

[NSW TRAFFIC PENALTY DATASET]

[Software Design Document]

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Table of Contents

[1.0 System Vision 3](#_Toc46748622)

[1.1 Problem Background 3](#_Toc46748623)

[1.2 System Overview 3](#_Toc46748624)

[1.3 Potential Benefits 3](#_Toc46748625)

[2.0 Requirements 4](#_Toc46748626)

[2.1 User Requirements 4](#_Toc46748627)

[2.2 Software Requirements 4](#_Toc46748628)

[2.3 Use Cases 4](#_Toc46748629)

[3.0 System Components and Software Design 5](#_Toc46748630)

[3.1 System Components 5](#_Toc46748631)

[3.2 Software Design 5](#_Toc46748632)

[4.0 User Interface Design 6](#_Toc46748633)

# System Vision

## Problem Background

A survey of NSW traffic penalty data from 2011 to 2017 shows a steep rise in penalty rates, while the average Australian has seen a steady increase in the percentage of people who own vehicles. This has led to the already high rate of traffic penalties in 2017, which may now be a problem that cannot be ignored. This project aims to analyse and sample all traffic penalty data from 2011 to 2017 based on statistical summaries. This data will be used as a template to create a traffic penalty search software that can be applied to the present.

## System Overview

The most basic requirement of this system is to complete the automatic recording of all traffic penalties for residents and to generate a relevant data-specific analysis for them automatically. The system is also designed to manage and categorise all uploaded data by section. A search function is added to make it easier for users to find the information they need (search by keyword or date).

## Potential Benefits

The ultimate benefits of this project should be divided into two phases. The first stage is to complete the basic requirements, like those already mentioned in the system overview of this project, to achieve the goal of being user-friendly for all users. At the same time, the other lies in the later development and improvement, with the efforts and collaboration of the developers who may or may not be able to design more user-friendly or more diverse functions according to this project. In any case, the aim of this project is to provide statistics on NSW traffic penalties from 2011 to 2017 and to reduce the chances of residents not receiving timely information about their violations in the future.

# Requirements

## User Requirements

Conclusions based on the group's research discussions. The primary target users of this program are likely to be all NSW vehicle owners for whom a violation is a possibility rather than an entirely avoidable event, such as going to a place they are unfamiliar with and having a different speed limit or another requirement that results in a violation, which can result in the person not knowing that they have violated the law and missing the best time to pay the fine. The best time to pay the fine is when you are unaware of the violation. This is, of course, only one of the possibilities discussed in this group and does not mean that all users will be in the same situation.

图示

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## Software Requirements

1. If the user enters a file name that does not exist, the program shall display an error message.

2. The program should check the user's input and only enter the appropriate value to process.

3. The program shall automatically advance the interval of the data in conjunction with the user's input.

4. The program shall draw a graph when the user demands for comparison data.

## Use Cases & Use Case Diagrams

It is divided into four sections: speeding queries, monitoring queries, Violation of regulations and provision of data analysis. All data is synchronised and uploaded to the relevant authorities.

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# Software Design and System Components

## Software Design

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## System Components

### Functions

1. **Select a period to report all penalty information.**

The main purpose of this function is to make it easier for users or government officials to understand the occurrence of accidents at a given time and to prepare statistical data.

**2. Generate a graphical analysis of the distribution of crime codes based on the times provided in the previous step.**  
This step is designed to help the user to visualise the type and number of crimes that have occurred in the selected time.

**3. Based on the previous step, radar and cameras are combined.**  
This step also specifies the type of data to be broken down, from the original data to a sample containing camera or radar data.

**4. Analysis of trends in the use of mobile phones leading to the occurrence of crimes.**  
Based on the previous steps, the software should be able to automatically generate statistics and graphs based on keyword searches.

**5. Summarise the statistics for all types of drink driving from 2011 to 2017.**  
This step should be done by completing the previous step and changing the period from the original selection to the full content of this data sampling to test the functionality of the software.

### Data Structures / Data Sources

Each keyword is entered directly into the text data.

For example, reading a document: the keywords are associated with the document data.

### Detailed Design

***Read the file***

def read\_file(path):

files\_list = os.listdir(path)

file\_path\_list = [os.path.join(path, img) for img in files\_list]

file\_path\_list.sort()

return file\_path\_list

def read\_file(path):

files\_list = os.listdir(path)

file\_path\_list = [os.path.join(path, img) for img in files\_list]

file\_path\_list.sort()

return file\_path\_list

***Charting***

file = open('text.txt') #open it

data = file.readlines()

para\_1 = [] #new list 1

para\_2 = [] #new list 2

for num in data:

para\_1.append(float(num.split(',')[0]))

para\_2.append(float(num.split(',')[1]))

plt.figure()

plt.title('text')

plt.plot(para\_1, para\_2)

plt.show()

# User Interface Design

The template design interface consists of.

* A theme tabs
* A detailed description of the information on the right-hand side
* A chart on the right side showing the customer's search needs
* On the left side there will be a selection of dates
* On the left side there is also an input box where you can directly enter information about the user and the crime code etc.

These are the template designs that we have produced after much discussion in our group and are more suitable for this project.

## Structural Design

The specific layout of the interface will be shown and described in detail in the next step, following joint discussions in this group. The initial idea for the development of this software is to provide an easier way to serve the user to check the time and place of traffic accidents. As the data used is from 2011 to 2017, the current stage is to test and refine the basic functions of the software, i.e., accident search, graph generation and keyword search.

## Visual Design

The following diagram shows the interface of the software, which includes three parts, title, search box and information box. The user needs to enter a specific offence code, date and type of traffic penalty ticket, and then click the search button, the information box on the right will display all the information of the traffic penalty. The purpose of this design is to allow users to use the keyword function to search for specific information, saving users time and improving their experience.

