

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 : 5.5.0
```

	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	0.0	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	WNW	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

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```