EXP:01Developing a Neural Network Regression Model

AIM

To develop a neural network regression model for the given dataset.

THEORY

Explain the problem statement

Neural Network Model

Include the neural network model diagram.

DESIGN STEPS

STEP 1:

Loading the dataset

STEP 2:

Split the dataset into training and testing

STEP 3:

Create MinMaxScalar objects ,fit the model and transform the data.

STEP 4:

Build the Neural Network Model and compile the model.

STEP 5:

Train the model with the training data.

STEP 6:

Plot the performance plot

STEP 7:

Evaluate the model with the testing data.

PROGRAM

```
from google.colab import auth
import gspread
from google.auth import default
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import MinMaxScaler
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense


auth.authenticate_user()
creds, _ = default()
gc = gspread.authorize(creds)

worksheet = gc.open('data').sheet1

rows = worksheet.get_all_values()
df = pd.DataFrame(rows[1:], columns=rows[0])
df1 = df.astype({'input':'float'})
df1 = df.astype({'output':'float'})
df1.head()
x = df1[['input']].values
y = df1[['output']].values
x
y
x_train,x_test,y_train,y_test = train_test_split(x,y,test_size=0.33,random_state=33)
scaler = MinMaxScaler()
scaler.fit(x_train)
x_train1 = scaler.transform(x_train)
x_train1 = scaler.transform(x_train)
ai_brain = Sequential([
    Dense(8,activation='relu'),
    Dense(10,activation='relu'),
    Dense(1)
])
ai_brain.compile(optimizer='rmsprop',loss = 'mse')
ai_brain.fit(x_train1,y_train,epochs=2000)
loss_df = pd.DataFrame(ai_brain.history.history)
loss_df.plot()
x_test1 = scaler.transform(x_test)
ai_brain.evaluate(x_test1,y_test)
x_n1 = [[4]]
x_n1_1 = scaler.transform(x_n1)
ai_brain.predict(x_n1_1)
```
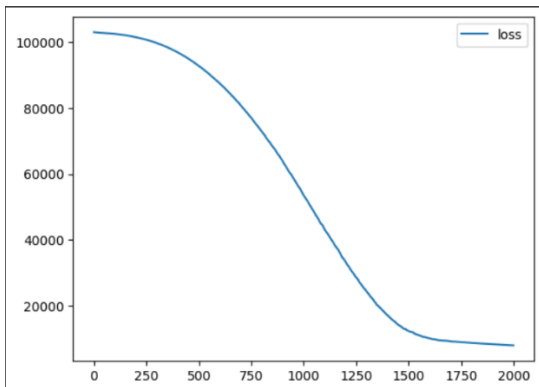
OUTPUT:

SAMPLE DATA:

input	output
1	11
2	22
3	33
4	44
5	55
6	66
7	77
8	88
9	99
10	110
11	121
12	132
13	143
14	154

graph:

Test Data Root Mean Squared Error:

```
1/1 [==============================] - 0s 128ms/step - loss: 8595.7832
8595.783203125
```

New Sample Data Prediction:

```
1/1 [==============================] - 0s 95ms/step
array([[193.93579]], dtype=float32)
```

Training Loss Vs Iteration Plot

Include your plot here

Test Data Root Mean Squared Error

Find the test data root mean squared error

New Sample Data Prediction

Include your sample input and output here

RESULT

Thus a neural network regression model for the given dataset is written and executed successfully.