022	31/03/2022	\$980.00	
C07	102323678	1/04/2022	15/04/2022	\$1,000.00	
C08	108998967	2/04/2022	23/04/2022	\$290.00	
C09	108998967	12/04/2022	19/04/2022	\$1,800.00	
C10	105454556	14/04/2022	21/04/2022	\$180.00	
C11	109867676	18/04/2022	25/04/2022	\$1,750.00	
C12	109774332	10/04/2022	24/04/2022	\$120.00	
C13	103232332	21/04/2022	28/04/2022	\$900.00	
C13	102121212	1/04/2022	29/04/2022	\$320.00	
C13	108767344	17/04/2022	25/04/2022	\$440.00	
C14	103236566	3/02/2022	10/02/2022	\$780.00	
C15	105454556	5/02/2022	12/02/2022	\$880.00	
C16	103234467	1/10/2022	22/10/2022	\$1,470.00	
C19	103234467	2/03/2022	9/03/2022	\$120.00	
C19	102233999	3/03/2022	10/03/2022	\$1,800.00	
C22	103181157	5/04/2022	12/04/2022	\$500.00	
C23	103232332	9/06/2022	16/06/2022	\$560.00	
C26	103232323	9/05/2022	16/05/2022	\$780.00	
C26	105454556	10/05/2022	24/05/2022	\$265.00	
C27	108987878	12/03/2022	19/03/2022	\$370.00	
C29	108987878	11/01/2022	18/01/2022	\$860.00	
C33	109867676	23/08/2022	30/08/2022	\$1,200.00	
C33	103181157	22/09/2022	29/09/2022	\$1,890.00	
C34	102123433	11/09/2022	18/09/2022	\$520.00	
C34	109774332	14/10/2022	21/10/2022	\$1,030.00	
C34	108998967	22/10/2022	29/10/2022	\$210.00	
C36	108989888	9/09/2022	23/09/2022	\$760.00	

EMPLOYEE1157 TABLE



EMPLOYEE1157 ✕				
Field Name		Data Type		
	Employee ID	Short Text		
	Employee Name	Short Text		
	Employee Phone Number	Short Text		
	Branch ID	Short Text		

EMPLOYEE1157 ✕				
Employee ID	Employee Name	Employee Phone Number	Branch ID	
E01	Nguyen Thi Lan Anh	0405335423	B01	
E02	Nguyen Hoang Quan	0427128902	B01	
E03	Nguyen Van An	0428929011	B02	
E04	Nguyen Bich Thuy	0483278382	B02	
E05	Daniel Wellington	0422989912	B02	
E06	Mackenzie Beth	0483298292	B03	
E07	Nguyen Nhat Minh	0489829890	B03	
E08	Nguyen Khac Tam	0491000001	B03	
E09	Tom Shark	0409230939	B04	
E10	Lyndsay Hoa	0424378900	B04	
E11	Gwen Stacy	0400013289	B04	
E12	Sam Walker	0489283012	B04	
E13	Bill Clayton	0482389933	B04	
E14	Sam Smith	0429392829	B04	
E15	Anthony William	0489238939	B04	
E16	Zayn Malik	0400002383	B04	
E17	Richard Waterson	0492389921	B05	
E18	Jayson Shaw	0482934202	B05	
E19	Shane Van Boening	0429801911	B05	
E20	Nancy Nguyen	0428465322	B06	
E21	Chloe Tran	0498100012	B06	
E22	Tran Minh Nghi	0429098032	B06	
E23	Dang Ngoc Anh	0420021123	B06	
E24	Mai Kien Huy	0429090430	B07	
E25	Bao Dai	0420990290	B08	
E26	Tung Minh Ly	0409221220	B08	
E27	Jack Daniel	0492098478	B08	
E28	Andrew Dang	0429047832	B08	
E29	John Park	0428943438	B08	
E30	Nguyen Minh Tien	0429843744	B09	
E31	Tran Thi Thao	0429324655	B09	
E32	Dang Thi Bao Tram	0423424352	B09	
E33	Nguyen Khac Huy	0425455344	B09	
E34	Nguyen Anh Khoa	0422182212	B09	

**PAYMENT1157 TABLE**

PAYMENT1157						
Field Name			Data Type			
CarCode			Short Text			
Customer ID			Number			
Start Date			Date/Time			
Payment Date			Date/Time			
Payment Amount			Currency			
Method Number			Number			

PAYMENT1157						
CarCode	Customer ID	Start Date	Payment Date	Payment Amount	Method Number	
C01	101221212	1/01/2022	16/01/2022	\$360.00	1	
C01	102123433	2/02/2022	10/02/2022	\$200.00	2	
C02	102323678	11/02/2022	19/02/2022	\$350.00	1	
C03	103324367	11/02/2022	26/02/2022	\$1,800.00	1	
C04	102233999	12/02/2022	20/02/2022	\$800.00	1	
C05	105454556	13/03/2022	21/03/2022	\$930.00	1	
C05	108987878	18/03/2022	26/03/2022	\$390.00	3	
C05	108989888	21/03/2022	29/03/2022	\$490.00	4	
C06	108989888	24/03/2022	1/04/2022	\$980.00	4	
C07	102323678	1/04/2022	16/04/2022	\$2,000.00	8	
C08	108998967	2/04/2022	24/04/2022	\$870.00	6	
C09	108998967	12/04/2022	20/04/2022	\$1,800.00	6	
C10	105454556	14/04/2022	22/04/2022	\$180.00	7	
C11	109867676	18/04/2022	26/04/2022	\$1,750.00	8	
C12	109774332	10/04/2022	25/04/2022	\$240.00	8	
C13	103232332	21/04/2022	29/04/2022	\$900.00	8	
C13	102121212	1/04/2022	30/04/2022	\$1,280.00	8	
C13	108767344	17/04/2022	26/04/2022	\$440.00	1	
C14	103236566	3/02/2022	11/02/2022	\$780.00	1	
C15	105454556	5/02/2022	13/02/2022	\$880.00	1	
C16	103234467	1/10/2022	23/10/2022	\$4,410.00	1	
C19	103234467	2/03/2022	10/03/2022	\$120.00	1	
C19	102233999	3/03/2022	11/03/2022	\$1,800.00	1	
C22	103181157	5/04/2022	13/04/2022	\$500.00	1	
C23	103232332	9/06/2022	17/06/2022	\$560.00	2	
C26	103232323	9/05/2022	17/05/2022	\$780.00	3	
C26	105454556	10/05/2022	25/05/2022	\$530.00	5	
C27	108987878	12/03/2022	20/03/2022	\$370.00	4	
C29	108987878	11/01/2022	19/01/2022	\$860.00	3	
C33	109867676	23/08/2022	31/08/2022	\$1,200.00	5	
C33	103181157	22/09/2022	30/09/2022	\$1,890.00	5	
C34	102123433	11/09/2022	19/09/2022	\$520.00	6	
C34	109774332	14/10/2022	22/10/2022	\$1,030.00	7	
C34	108998967	22/10/2022	30/10/2022	\$210.00	1	
C36	108989888	9/09/2022	24/09/2022	\$1,520.00	1	

**PAYMENTMETHOD1157 TABLE:**

PAYMENTMETHOD1157	
Field Name	Data Type
Method Number	Number
Method Name	Short Text

PAYMENTMETHOD1157	
Method Number	Method Name
1	Bank Transfer
2	Cash
3	Credit Card
4	Debit Card
5	Checks
6	Mobile Wallet
7	PayPal
8	Cryptocurrency

### Part 5 – Queries, Visualisations, (i.e. Queries or sql scripts)

Query 1; Display the branch ID, branch name, branch location and the total number of employees in each brand (Elizabeth branch has the greatest number of employees)

Branch ID	Branch Name	Location	Total Employees: [Employee ID]
BRANCH1157	BRANCH1157	BRANCH1157	EMPLOYEE1157
Group By	Group By	Group By	Count
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Query1			
Branch ID	Branch Name	Location	Total Employees
B01	TANDT Power	Hawthorn	2
B02	TANDT Victoria	Richmond	3
B03	TANDT Watt	Sunshine	3
B04	TANDT Elizabeth	Melbourne CBD	8
B05	TANDT Station	Box Hill	3
B06	TANDT Queen Bridge	Southbank	4
B07	TANDT Packard	Keilor Down	1
B08	TANDT Swan	Burnley	5
B09	TANDT Harold	Camberwell	5

Query 2: Display the customer ID, customer name of customers that spend more than \$400 in TANDT Rental service (Display my name, my tutor in my convenor)

Customer ID	Customer Name	Payment Amount
CUSTOMER1157	CUSTOMER1157	PAYMENT1157
Group By	Group By	Sum
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		> 400

Query2		
Customer ID	Customer Name	SumOfPayment Amount
102121212	Nguyen Dang Khanh Toan	\$1,280.00
102123433	Ben Nathan	\$720.00
102233999	Ella Warren	\$2,600.00
102323678	Julia Gillard	\$2,350.00
103181157	Nguyen Nam Tung	\$2,390.00
103232323	Maria Theresa	\$780.00
103232332	Coco Channel	\$1,460.00
103234467	Robert Tipping	\$4,530.00
103236566	Harry Styles	\$780.00
103324367	Danh Kevin	\$1,800.00
105454556	Joshua Wright	\$2,520.00
108767344	Paul Darbyshire	\$440.00
108987878	Binh Mike	\$1,620.00
108989888	Andrew Tate	\$2,990.00
108998967	Smith Daniel	\$2,880.00
109774332	Nguyen Tran Thanh	\$1,270.00
109867676	Michael Kenny	\$2,950.00

Query 3: Display the number of transactions used in each payment method (Bank transfer is the most common payment method)

Method Number	Method Name	Number of transactions: [Method Number]
PAYMENTMETHOD115	PAYMENTMETHOD115	PAYMENT1157
Group By	Group By	Count
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Query3		
Method Number	Method Name	Number of transacti
1	Bank Transfer	14
2	Cash	2
3	Credit Card	3
4	Debit Card	3
5	Checks	3
6	Mobile Wallet	3
7	PayPal	2
8	Cryptocurrency	5

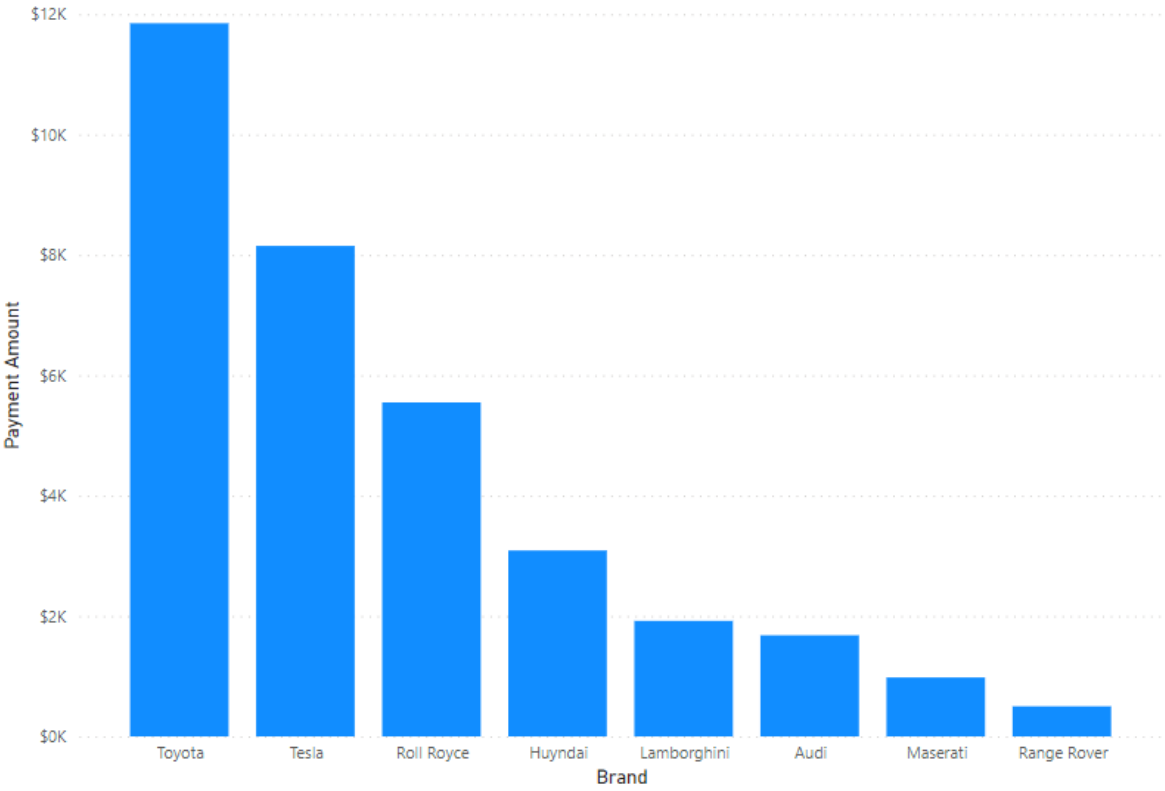
Query 4: Display all the total sum of payment (revenue) earned by each branch

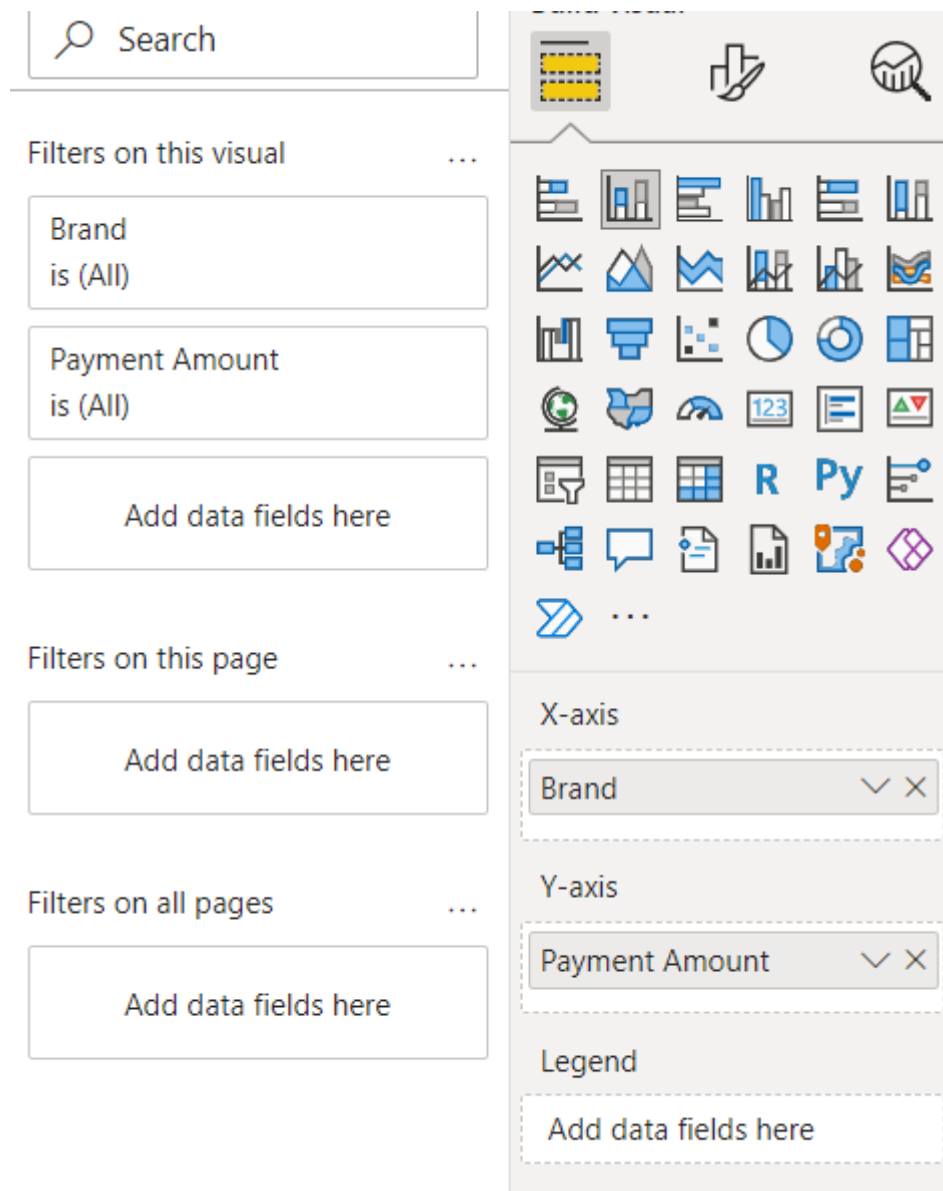
Branch ID	Branch Name	Location	Hotline	Payment Amount
BRANCH1157	BRANCH1157	BRANCH1157	BRANCH1157	PAYMENT1157
Group By	Group By	Group By	Group By	Sum
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Query4				
Branch ID	Branch Name	Location	Hotline	SumOfPayment Amount
B01	TANDT Power	Hawthorn	0411111111	\$5,320.00
B02	TANDT Victoria	Richmond	0422222222	\$5,650.00
B03	TANDT Watt	Sunshine	0433333333	\$2,170.00
B04	TANDT Elizabeth	Melbourne CBD	0444444444	\$10,610.00
B05	TANDT Station	Box Hill	0455555555	\$500.00
B06	TANDT Queen Bridge	Southbank	0466666666	\$560.00
B07	TANDT Packard	Keilor Down	0477777777	\$1,310.00
B08	TANDT Swan	Burnley	0488888888	\$1,230.00
B09	TANDT Harold	Camberwell	0499999999	\$6,370.00

Visualization 1: Display the number of sales made by each car brand (Toyota has the highest sales)

103181157 Total sales by car brand of TANDT





Visualization 2: Display the number of transactions made by each customer: (Display me, tutor and convenor)

### 103181157 Number of transactions of each customer

Customer ID	Customer Name	Number of transactions
101221212	Joe Biden	1
102121212	Nguyen Dang Khanh Toan	1
102123433	Ben Nathan	2
102233999	Ella Warren	2
102323678	Julia Gillard	2
103181157	Nguyen Nam Tung	2
103232323	Maria Theresa	1
103232332	Coco Channel	2
103234467	Robert Tipping	2
103236566	Harry Styles	1
103324367	Danh Kevin	1
105454556	Joshua Wright	4
108767344	Paul Darbyshire	1
108987878	Binh Mike	3
108989888	Andrew Tate	3
108998967	Smith Daniel	3
109774332	Nguyen Tran Thanh	2
109867676	Michael Kenny	2
Total		35





 Search

...

Branch Name  
is (All)

Count of CarCode  
is (All)

Add data fields here

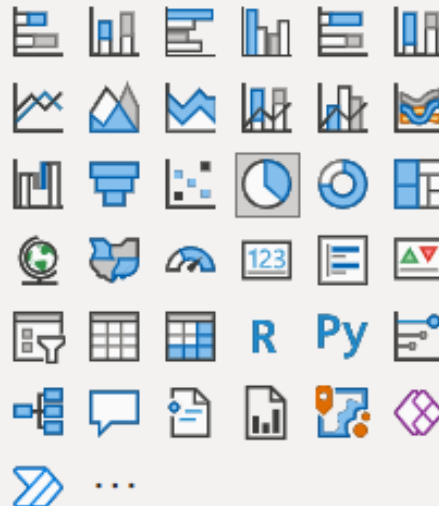
...

Add data fields here

...

Add data fields here

## Build visual



### Legend

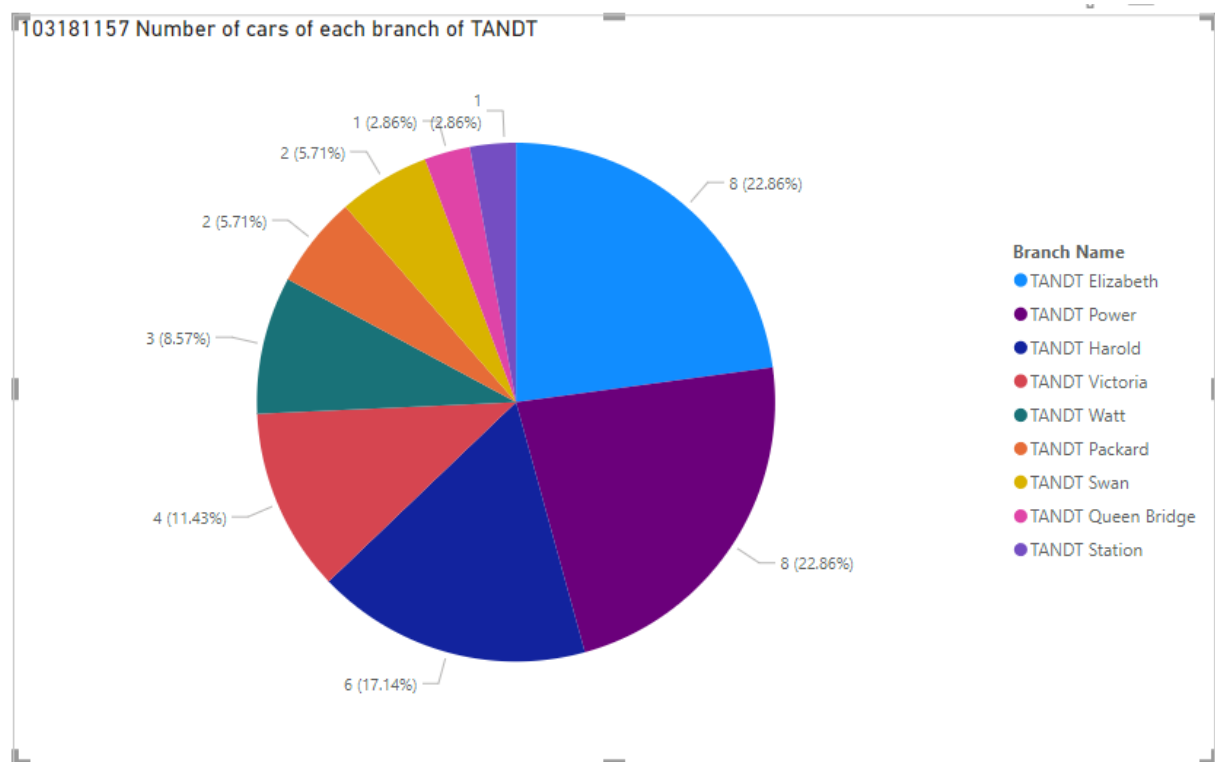
Branch Name

### Values


Count of CarCode  

### Details

Add data fields here






Visualization 4: Display the number of cars by brand in all branches of TANDT

 Search

Filters on this visual ...

Brand  
is (All)

Count of Car Code    
is (All) 

Add data fields here

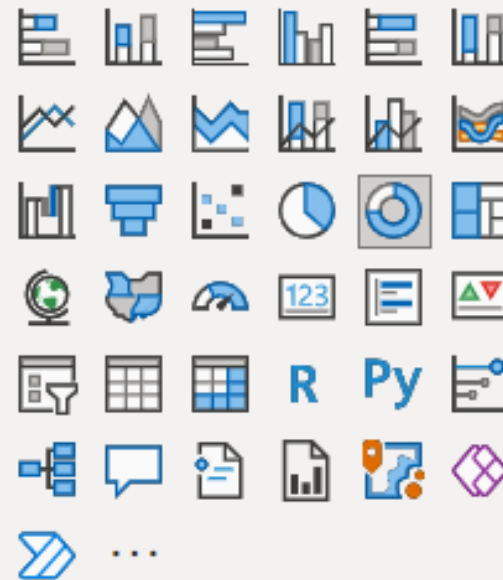
Filters on this page ...

Add data fields here



Filters on all pages ...

Add data fields here

Build visual



Legend

Brand  

Values

Count of Car Code  

103181157 Number of cars by brand in all branches of TANDT

