Low Level Design (LLD)

Crime Analysis

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Document Control

Date	Version	Description	Author
10/05/22	1.0	Introduction, Problem Statement	Taniya Nath
11/05/22	1.1	Dataset Information, Architecture Description	Taniya Nath
13/05/22	1.2	Final Revision	Taniya Nath

Contents

1. Introduction

1.1 What is Low-Level design document?

The goal of the LDD or Low-level design document (LLDD) is to give the internal logic design of the actual program code for the ***Crime Analysis*** dashboard. LDD describes the class diagrams with the methods and relations between classes and programs specs. It describes the modules so that the programmer can directly code the program from the document.

1.2 Scope

Low-level design (LLD) is a component-level design process that follows a step-by-step refinement process. The process can be used for designing data structures, required software architecture, source code and ultimately, performance algorithms. Overall, the data organization may be defined during requirement analysis and then refined during data design work.

1.3 Project Introduction

Crime analysis is a law enforcement duty that involves a systematic investigation of patterns and trends in crime and disorder. Pattern information can help law enforcement organizations deploy resources more effectively and aid detectives in locating and apprehending criminals. Crime analysis is also important in developing answers to crime problems and developing crime prevention methods.

2. Problem Statement

Crime incident reports are provided by Boston Police Department (BPD) to document the initial details surrounding an incident to which BPD officers respond. This is a dataset containing records from the new crime incident report system, which includes a reduced set of fields focused on capturing the type of incident as well as when and where it occurred.

3. Dataset Information

INCIDENT_NUMBER: The id of the crime committed. It is unique value for each crime.

OFFENSE_CODE: It shows code of crime types.

OFFENSE_CODE_GROUP: General crime types.

OFFENSE_DESCRIPTION: Detailed explanation of the crime.

DISTRICT: District name where the crime occurred.

REPORTING_AREA: Area number that crime reported.

YEAR: the year that crime occured. (2015,2016,2017,2018)

MONTH: the month that crime occured.

DAY OF WEEK: the week that crime occured.

HOUR: the hour that crime occured.

UCR_PART: Uniform Crime Reporting Offence types. Part 1 contains the most dangerous and important crimes.

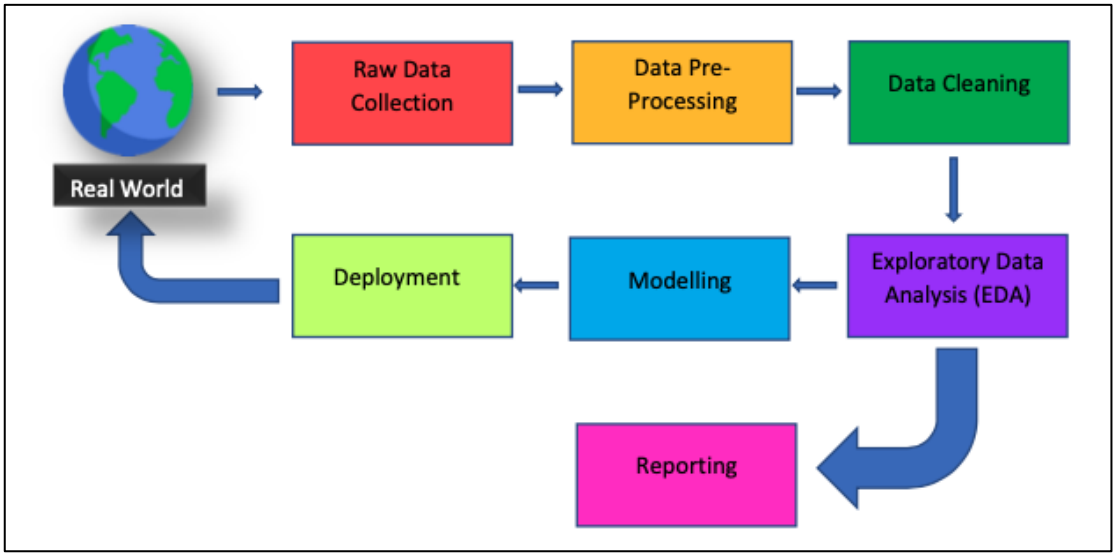
STREET: the street where crime occured.

LAT: the latitude where the crime occurred.

LONG: the longitude where the crime occurred.

LOCATION: the location where the crime occurred.(include latitude and longitude)

4. Architecture



4.1 Architecture Description

1. Raw Data Collection

The Dataset was taken from **iNeuron** provided Project Description Document.

https://data.boston.gov/dataset/crime-incident-reports-august-2015-to-date-source-new-system

2. DataPre-Processing

Before building any model, it is crucial to perform data pre-processing to feed the correct data to the model to learn and predict. Model performance depends on the quality of data feeded to the model to train.

This Process includes-

1. Handling Null/Missing Values
2. Handling Skewed Data
3. Outliers Detection and Removal

3. Data Cleaning

Data cleaning is the process of fixing or removing incorrect, corrupted, incorrectly formatted, duplicate, or incomplete data within a dataset.

1. Remove duplicate or irrelevant observations
2. Filter unwanted outliers
3. Renaming required attributes

4. Exploratory Data Analysis (EDA)

Exploratory Data Analysis refers to the critical process of performing initial investigations on data to discover patterns, spot anomalies, test hypothesis and to check assumptions with the help of summary statistics and graphical representations.

5. Reporting

Reporting is a most important and underrated skill of a data analytics field. Because being a Data Analyst you should be good in easy and self- explanatory report because your model will be used by many stakeholders who are not from technical background.

a) High Level Design Document (HLD)
b) Low Level Design Document (LLD)
c) Architecture
d) Wireframe
e) Detailed Project Report
f) Power Point Presentation

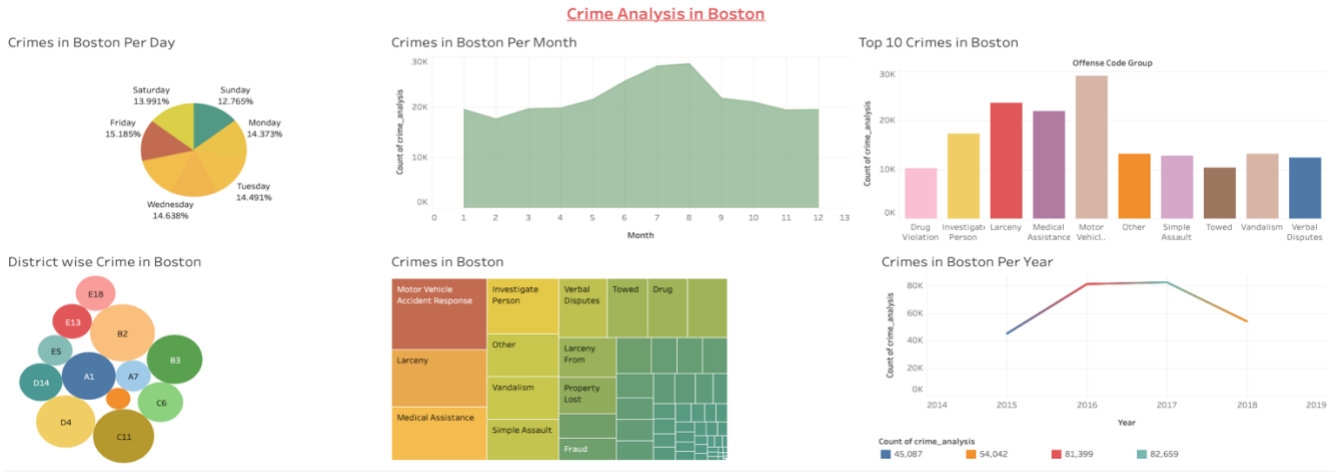
6. Modelling

Data Modelling is the process of analysing the data objects and their relationship to the other objects. It is used to analyse the data requirements that are required for the business processes. The data models are created for the data to be stored in a database. The Data Model's main focus is on what data is needed and how we have to organize data rather than what operations we have to perform.

7. Deployment

I created a Tableau Dashboard with the above dataset information for further analysis.

TableauURL:
https://public.tableau.com/app/profile/taniya.nath/viz/Crime_analysis_16523655240620/Dashboard1



5. Conclusion

This concludes the *Low Level Documentation* of the **Crime Analysis**.