# hypothesis-test-1

November 20, 2024

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#State the Hypotheses statement:

#Null Hypothesis (H0): The weekly operating costs are as per the theoretical␣
 ↪model, i.e., W = $1,000 + $5X.

#Alternative Hypothesis (H1): The weekly operating costs are higher than what␣
 ↪the theoretical model suggests.
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[1]:
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import numpy as np
from scipy.stats import norm

# Given data
sample_mean = 3050
theoretical_mean = 1000 + (5 * 600)
standard_deviation = 5 * 25
sample_size = 25
alpha = 0.05
```

[2]:
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# Calculate the test statistic (z)
Z_statistic = (sample_mean - theoretical_mean) / (standard_deviation )


# Calculate the P value
p_value = norm.cdf(Z_statistic)

# Make a decision
if p_value < alpha:
    print("Reject the null hypothesis.")
    print("There is strong evidence to support the claim that the weekly␣
 ↪operating costs are higher than the model suggests.")
else:
    print("Fail to reject the null hypothesis.")
    print("There is not enough evidence to support the claim that the weekly␣
 ↪operating costs are higher than the model suggests.")

# Print the test statistic and critical value
print("Test Statistic:", Z_statistic)
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print("P_ Value:", p_value)
```

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Reject the null hypothesis.
There is strong evidence to support the claim that the weekly operating costs
are higher than the model suggests.
Test Statistic: -7.6
P_ Value: 1.480653749004806e-14
```

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