Table of Contents

[Introduction: - 1](#_Toc80914261)

[Numerical and Graphical summaries of the files: - 1](#_Toc80914262)

[Maximal temperature as per decades: - 2](#_Toc80914263)

[Extremely hot VS Extremely cold days: - 3](#_Toc80914264)

[Brief Statement: - 3](#_Toc80914265)

[Correlation analysis of Cold days VS Hot days: - 4](#_Toc80914266)

[Linear regression analysis of Hot days VS Cold days: - 5](#_Toc80914267)

[Rainfall Data: - 6](#_Toc80914268)

[Conclusion: - 7](#_Toc80914269)

# Introduction: -

These data files represent the temperature and rainfall around the Adelaide airport. In all the files, the variable name Bureau of Meteorology station number represents the ID number given by Australian Bureau of Meteorology to Adelaide airport, Year represents the year in which the data has been recorded and Month and day variables shows the month and date respectively, in which this data has been recorded.

The variable Maximum temperature in file IDCJAC0010\_023034\_1800.csv shows the maximum temperature recorded for a day in degree Celsius whereas minimum temperature variable in file name IDCJAC0011\_023034\_1800.csv shows the minimum temperature recorded in that day. In file IDCJAC0009\_023034\_1800.csv, a column called rainfall amount which represents the record of rain fall around Adelaide airport in that day in millimetres.

# Numerical and Graphical summaries of the files: -

The graphical visualisation is following: -

A picture containing text, measuring stick

Description automatically generated

Figure1 GRAPHS of minimum, maximum temperature and rainfall

As per the figure 1, December to February has been recorded the hottest months whereas June to August has been recorded the coldest months. The minimum temperature in the Maximum time data set was recorded in 1955 and 1998 which was 9.8 degree Celsius.

Whereas minimum temperature in the minimum temperature data set was recorded in 1982 which was -2.6. Interestingly, the maximum rain was recorded in 1969 which was 85.6 millimetres.

Additionally, measure of centrality for the minimum temperature data would be mean and standard deviation would be the measure of dispersion. However, median would be measure of centrality for maximum temperature and rainfall data as the data has spread widely and interquartile range would be the measure of dispersion for both the data.

Lastly, the diagrams clearly indicate that January is the hottest month around the airport, June is the coldest and February is month of most rain. All the three graphs have the outliners.

# Maximal temperature as per decades: -

The point graph of recorded maximum temperature as per decades is following: -

Chart, line chart

Description automatically generated

Figure 2 Maximum temperature as per decades

As per the figure 2, point graph all over the decades temperature pretty much stayed same but it is slowly moving towards the hotness as since last two decades highest temperature did not come below 10 degrees Celsius. Moreover, last decade was recorded as the hottest among all the decades, because the lowest temperature was recorded around 10 degrees in June but it reached around 45 degree Celsius in January.

# Extremely hot VS Extremely cold days: -

## Brief Statement: -

The graphical summary for extremely hot and cold days is following: -

Chart, scatter chart

Description automatically generated

Figure 3 Cold days VS Hot days from 1955 to 2021

As per the graph above there is no relationship at all between extremely hot days in a year and cold days in that year. Interestingly, there are more cold days then hot days around the Adelaide airport. For instance, if there are 3 extremely hot days in 1956 then there are 20 days, in the same year, when temperature was below 5 degrees Celsius.

Moreover, it is interesting fact that cold day’s numbers were decreased from 1990 to 2000 and there was incline in hot days during that time. Additionally, there are very blue dots are towards cold days, which represents the early days, it means slowly temperature is moving towards hotness around Adelaide airport in recent decades.

## Correlation analysis of Cold days VS Hot days: -

The graphical summary for correlation is following: -

Chart

Description automatically generated

Figure 4 correlation graph for Hot days VS Cold days

It has been clearly seen in the graph that there is no correlation between hot and cold days in a year. The correlation between them is -0.24, which represents as a no relation between them. It means, if any year having more extremely hot days, same year would have same amount of extremely cold days.

## Linear regression analysis of Hot days VS Cold days: -

The point graph for cold days is following: -

Chart, line chart

Description automatically generated

Figure 5 Cold days graph since 1955

The correlation between cold days and year is -0.24, the slops is -0.11. It means that the cold numbers are getting reduced slowly every year. It is not declining rapidly, but gradually, number of cold days are reducing in coming years with the same trend.

As per graph even the line has big curve towards down during 1980 to 1990 but it is stable since 2000. The R – squared for the data is 0.058. it means this data represents only 6 percent of all the information in the data.

The graph for hot days is following: -

Chart, line chart

Description automatically generated

Figure 6 Hot days graph since 1995

The relationship between years and hot days is very weak. The correlation between both is 0.44 and slop is just 0.13. It means every 1000 years there would be a 0.13 degrees Celsius increase in the temperature. Even as per graph, there were only few very hot days in early decades, but it is increasing gradually every year. In the year 2019 there were 26 days which were extremely hot which are 102% more than 1979, but last year there were only 11 days extremely hot, which are equal to the 1979. Therefore, temperature around the Adelaide airport is fluctuating a lot, but slightly, it is moving towards heat, in the future years, with the same trend.

# Rainfall Data: -

Point plot of rainfall data is following: -

Chart, scatter chart

Description automatically generated

Figure 7 Rainfall graph from 1955 to 2021

The measure of centrality for rainfall data would be median and interquartile range would be measure of dispersion. The correlation between year and rain is 0.01 and slop is -0.0. It means there is hardly any effect over the years on the rain around Adelaide airport, even in graph, during 1970s there were heavy rains but in 2000s the heavy rain has reduced, however the number of days for the rain did not have much impact. In the future the number of rainy days would stay the same, but the amount of the rain would be reduced slightly.

# Conclusion: -

As per analysing the data above, temperature is moving towards warmness as the cold days are reducing year by year and warm days are increasing gradually. Moreover, the heavy rainy days has been on fall over compared to early decades around the Adelaide airport. These things are happing because of the climate changing, as human beings are dependent on fossil fuel for daily necessity such as cars and electricity. Therefore, to stop the climate changes, humans need to stop the fossil fuel or use of plastic and start using the renewable energy source.