

Code for part 1+2

''''

Created on Sun Feb 20 11:17:19 2022

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```
import pandas as pd
```

```
import numpy as np
```

```
import matplotlib.pyplot as plt
```

```
import random
```

```
data = pd.read_excel('mth130prepost.xls')
```

```
m=1
```

```
gain = np.empty(155, dtype=object);
```

```
for i in range(0,155):
```

```
    gain[i] = (((data.Post.iloc[i])-(data.Pre.iloc[i]))/(1-(data.Pre.iloc[i])));
```

```
PreTestMedian = (data.Pre.median())
```

```
print("Pre-Test median = ")
```

```
PostTestMedian = (data.Post.median())
```

```
print("Post-Test median = ")
```

```
print(PostTestMedian)
```

```
groupAorB = np.empty(155, dtype=object)
```

```
for i in range(0,155):
```

```
    if ((data.Pre.iloc[i])<PreTestMedian):
```

```
        groupAorB[i]= "A";
```

```
    else:
```

```
        groupAorB[i]= "B";
```

```
aGainsList = np.array(0, dtype=object);
```

```
for i in range(0,155):
```

```
    if (groupAorB[i]=="A"):
```

```
        aGainsList = np.append(aGainsList, gain[i]);
```

```
bGainsList = np.array(0, dtype=object);
```

```
for i in range(0,155):
```

```
    if (groupAorB[i]=="B"):
```

```
        bGainsList = np.append(bGainsList, gain[i]);
```

```
fig, axs = plt.subplots(1, 2, sharey=True, tight_layout=True)
```

```
groupA = axs[0].hist(aGainsList,bins=30);
```

```
groupB = axs[1].hist(bGainsList,bins=30);
```

```
axs[0].set_xlabel("Gains Group A");
axs[0].set_ylabel("Occurrences Group A");
```

```
axs[1].set_xlabel("Gains Group B");
axs[1].set_ylabel("Occurrences Group B");
```

```
d = 10000; #number of samples
```

```
meanPsuA= np.zeros(1)
```

```
meanPsuB= np.zeros(1)
```

```
pseudoGain = np.zeros(1)
```

```
for i in range(0,d):
```

```
    random.shuffle(gain)
```

```
    pseudoGroupA = gain[0:74]
```

```
    pseudoGroupB = gain[74:156]
```

```
    meanPsuA = np.append(meanPsuA,pseudoGroupA.mean())
```

```
    meanPsuB = np.append(meanPsuB,pseudoGroupB.mean())
```

```
    pseudoGain[i] = meanPsuA[i]-meanPsuB[i];
```

Code for part 3

```
"""
```

```
Created on Thu Mar 3 22:35:41 2022
```

```
@author: disco
```

```
"""
```

```
import pandas as pd
```

```
import numpy as np
import matplotlib.pyplot as plt
import random

data2 = pd.read_excel('pilot_vs_traditional.xls').transpose();

pilotPre = data2.iloc[0];
pilotPost = data2.iloc[1];
tradPre = data2.iloc[2];
tradPost = data2.iloc[3];

pilotGain= pd.Series()
tradGain = pd.Series()

groupAorBp = np.empty(pilotPre.size, dtype=object)
for i in range(0,pilotPre.size):
    if ((pilotPre.iloc[i])<(pilotPre.median())):
        groupAorBp[i]= "A";
    else:
        groupAorBp[i]= "B";

groupAorBt = np.empty(tradPre.size, dtype=object)
for i in range(0,tradPre.size):
    if ((tradPre.iloc[i])<(tradPre.median())):
        groupAorBt[i]= "A";
    else:
```

```
groupAorBt[i]= "B";
```

```
for i in range(0,pilotPre.size):
```

```
    pilotGain.loc[i] = pilotPre[i] - pilotPost[i];
```

```
for i in range(0,tradPre.size):
```

```
    tradGain.loc[i] = tradPre[i] - tradPost[i];
```

```
pilotA = np.array(0);
```

```
for i in pilotGain:
```

```
    if (groupAorBt[i]=="A"):
```

```
        pilotA[i] = np.append(tradGain.iloc[i])
```

```
print(pilotA)
```

```
d = 10000;
```