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Proportion Test

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```python
# imports and packages
import matplotlib.pyplot as plt
from scipy import stats
from statsmodels.stats.proportion import proportions_ztest,proportions_chisquare
```

[ ] Python

1-Proportion Test

```python
# two-tailed test
# Ho: P1 = 0.5
# Ha: P1 != 0.5
pop_prop = 0.5
sucess = 600
sample_size = 1250

results = stats.binomtest(
    k = sucess,
    n = sample_size,
    p = pop_prop,
)
```

[ ] Python

```python
# product A proportion bar graph
pop_prop = 0.5*100
sample_prop = (sucess/sample_size)*100

plt.bar(['Population','Sample'],[pop_prop,sample_prop])
plt.show()
```

[ ] Python

2 Proportion Test

```python
# two-tailed test
# Ho: Board A = Board B
# Ha: Board A != Board B
success_A = 35
success_B = 25
sample_A = 150
sample_B = 120

z_stat, p_value = proportions_ztest(
    count = [success_A, success_B],
    nobs = [sample_A, sample_B],
)
```

[ ] Python

```python
# circuit board defects proportion bar graph
board_A = (success_A/sample_A)*100
board_B = (success_B/sample_B)*100

plt.bar(['Board A','Board B'],[board_A,board_B])
plt.show()
```

[ ] Python

PROPORTION TEST

INFERENTIAL STATISTICS

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ANOM

```
# Hypothesis
# Ho: equal proportions
# Ha: at least 1 is different
success_A = 35
success_B = 25
success_C = 30
trial_A = 150
trial_B = 120
trial_C = 85

chi_stat, p_value, table = proportions_chisquare(
    count = [success_A, success_B, success_C],
    nobs = [trial_A, trial_B, trial_C],
)
```

[ ] Python

```
# circuit board defects proportion bar graph
board_A = (success_A/trial_A)*100
board_B = (success_B/trial_B)*100
board_C = (success_C/trial_C)*100

plt.bar(['Board A','Board B','Board C'],[board_A,board_B,board_C])
plt.show()
```

[ ] Python