

A Pricing Problem

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- ▶ What's the data? What are the data relationships?



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- ▶ What's the data? What are the data relationships?
 - ▶ burgers sold, burger price, shakes sold, shake price
 - ▶ Also revenue (the unknown)
 - ▶ We'll ignore costs for now, they're not a hard extension



A Pricing Problem

- ▶ **Some market research:**
 - ▶ 70% of customers who buy a burger also buy a shake
 - ▶ You've noted in the past that:
 - ▶ At \$2 a burger, people buy 400 burgers a day
 - ▶ At \$3 a burger, people buy 350 burgers a day
 - ▶ At \$4 a burger, people buy 300 burgers a day
- ▶ **Okay, so how do you solve this problem?**
 - ▶ What is the approach, not what is the answer...yet.



A Pricing Problem

- ▶ Equations, equations (data relationships)
 - ▶ $\text{revenue} = \text{burgers} * \text{burger_price} + \text{shakes} * \text{shake_price}$
 - ▶ Algebra time!
 - ▶ Relate `shakes_sold` to `burgers_sold`
 - ▶ Relate `burger_price` to `burgers sold`
 - ▶ `shake_price` is fixed (\$1)



A Pricing Problem

- ▶ **Equations, equations (data relationships)**

- ▶ $\text{revenue} = \text{burgers} * \text{burger_price} + \text{shakes} * \text{shake_price}$
- ▶ Algebra time!

- ▶ **Maximizing revenue**

- ▶ Calculus time?
- ▶ Plug and chug?
- ▶ Python to the rescue!



A Pricing Problem

- ▶ **Graphing is great for this sort of thing**

- ▶ Install a graphing package

- ▶ The python package manager is awesome

- ▶ Open a command window:

- ▶ `py -3 -m pip install matplotlib`

- ▶ Done!

- ▶ **Plot our equation (x is burger prices, y is revenue)**

```
from pylab import plot, show
```

```
plot(x, y) // x and y are lists
```

```
show()
```



A Pricing Problem

- ▶ How to create a list of burger price points?
 - ▶ Manually? Like prices = [2,3,4]
- ▶ Leverage the computer's ability to do an obnoxious amount of repetitive work!
 - ▶ This prints the numbers from 0 to 99:

```
for i in range(0, 100):  
    print i
```
 - ▶ Because range(0, 100) returns the list [0,1,2,3...98,99]
- ▶ So how to create a list of burger price points?
 - ▶ [2.0, 2.1, 2.2, 2.3...4.8, 4.9, 5.0]

