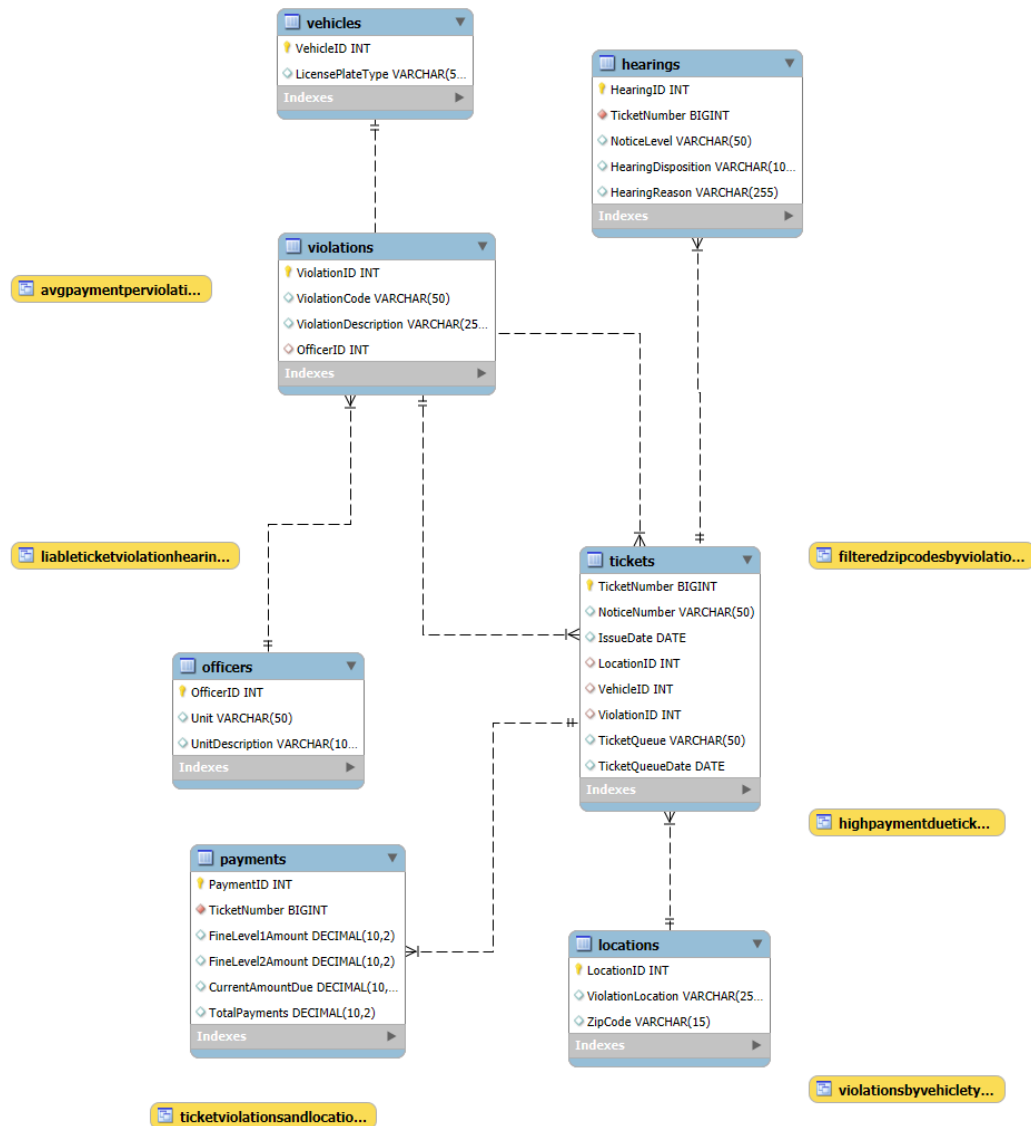# Chicago Traffic Citation Report

Introduction

Using the provided data set of Chicago traffic citations we have designed and created a database that can be easily interpretable for users and help showcase correlations within the data in order to find trends or valuable information such as finding average payments per violation, filtering zip codes to find the total amount of violations, sorting high payment due tickets, sorting liable ticket violation hearings and sorting the different types of ticket violations with their respective locations as shown.

In this database, we are using ticket numbers as our primary foundation. The numbers represent each unique traffic ticket violation that was issued to a driver from that particular case. There are a total of 1,992 tickets that include details in respect to the violations such as its location, violation description, dates, assigned officers, vehicle and payment information. Based on the given data, we have carefully constructed a database design that includes 7 entities that we think would help satisfy the needs of the user. Our tickets table is our main table that mostly links to other tables in the database. While working on our design, we decided to separate locations, payments, violations and hearings into its own designated tables. Then we decided to create an "officers" table which only links to violations.

Database Description

Logical Design

Above is the logical design of our database, and this was based on our dataset where we normalized it to the third form. This database represents the depictions of our final structure as it demonstrates the relationships between the tables, as well as the primary and foreign keys. The ERD was first created as a way to visualize where our data was supposed to be. Once the ERD was at a good place we forward engineered it by importing our dataset. Our original CSV was broken down into 7 separate tables and imported into their respective tables.
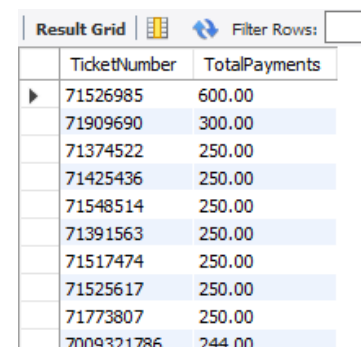
Physical Database

As for our physical design, our database demonstrates the functionality of the MySQL environment through the implementation of all the required tables, sample data as well as views. The table is structured in a manner where new data could be implemented and added to each of the tables without altering any other relationships.

In order to validate the dataset we backed up the database through the export feature in Workbench. This backup is within a single self-contained SQL file and ensures that the database structure, sample data, as well as views are stored in a portable format.
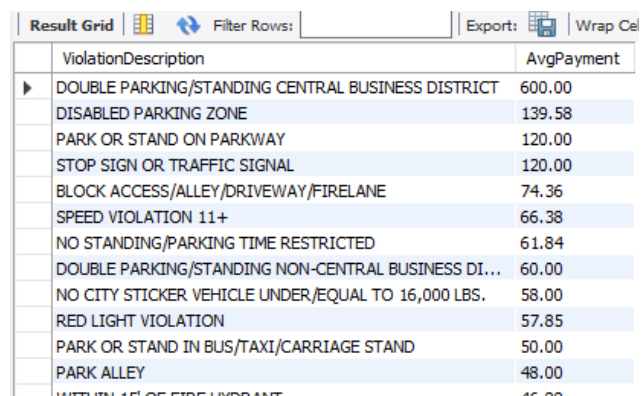
Sample Data

Our sample data consists of 1,992 rows of data and is based on Chicago Traffic Citations. The dataset consists of numerous tables detailing the systems in place in order to track traffic violations in a large city like Chicago. Each one of our tables consist of at least 15 records with them containing various types of data. Primary keys were created in our data in order to make certain aspects easier to track. For instance, in our data we created IDs for Violations which showed the violation code as well the violation description. This made it easier to track the types of violations in our dataset as well as which Officer/Units were responsible for what type of violation (Red Light, Speeding, Parking, etc.)

"HighPaymentDueTickets" is a view that returns tickets that had total payments that were more than the average in total payments made. This view displays both the ticket number as well as the total amount that was paid.

Result Grid		
	TicketNumber	TotalPayments
▶	71526985	600.00
	71909690	300.00
	71374522	250.00
	71425436	250.00
	71548514	250.00
	71391563	250.00
	71517474	250.00
	71525617	250.00
	71773807	250.00
	7009321786	244.00

This view is called "AvgPaymentPerViolation" and displays the violation description and the average payment made for that specific violation. This provides insight on which violations are generally more severe and result in bigger fines.

Result Grid	
ViolationDescription	AvgPayment
▶ DOUBLE PARKING/STANDING CENTRAL BUSINESS DISTRICT	600.00
DISABLED PARKING ZONE	139.58
PARK OR STAND ON PARKWAY	120.00
STOP SIGN OR TRAFFIC SIGNAL	120.00
BLOCK ACCESS/ALLEY/DRIVEWAY/FIRELANE	74.36
SPEED VIOLATION 11+	66.38
NO STANDING/PARKING TIME RESTRICTED	61.84
DOUBLE PARKING/STANDING NON-CENTRAL BUSINESS DI...	60.00
NO CITY STICKER VEHICLE UNDER/EQUAL TO 16,000 LBS.	58.00
RED LIGHT VIOLATION	57.85
PARK OR STAND IN BUS/TAXI/CARRIAGE STAND	50.00
PARK ALLEY	48.00
WITHIN 15' OF FIRE HYDRANT	46.88

"ViolationsByVehicleType" displays each violation for the said Vehicle type and also measures the number of tickets for said vehicle type and violation. This view provides information regarding which violations are more common for specific vehicle types.

ViolationDescription	LicensePlateType	TotalTickets
RED LIGHT VIOLATION	PAS	660
SPEED VIOLATION 11+	PAS	345
SPEED WARNING	PAS	285
EXPIRED PLATE OR TEMPORARY REGISTRATION	PAS	159
SPEED VIOLATION 6-10	PAS	91
NO STANDING/PARKING TIME RESTRICTED	PAS	73
WITHIN 15' OF FIRE HYDRANT	PAS	42
PARKING/STANDING PROHIBITED ANYTIME	PAS	40
RESIDENTIAL PERMIT PARKING	PAS	29
PARK ALLEY	PAS	24
EXPIRED PLATE OR TEMPORARY REGISTRATION	TMP	21
NO CITY STICKER VEHICLE UNDER/EQUAL TO 16,000 LBS.	PAS	20
MISSING/NONCOMPLIANT FRONT AND/OR REAR PLATE	PAS	17

To the right is a view called "FilteredZipCodesByViolations" and this displays which Zip Codes contained the most number of violations. This view works by counting the violations per Zip Code and only displays ZipCodes with more than 2 violations. This information could point towards specific Zip Codes that may be more policed, resulting in more violations.

ZipCode	TotalViolations
60623	24
60644	21
60629	21
60620	20
60649	20
60636	20
60651	18
60637	18
60617	18
60632	16

The view to the right is "TicketViolationsAndLocations" and it displays each Ticket Number as well as its violation description along with its location of said violation. This can be used as a general view without extra unrelated data.

TicketNumber	ViolationDescription	ViolationLocation
69006797	NO STANDING/PARKING TIME RESTRICTED	249 E PEARSON
69006798	NO CITY STICKER VEHICLE UNDER/EQUAL TO 1...	249 E PEARSON
69421397	EXPIRED PLATE OR TEMPORARY REGISTRATION	3800 W FILLMORE ST
70554319	EXPIRED PLATE OR TEMPORARY REGISTRATION	2100 W NORWOOD
70554321	MISSING/NONCOMPLIANT FRONT AND/OR REA...	6102 N SEELEY
70554322	MISSING/NONCOMPLIANT FRONT AND/OR REA...	6115 N SEELEY
70554323	EXPIRED PLATE OR TEMPORARY REGISTRATION	2010 W COLUMBIA
70554324	MISSING/NONCOMPLIANT FRONT AND/OR REA...	2040 W COLUMBIA
70705463	BLOCK ACCESS/ALLEY/DRIVEWAY/FIRELANE	10959 S NORMAL
70895177	WITHIN 15' OF FIRE HYDRANT	6428 N TROY
71354616	DISABLED PARKING ZONE	1821 N LUNA

"LiableViolationHearings" is a view that displays the ticket number and violations for those that were deemed Liable in their deposition. This view shows which violations the defendants were most likely to be held liable in court hearings.

TicketNumber	ViolationDescription	Disposition
71886213	NO STANDING/PARKING TIME RESTRICTED	Liable
7009321435	RED LIGHT VIOLATION	Liable
71793412	RESIDENTIAL PERMIT PARKING	Liable
7009321458	RED LIGHT VIOLATION	Liable
71793414	RESIDENTIAL PERMIT PARKING	Liable
7009321475	RED LIGHT VIOLATION	Liable
71909232	PARKING/STANDING PROHIBITED ANYTIME	Liable
7009322712	RED LIGHT VIOLATION	Liable
7009321421	RED LIGHT VIOLATION	Liable
71513204	PARKING/STANDING PROHIBITED ANYTIME	Liable
7009321480	RED LIGHT VIOLATION	Liable
7009321497	RED LIGHT VIOLATION	Liable
7009321752	RED LIGHT VIOLATION	Liable
7009321553	RED LIGHT VIOLATION	Liable

Potential Future Work

As for future work, opportunities with expanding the database with more recent data could enhance it. Adding additional tables or attributes could also expand the relationships within the database and allow for deeper insight. More information about the number of Officers dispatched to certain locations could allow for analysis into how heavily policed certain areas were and if that had an impact on the number of traffic violations. When combining this data with geographic and economic data we could infer why certain areas may be more susceptible to traffic violations. Information regarding why certain areas have more parking violations could suggest the need for improved parking infrastructure. These potential enhancements could make this database more efficient and useful in gathering a consensus regarding the City of Chicago. These concepts could also be applied to other areas using similar datasets.

References:

ProPublica. (n.d.). City of Chicago camera tickets and warnings data. ProPublica Data Store. https://www.propubli ca.org/datastore/dataset/city-of-chicago-camera-tickets-and-warnings-data