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Roll No: 05
CSE (DS)
Deep Learning Exp2

Implementing XOR in Deep learning using python

Code:

```
import numpy as np

from keras.models import Sequential

from keras.layers import Dense

X = np.array([[0, 0], [0, 1], [1, 0], [1, 1]])

Y = np.array([[0], [1], [1], [0]])

model = Sequential()

model.add(Dense(8, input_dim=2, activation='relu'))

model.add(Dense(1, activation='sigmoid'))

model.compile(loss='binary_crossentropy', optimizer='adam', metrics=['accuracy'])

model.fit(X, Y, epochs=1000, verbose=0)

loss, accuracy = model.evaluate(X, Y)

print(f"Loss: {loss:.4f}, Accuracy: {accuracy:.4f}")

predictions = model.predict(X)

rounded_predictions = np.round(predictions)

print("Predictions:")

print(rounded_predictions)
```

Output:

colab.research.google.com/drive/1AyyMC6GQGGuwpnKlvR53ojrSHKzIph3jt

05_DL Exp 2.ipynb

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```
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from keras.models import Sequential
from keras.layers import Dense
X = np.array([[0, 0], [0, 1], [1, 0], [1, 1]])
Y = np.array([[0], [1], [1], [0]])
model = Sequential()
model.add(Dense(8, input_dim=2, activation='relu'))
model.add(Dense(1, activation='sigmoid'))
model.compile(loss='binary_crossentropy', optimizer='adam', metrics=['accuracy'])
model.fit(X, Y, epochs=1000, verbose=0)
loss, accuracy = model.evaluate(X, Y)
print(f"Loss: {loss:.4f}, Accuracy: {accuracy:.4f}")
predictions = model.predict(X)
rounded_predictions = np.round(predictions)
print("Predictions:")
print(rounded_predictions)
```

1/1 [=====] - 0s 223ms/step - loss: 0.2722 - accuracy: 1.0000
Loss: 0.2722, Accuracy: 1.0000
1/1 [=====] - 0s 126ms/step
Predictions:
[[0.]
 [1.]
 [1.]
 [0.]]

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