


```
import pandas as pd
import numpy as np
import statistics

from google.colab import drive
drive.mount("/content/gdrive")

Drive already mounted at /content/gdrive; to attempt to forcibly remount, call drive.mount("/content/gdrive", force_remount=True).
```

```
aus_weather = pd.read_csv('/content/gdrive/My Drive/datasets/weatherAUS.csv',encoding= 'unicode_escape')
```

```
aus_weather.head()
```



	Date	Location	MinTemp	MaxTemp	Rainfall	Evaporation	Sunshine	WindGustDir	WindGustSpeed	WindDir9am	WindDir3pm	WindSpeed9am	WindSpeed3pm	Humidity9am	Humidity3pm	Pressure9am	Pressure3pm	Cloud9am	Cloud3pm	Temp9am	Temp3pm	RainToday	RISK_MM	RainTomorrow
0	2008-12-01	Albury	13.4	22.9	0.6	NaN	NaN	W	44.0	W	WNW	20.0	24.0	71.0	22.0	1007.7	1007.1	8.0	NaN	16.9	21.8	No	0.0	No
1	2008-12-02	Albury	7.4	25.1	0.0	NaN	NaN	WNW	44.0	NNW	WSW	4.0	22.0	44.0	25.0	1010.6	1007.8	NaN	NaN	17.2	24.3	No	0.0	No
2	2008-12-03	Albury	12.9	25.7	0.0	NaN	NaN	WSW	46.0	W	WSW	19.0	26.0	38.0	30.0	1007.6	1008.7	NaN	2.0	21.0	23.2	No	0.0	No
3	2008-12-04	Albury	9.2	28.0	0.0	NaN	NaN	NE	24.0	SE	E	11.0	9.0	45.0	16.0	1017.6	1012.8	NaN	NaN	18.1	26.5	No	1.0	No
4	2008-12-05	Albury	17.5	32.3	1.0	NaN	NaN	W	41.0	ENE	NW	7.0	20.0	82.0	33.0	1010.8	1006.0	7.0	8.0	17.8	29.7	No	0.2	No

```
aus_weather.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 142193 entries, 0 to 142192
Data columns (total 24 columns):
#   Column              Non-Null Count  Dtype
---  -
0   Date                142193 non-null object
1   Location            142193 non-null object
2   MinTemp             141556 non-null float64
3   MaxTemp             141871 non-null float64
4   Rainfall            140787 non-null float64
5   Evaporation         81350 non-null float64
6   Sunshine            74377 non-null float64
7   WindGustDir         132863 non-null object
8   WindGustSpeed       132923 non-null float64
9   WindDir9am          132180 non-null object
10  WindDir3pm          138415 non-null object
11  WindSpeed9am        140845 non-null float64
12  WindSpeed3pm        139563 non-null float64
13  Humidity9am         140419 non-null float64
14  Humidity3pm         138583 non-null float64
15  Pressure9am         128179 non-null float64
16  Pressure3pm         128212 non-null float64
17  Cloud9am            88536 non-null float64
18  Cloud3pm            85099 non-null float64
19  Temp9am             141289 non-null float64
20  Temp3pm             139467 non-null float64
21  RainToday           140787 non-null object
22  RISK_MM             142193 non-null float64
23  RainTomorrow        142193 non-null object
dtypes: float64(17), object(7)
memory usage: 26.0+ MB
```

```
aus_weather.isnull().sum()
```

```
Date                0
Location            0
MinTemp             637
MaxTemp             322
Rainfall            1406
Evaporation         60843
Sunshine            67816
WindGustDir         9330
WindGustSpeed       9270
WindDir9am          10013
WindDir3pm          3778
WindSpeed9am        1348
WindSpeed3pm        2630
Humidity9am         1774
Humidity3pm         3610
Pressure9am         14014
Pressure3pm         13981
Cloud9am            53657
Cloud3pm            57094
Temp9am             904
Temp3pm             2726
RainToday           1406
RISK_MM             0
RainTomorrow        0
dtype: int64
```

```
aus_weather = aus_weather.replace(np.NaN , 0.0)
```

```
aus_weather.isnull().sum()
```

```
Date                0
Location            0
```

```
MinTemp      0
MaxTemp      0
Rainfall     0
Evaporation  0
Sunshine     0
WindGustDir  0
WindGustSpeed 0
WindDir9am   0
WindDir3pm   0
WindSpeed9am 0
WindSpeed3pm 0
Humidity9am  0
Humidity3pm  0
Pressure9am  0
Pressure3pm  0
Cloud9am     0
Cloud3pm     0
Temp9am      0
Temp3pm      0
RainToday    0
RISK_MM      0
RainTomorrow 0
dtype: int64
```

aus_weather.head()

	Date	Location	MinTemp	MaxTemp	Rainfall	Evaporation	Sunshine	WindGustDir	WindGustSpeed	WindDir9am	WindDir3pm	WindSpeed9am	WindSpeed3pm	Humidity9am	Humidity3pm	Pressure9am	Pressure3pm	Cloud9am	Cloud3pm	Temp9am	Temp3pm	RainToday	RISK_MM	RainTomorrow
0	2008-12-01	Albury	13.4	22.9	0.6	0.0	0.0	W	44.0	W	WNW	20.0	24.0	71.0	22.0	1007.7	1007.1	8.0	0.0	16.9	21.8	No	0.0	No
1	2008-12-02	Albury	7.4	25.1	0.0	0.0	0.0	WNW	44.0	NNW	WSW	4.0	22.0	44.0	25.0	1010.6	1007.8	0.0	0.0	17.2	24.3	No	0.0	No
2	2008-12-03	Albury	12.9	25.7	0.0	0.0	0.0	WSW	46.0	W	WSW	19.0	26.0	38.0	30.0	1007.6	1008.7	0.0	2.0	21.0	23.2	No	0.0	No
3	2008-12-04	Albury	9.2	28.0	0.0	0.0	0.0	NE	24.0	SE	E	11.0	9.0	45.0	16.0	1017.6	1012.8	0.0	0.0	18.1	26.5	No	1.0	No
4	2008-12-05	Albury	17.5	32.3	1.0	0.0	0.0	W	41.0	ENE	NW	7.0	20.0	82.0	33.0	1010.8	1006.0	7.0	8.0	17.8	29.7	No	0.2	No

aus_weather['RainToday'].replace({'No': 0 , 'Yes': 1}, inplace=True)

aus_weather['RainTomorrow'].replace({'No': 0 , 'Yes': 1}, inplace=True)

aus_weather.head()

	Date	Location	MinTemp	MaxTemp	Rainfall	Evaporation	Sunshine	WindGustDir	WindGustSpeed	WindDir9am	WindDir3pm	WindSpeed9am	WindSpeed3pm	Humidity9am	Humidity3pm	Pressure9am	Pressure3pm	Cloud9am	Cloud3pm	Temp9am	Temp3pm	RainToday	RISK_MM	RainTomorrow
0	2008-12-01	Albury	13.4	22.9	0.6	0.0	0.0	W	44.0	W	WNW	20.0	24.0	71.0	22.0	1007.7	1007.1	8.0	0.0	16.9	21.8	0.0	0.0	0
1	2008-12-02	Albury	7.4	25.1	0.0	0.0	0.0	WNW	44.0	NNW	WSW	4.0	22.0	44.0	25.0	1010.6	1007.8	0.0	0.0	17.2	24.3	0.0	0.0	0
2	2008-12-03	Albury	12.9	25.7	0.0	0.0	0.0	WSW	46.0	W	WSW	19.0	26.0	38.0	30.0	1007.6	1008.7	0.0	2.0	21.0	23.2	0.0	0.0	0
3	2008-12-04	Albury	9.2	28.0	0.0	0.0	0.0	NE	24.0	SE	E	11.0	9.0	45.0	16.0	1017.6	1012.8	0.0	0.0	18.1	26.5	0.0	1.0	0
4	2008-12-05	Albury	17.5	32.3	1.0	0.0	0.0	W	41.0	ENE	NW	7.0	20.0	82.0	33.0	1010.8	1006.0	7.0	8.0	17.8	29.7	0.0	0.2	0

aus_weather.tail()

	Date	Location	MinTemp	MaxTemp	Rainfall	Evaporation	Sunshine	WindGustDir	WindGustSpeed	WindDir9am	WindDir3pm	WindSpeed9am	WindSpeed3pm	Humidity9am	Humidity3pm	Pressure9am	Pressure3pm	Cloud9am	Cloud3pm	Temp9am	Temp3pm	RainToday	RISK_MM	RainTomorrow
142188	2017-06-20	Uluru	3.5	21.8	0.0	0.0	0.0	E	31.0	ESE	E	15.0	13.0	59.0	27.0	1024.7	1021.2	0.0	0.0	9.4	20.9	0.0	0.0	0
142189	2017-06-21	Uluru	2.8	23.4	0.0	0.0	0.0	E	31.0	SE	ENE	13.0	11.0	51.0	24.0	1024.6	1020.3	0.0	0.0	10.1	22.4	0.0	0.0	0
142190	2017-06-22	Uluru	3.6	25.3	0.0	0.0	0.0	NNW	22.0	SE	N	13.0	9.0	56.0	21.0	1023.5	1019.1	0.0	0.0	10.9	24.5	0.0	0.0	0
142191	2017-06-23	Uluru	5.4	26.9	0.0	0.0	0.0	N	37.0	SE	WNW	9.0	9.0	53.0	24.0	1021.0	1016.8	0.0	0.0	12.5	26.1	0.0	0.0	0
142192	2017-06-24	Uluru	7.8	27.0	0.0	0.0	0.0	SE	28.0	SSE	N	13.0	7.0	51.0	24.0	1019.4	1016.5	3.0	2.0	15.1	26.0	0.0	0.0	0

```
aus_weather["WindGustDir"] = aus_weather["WindGustDir"].astype('category')
aus_weather["WindGustDirCat"] = aus_weather["WindGustDir"].cat.codes
aus_weather["WindDir9am"] = aus_weather["WindDir9am"].astype('category')
aus_weather["WindDir9amCat"] = aus_weather["WindDir9am"].cat.codes
aus_weather["WindDir3pm"] = aus_weather["WindDir3pm"].astype('category')
aus_weather["WindDir3pmCat"] = aus_weather["WindDir3pm"].cat.codes
aus_weather
```

	Date	Location	MinTemp	MaxTemp	RainFall	Evaporation	Sunshine	WindGustDir	WindGustSpeed	WindDir9am	WindDir3pm	WindSpeed9am	WindSpeed3pm	Humidity9am	Humidity3pm	Pressure9am	Pressure3pm	Cloud9am	Cloud3pm	Temp9am	Temp3pm	RainToday	RISK_MM	RainTomorrow	WindGustDirCat	WindDir9amCat	WindDir3pmCat	
	0	2008-12-01	Albury	13.4	22.9	0.6	0.0	0.0	W	44.0	W	WNW	20.0	24.0	71.0	22.0	1007.7	1007.1	8.0	0.0	16.9	21.8	0.0	0.0	0	14	14	15
	1	2008-12-02	Albury	7.4	25.1	0.0	0.0	0.0	WNW	44.0	NNW	WSW	4.0	22.0	44.0	25.0	1010.6	1007.8	0.0	0.0	17.2	24.3	0.0	0.0	0	15	7	16
	2	2008-12-03	Albury	12.9	25.7	0.0	0.0	0.0	WSW	46.0	W	WSW	19.0	26.0	38.0	30.0	1007.6	1008.7	0.0	2.0	21.0	23.2	0.0	0.0	0	16	14	16
	3	2008-12-04	Albury	9.2	28.0	0.0	0.0	0.0	NE	24.0	SE	E	11.0	9.0	45.0	16.0	1017.6	1012.8	0.0	0.0	18.1	26.5	0.0	1.0	0	5	10	1
	4	2008-12-05	Albury	17.5	32.3	1.0	0.0	0.0	W	41.0	ENE	NW	7.0	20.0	82.0	33.0	1010.8	1006.0	7.0	8.0	17.8	29.7	0.0	0.2	0	14	2	8
	
	142188	2017-06-20	Uluru	3.5	21.8	0.0	0.0	0.0	E	31.0	ESE	E	15.0	13.0	59.0	27.0	1024.7	1021.2	0.0	0.0	9.4	20.9	0.0	0.0	0	1	3	1
	142189	2017-06-21	Uluru	2.8	23.4	0.0	0.0	0.0	E	31.0	SE	ENE	13.0	11.0	51.0	24.0	1024.6	1020.3	0.0	0.0	10.1	22.4	0.0	0.0	0	1	10	2
	142190	2017-06-22	Uluru	3.6	25.3	0.0	0.0	0.0	NNW	22.0	SE	N	13.0	9.0	56.0	21.0	1023.5	1019.1	0.0	0.0	10.9	24.5	0.0	0.0	0	7	10	4
	142191	2017-06-23	Uluru	5.4	26.9	0.0	0.0	0.0	N	37.0	SE	WNW	9.0	9.0	53.0	24.0	1021.0	1016.8	0.0	0.0	12.5	26.1	0.0	0.0	0	4	10	15
aus_weather = aus_weather.drop(columns=['WindGustDir','WindDir9am','WindDir3pm'])																												
	142192	2017-06-24	Uluru	7.8	27.0	0.0	0.0	0.0	SE	28.0	SSE	N	13.0	7.0	51.0	24.0	1019.4	1016.5	3.0	2.0	15.1	26.0	0.0	0.0	0	10	11	4
aus_weather																												

	Date	Location	MinTemp	MaxTemp	Rainfall	Evaporation	Sunshine	WindGustSpeed	WindSpeed9am	WindSpeed3pm	Humidity9am	Humidity3pm	Pressure9am	Pressure3pm	Cloud9am	Cloud3pm	Temp9am	Temp3pm	RainToday	RISK_MM	RainTomorrow	WindGustDirCat	WindDir9amCat	WindDir3pmCat
0	2008-12-01	Albury	13.4	22.9	0.6	0.0	0.0	44.0	20.0	24.0	71.0	22.0	1007.7	1007.1	8.0	0.0	16.9	21.8	0.0	0.0	0	14	14	15
1	2008-12-02	Albury	7.4	25.1	0.0	0.0	0.0	44.0	4.0	22.0	44.0	25.0	1010.6	1007.8	0.0	0.0	17.2	24.3	0.0	0.0	0	15	7	16
2	2008-12-03	Albury	12.9	25.7	0.0	0.0	0.0	46.0	19.0	26.0	38.0	30.0	1007.6	1008.7	0.0	2.0	21.0	23.2	0.0	0.0	0	16	14	16
3	2008-12-04	Albury	9.2	28.0	0.0	0.0	0.0	24.0	11.0	9.0	45.0	16.0	1017.6	1012.8	0.0	0.0	18.1	26.5	0.0	1.0	0	5	10	1
4	2008-12-05	Albury	17.5	32.3	1.0	0.0	0.0	41.0	7.0	20.0	82.0	33.0	1010.8	1006.0	7.0	8.0	17.8	29.7	0.0	0.2	0	14	2	8
...
142188	2017-06-20	Uluru	3.5	21.8	0.0	0.0	0.0	31.0	15.0	13.0	59.0	27.0	1024.7	1021.2	0.0	0.0	9.4	20.9	0.0	0.0	0	1	3	1
142189	2017-06-21	Uluru	2.8	23.4	0.0	0.0	0.0	31.0	13.0	11.0	51.0	24.0	1024.6	1020.3	0.0	0.0	10.1	22.4	0.0	0.0	0	1	10	2
142190	2017-06-22	Uluru	3.6	25.3	0.0	0.0	0.0	22.0	13.0	9.0	56.0	21.0	1023.5	1019.1	0.0	0.0	10.9	24.5	0.0	0.0	0	7	10	4
142191	2017-06-23	Uluru	5.4	26.9	0.0	0.0	0.0	37.0	9.0	9.0	53.0	24.0	1021.0	1016.8	0.0	0.0	12.5	26.1	0.0	0.0	0	4	10	15
142192	2017-06-24	Uluru	7.8	27.0	0.0	0.0	0.0	28.0	13.0	7.0	51.0	24.0	1019.4	1016.5	3.0	2.0	15.1	26.0	0.0	0.0	0	10	11	4

142193 rows × 24 columns