**Vehicle Recall Data of Various Car Manufacturers**

I have created this Project as my Individual Project for the Mid-Term of by Business Analytics Course and I have discussed the goals for this project below.

b**. Goal of the project – What do you want to learn from this data?**

* My Goal for this project is to retrieve the Recall Data of vehicles by using various queries below.
  + Getting the recall number, make name and model name of vehicles which affected and recalled in the year 2008.
  + Find a category with lowest number of recalls.
  + Find the details of vehicles which are from RV trailer category.
  + List all vehicles with updates having category for Minivan.
  + Retrieve the information about the vehicles recalls and their latest update and order it by recall date.
  + List the latest recall details for every vehicle present in the list with vehicle details and recall details.
  + Find the structure recalls in KINGS COUNTY
  + Get the details of the vehicles manufactured by HYUNDAI.
  + List the comments on each vehicle with its Make Name
  + List the brakes affected system and their notification with their recall number.

c**. Data source and how it was cleaned.**

* I took this Data from (opencanada.ca) having the
* URL - <https://open.canada.ca/data/en/dataset/1ec92326-47ef-4110-b7ca-959fab03f96d/resource/c7472dec-bef4-4924-837e-51b9333c2082> .
* Data Cleaning
  + I translated some text from French to English.
  + I had to create some columns as their where missing Primary Key to make the data usable for analysing purpose.
  + Here, I divided the data into four appropriate table and then normalized the tables by assigning Primary key and foreign key to the created tables.

1. **Relational schema/ERD – Draw the schema to help explain the primary, foreign and secondary keys within each table.**

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1. **SQL queries, output and insight as discussed in class**

Q1. Getting the recall number, make name and model name of vehicles which affected and were recalled in the year 2008.

* Select v."Recall\_Number",v."Make\_Name",v."Model\_Name"

From "Project Work"."Vehicle\_Details" v

Inner Join "Project Work"."Recall\_Details" r

ON v."Vehicle\_ID" =r. "Vehicle\_ID"

Where r."Year" = 2008;

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**Insights:** From the above query we have gathered the information of total 20 vehicles were recalled in the year 2008.

Q2. Find a category with lowest number of recalls.

🡪 Select v."Category"

From "Project Work"."Vehicle\_Details" v

Inner Join "Project Work"."Recall\_Details" r

ON v."Vehicle\_ID" = r."Vehicle\_ID"

Group by v."Category"

Order by Count(r."Recall\_Number")

Limit 1;

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**Insights:** In the above query**,** School bus is the least recalled category in the recalling data.

* Q3. Find the details of vehicles which are from RV trailer category.
* Select "Vehicle\_ID","Recall\_Number","Category","Make\_Name"

From "Project Work"."Vehicle\_Details"

where "Category" = 'RV Trailer';

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**Insights:** In the above query is it clear that there were total 21 RV trailer’s recalled.

Q4. List all vehicles with updates having category for Minivan.

* Select r."Recall\_Number",r."Year",r."Vehicle\_ID",r."Location" ,r."Recall\_Date"

From "Project Work"."Recall\_Details" r

Inner join "Project Work"."Vehicle\_Details" v

on v."Vehicle\_ID" = r."Vehicle\_ID"

Inner join "Project Work"."Updates" u

on r."Recall\_Number"= u."Recall\_Number"

where v."Category" = 'Minivan';

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**Insights:** In the above query we have gathered the information of Minivan’s recalled in several years in various locations.

Q5. Retrieve the information about the vehicles recalls and their latest update and order it by recall date.

* Select r."Recall\_Number",r."Vehicle\_ID" , r."Recall\_Date", u."Last\_Update" , u."Notification"

From "Project Work"."Recall\_Details" r

Left join "Project Work"."Updates" u

on r."Recall\_Number" = u."Recall\_Number"

Order by r."Recall\_Date"

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**Insights:** In the above query we have got the information about the latest updates on recall and the date of the same.

Q6. List the latest recall details for every vehicle present in the list with vehicle details and recall details.

* With CTE as

( select "Vehicle\_ID" , MAX("Recall\_Date") as Latest\_Recall\_Date

From "Project Work"."Recall\_Details"

Group by "Vehicle\_ID")

Select v."Make\_Name" , v."Model\_Name" , r."Recall\_Number", r."Recall\_Date"

From CTE ce

Inner join "Project Work"."Recall\_Details" r

ON ce."Vehicle\_ID" = r."Vehicle\_ID" and ce.Latest\_Recall\_Date = r."Recall\_Date"

Inner join "Project Work"."Vehicle\_Details" v

ON ce."Vehicle\_ID" = v."Vehicle\_ID";

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**Insights:** Here we have the total details about vehicle make and name with the recall number and date.

Q7. Find the structure recalls in KINGS COUNTY

* Select r."Recall\_Number" ,r."Year" , r."Vehicle\_ID" , r."Location" , r."Recall\_Date"

From "Project Work"."Recall\_Details" r

Inner join "Project Work"."System\_Affected" s

ON r."Vehicle\_ID" = s."Vehicle\_ID"

where s."System\_Type" = 'Structure' and r."Location" = 'KINGS COUNTY';

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**Insights:** We have gathered the information the vehicles having structure defects in the Kings county location.

Q8. Get the details of the vehicles manufactured by HYUNDAI.

* Select "Vehicle\_ID","Recall\_Number","Category","Make\_Name","Model\_Name"

From "Project Work"."Vehicle\_Details"

Where "Make\_Name" = 'HYUNDAI'

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**Insights:** In the above query there are total 39 Hyundai vehicles which were recalled.

Q9. List the comments on each vehicle with its Make\_Name.

* Select v."Vehicle\_ID", v."Make\_Name" , s."Comment"

From "Project Work"."Vehicle\_Details" v

Inner Join "Project Work"."System\_Affected" s

ON v."Vehicle\_ID" = s."Vehicle\_ID"

Where s."System\_Type" = 'Lights And Instruments';

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**Insights:** In the above table we have the comments for the vehicles with Lights and Instruments defect.

Q10. List the brakes affected system and their notification with their recall number.

* Select u."Recall\_Number" , s."System\_Type" , u."Notification"

From "Project Work"."Updates" u

Inner Join "Project Work"."Vehicle\_Details" v

ON u."Recall\_Number" = v."Recall\_Number"

Inner Join "Project Work"."System\_Affected" s

ON v."Vehicle\_ID" = s."Vehicle\_ID"

Where s."System\_Type" = 'Brakes'

Order by u."Recall\_Number"

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**Insights:** In the above query we have listed the brakes affected with the recall number and notification for the same.

**Below are the Table created queries**:

-- Table: Project Work.Vehicle\_Details

-- DROP TABLE IF EXISTS "Project Work"."Vehicle\_Details";

CREATE TABLE IF NOT EXISTS "Project Work"."Vehicle\_Details"

(

"Vehicle\_ID" bigint NOT NULL,

"Recall\_Number" bigint,

"Category" character varying(50) COLLATE pg\_catalog."default",

"Make\_Name" character varying(50) COLLATE pg\_catalog."default",

"Model\_Name" character varying(50) COLLATE pg\_catalog."default",

CONSTRAINT "Vehicle\_Details\_pkey" PRIMARY KEY ("Vehicle\_ID")

)

TABLESPACE pg\_default;

ALTER TABLE IF EXISTS "Project Work"."Vehicle\_Details"

OWNER to postgres;

-- Table: Project Work.Recall\_Details

-- DROP TABLE IF EXISTS "Project Work"."Recall\_Details";

CREATE TABLE IF NOT EXISTS "Project Work"."Recall\_Details"

(

"Recall\_Number" bigint NOT NULL,

"Year" bigint,

"Vehicle\_ID" bigint,

"Location" character varying(100) COLLATE pg\_catalog."default",

CONSTRAINT "Recall\_Details\_pkey" PRIMARY KEY ("Recall\_Number"),

CONSTRAINT "Vehicle\_ID" FOREIGN KEY ("Vehicle\_ID")

REFERENCES "Project Work"."Vehicle\_Details" ("Vehicle\_ID") MATCH SIMPLE

ON UPDATE NO ACTION

ON DELETE NO ACTION

)

TABLESPACE pg\_default;

ALTER TABLE IF EXISTS "Project Work"."Recall\_Details"

OWNER to postgres;

-- Table: Project Work.System\_Affected

-- DROP TABLE IF EXISTS "Project Work"."System\_Affected";

CREATE TABLE IF NOT EXISTS "Project Work"."System\_Affected"

(

"System\_ID" character varying(50) COLLATE pg\_catalog."default" NOT NULL,

"Vehicle\_ID" bigint,

"System\_Type" character varying(50) COLLATE pg\_catalog."default",

"Comment" character varying(500) COLLATE pg\_catalog."default",

CONSTRAINT "System\_Affected\_pkey" PRIMARY KEY ("System\_ID"),

CONSTRAINT "Vehicle\_ID" FOREIGN KEY ("Vehicle\_ID")

REFERENCES "Project Work"."Vehicle\_Details" ("Vehicle\_ID") MATCH SIMPLE

ON UPDATE NO ACTION

ON DELETE NO ACTION

)

TABLESPACE pg\_default;

ALTER TABLE IF EXISTS "Project Work"."System\_Affected"

OWNER to postgres;

-- Table: Project Work.Updates

-- DROP TABLE IF EXISTS "Project Work"."Updates";

CREATE TABLE IF NOT EXISTS "Project Work"."Updates"

(

"Update\_ID" bigint NOT NULL,

"Recall\_Number" bigint,

"Year" bigint,

"Last\_Update" date,

"Notification" character varying(100) COLLATE pg\_catalog."default",

CONSTRAINT "Updates\_pkey" PRIMARY KEY ("Update\_ID"),

CONSTRAINT "Recall\_Number" FOREIGN KEY ("Recall\_Number")

REFERENCES "Project Work"."Recall\_Details" ("Recall\_Number") MATCH SIMPLE

ON UPDATE NO ACTION

ON DELETE NO ACTION

)

TABLESPACE pg\_default;

ALTER TABLE IF EXISTS "Project Work"."Updates"

OWNER to postgres;

**Below are the 2 Create views for end users:**

Create view Vehicle\_Recall\_Details as

Select v."Vehicle\_ID" , v."Make\_Name", v."Model\_Name" , r."Recall\_Date"

From "Project Work"."Vehicle\_Details" v

Inner Join "Project Work"."Recall\_Details" r

ON v."Vehicle\_ID" = r."Vehicle\_ID";

Create view MakeN\_System\_Details as

Select v."Make\_Name" , s."System\_ID",s."Vehicle\_ID",s."System\_Type",s."Comment"

From "Project Work"."Vehicle\_Details" v

Inner Join "Project Work"."System\_Affected" s

ON v."Vehicle\_ID" = s."Vehicle\_ID"

**Conclusion Section:**

In this Project I have learned to filter data according to the various filter requirements where I used Filters, Joins, Sub-queries, CTEs, etc. constraints and also, I got the overall view of vehicles recall data.