Software Design Document

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Assignment Groups 130

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# System Vision

## Problem Background

The dataset we have chosen is the Victorian state accident dataset. There are far too many accidents on our roads and we feel the need to develop an application which will let data scientists, lawmakers and other researchers interface with the aforementioned dataset. The dataset lists all fatal and injury accidents in Victoria from 2015 to 2020, as well as displaying various other factors such as time, locations, the involvement of alcohol and more.

## System Overview

The features we intend to fit into our application include:

* The ability for the user to enter a period and have the application show all of the accidents from the dataset in between the specific period
* The ability for the user to enter a period and have the application produce a chart that shows the number of average accidents per hour of the day.
* The ability for the user to enter a period and a keyword and have the program show all of the accidents from the dataset involving the aforementioned keyword.
* The ability for the user to view the impacts that alcohol has had on the data
* The ability for the user to enter a period and a specific day of the week and have the program show all of the accidents taking place on the specific day of the week.

## Potential Benefits

Our software will give the ability to lawmakers and researchers to closely examine the trends that occur with road traffic accidents and will empower them to plan accordingly.

# Requirements

## User Requirements

In this section you detail how a user is supposed to interact with or use your program. What do they ***need*** to be able to do? This should all be from the end users perspective. Can be a combination of narrative text and listing of needs.

**Assignment note: You have not been given a client/user, so you can make one up. Who do you think would be using your software?**

## Software Requirements

In this section you detail what the requirements for the software are. What functionality will it provide? This is usually a formal listing, with requirements often using the word ‘Shall’. IE:

R1.1 The program shall accept multiple file names as arguments from the command line.

R1.2 Each file name can be a simple file name or include the full path of the file with one or more levels.

etc …

Can be primarily functional requirements, though you may include other types if you think of them.

## Use Cases & Use Case Diagrams

In this section you provide some use cases showing how people may use your software.

# Software Design and System Components

## Software Design

A block diagram/flowchart of how your software might work

## System Components

### Functions

Preliminary list of all functions in the software. For each function in the list the following information is provided:

* a brief description of what it does (1 or 2 sentences);
* a list of the input parameters, and their data types, and what they are used for;
* a list of any side effects caused by the function (ie change global or member variables, changes data passed by reference from calling function etc)
* a description of the function’s return value

### Data Structures / Data Sources

List of all data structures in the software (eg linked lists, trees, arrays etc) or eternal data sources. For each data structure in the list the following information is provided:

* Type of structure (tree, list etc),
* Description of where and how it is used
* List of data members, and what each one is for do
* List of functions that use it

### Detailed Design

Pseudocode for all non-standard / non-trivial algorithms that operate on data structures

# User Interface Design

This is your initial interface design. Describe the tools you used for this design stage and any key findings that informed your design. This introduction is descriptive and should explain what you have completed for the actual design work you will present in the sub-sections below.

## Structural Design

Structural design refers to the navigational and information structure of your product – the structure that supports the interface layout. How will you structure your product? How will you group your information? How will you navigate through your product? Why? This can take the form of a diagram showing structure and hierarchy, supported by a discussion and justification of your choices. Why have you made these design choices? Describe and outline the structure of your interface and of your information.

## Visual Design

Detail your visual design: Layout, visual elements, icons, graphics, style, colour, fonts general screen designs. This can be sketches, wireframes, mockups etc, supported by a discussion, explanation, and justification of your choices.