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# -*- coding: utf-8 -*-
"""
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"""

import pandas as pd
import matplotlib.pyplot as plt
import numpy as np
from scipy.stats import ttest_ind
from scipy import stats

ml_acc =
[76.04,88.02,85,71.09,85.83,86.3,82.13,85,75.67,84.47,82.23,66.25,88.38,82.03
,88.48]

cnn_acc =
[82.76041667,93.125,91.40625,78.59375,91.71875,93.64583333,86.40625,86.145833
33,86.5625,89.84375,85.52083333,84.32291667,92.65625,87.65625,90.20833333]

lstm_acc =
[82.70833333,88.28125,86.66666667,95.15625,89.79166667,89.79166667,84.0625,92
.23958333,87.03125,94.21875,84.84375,84.32291667,93.28125,89.89583333,88.6979
1667]

ttest1, pval1 = ttest_ind(ml_acc, cnn_acc)

print("p-value = ", pval1)
if pval1 < 0.05:
    print("we REJECT null hypothesis for ML, DL accuracies being random")
else:
    print("we ACCEPT null hypothesis for ML, DL accuracies being random")

ttest2, pval2 = ttest_ind(cnn_acc, lstm_acc)

print("p-value = ", pval1)
if pval2 < 0.05:

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        print("we REJECT null hypothesis for DL, LSTM accuracies being random")
else:
    print("we ACCEPT null hypothesis for DL, LSTM accuracies being random")

''' ONE WAY ANOVA test for all groups at once'''

F, p = stats.f_oneway(ml_acc, cnn_acc, lstm_acc)

print("p-value = ", p)

if p < 0.05:
    print("we REJECT null hypothesis for Ml, DL and LSTM accuracies being
random")
else:
    print("we ACCEPT null hypothesis for ML, DL and LSTM accuracies being
random")
```