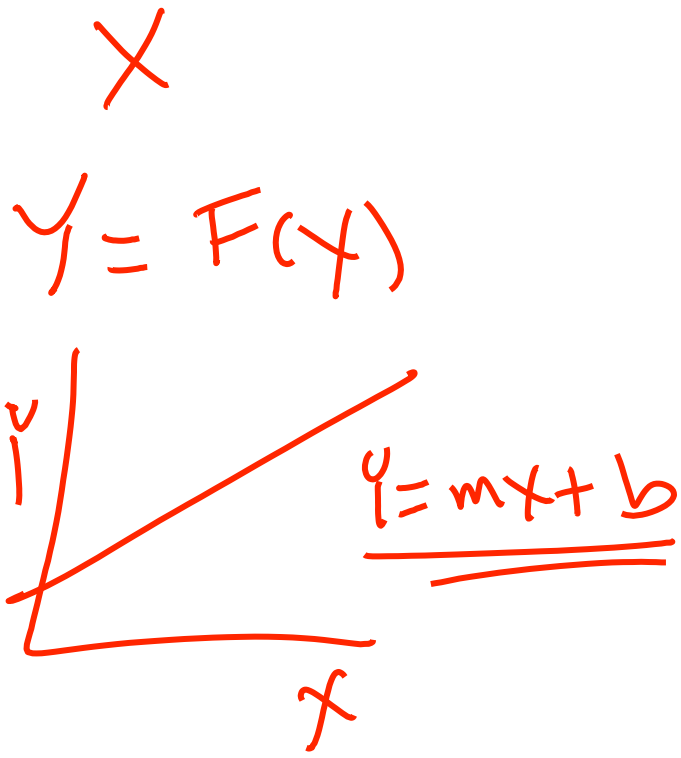
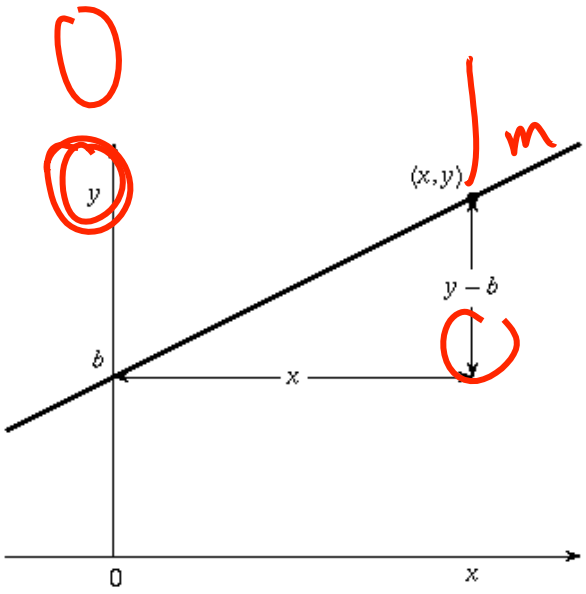
# Model Thinking

Scott E Page




# Linear Models

$y = mx + b$

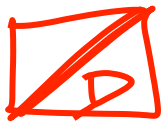


# Linear Model vs Line

X = Independent Variable

Y = Dependent Variable

Y depends on X




X = Length of Diagonal

Y = Cost of TV

Linear Model:

Cost = 15*Length + 100

$Y = 5X$

**Sign**: does Y increase or decrease in X?

**Magnitude:** how much does Y increase for each one unit increase in X?

Cost = 15*Length + 100

Predict

Understand Data

Cost = 15*Length + 100

30 inch TV?

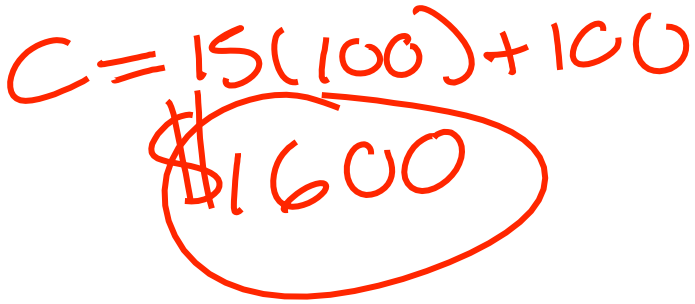
$C = 15(30) + 100$

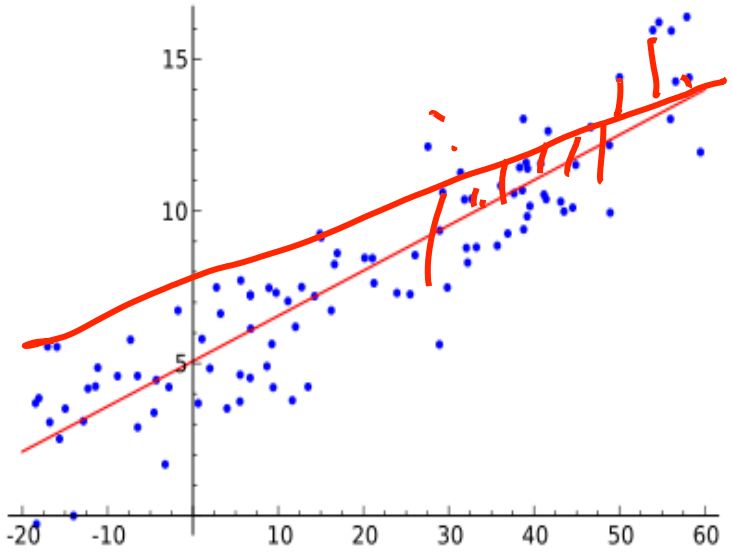
$450 + 100$

$\$550$

Cost = 15*Length + 100

100 inch TV?



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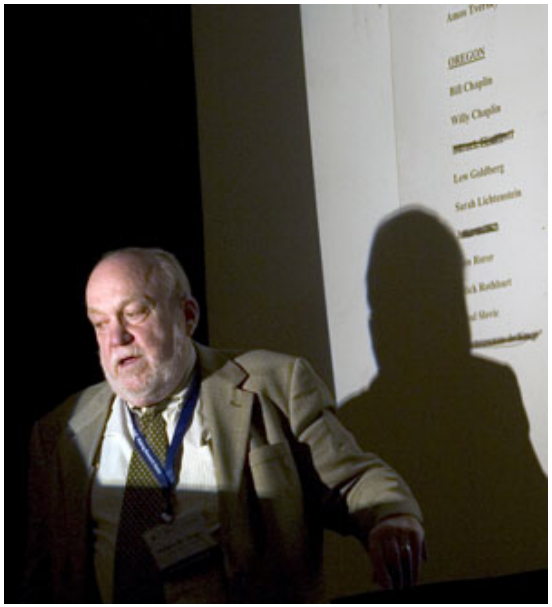



Robyn Dawes 1979:
"The Robust Beauty of Improper Linear Models in Decision Making"

43 bank loan officers predict which 30 of 60 firms would go bankrupt. They see financial statements.

Bankers: 75 % accurate

Linear Model: ratio of assets to liabilities 80%

Mehl (1954) 20 studies of clinicians

Sawyer (1966) 45 studies of predictions in the social world.

Experts NEVER did significantly better

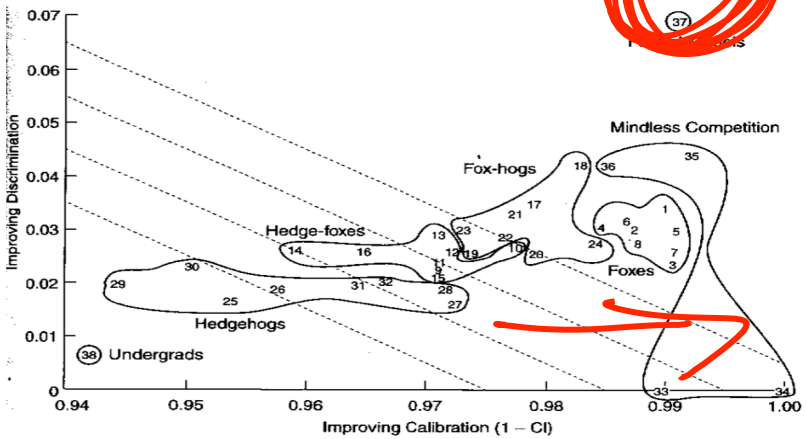
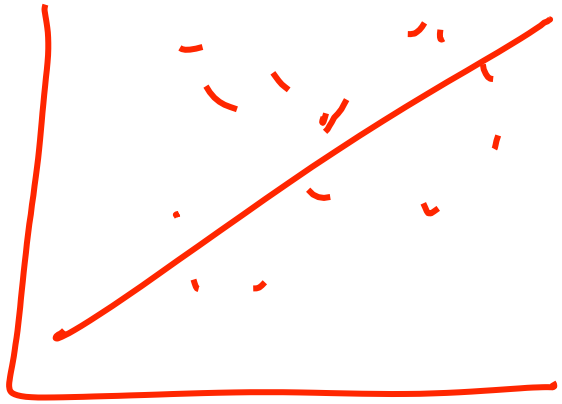



Figure 3.2. How thoroughly foxes and fox-hog hybrids (first and second



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