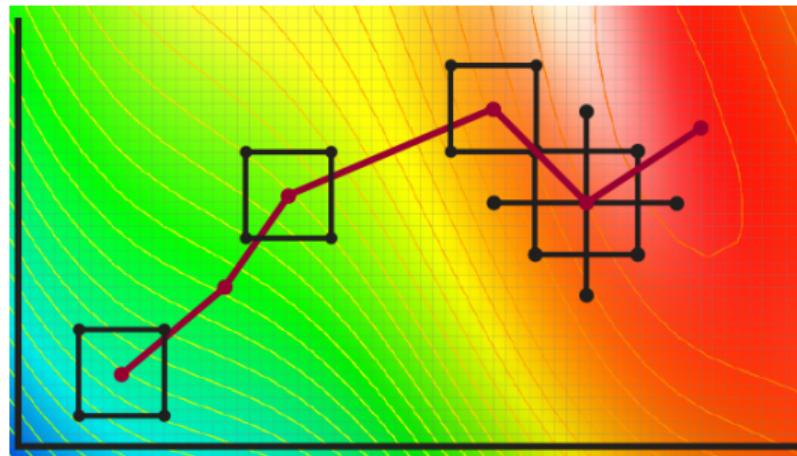


Experimentation for Improvement



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Design and Analysis of Experiments

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Outcome = Response



[Flickr: free-stock]

Factors = Variables



Amount of soil
(Numeric)



Type of soil
(Categorical)

Experiment for this class

Outcome

Profit made in one day when selling a specific product

Our outcome today

Profit = total income – total expenses

Experiment for this class

Objective

combine the **outcome** with a desire to *adjust* the outcome

Our objective today

to *maximize* profit

Experiment for this class

Factors

1. the amount of light in the store
2. the price of the product

Always try to make a prediction

How will price affect the outcome (profit)?

Does a higher price increase the profit?

Does a higher price decrease the profit?

Does a higher price actually affect profit?

How will the lighting amount affect the outcome?



Prediction:

More lighting
= profit

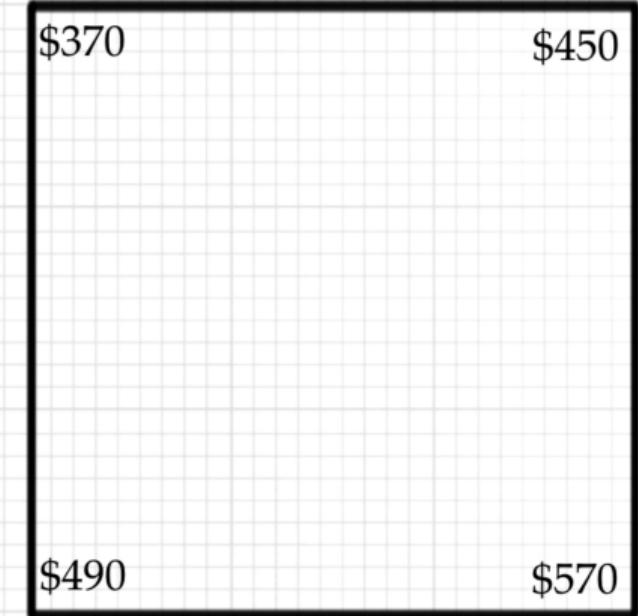


Dimmer setting	Price	Profit made
50%	Lower price	\$490
75%	Lower price	\$570
50%	Higher price	\$370
75%	Higher price	\$450

\$8.49

Pricing

\$7.79



50%

Dimmer
(lighting)

+
75%

Dimmer setting	Price	Profit made
50%	Lower price	\$490
75%	Lower price	\$570
50%	Higher price	\$370
75%	Higher price	\$450

Cube plot

Lighting effect

\$ 8.49

Pricing

\$ 7.79

\$370	\$450
\$490	\$570

-
50%

Dimmer
(lighting)

+

75%

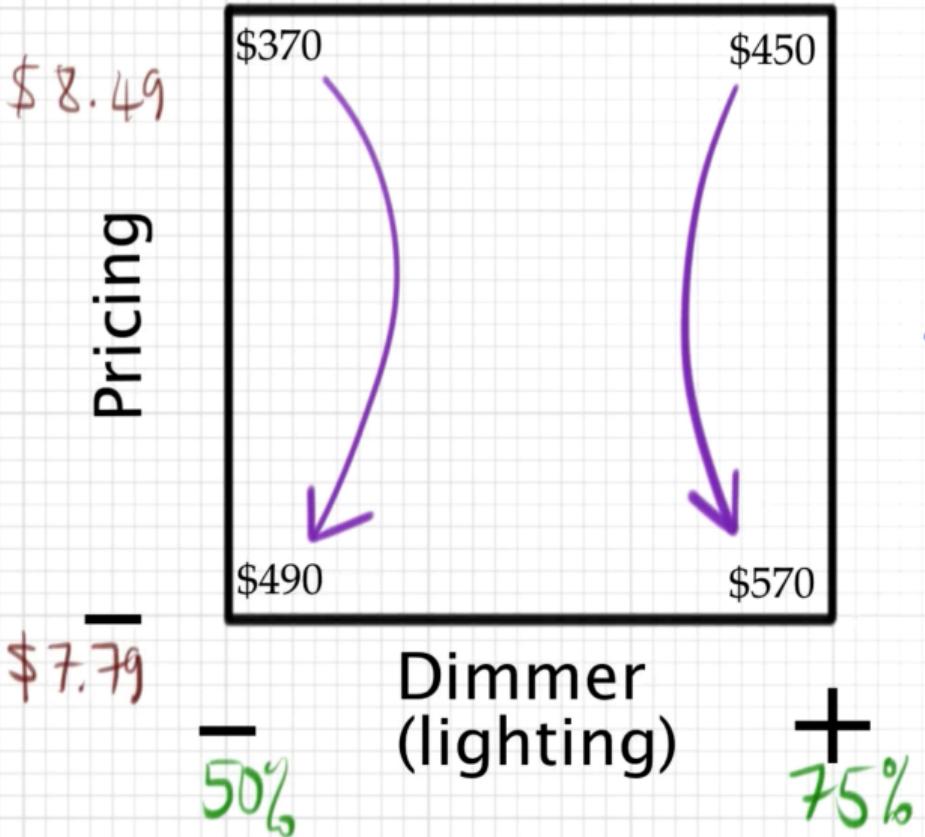
$$1 \quad 570 - 490 = \$80$$

$$2 \quad 450 - 370 = \$80$$

Average lighting effect
increases profit by

\$ 80

Pricing effect



$$\begin{array}{r} 1 \quad 370 - 490 = -\$120 \\ 2 \quad 450 - 570 = -\$120 \\ \hline \end{array}$$

Reduction in profit when we raise prices is \$120

Summary

+

\$ 8.49

Pricing

-

\$ 7.79



-

50%

Dimmer
(lighting)

+

75%

Lighting effect:

+\$80 per 25% increase
on the dimmer setting



Price effect:

-\$120 profit for a 70c
increase in the price.

