Section C – Australian road fatalities (10 marks)

Over the last 50 years Australia has implemented a variety of successful interventions for reducing the number of fatalities and serious injuries on our roads including: seatbelts, licensing schemes, and targeted campaigns against drink driving and speeding. Along with safer vehicles and improved roads, these interventions have been shown to be effective[1] in reducing road fatalities over time despite our growing population.

National data on fatal crashes on Australian roads are recorded in the Australian Road Deaths Database (ARDD) maintained by the Bureau of Infrastructure and Transport Research Economics (BITRE).

In this question you will investigate data on fatal crashes from January 1989 to October 2020. The files provided are:

A2C road crashes.csv
This dataset contains details on the timing, location, and setting of crashes involving at least one fatality

A2C road fatalities.csv
This dataset contains basic demographic information on people killed on roads

A2C ARDD data dictionary.pdf
This is a data dictionary for the variables in the road crashes and fatalities datasets

A2C ABS population data.xls
Quarterly population data for Australian states from June 1981 to March 2020 from the Australian Bureau of Statistics

Question 1

Merge the crashes and fatalities datasets. Describe the relationship between these datasets and what checks you need to make to ensure the merge performs correctly. **[3 marks]**

Question 2

Complete the following table with appropriate counts and percentages. Are there any associations between gender and crash factors such as location, timing, type, or vehicle involvement?

Note: percentages should be correct to whole percentages if >=10%, or correct to 1 decimal point if <10%. **[3 marks]**

[1] https://www.roadsafety.gov.au/rsa

		Number of crashes		Number of fatalities			
		Total (n=)	**Percent ***	**Total (n=)**	**Females (n=)**	**Males (n=)**	**% Male**
Crash type	Multiple						
	Single						
Bus involved	No						
	Yes						
Heavy rigid truck involved	No						
	Yes						
Articulated truck involved	No						
	Yes						
Time of day	Day						
	Night						
Time of week	Weekday						
	Weekend						

*percentages that don't add up to 100% are due to missing/unknown data.

Question 3

Using the provided ABS time series data for the state populations, compare the number of fatalities and fatality rates per capita (deaths per 100,000 persons) by state over time.

Are Australian State roads becoming safer according to these statistics? Include appropriate graphs to support your answer.

HINT: for the ABS population dataset you can delete unnecessary rows or columns in Excel before reading it into SAS.

[4 marks]