SCM 651: Business Analytics

WEEK 2

Agenda

Record Meeting

Review of concepts

Group discussion of articles

- Sustaining an Analytics Advantage
- Creating Business Values with Analytics
- Raising the Bar with Analytics

Teams

Homework #1

Week 2 - Review

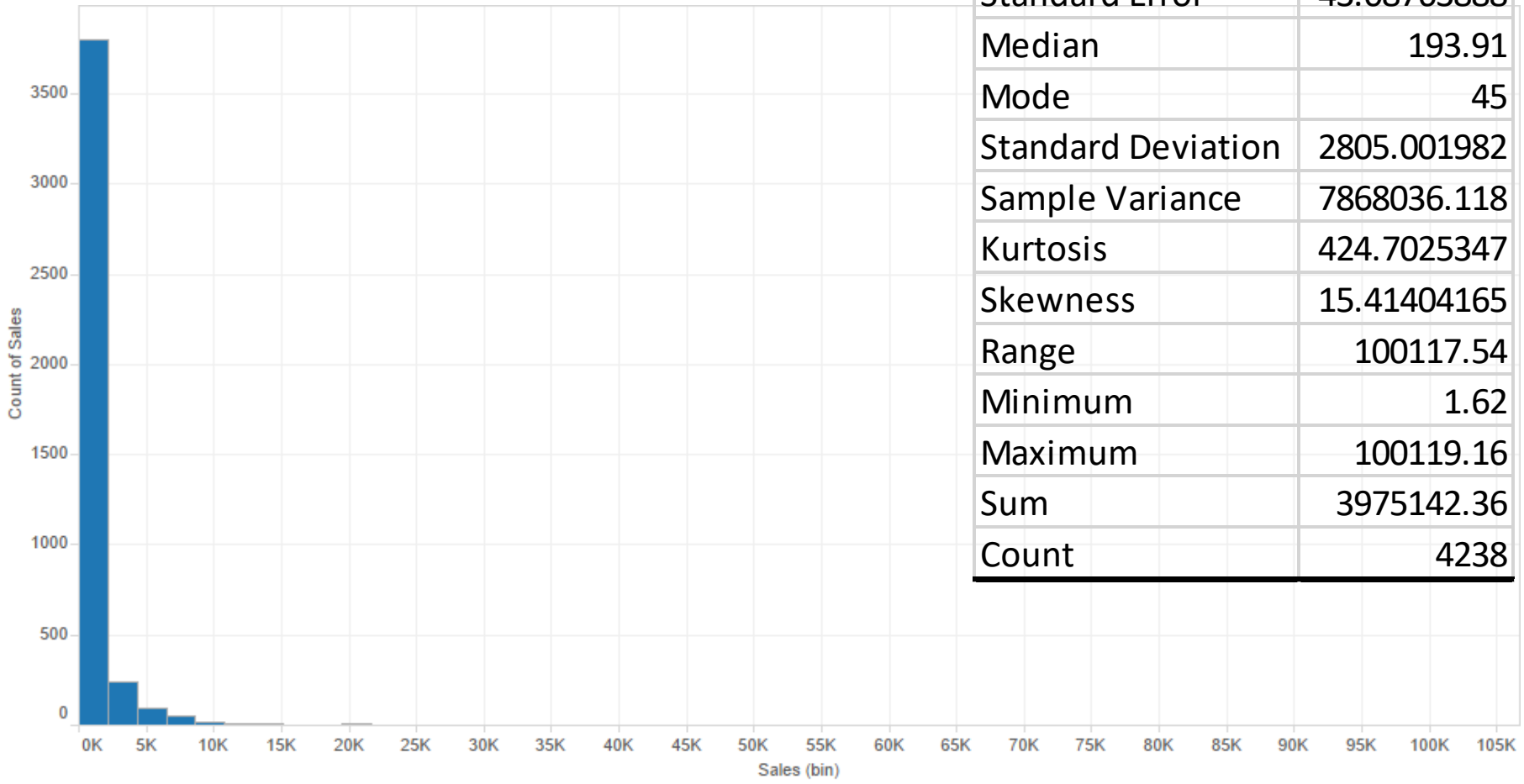
NPV

- Calculates today's value of a cash flow stream
- Investments are entered as negative numbers

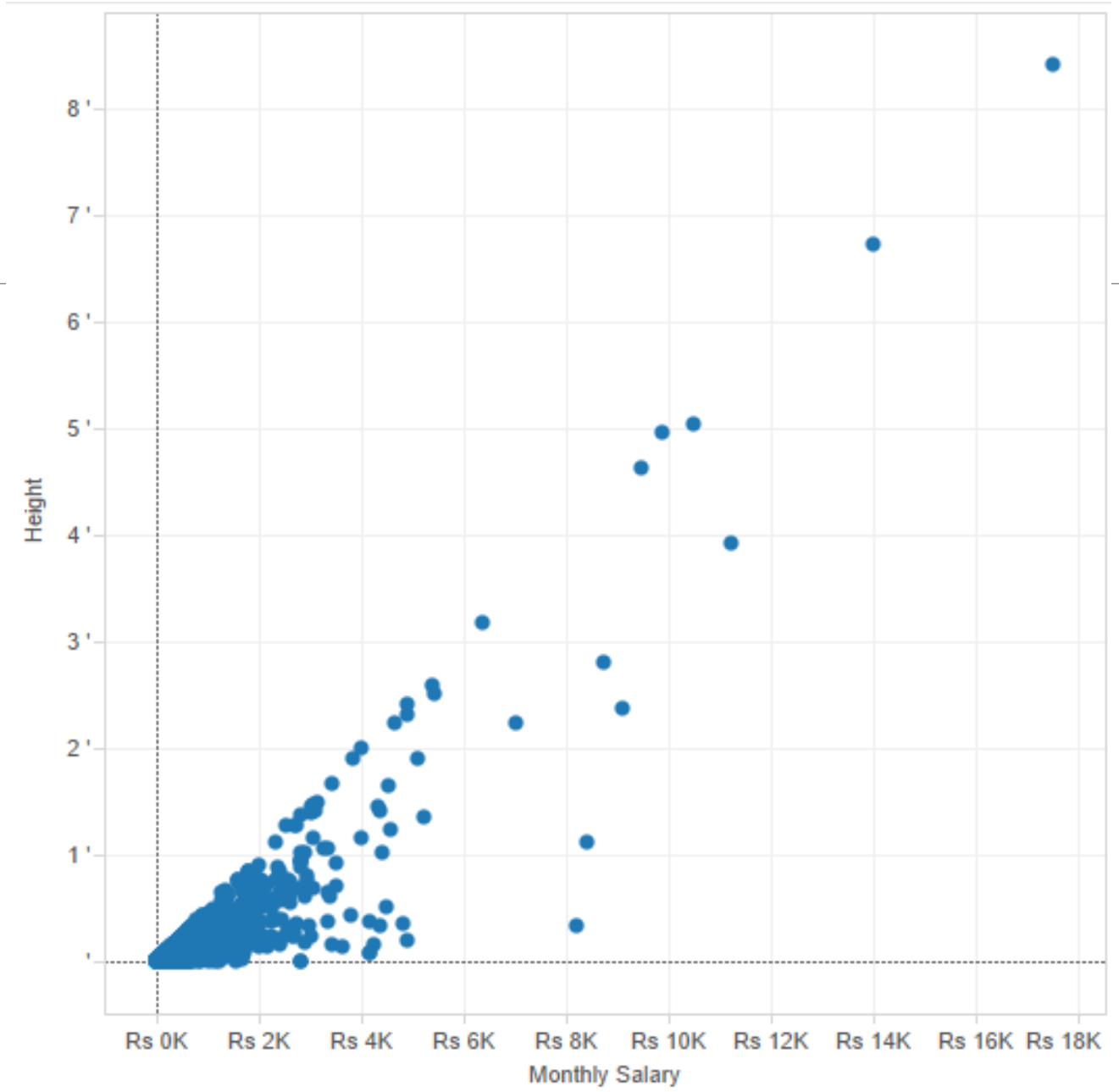
IRR

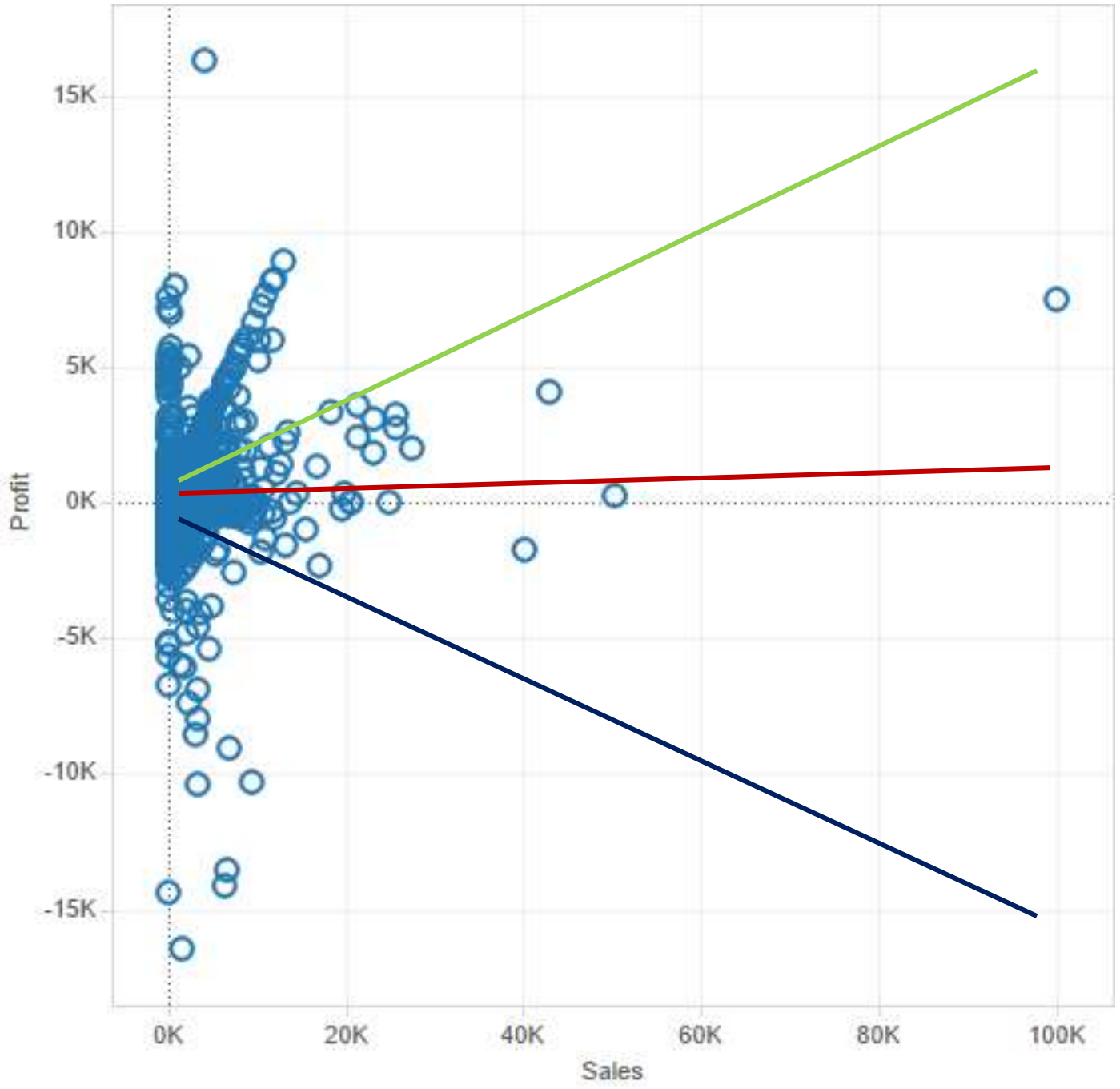
- IRR > interest rate ➔ positive NPV
- IRR < interest rate ➔ negative NPV

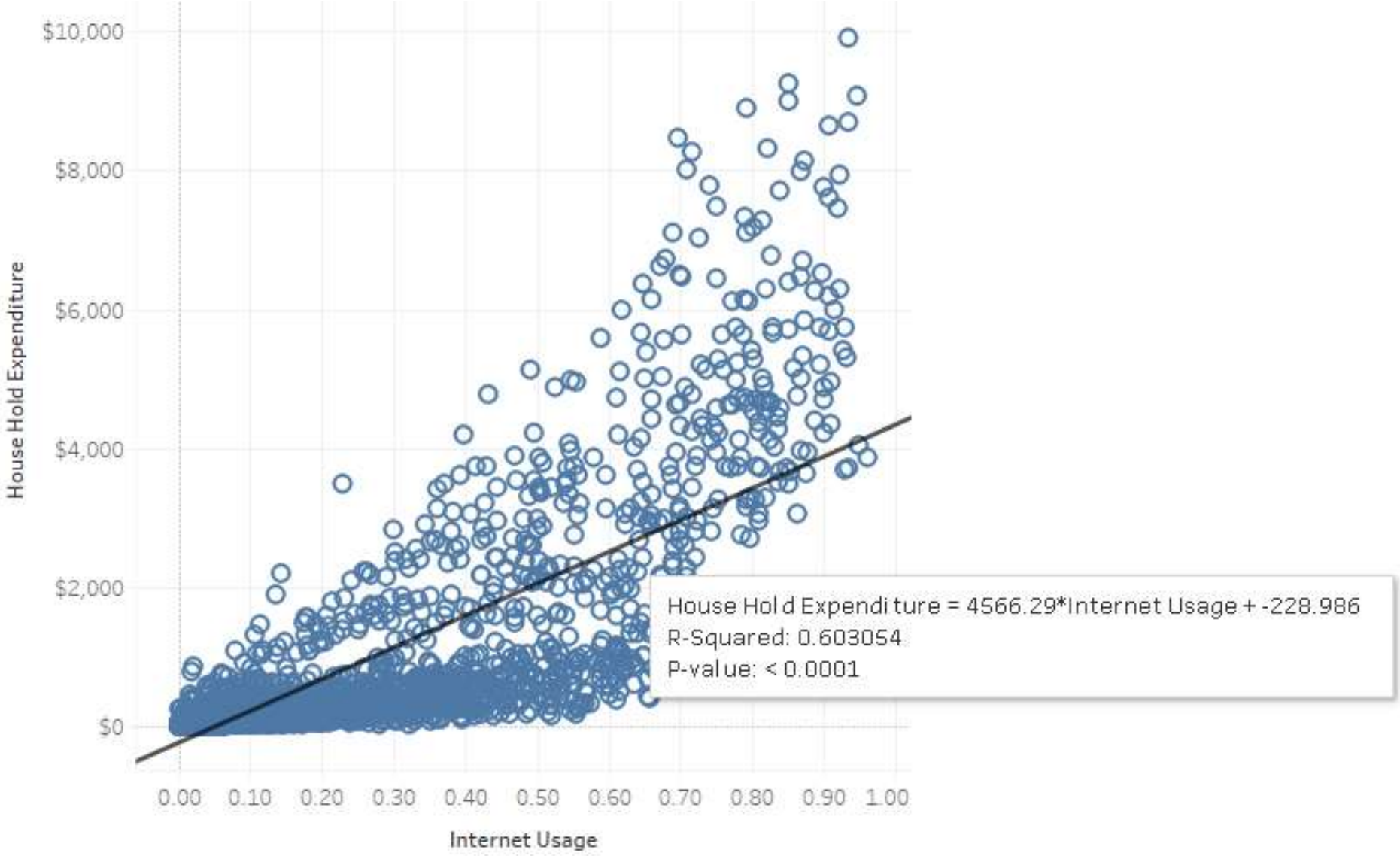
The rate of return of the outstanding investment for each period it remains invested.



Sales	
Mean	937.976017
Standard Error	43.08763888
Median	193.91
Mode	45
Standard Deviation	2805.001982
Sample Variance	7868036.118
Kurtosis	424.7025347
Skewness	15.41404165
Range	100117.54
Minimum	1.62
Maximum	100119.16
Sum	3975142.36
Count	4238


8 '
7 '
6 '
5 '
4 '
3 '
2 '
1 '
'
Height
Rs 0K
Rs 2K
Rs 4K
Rs 6K
Rs 8K
Rs 10K
Rs 12K
Rs 14K
Rs 16K
Rs 18K
Monthly Salary


15K
10K
5K
0K
-5K
-10K
-15K
Profit
0K
20K
40K
60K
80K
100K
Sales


$10,000
$8,000
$6,000
$4,000
$2,000
$0
House Hold Expenditure
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
Internet Usage
House Hold Expenditure = 4566.29*Internet Usage + -228.986
R-Squared: 0.603054
P-value: < 0.0001

Week 2 - Review

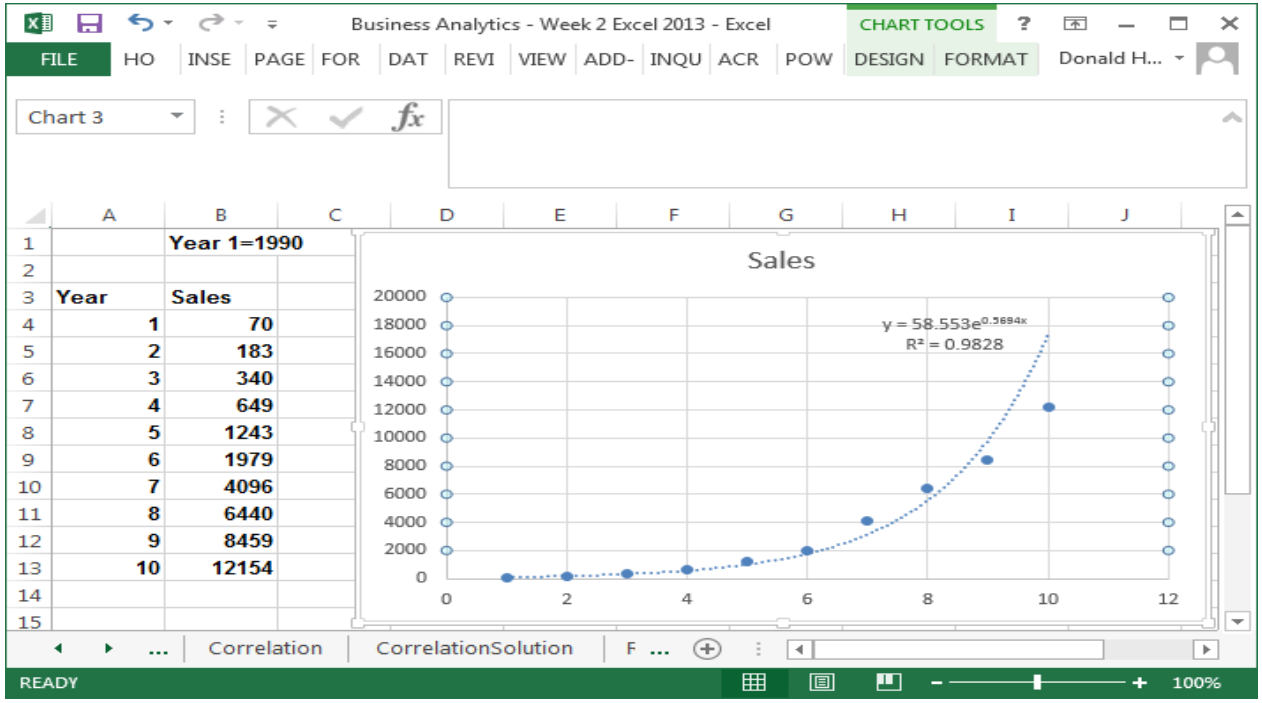
Regression Example

- Fixed Costs
  - Measured by intercept
- Variable costs
  - Measured by coefficient of variable

Week 2 - Review

Exponential regression

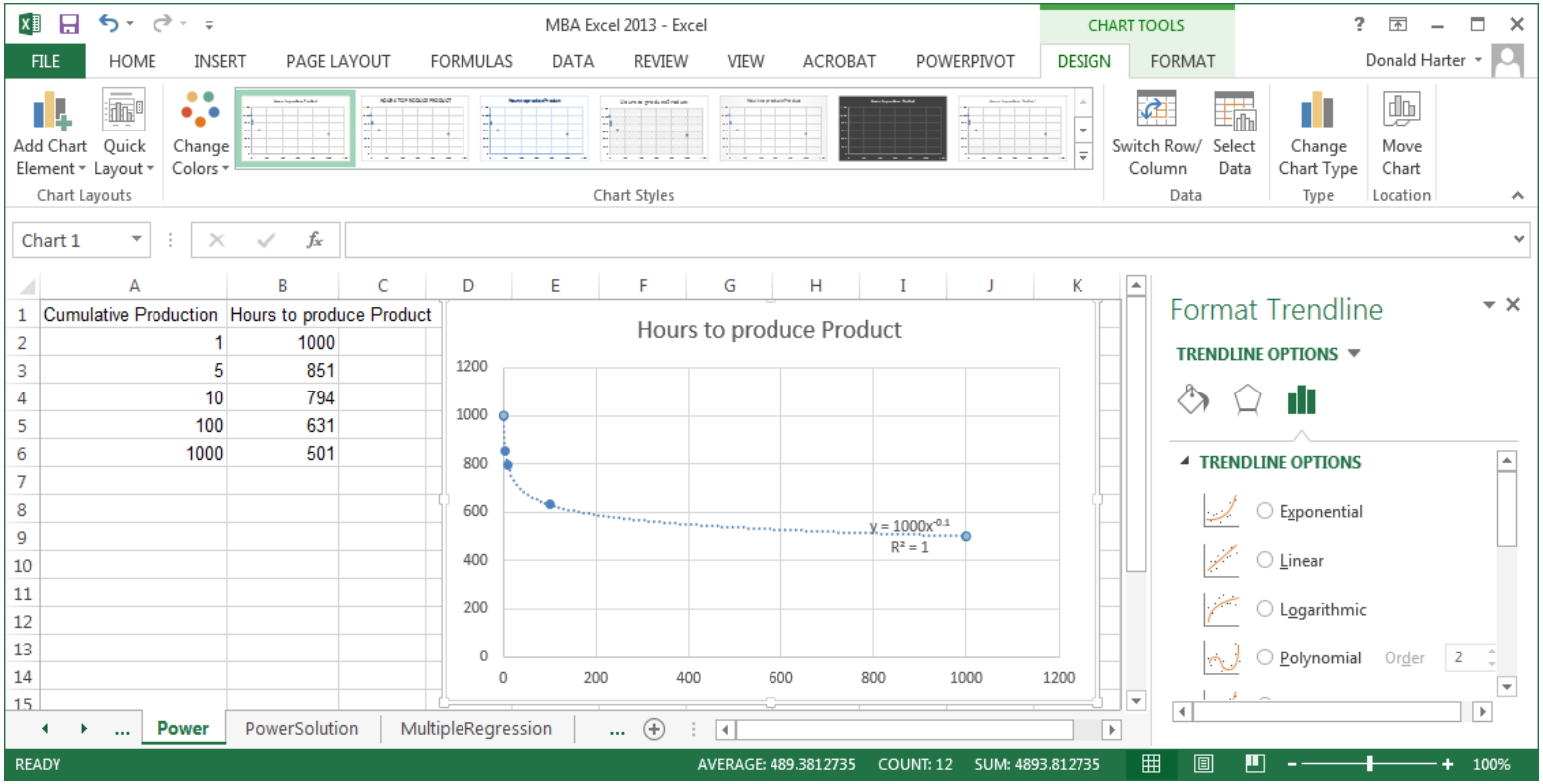
- Compounded growth



Week 2 - Review

Power regression

- Learning curve or volume efficiencies



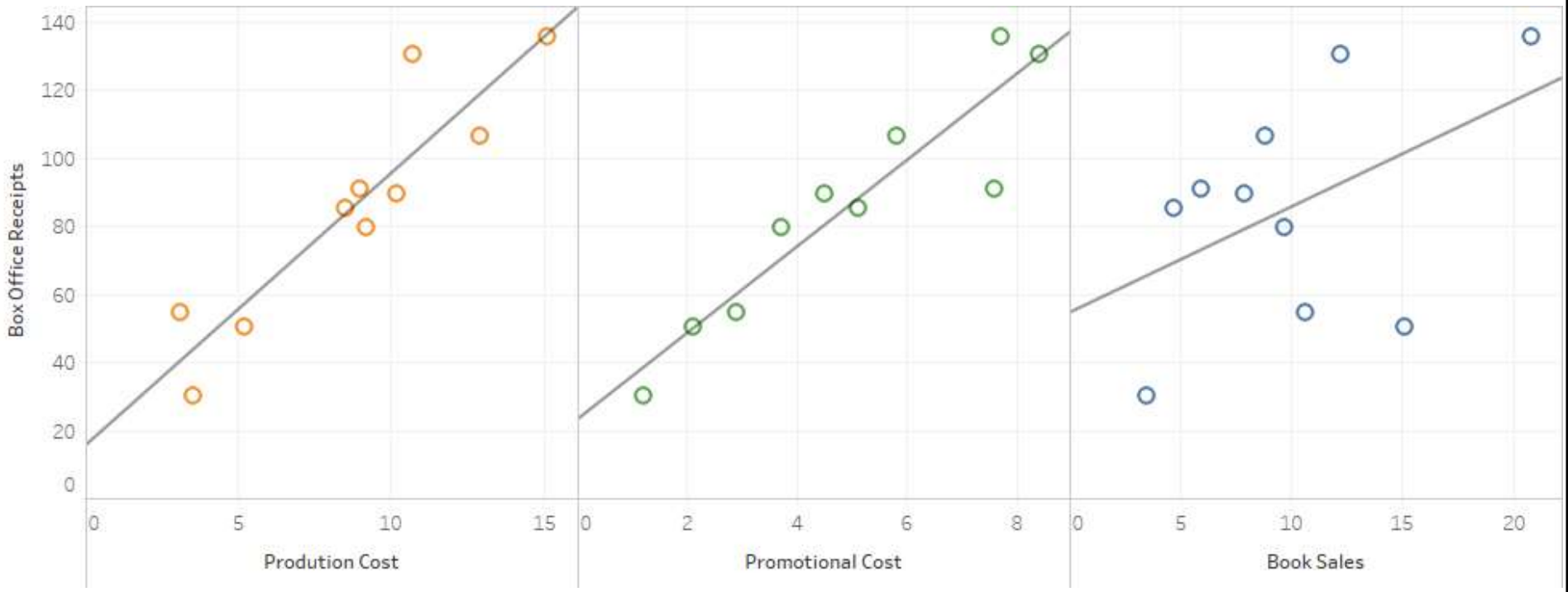
Week 2 - Review

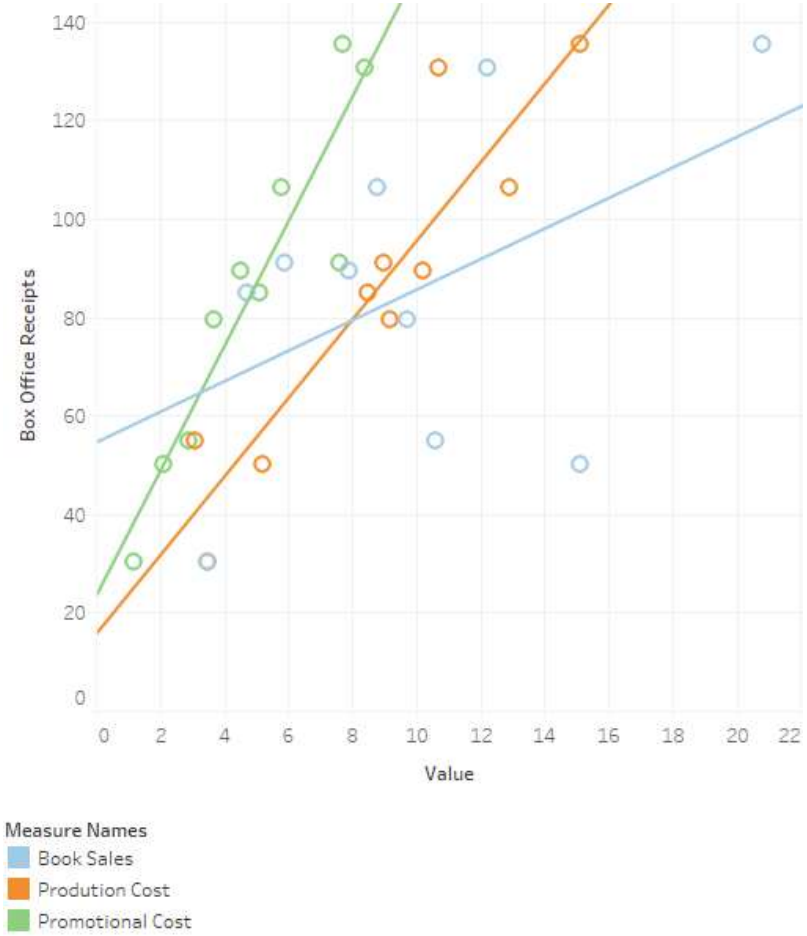
Correlation

- Strongest (highest positive or negative correlation): INTC & MSFT = 0.39
- Weakest (closest to zero): CAT & MSFT = 0.08

Correlation versus regression

- If one variable changes, does the other variable go up or down? (correlation)
- If one variable changes, how much does the other change? (regression)


Box Office Receipts
140
120
100
80
60
40
20
0
0
5
10
15
Prodution Cost
0
2
4
6
8
Promotional Cost
0
5
10
15
20
Book Sales


140
120
100
80
60
40
20
0
Box Office Receipts
0
2
4
6
8
10
12
14
16
18
20
22
Value
Measure Names
Book Sales
Prodution Cost
Promotional Cost

Week 2 - Review

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.983254182							
R Square	0.966788786							
Adjusted R Square	0.950183179							
Standard Error	7.541008534							
Observations	10							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	3	9932.463298	3310.821099	58.22062318	7.91266E-05			
Residual	6	341.2008582	56.86680971					
Total	9	10273.66416						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	7.676028542	6.760227552	1.135468959	0.299491477	-8.865652371	24.21770946	-8.865652371	24.21770946
X2total production costs/millions	3.661604009	1.117751448	3.275866041	0.016909724	0.926564745	6.396643273	0.926564745	6.396643273
X3 total promotional costs/millions	7.621051257	1.657317235	4.598426358	0.003698129	3.565742073	11.67636044	3.565742073	11.67636044
X4total book sales/millions	0.828468066	0.539359059	1.536023271	0.175439839	-0.491296007	2.14823214	-0.491296007	2.14823214

Week 2 - Review

Multivariate regression (multiple X variables)

- T-statistics measures the significance of one coefficient
- F-statistic measures the significance of the entire equation
- R^2 measures the goodness of fit of the equation, i.e., how much of the change in Y is explained by changes in X

Seasonality

- Periodicity of 4 – quarterly
- Periodicity of 12 – monthly
- Periodicity of 52 - weekly

Article #1: Sustaining an Analytics Advantage

- Sustaining an Analytics Advantage
  - What are some examples of creating competitive advantage with analytics (companies and their techniques)?
    - Wal-Mart: keep analytics techniques secret (consumer choice and human resources)
    - ABB: implement analytics fast (customer choice)
    - Procter & Gamble: apply to the right problem (reengineer the supply chain)
    - American Airlines (Sabre): data is more important (schedules)
    - Amazon: become data driven (algorithms)

Article #1: Sustaining an Analytics Advantage

- Sustaining an Analytics Advantage
  - Analytics does not provide a sustainable competitive advantage
  - Analytics capability to change and innovate does provide a sustainable competitive advantage
  - Analytics is becoming a competitive necessity; ATM machines were initially a competitive advantage, now are a competitive necessity
    - ATM: Barclays Bank, London, 1967
    - ATM: Chemical Bank, Rockville Centre, New York, 1969

Article #2: Creating Business Value with Analytics

Creating Business Value with Analytics

- What are the differences between competencies in information management and analytics expertise?
  - Information management: develop enterprise wide data systems
  - Analytics: developing functional expertise
- What are the advantages of starting with each?
  - Information management: break down cultural barriers, leverage customer focused data (expand sales)
  - Analytics: leverage algorithms to optimize activities (order placement, fulfillment, shipping, delivery)

Article #3: Raising the Bar with Analytics

Raising the Bar with Analytics

- What new opportunities did StyleSeek and Entravision encounter when they used analytics?
  - StyleSeek: sold their technology to partners
  - Entravision: expanded beyond media spots to information services for the Latino market
- What opportunity allowed MillerCoors to create efficiencies with analytics?
  - MillerCoors: applied analytics to identify efficiencies with the joint venture

Teams

Homework

Homework #1 – Regression

- due before class in Week 4 live session