

Program – 13

Aim: Programs on feedforward network to classify any standard dataset available in the public domain.

PROGRAM

```
from tensorflow import keras

print('Tensorflow/keras : %s'%keras.version)

from keras.models import Sequential

from keras import Input

from keras.layers import Dense

import pandas as pd

print('pandas : %s' %pd.version)

import numpy as np

print('numpy : %s' %np.version)

import sklearn

print('sklearn : %s' %sklearn.version)

from sklearn.model_selection import train_test_split

from sklearn.metrics import classification_report

import plotly

import plotly.express as px

import plotly.graph_objects as go

print('plotly : %s' %plotly.version)

pd.options.display.max_columns=50

df=pd.read_csv('weatherAUS.csv', encoding='utf-8')

df=df[pd.isnull(df['RainTomorrow'])==False]

#df=df.fillna(df.mean())

df['RainTodayFlag']=df['RainToday'].apply(lambda x: 1 if x=='Yes' else 0)

df['RainTomorrowFlag']=df['RainTomorrow'].apply(lambda x: 1 if x=='Yes' else 0)

print(df)

X = df[['Humidity3pm']]
```

```
Y = df['RainTomorrowFlag'].values
```

```
X_train, X_test, Y_train, Y_test = train_test_split(X, Y, test_size=0.2, random_state=0)
```

```
model = Sequential(name="Model-with-One-Input")
```

```
model.add(Input(shape=(1,), name='Input-Layer'))
```

```
model.add(Dense(1, activation='sigmoid', name='Output-Layer'))
```

OUTPUT

```
Tensorflow/keras : 2.7.0
pandas : 1.2.3
numpy : 1.20.1
sklearn : 1.0.1
plotly : 5.5.8
```

	Date	Location	MinTemp	MaxTemp	Rainfall	Evaporation	\
0	2008-12-01	Albury	13.4	22.9	0.6	NaN	
1	2008-12-02	Albury	7.4	25.1	0.0	NaN	
2	2008-12-03	Albury	12.9	25.7	0.8	NaN	
3	2008-12-04	Albury	9.2	28.0	0.0	NaN	
4	2008-12-05	Albury	17.5	32.3	1.0	NaN	
...
145454	2017-06-20	Uluru	3.5	21.8	0.0	NaN	
145455	2017-06-21	Uluru	2.8	23.4	0.0	NaN	
145456	2017-06-22	Uluru	3.6	25.3	0.0	NaN	
145457	2017-06-23	Uluru	5.4	26.9	0.0	NaN	
145458	2017-06-24	Uluru	7.8	27.0	0.0	NaN	

	Sunshine	WindGustDir	WindGustSpeed	WindDir9am	WindDir3pm	\
0	NaN	W	44.0	W	WNW	
1	NaN	NNW	44.0	NNW	WSW	
2	NaN	WSW	46.0	W	WSW	
3	NaN	NE	24.0	SE	E	
4	NaN	W	41.0	ENE	NW	
...
145454	NaN	E	31.0	ESE	E	
145455	NaN	E	31.0	SE	ENE	
145456	NaN	NNW	22.0	SE	N	

145456	NaN	NNW	22.0	SE	N
145457	NaN	N	37.0	SE	WNW
145458	NaN	SE	28.0	SSE	N
	WindSpeed9am	WindSpeed3pm	Humidity9am	Humidity3pm	Pressure9am \
0	20.0	24.0	71.0	22.0	1007.7
1	4.0	22.0	44.0	25.0	1010.6
2	19.0	26.0	38.0	30.0	1007.6
3	11.0	9.0	45.0	16.0	1017.6
4	7.0	20.0	82.0	33.0	1010.8
...
145454	15.0	13.0	59.0	27.0	1024.7
145455	13.0	11.0	51.0	24.0	1024.6
145456	13.0	9.0	56.0	21.0	1023.5
145457	9.0	9.0	53.0	24.0	1021.0
145458	13.0	7.0	51.0	24.0	1019.4
	Pressure3pm	Cloud9am	Cloud3pm	Temp9am	Temp3pm RainToday \
0	1007.1	8.0	NaN	16.9	21.8 No
1	1007.8	NaN	NaN	17.2	24.3 No
2	1008.7	NaN	2.0	21.0	23.2 No
3	1012.8	NaN	NaN	18.1	26.5 No
4	1006.0	7.0	8.0	17.8	29.7 No
...
145454	1021.2	NaN	NaN	9.4	20.9 No
145455	1020.3	NaN	NaN	10.1	22.4 No
145456	1019.1	NaN	NaN	10.9	24.5 No
145457	1016.8	NaN	NaN	12.5	26.1 No
145458	1016.5	3.0	2.0	15.1	26.0 No

...
145454	1021.2	NaN	NaN	9.4	20.9	No
145455	1020.3	NaN	NaN	10.1	22.4	No
145456	1019.1	NaN	NaN	10.9	24.5	No
145457	1016.8	NaN	NaN	12.5	26.1	No
145458	1016.5	3.0	2.0	15.1	26.0	No
	RainTomorrow	RainTodayFlag	RainTomorrowFlag			
0	No	0	0			
1	No	0	0			
2	No	0	0			
3	No	0	0			
4	No	0	0			
...			
145454	No	0	0			
145455	No	0	0			
145456	No	0	0			
145457	No	0	0			
145458	No	0	0			