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CSE (DS)

Deep Learning Exp 2

### **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}")

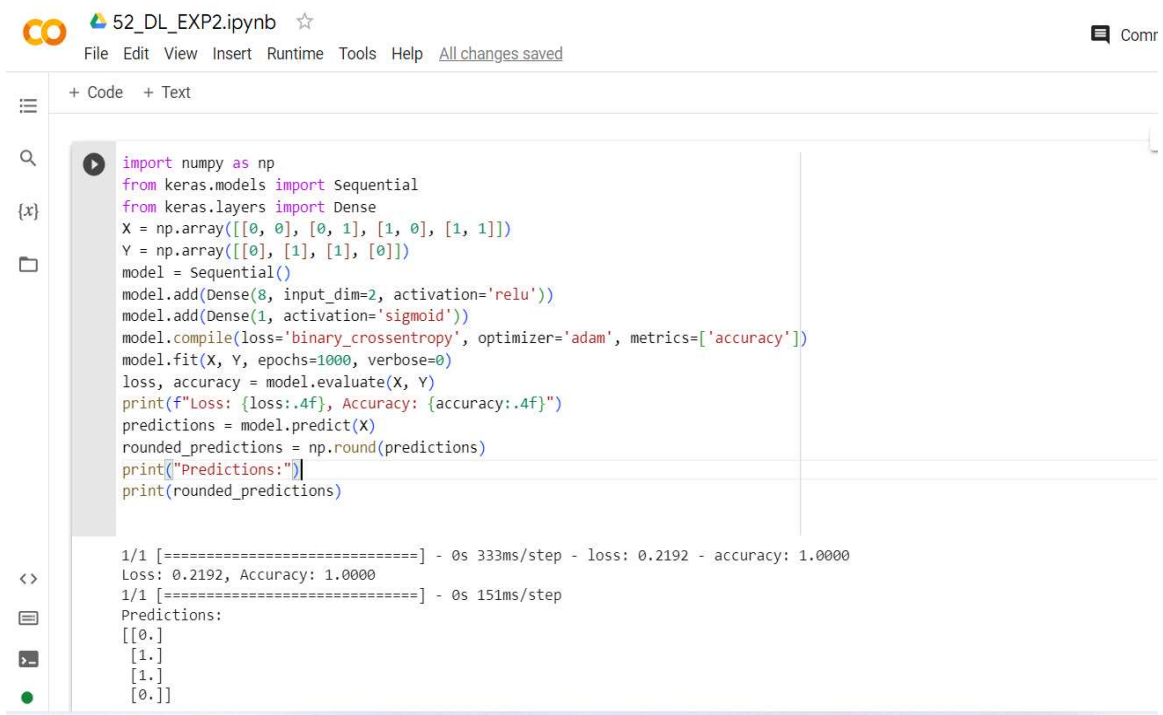
predictions = model.predict(X)

rounded_predictions = np.round(predictions)
```

```
print("Predictions:")
```

```
print(rounded_predictions)
```

## Output:



The screenshot shows a Jupyter Notebook titled "52\_DL\_EXP2.ipynb". The code cell contains the following 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)
```

The output of the code is displayed in the console area below the code cell:

```
1/1 [=====] - 0s 333ms/step - loss: 0.2192 - accuracy: 1.0000
Loss: 0.2192, Accuracy: 1.0000
1/1 [=====] - 0s 151ms/step
Predictions:
[[0.]
 [1.]
 [1.]
 [0.]]
```