Appendix A: Calculating Standard Deviations & Confidence Intervals

Standard Deviation Equation

$$S = \sqrt{\frac{\sum_{i=1}^{n} (X_i - \overline{X})^2}{(n-1)}}$$

Where X_i = losses, $\overline{X}$ = mean
n = number of observations

Standard Deviations for Example 3

Claim Count for Smoothly ISD.

X_i	–	$\overline{X}$	=	deviation	deviation^2
200	–	245	=	(45)	2025
210	–	245	=	(35)	1225
220	–	245	=	(25)	625
230	–	245	=	(15)	225
240	–	245	=	(5)	25
250	–	245	=	5	25
260	–	245	=	15	225
270	–	245	=	25	625
280	–	245	=	35	1225
290	–	245	=	45	2025
				Sum	8250
				÷ n-1	÷ 9
				Variance =	917

$$S = \sqrt{917} = 30.28\ldots$$

95% Confidence Intervals (2 Standard Deviations) for Smoothly ISD:

Mean ± 60.56 = 184 to 306

Claim Count for Jumping Jack ISD

X_i (# losses)	–	$\bar{X}$	=	deviation	deviation^2
179	–	245	=	(66)	4,356
246	–	245	=	1	1
241	–	245		(4)	16
237	–	245		(8)	64
302	–	245		57	3,249
284	–	245		39	1,521
311	–	245		66	4,356
250	–	245	=	5	25
237	–	245	=	(8)	64
163	–	245	=	(82)	6,724
					20,376
					÷ 9
				Variance =	2,264

$$S = \sqrt{2,264} = 47.58\ldots$$

$$2S = 95$$

95% Confidence Intervals (2 Standard Deviations) for Jumping Jack ISD:

Mean ± 95 = 150 to 340

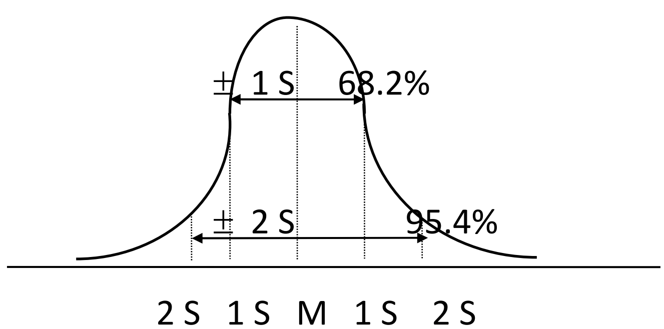
Confidence Interval Calculation

We can say statistically that the number of claims these schools should sustain in any give year will be:

% of the time	Smoothly ISD	Jumping Jack ISD
68.2 %	Between 215 and 275	Between 197 and 293
95.4 %	Between 184 and 306	Between 150 and 340
99.7 %	Between 154 and 336	Between 102 and 388

With an average severity of $1,200, we can say statistically that the losses these schools should sustain in any given year will be:

% of the time	Smoothly ISD	Jumping Jack ISD
68.2 %	Between $258,000 and $330,000	Between $236,400 and $351,600
95.4 %	Between $220,800 and $367,200	Between $180,000 and $408,000
99.7 %	Between $184,800 and $403,200	Between $122,400 and $465,600



Appendix B: Regression issues

A. Assumptions

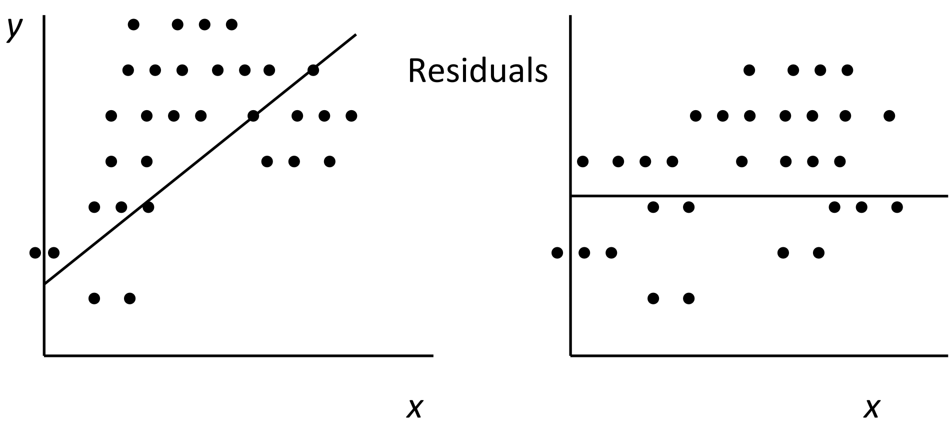
1. The value(s) of the independent variable *x* are not correlated with the random error term.
2. The error terms are normally distributed with mean 0 and constant variances. Constant variance means that *y* is no easier/harder to predict for high or low *x* values. The errors are uncorrelated with each other in successive observations.

B. Heteroscedasticity: the width of the scatter plot of the residuals increases or decreases as the *x* variable increases. This violates the assumption of constant variance in (2) above and a more complex generalized least squares method must be utilized.

C. Serial Correlation: there is a pattern between the error term and x. This violates assumption (2) above and might result from:

1. **Missing variables.** There should be no trend in the residuals (error terms) when plotted against time or any other possible independent variable not already in the regression equation. If a trend is found to exist, those variable(s) should be included in the model along with *x* resulting in a multiple regression model.

2. **Nonlinear relationships.** If the relationship between *x* and *y* is curved or nonlinear, forcing a straight line to fit the data will result in a poor fit. The residuals are not random and independent and show curvature. This can be corrected by adding the variable x^2 to the model. This entails utilizing a multiple regression technique.



D. **Regression model as a predictor** Predictions should be limited to the region of the data used in the estimation process. Extrapolation outside the estimation range is risky, as the estimated relationship may not hold outside this range, e.g. oil prices over time.

E. **Multiple regression analysis** involves the use of several independent variables in the regression equation. More realistic and thorough relationships can be modeled in this way.

F. **Notes**

1. Adding independent variables will raise the r^2 (capital R with multiple regression) if the variable adds explanatory information not already provided by the existing variables. Raising the r^2 to .99 or even 1.0 would be extremely rare, however. Very high r^2's do not imply that the model is correct or that it can be used to predict the dependent variable with any degree of accuracy.

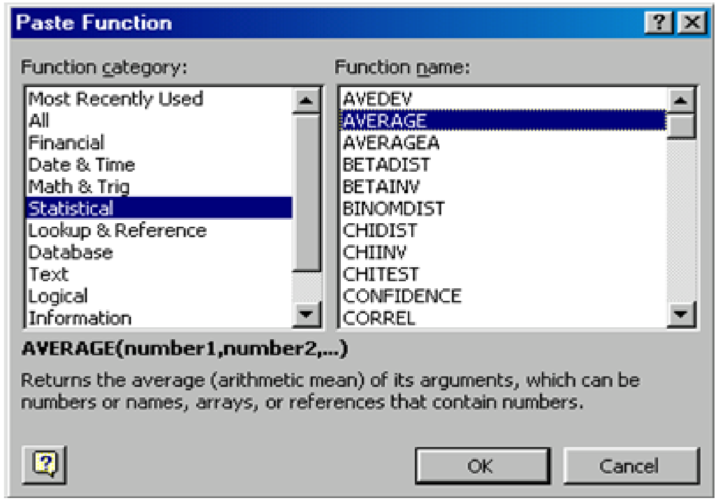
2. The F test is utilized to determine if there is a regression relationship between the dependent variable *y* and any of the proposed explanatory *x* variables.

Appendix C: Using Excel

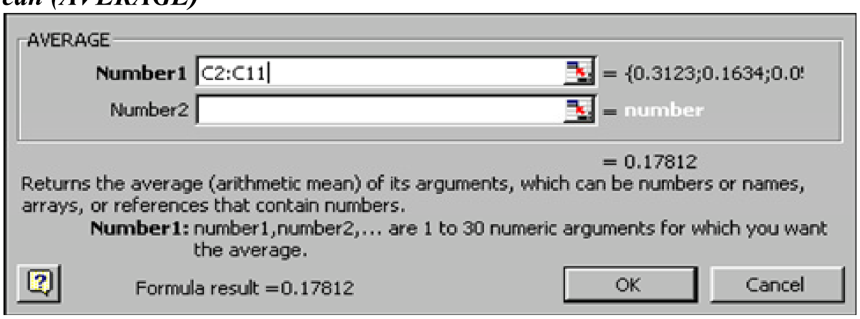
Using Excel's "Paste Function" (*fx*) for Section 3, Example 4's Mean, Median & Mode

Total Return on the S&P 500

1989	31.23%
1988	16.34%
1987	5.67%
1986	18.54%
1985	31.06%
1984	5.97%
1983	22.31%
1982	20.37%
1981	-4.85%
1980	31.48%



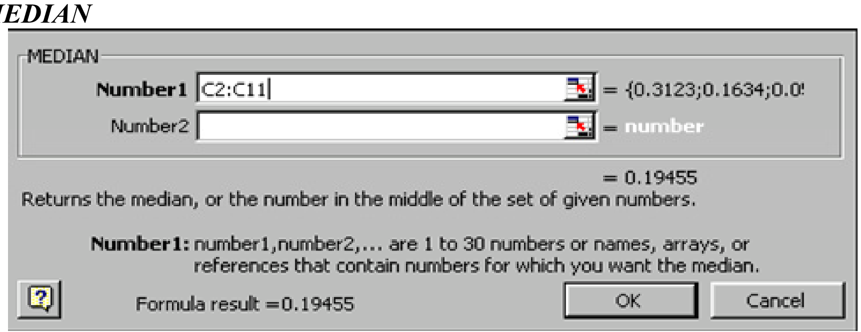
for the Mean (AVERAGE)



Result

17.81%

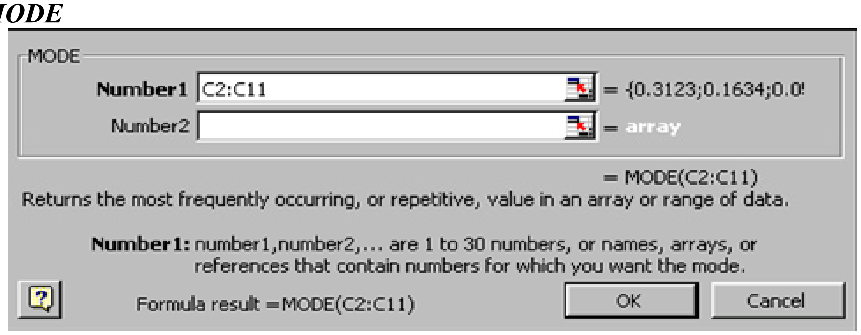
for the MEDIAN



Result

19.46%

for the MODE



Result

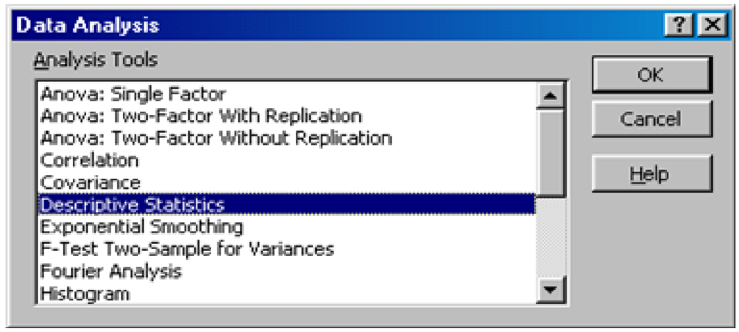
#N/A

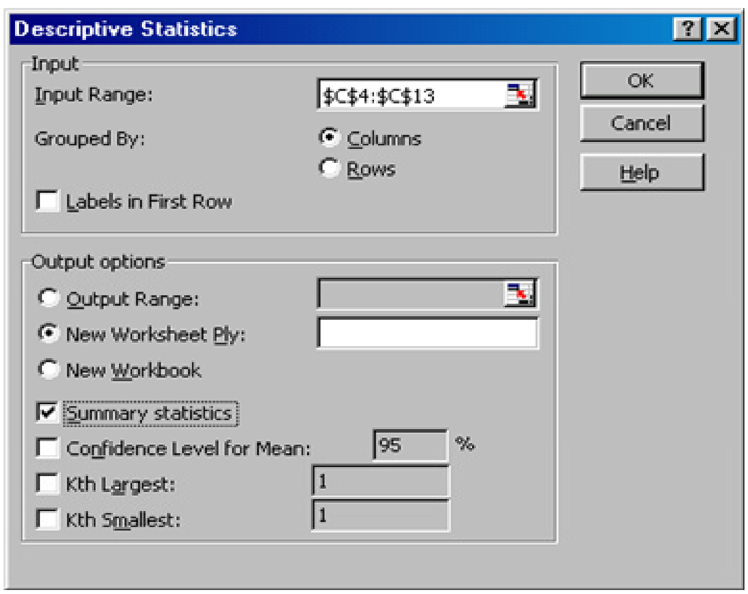
(indicating no mode)

Using Excel's "Tools" -- "Data Analysis" for Section 3, Example 4's Descriptive Statistics

Total Return on the S&P 500

1989	31.23
1988	16.34
1987	5.67
1986	18.54
1985	31.06
1984	5.97
1983	22.31
1982	20.37
1981	(4.85)
1980	31.48





Results

Column1	
Mean	17.812
Standard Error	3.90593
Median	19.455
Mode	#N/A
Standard Deviation	12.35163
Sample Variance	152.5629
Kurtosis	-0.55354
Skewness	-0.566778
Range	36.33
Minimum	-4.85
Maximum	31.48
Sum	178.12
Count	10

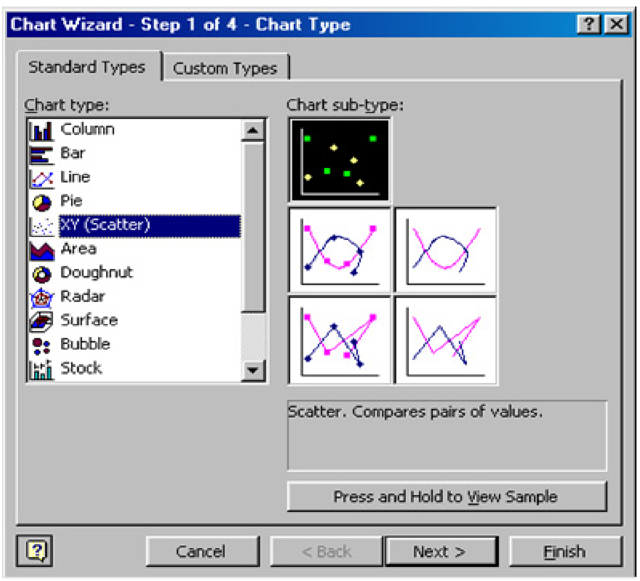
Notes: *(1) Use the "Tools" pull-down menus. If you do not see "Data Analysis" among the options, then select "Add-Ins..." and click on the box to the left of "Analysis ToolPak." You will probably need the original Excel CD and it might take a few seconds while Excel loads the ToolPak.*

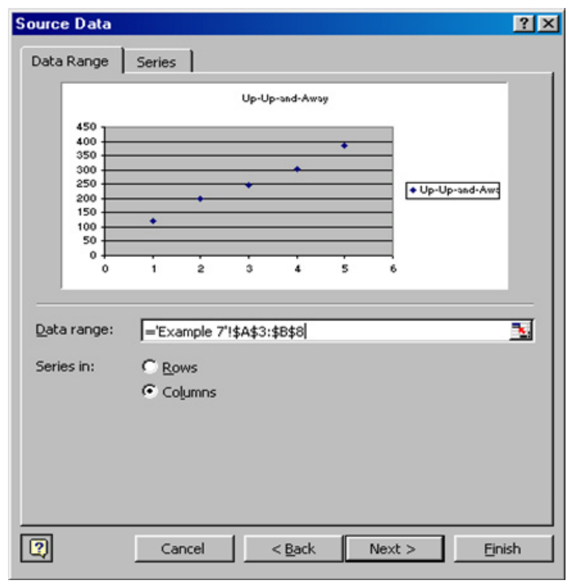
(2) Not all of these descriptive statistics are covered in this session. The ones discussed have been highlighted in the results.

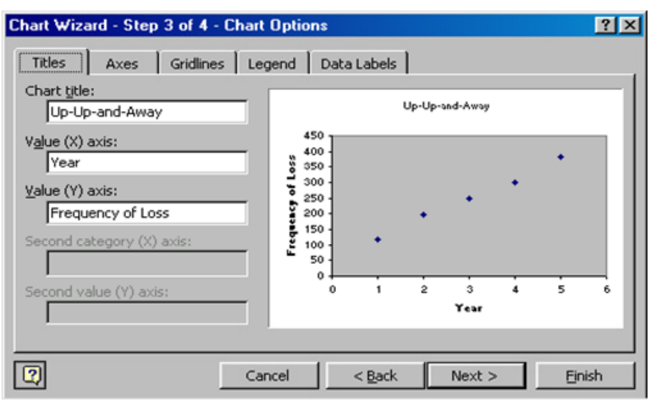
Using Excel's "Chart Wizard" to Graph a Regression for Section 3, Example 7

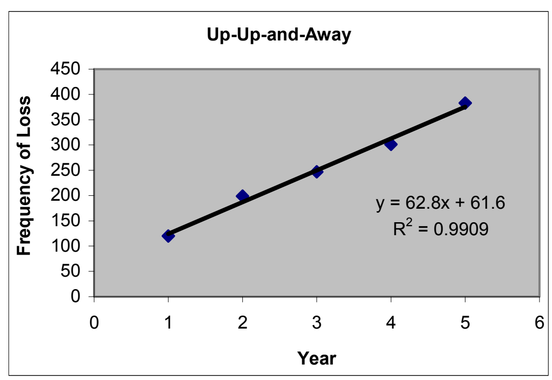
Year	Up-Up-and-Away
1	120
2	199
3	247
4	301
5	383

The "Chart Wizard" icon looks like a 3-dimensional bar chart at the top of the Excel screen. It provides the simplest way to plot Y against X and display a regression trendline. We display a straight line relationship, but you will see that there are nonlinear alternatives.









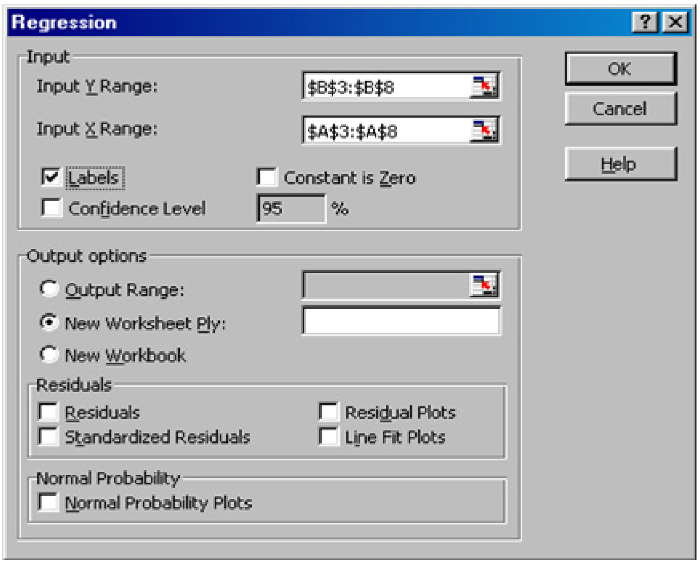
While in Step 3, also remove the check next to "Major Gridlines" under "Gridlines" and "Show Legend" under "Legend." Then click on "Finish." This will give you the graph shown here.

To add the trend line, (1) right-click on any dot and select "Add Trendline..." (2) Under "Options", click on "Display equation on chart" and also on "Display R-squared value on chart". (3) Click OK.

Using Excel's "Tools" -- "Data Analysis" to Perform a Regression for Section 3, Example 7

Year	Up-Up-and-Away
1	120
2	199
3	247
4	301
5	383

Use the "Tools" pull-down menus. If you do not see "Data Analysis" among the options, then select "Add-Ins…" and click on the box to the left of "Analysis ToolPak." You will probably need the original Excel CD and it might take a few seconds while Excel loads the ToolPak.



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.99545
R Square	0.99091
Adjusted R Square	0.98789
Standard Error	10.97877
Observations	5

The "Regression" option of the "Data Analysis" tool prints many statistics beyond the scope of this session. The ones discussed are highlighted in the results to the left and below.

An advantage of the "Regression" option over the "Chart Wizard" is that it allows you to include multiple X-variables as causal influences on Y. The X variables must be in consecutive columns.

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	39438.4	39438.4	327.19912	0.00037
Residual	3	361.6	120.5		
Total	4	39800.0			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	61.60000	11.51463	5.34972	0.01278	24.95528	98.24472
Year	62.80000	3.47179	18.08865	0.00037	51.75120	73.84880

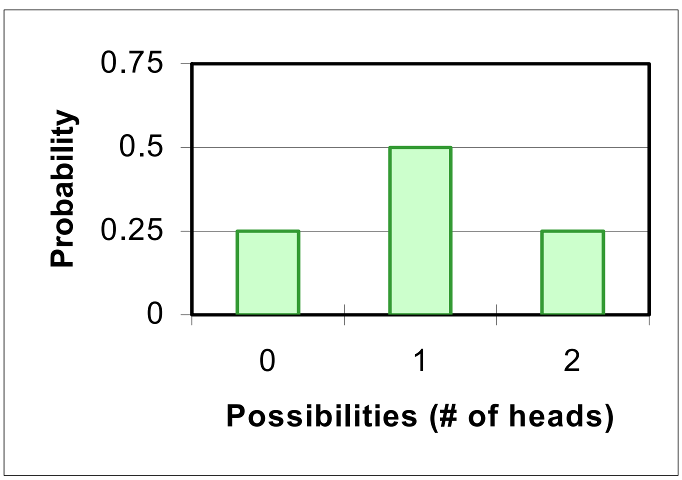
Appendix D: Probability Concepts

<u>Probability</u> is the chance of something occurring, ranging from 0 (an impossibility) to 1.0 (a certainty). Flip a coin, and the probability of heads is one in two, or 1/2, or 0.5, or 50%.

If we flip a coin, the probability of "heads" is .50; if we flip two coins, the probability of heads on each is .25, etc.

outcomes	probability	outcomes	probability
HH	.25	HH	.25
HT	.25	TH or HT	.50
TH	.25	TT	<u>.25</u>
TT	<u>.25</u>		1.00
	1.00		

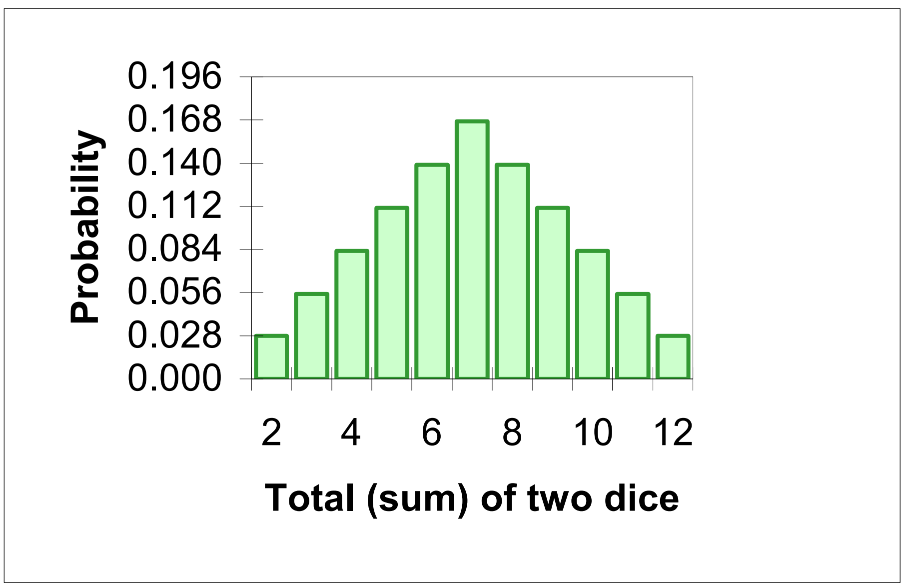
Let us graph these outcomes and their probabilities:



If we do the same thing with two dice: there are 36 possible outcomes from one throw of two dice. As you can see, the possibility of a seven is 6/36 or 1/6 or 0.167.

Numbers Thrown	Dice Total	# of times Occurring	Probability
1-1	2	1	1/36
1-2, 2-1	3	2	2/36
1-3, 2-2, 3-1	4	3	3/36
1-4, 2-3, 3-2, 4-1	5	4	4/36
1-5, 2-4, 3-3, 4-2, 5-1	6	5	5/36
1-6, 2-5, 3-4, 4-3, 5-2, 6-1	7	6	6/36
2-6, 3-5, 4-4, 5-3, 6-2	8	5	5/36
3-6, 4-5, 5-4, 6-3	9	4	4/36
4-6, 5-5, 6-4	10	3	3/36
5-6, 6-5	11	2	2/36
6-6	12	1	1/36
		36	36/36

Graphing the results:



Note that for both examples, the sum of the probabilities of all possible outcomes is 1.0 (e.g. - The chance of either heads OR tails is 0.5 + 0.5 = 1.0, i.e. 100%; all dice probabilities total 36/36.)

Joint probability - The probability of both A and B occurring, i.e. the joint probability of two independent events, is equal to the product of the two. $P_{(A \text{ and } B,\ both)} = P_{(A)} \times P_{(B)}$. So, the chance of two heads (HH) is 1/2 times 1/2 = 1/4 or 0.25. The events (each coin dropping is an event) are independent, that is, the occurrence of one has no effect on the other. Also note 1/4 + 1/4 + 1/4 + 1/4 = 1.0 (all possibilities). Notice HT and TH will look the same when they land, but each is a separate alternative. The probability of either one of these occurring in one toss is 1/4 + 1/4 = 1/2 or .50, a 50% chance.

Example: A shipping line has two “independent” ships. The probability of a total loss to Ship A by exploding is .02, and of Ship B grounding is .04, during a given period of time. What is the probability of these specific losses (A explodes and B runs aground) happening to BOTH ships in that period? This is a joint probability with independent events: $p_{(A \text{ and } B)} = A \times B = .02 \times .04 = .0008$ or 8 in 10,000 chances.

What is the probability A will NOT explode? That B will NOT run aground?

$p_{(not\ A)} = 1.0 - p_{(A)}$; $p_{(not\ A)} = 1.0 - .02 = .98$;
$p_{(not\ B)} = 1.0 - .04 = .96$

What is the probability NEITHER ship will suffer their respective losses (A won’t explode, and B won’t ground) during the same period?

$p_{(not\ A)} \times p_{(not\ B)} = .98 \times .96 = .9408$

Note $p_{(A)} \times p_{(not\ B)} = .02 \times .96 = .0192$ and $p_{(B)} \times p_{(not\ A)} = .98 \times .04 = .0392$;

Now, .0392 + .0192 + .9408 + .0008 = 1.0000; so all possibilities are accounted for.

<u>Alternative probability</u> - The probability any ONE of 2 or more events will occur (but not both or more than one).

Calculations vary depending on whether or not the events are mutually exclusive (can occur during the same period) or not.

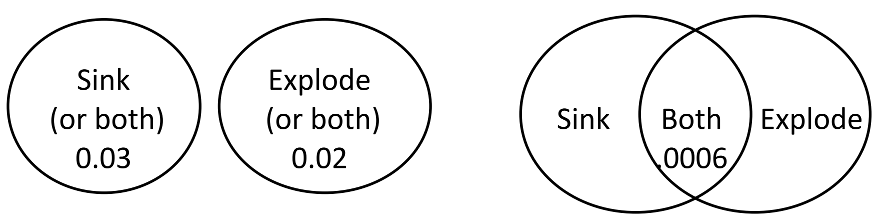
Example: A third Ship C may sink (.03), run aground (.04) or explode (.02).

If the events are <u>mutually exclusive</u>, as in a single coin toss (H or T can occur, not both), the events are additive, as above:

$$p_{(\text{sink or ground, but not both})} = .03 + .04 = .07$$

If the events are <u>not mutually exclusive</u>, as with most real-life situations, calculation of alternative probability must <u>subtract</u> out the JOINT probability to arrive at "either or both" and avoid double counting (Venn Diagrams help illustrate):

$$\begin{aligned} p_{(\text{sink or explode or both})} &= p_{(\text{sink})} + p_{(\text{explode})} - p_{(\text{both})} \\ &= .03 + .02 - (.03 \times .02) \\ &= .05 - .0006 = .0494 \end{aligned}$$



Each of these events has a little overlap that <u>each</u> probability <u>includes</u> (i.e., the chance of <u>both</u> events occurring).

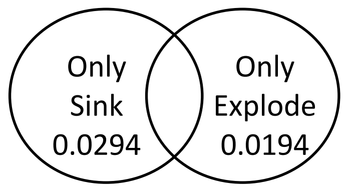
To calculate alternative probability <u>excluding</u> the possibility of both, we subtract the joint probability again:

$$p_{(\text{sink or explode but not both})} = .0494 - .0006 = .0488$$

Another way of looking at it is that

$p_{(\text{sinking but not exploding})}$ = 0.03 – 0.0006 = 0.0294 and
$p_{(\text{exploding but not sinking})}$ = 0.02 – 0.0006 = 0.0194, and

the alternate probability of these two events, the
$p_{(\text{sink but not explode})}$ or $p_{(\text{explode but not sink})}$ = 0.0194 + 0.0294 = 0.0488.



<u>Conditional Probability</u> - When one event may follow from another event, we say the second event has a conditional probability:

Example: The probability of Ship C (having already grounded) then exploding is .15; i.e., $p_{(\text{explode given grounding})} = p_{(e|g)} = .15$

<u>Joint Probability - Dependent Events</u> – The probability of events occurring in a given order is the probability of the first event times the probability of the conditional probability of the event:

$$p_{(\text{ground then explode})} = p_{(g)} \times p_{(e|g)} = .04 \times .15 = .006$$

Appendix E

Jumping Jack ISD
Calculating Standard Deviation
for Developed Claim Count

Year	Developed Claim Count	Mean	Deviation	Squared Deviation
1	179	421	-242	58,564
2	253	421	-168	28,096
3	270	421	-151	22,825
4	287	421	-134	18,018
5	390	421	-31	987
6	449	421	28	768
7	547	421	126	15,967
8	573	421	152	22,952
9	607	421	186	34,492
10	657	421	236	55,644
	4,211			258,314

mean = 4,211 ÷ 10 = 421 (Average expected ultimate claims per year; ultimate or fully developed frequency)

$$S^2 = \frac{258{,}314}{(n-1)} = \frac{258{,}314}{9} = 28{,}702$$

$$S = \sqrt{28{,}702} = 169 \text{ (rounded)}$$

	Range (Rounded)	Approx. Prob.
1 S = ± 169 claims	252 to 590 claims	68.2%
2 S = ± 338 claims	83 to 759 claims	95.4%
3 S = ± 507 claims	-86 to 928 claims	99.7%

Appendix F

Development by Triangulation

Claim Count
Incurred Losses
Payout Pattern

<u>Let us assume that these losses were as of December 31, 'X5.</u>

<u>History of losses for each of the past five years, as of December 31, 'X5.</u>

Year	# Claims	Total Claims	# Emp
'X1	156	125,986	494
'X2	115	469,091	535
'X3	148	386,550	543
'X4	192	291,555	552
'X5	138	357,171	565

Year	# Claims (a)	Frequency Dev. Factor (b)	Developed Frequency (a × b)
'X1	156	1.00	156
'X2	115	1.00	115
'X3	148	1.03	152
'X4	192	1.09	209
'X5	138	1.45	200

Incident to Date Losses as of Dec. 31

Claim Count Development Factors

Policy Year	Months from Inception 12	24	36	48	60
'X1	116	146	154	156	156
'X2	77	106	110	115	
'X3	100	136	148		
'X4	144	192			
'X5	138				

Policy Year	Year-to-Year Development 12-24	24-36	36-48	48-60
'X1	1.26	1.06	1.01	1.00
'X2	1.38	1.03	1.05	
'X3	1.36	1.09		
'X4	1.33			
'X5				
Totals	**5.33**	**3.18**	**2.06**	**1.00**
Averages	**1.33**	**1.06**	**1.03**	**1.00**

Policy Year	Age to Ultimate Development								
1 to 5	1.33	×	1.06	×	1.03	×	1.00	=	1.45
2 to 5	1.06	×	1.03	×	1.00			=	1.09
3 to 5	1.03	×	1.00					=	1.03
4 to 5	1.00							=	1.00
5 and beyond									1.00

* Any adding error due to rounding.

Develop the Dollars (Incurred Losses); Differentiate from Claim Count Development

Incurred Losses Development Factors (in thousands)

Policy	Months from Inception				
Year	**12**	**24**	**36**	**48**	**60**
'X1	$ 47	$ 76	$ 98	$113	$126
'X2	$215	$323	$394	$469	
'X3	$219	$346	$387		
'X4	$173	$292			
'X5	$357				

Policy	Year-to-Year Development			
Year	**12-24**	**24-36**	**36-48**	**48-60**
'X1	1.61	1.29	1.15	1.11
'X2	1.50	1.22	1.19	
'X3	1.58	1.12		
'X4	1.69			
'X5				
Totals	**6.38**	**3.63**	**2.34**	**1.11**
Averages	**1.60**	**1.21**	**1.17**	**1.11**

Policy Year	Age to Ultimate Development								
1 to 5	1.60	×	1.21	×	1.17	×	1.11	=	2.51
2 to 5	1.21	×	1.17	×	1.11			=	1.57
3 to 5	1.17	×	1.11					=	1.30
4 to 5	1.11							=	1.11
5 and beyond									1.00

Year	Total Incurred	Dev. Factors	Ultimate Total Loss
'X1	$ 125,986	1.00	$ 125,986
'X2	$ 469,091	1.11	$ 520,691
'X3	$ 386,550	1.30	$ 502,012
'X4	$ 291,555	1.57	$ 458,157
'X5	$ 357,171	2.51	$ 895,223

Please Note: Development Factors and Ultimate Total Loss were calculated on an Excel spreadsheet using the unrounded numbers. Any discrepancies here are

Calculate Average Severity using Developed Incurred Losses and Developed Claim Count for each Year

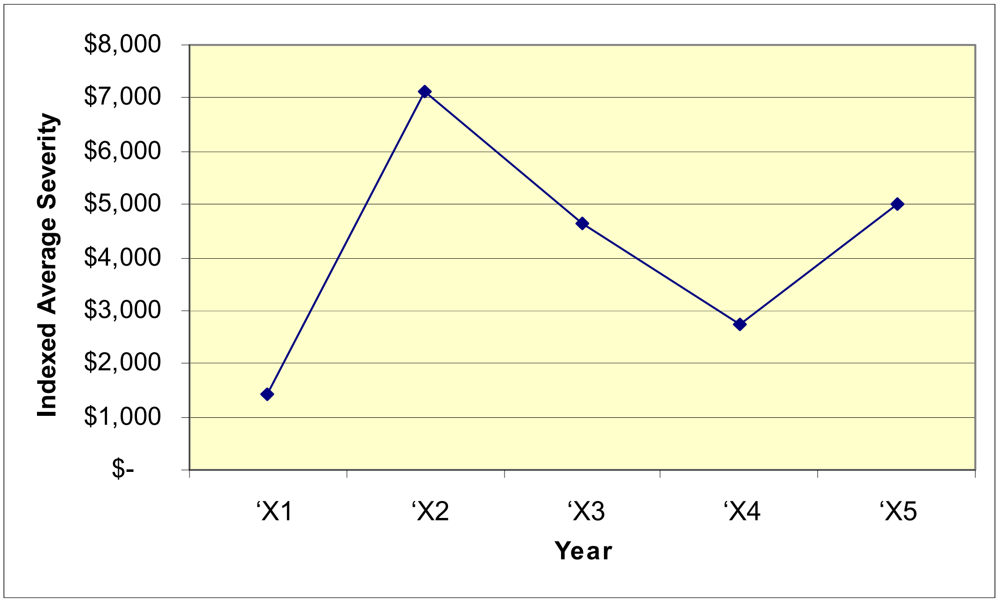
Year	Total Incurred ($) (a)	Development Factor (b)	Ultimate Total Loss (a × b) (c)	Developed Clm Count (#) (d)	Average Severity (c ÷ d) (e)
'X1	$ 125,986	1.00	$ 125,986	156	$ 808
'X2	$ 469,091	1.11	$ 520,691	115	$ 4,528
'X3	$ 386,550	1.30	$ 502,012	152	$ 3,293
'X4	$ 291,555	1.57	$ 458,157	209	$ 2,189
'X5	$ 357,171	2.51	$ 895,223	200	$ 4,474

Indexing Average Severity for Inflation

Year	Average Severity	Inflation Index	Indexed Average Severity
'X1	$ 808	1.762	$ 1,423
'X2	$ 4,528	1.574	$ 7,127
'X3	$ 3,293	1.405	$ 4,627
'X4	$ 2,189	1.254	$ 2,745
'X5	$ 4,474	1.120	$ 5,011

Please Note: Indexed Average Severity was calculated on an Excel spreadsheet using the unrounded numbers. Any discrepancies here are due to rounding.

Plot or Regress Indexed Average Severities to Forecast Future Average Severity



What is a reasonable estimate of average severity for 'X6?

Trending by regression will not be useful because the r^2 = 0.040 and that is TOO LOW to be reliable

The mean average severity is $20,933 ÷ 5 = $4,187, however.

Calculate a Point Estimate of Future Losses

Forecast Claim Count × Forecast Average Severity = Point Estimate of Losses

(next year)

227 × $4,187 = $ 950,449 (eyeball)

182 × $4,187 = $ 762,034 (average)

(i.e. the "loss pick")

Calculate an Interval Estimate of Future Losses using Intervals from Standard Deviations of Claim Count (or error estimates from regression; projected severity can have intervals as well, perhaps using high and low historical averages).

Intervals		
low 106	$4,187	$ 443,822
high 257	$4,187	$1,076,059

The claim count interval represents the 95% confidence interval (106 to 257 claims). The $4,187 is the forecast of the indexed average severity from previous calculation.

Note: Since incurred amount of individual losses is not distributed normally, it is not actually statistically valid to pick low and high intervals of equal size; this is shown only to illustrate the desirability of considering intervals.

Payout Patterns - More Important to Casualty than Property

Determining Payout Patterns using Triangulation

Payout Pattern Development Factors (in thousands)

Policy Year	Months from Inception 12	24	36	48	60
'X1	$ 15	$ 41	$ 47	$ 67	$ 75
'X2	140	234	304	469	
'X3	93	186	205		
'X4	63	141			
'X5	143				

Policy Year	Year-to-Year Development 12-24	24-36	36-48	48-60
'X1	2.73	1.15	1.43	1.12
'X2	1.67	1.30	1.54	
'X3	2.00	1.10		
'X4	2.24			
'X5				
Totals	**8.64**	**3.55**	**2.97**	**1.12**
Averages	**2.16**	**1.18**	**1.48**	**1.12**

Policy Year	Age to Ultimate Development									(% Ult. Payout)
1 to 5	2.16	×	1.18	×	1.48	×	1.12	=	4.25	24%
2 to 5	1.18	×	1.48	×	1.12			=	1.96	51%
3 to 5	1.48	×	1.12					=	1.66	60%
4 to 5	1.12							=	1.12	89%
5 and beyond									1.00	100%

Appendix G: WACC EXAMPLE

WEIGHTED AVERAGE COST OF CAPITAL: Given the following information about the AJAX Co.

Debt: The company is contemplating issuing $10 million worth of 20 year 8% coupon bonds. The bonds will sell at face value, and the underwriter's fee for floating the bond issue is 2% of the face value per bond.

Preferred Stock: The company is contemplating issuance of a 9% P.S. that is expected to sell for $85 per share. The cost of issuing and marketing the stock is expected to be $3 per share.

Common Stock: The current market price of the firm's common stock is $50 per share. The firm expects to use a dividend of $4 at the end of the coming year (Year 7). Year 6's dividend was $3.60 and Year 1's was $2.50. Any new stock could be sold at face value, but the firm would have to pay $2 per share underwriting costs.

Balance Sheet:	Source of Capital	Market Value
	Long term debt	15,000,000
	Preferred stock	15,000,000
	Common stock	32,000,000
	Retained earnings	8,000,000
	TOTALS	70,000,000

NOTE: The firm's tax rate is 34%.

WACC Definition: After-tax cost to the firm of an average dollar of capital or long term funds. Capital consists of four components:

- LTD (Long Term Debt)
- PS (Preferred Stock)
- CS (Common Stock – new issues)
- R/E (Retained Earnings)

Calculation the A/T cost of the 4 capital components is calculated, multiplied by a weighting system and summed up

$$
\begin{array}{rl}
 & K_D \times WT \\
+ & K_{PS} \times WT \\
+ & K_{CS} \times WT \\
+ & K_{RE} \times WT \\
\hline
= & WACC
\end{array}
$$

For AJAX Co. assume:

$$
\begin{array}{rlll}
 & K_D & = 8.205\% \times (1 - t) & = \text{A/T Cost} \\
 & & = 8.205\% \times .66 & = \mathbf{5.4153\%} \\
+ & K_{PS} & = \mathbf{9.329\%} & \\
+ & K_{CS} & = \mathbf{15.8983\%} & \\
+ & K_{RE} & = \mathbf{15.565\%} &
\end{array}
$$

WACC – MARKET VALUE WEIGHTS (MV)

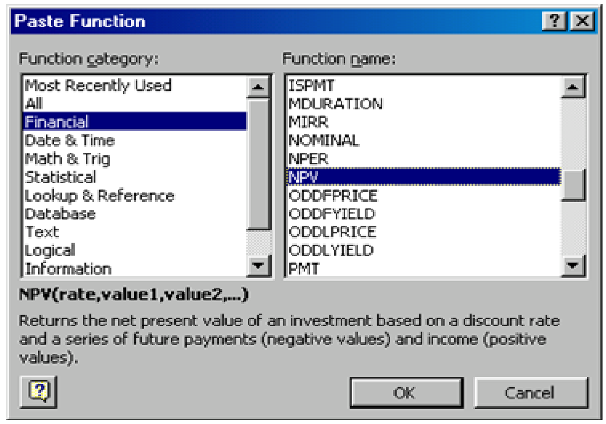
	COST	×	WEIGHT		
K_D	5.4153		15/70 or (.21428)	=	1.16039
K_{PS}	9.329		15/70 or (.21428)	=	1.9990
K_{RE}	15.565		8/70 or (.11429)	=	1.7789
K_{CS}	15.8983		32/70 or (.45714)	=	7.2679
					Σ 12.2062%

Appendix H: Using Excel for Cash Discounting

Using Excel's "Paste Function" (*fx*) for Section 5's First NPV, B/C, IRR Example

	Year	A	B
Investment Outflow	0	(100)	(200)
Cash Inflows	1	10	140
	2	60	100
	3	80	40

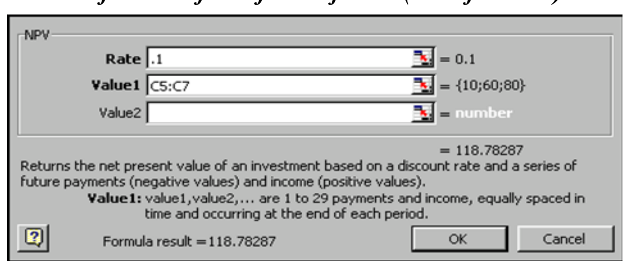
If you do not see either the NPV or IRR functions under the "Financial" category, then select "Add-Ins..." and click on the box to the left of "Analysis ToolPak." You will probably need the original Excel CD and it might take a few seconds while Excel loads the ToolPak.



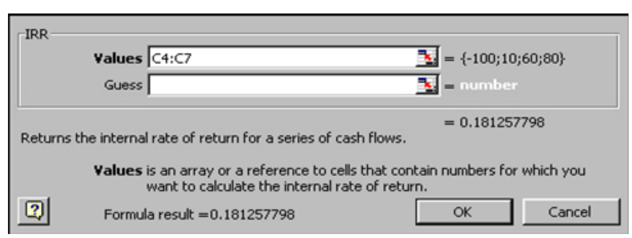
	A	B
PV of Cash Inflows (from NPV function)	**$118.78**	**$239.97**
NPV (sum of Outflow & PV)	**$18.78**	**$39.97**
Benefit-to-Cost Ratio (ratio of PV to Outflow)	**1.1878287**	**1.199849737**

(These values do not match those in the text because of rounding differences.)

PV of Cash Inflows for Project A (NPV function)



IRR for Project A (IRR function)



	A	B
Internal Rate of Return (from IRR function)	**18.126%**	**23.564%**