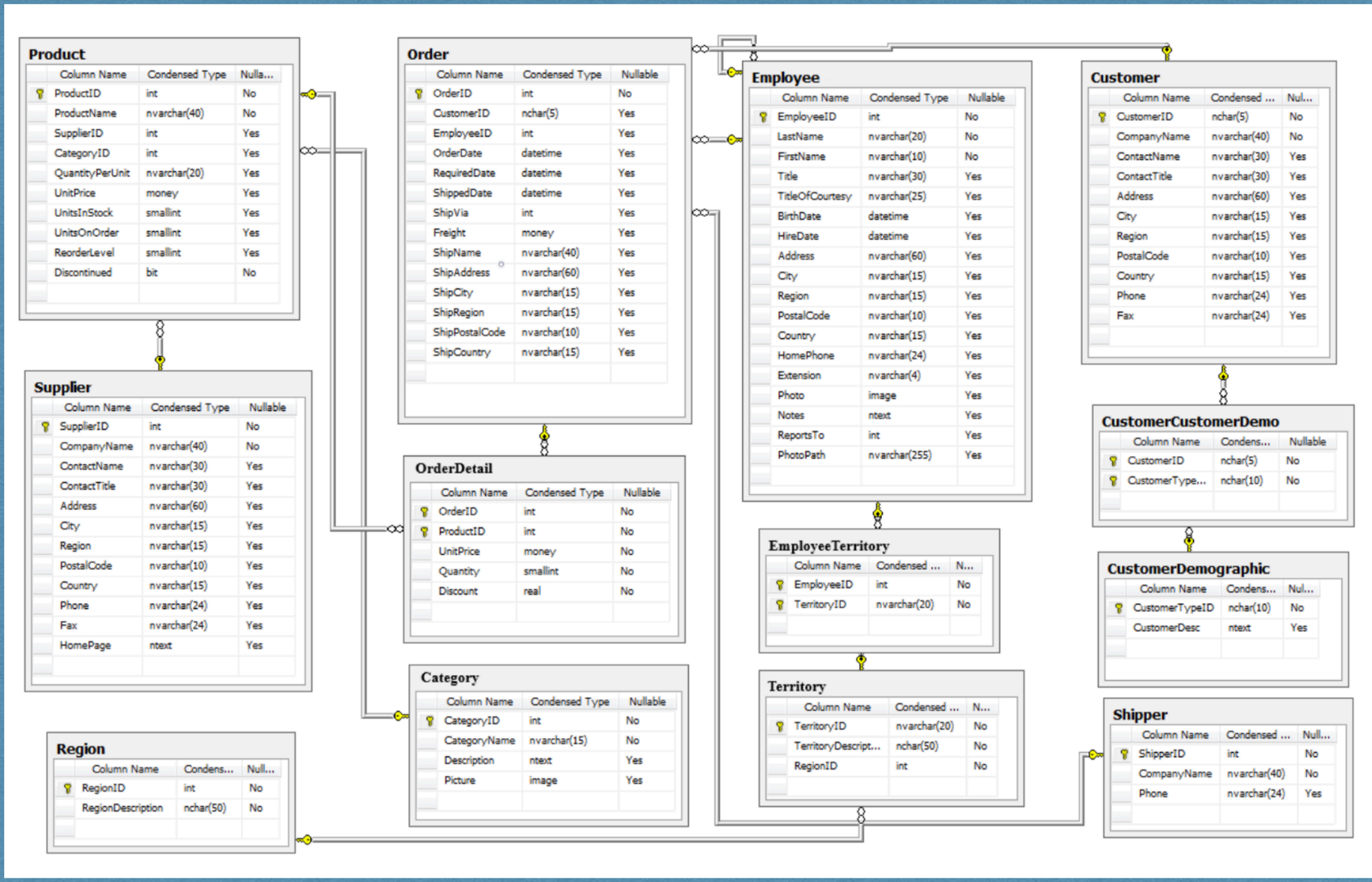
Hypothesis Testing
Northwind database



Stacy Shingleton

Module 3 (V2) Project

Objective

Answer the following questions:

1. Do discounts have a statistically significant effect on the quantity of a product sold? And if so, at what levels of discount?
2. Is there a statistically significant increase in revenue for discounted items?
3. Does the region of Northwind customers have a statistically significant effect on quantities ordered?
4. Does the region of the Northwind sales representatives have a statistically significant effect on quantities ordered?

Methodology

1. Compose null and alternative hypothesis
2. Check for normality
3. Set alpha value: 0.05
4. Calculate p-value using Welch's test
5. Calculate effect size using Cohen's d
6. Reject or fail to reject the null hypothesis

null hypothesis:

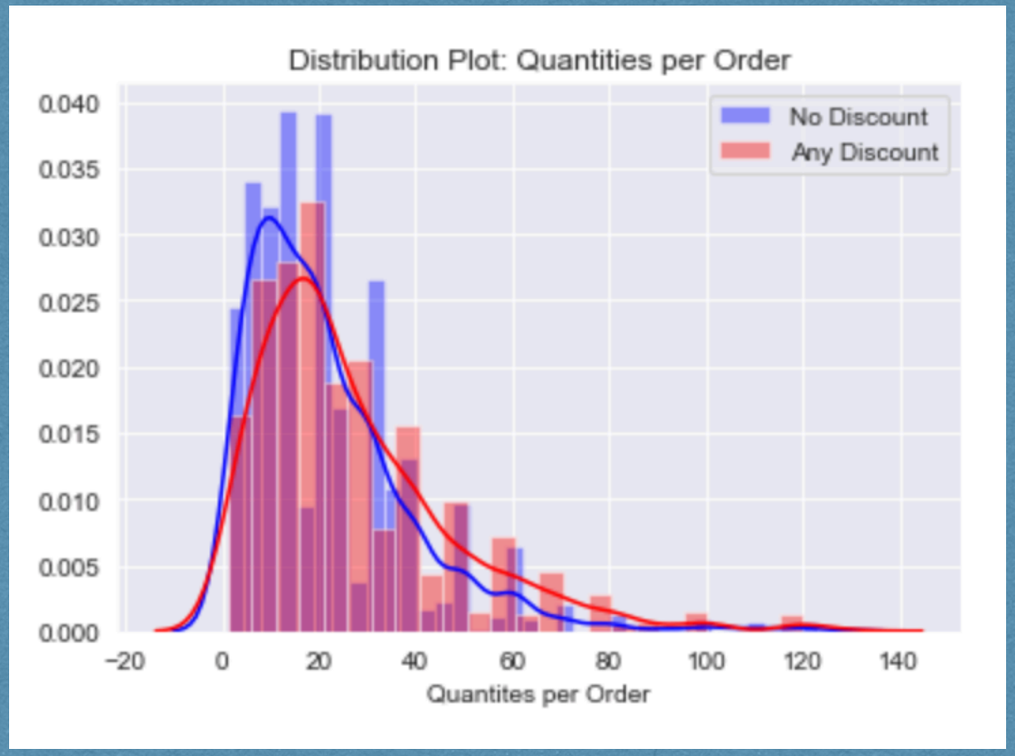
There is not a significant increase in quantities sold when items are discounted.

alternative hypothesis:

There is a significant increase in quantities sold when items are discounted.

Result:

There is enough evidence to reject the null hypothesis given an alpha of 0.05 for discounts of 5%, 10%, 15%, 20% and 25%



	5%	10%	15%	20%	25%
P-value	1.36E-04	1.87E-02	8.6E-05	4.06E-04	7.96E-05
Cohen's d	0.35	0.20	0.37	0.30	0.37

null hypothesis:

There is not a significant difference in sales revenue per item when discounted.

alternative hypothesis:

There is a significant difference in sales revenue per item when discounted.

Result:

There is not enough evidence to reject the null hypothesis given an alpha of 0.05.

P-value	0.73
Cohen's d	0.10

null hypothesis:

The region of the customer has no significant effect on quantities per order.

alternative hypothesis:

The region of the customer has a significant effect on quantities per order.

Result:

There is not enough evidence to reject the null hypothesis given an alpha of 0.05.

P-value	0.27
Cohen's d	0.05

null hypothesis:

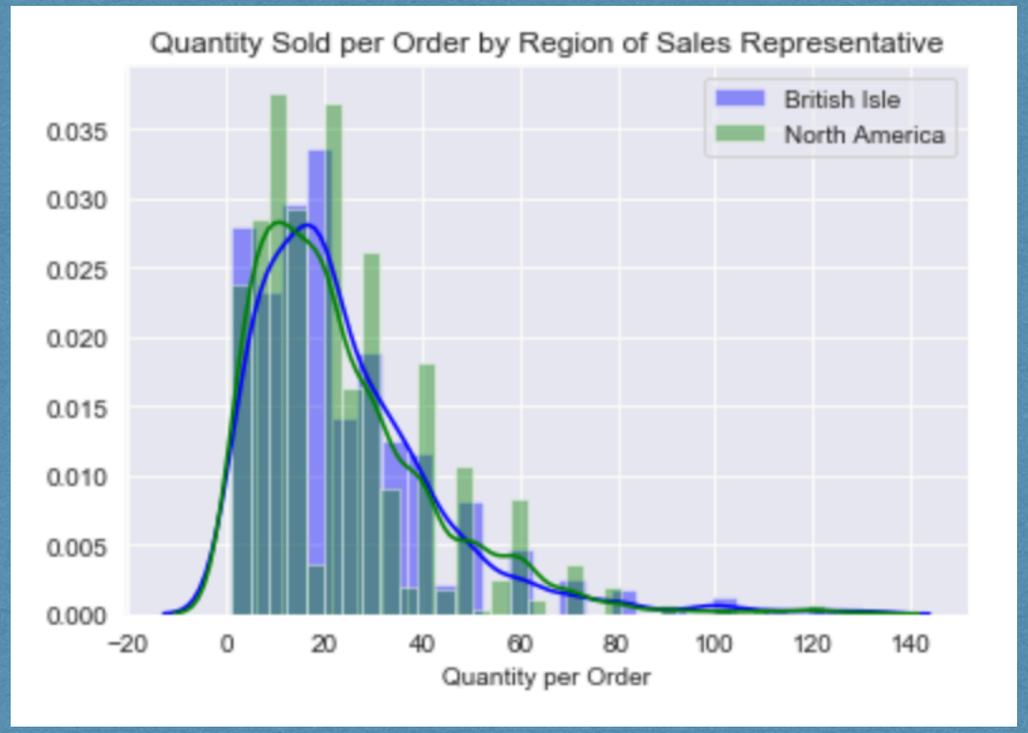
The region of the sales representative has no significant effect on quantities per order.

alternative hypothesis:

The region of the sales representative has a significant effect on quantities per order.

Result:

There is not enough evidence to reject the null hypothesis given an alpha of 0.05.



P-value	0.56
Cohen's d	0.03