Experiment No.: 10

Aim

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

CO4

Implement convolutional neural network algorithm using Keras framework.

Procedure

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

Output Screenshot

```
p10
C:\ALBINA\ml\venv\Scripts\python.exe C:/ALBINA/ml/p10.py
Tensorflow/keras : 2.11.0
pandas : 1.5.2
numpy : 1.23.5
sklearn : 1.1.3
plotly : 5.11.0
             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
145457      NaN           N           37.0         SE        WNW
```

Result

The program was executed and the result was successfully obtained. Thus CO4 was obtained.