```
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 keras.models import Sequential
from keras.layers import Dense
from sklearn.preprocessing import StandardScaler
```

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

worksheet = gc.open('student_data').sheet1
rows = worksheet.get_all_values()
df = pd.DataFrame(rows[1:], columns=rows[0])
print(df.shape)
```

```
(20, 2)
```

```
worksheet=gc.open('student_data').sheet1
rows = worksheet.get_all_values()
```

```
dataset1 = pd.DataFrame(rows[1:], columns=rows[0])
dataset1 = dataset1.astype({'Input': 'int'})
dataset1 = dataset1.astype({'output': 'int'})
```

```
dataset1.head()
```

```
   Input  output
0      1      11
1      2      21
2      3      31
3      4      41
4      5      51
```

```
X = dataset1[['Input']].values
y_train = dataset1[['output']].values
```

```
#x
```

```
from sklearn.model_selection import train_test_split

X_train, X_test, y_train, y_test = train_test_split(X, y_train, test_size=0.33, random_state=33)
```

```
scaler = MinMaxScaler()
```

```
scaler.fit(X_train)
```

```
▾ MinMaxScaler
MinMaxScaler()
```

```
X_train1= scaler.transform(X_train)
```

```
ai_brain = Sequential([
Dense(8,activation='relu'),
Dense(4,activation='relu'),
Dense(1)
])
```

```
ai_brain.compile(optimizer= 'rmsprop', loss="mse")
```

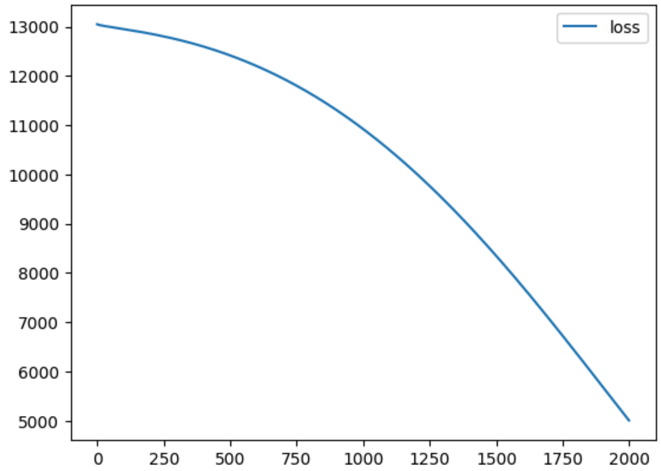
```
ai_brain.fit(X_train1,y_train,epochs=2000)
```

```
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 24ms/step - loss: 12931.4707
Epoch 126/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 25ms/step - loss: 12930.5674
Epoch 127/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 26ms/step - loss: 12929.6611
Epoch 128/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 59ms/step - loss: 12928.7520
Epoch 129/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 25ms/step - loss: 12927.8398
Epoch 130/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 26ms/step - loss: 12926.9258
Epoch 131/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 26ms/step - loss: 12926.0068
Epoch 132/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 27ms/step - loss: 12925.0869
Epoch 133/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 25ms/step - loss: 12924.1631
Epoch 134/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 24ms/step - loss: 12923.2354
Epoch 135/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 24ms/step - loss: 12922.3086
Epoch 136/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 25ms/step - loss: 12921.3818
Epoch 137/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 60ms/step - loss: 12920.4688
Epoch 138/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 32ms/step - loss: 12919.5527
Epoch 139/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 56ms/step - loss: 12918.6348
Epoch 140/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 55ms/step - loss: 12917.7139
Epoch 141/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 59ms/step - loss: 12916.7900
Epoch 142/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 43ms/step - loss: 12915.8613
Epoch 143/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 56ms/step - loss: 12914.9316
Epoch 144/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 54ms/step - loss: 12913.9980
Epoch 145/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 26ms/step - loss: 12913.0586
Epoch 146/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 57ms/step - loss: 12912.1182
Epoch 147/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 23ms/step - loss: 12911.1768
Epoch 148/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 26ms/step - loss: 12910.2295
Epoch 149/2000
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 58ms/step - loss: 12909.2803
Epoch 150/2000
```

```
loss_df = pd.DataFrame(ai_brain.history.history)
```

```
loss_df.plot()
```

```
<Axes: >
```



```
scaler = StandardScaler()
scaler.fit(X_train)
```

```
▾ StandardScaler
StandardScaler()
```

```
X_test1 = scaler.transform(X_test)
```

```
ai_brain.evaluate(X_test1,y_test)
```

```
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 94ms/step - loss: 6373.4326
6373.4326171875
```

```
X_n1 = [[50]]
```

```
X_n1_1 = scaler.transform(X_n1)
```

```
ai_brain.predict(X_n1_1)
```

```
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 46ms/step
array([[235.92375]], dtype=float32)
```