

CNP 553 - IT for PM

PART II ESSENTIAL SOFTWARE PACKAGES FOR CONST. PROJECT MANAGEMENT

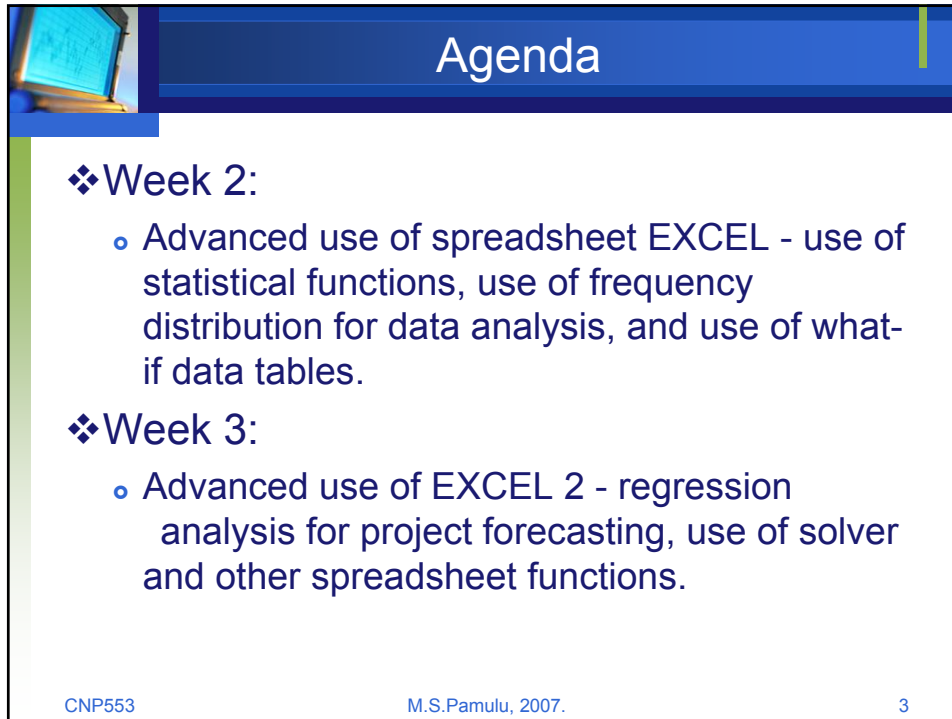
QUT Queensland University of Technology
Brisbane Australia

Agenda

Part II

WEEK 2 WEEK 3 WEEK 3 WEEK 4

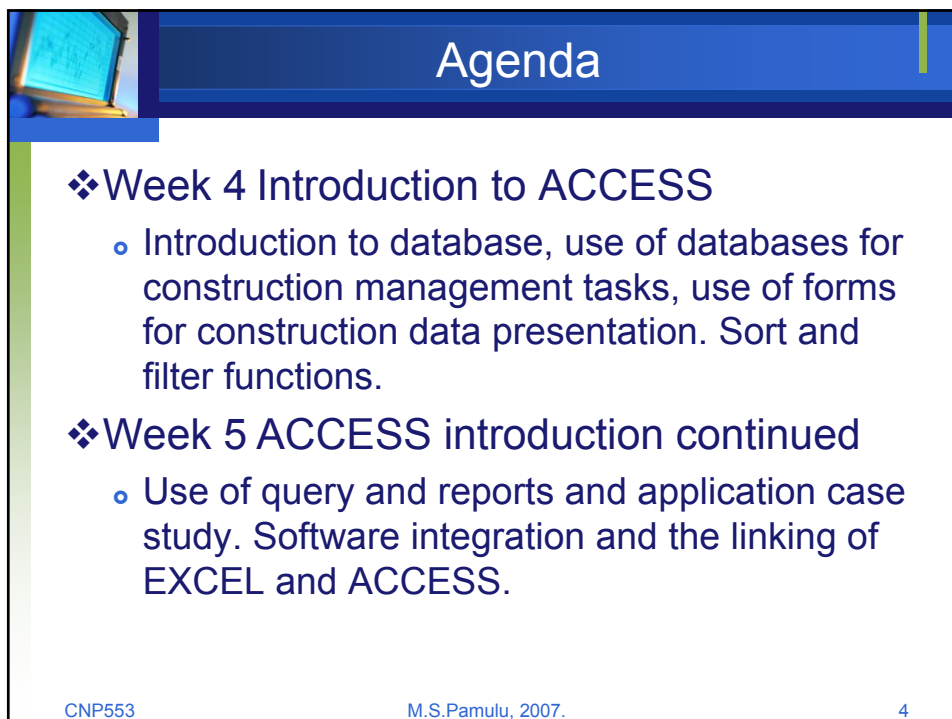
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Agenda

- ❖ Week 2:
 - Advanced use of spreadsheet EXCEL - use of statistical functions, use of frequency distribution for data analysis, and use of what-if data tables.
- ❖ Week 3:
 - Advanced use of EXCEL 2 - regression analysis for project forecasting, use of solver and other spreadsheet functions.


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Agenda

- ❖ Week 4 Introduction to ACCESS
 - Introduction to database, use of databases for construction management tasks, use of forms for construction data presentation. Sort and filter functions.
- ❖ Week 5 ACCESS introduction continued
 - Use of query and reports and application case study. Software integration and the linking of EXCEL and ACCESS.


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Agenda – Excel I

1. Use of statistical functions
2. Use of frequency distribution
3. Use of what-if data tables

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Statistics Review

❖ A **statistic** is a summary measure computed from a sample to describe a characteristic of the population

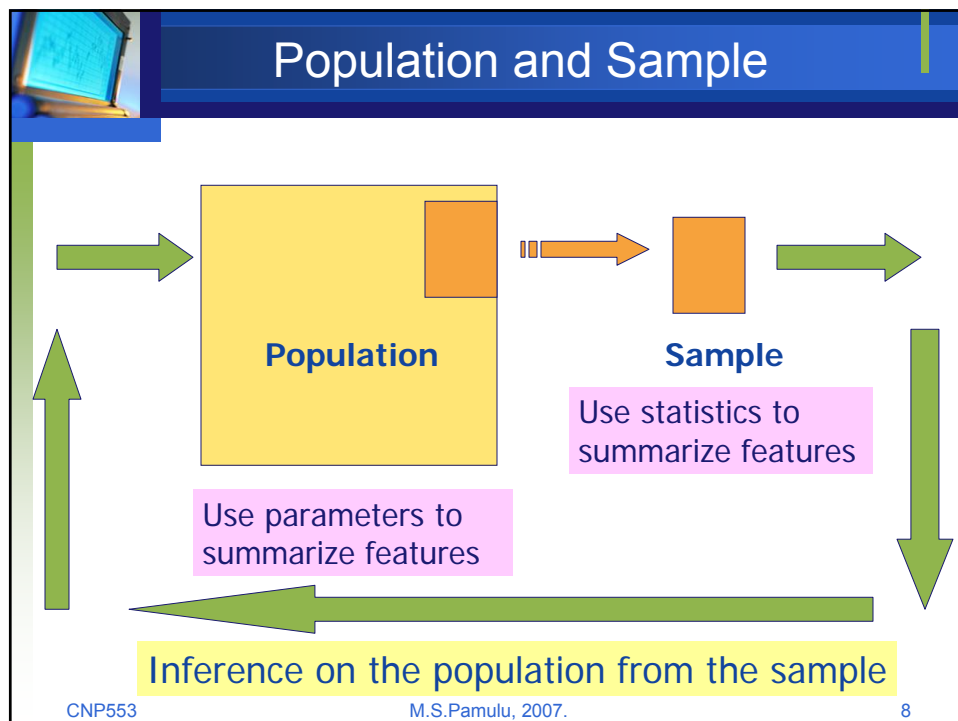
Statistics is the science of collecting, organizing, presenting, analyzing, and interpreting numerical data to assist in making more effective decisions.

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Key Definitions

- ❖ A **population** (universe) is the collection of all items or things under consideration
- ❖ A **sample** is a portion of the population selected for analysis
- ❖ A **parameter** is a summary measure that describes a characteristic of the population

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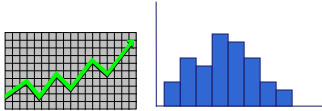


Statistical Methods

- ❖ **Descriptive statistics**
 - Collecting, summarizing, and describing data
- ❖ **Inferential statistics**
 - Drawing conclusions and/or making decisions concerning a population based only on sample data

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Descriptive Statistics

- ❖ **Collect data**
 - e.g., Survey 
- ❖ **Present data**
 - e.g., Tables and graphs 
- ❖ **Characterize data**
 - e.g., Sample mean = $\frac{\sum X_i}{n}$

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Descriptive Statistics

- ❖ Elements of Descriptive Statistical Problems
 - population/sample of interest
 - investigative variables
 - numerical summary tools (charts, graphs, tables)
 - pattern identification in data

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Inferential Statistics

- ❖ Estimation
 - e.g., Estimate the population mean weight using the sample mean weight
- ❖ Hypothesis testing
 - e.g., Test the claim that the population mean weight is 120 pounds



Drawing conclusions and/or making decisions concerning a population based on sample results.


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Inferential Statistics

- ❖ Elements of Inferential Statistical Problems
 - population of interest
 - investigative variables
 - sample taken from population
 - inference about population based on sample data
 - Reliability measure for the inference

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Statistics Review

- ❖ Why a Manager Needs to Know About Statistics?
 - To Know How to Properly Present Information
 - To Know How to Draw Conclusions about Populations Based on Sample Information
 - To Know How to Improve Processes
 - To Know How to Obtain Reliable Forecasts

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Application Areas

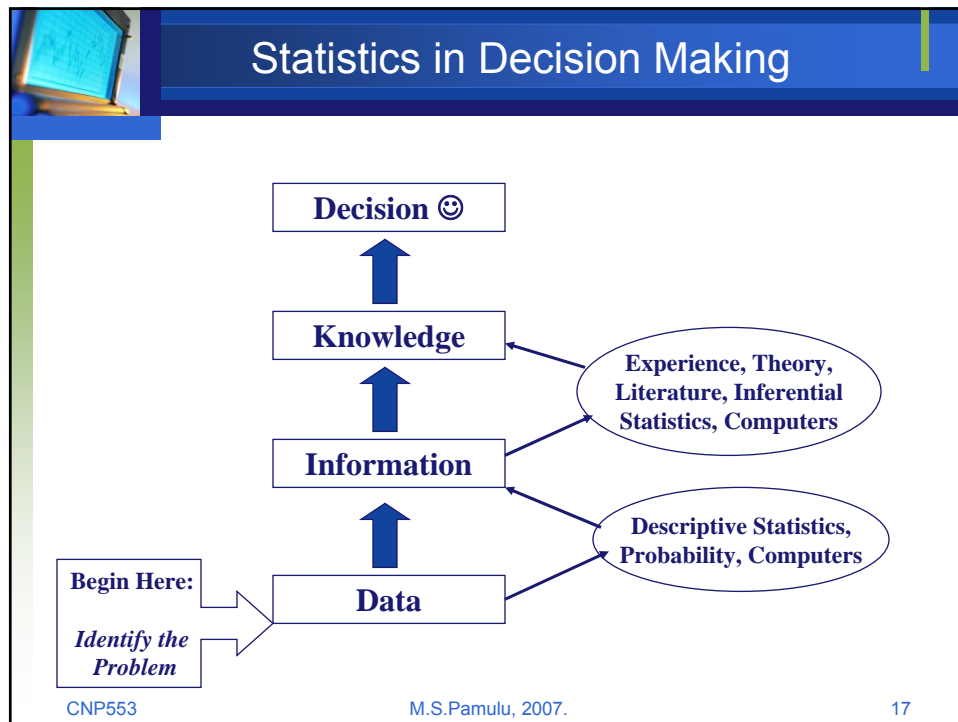
<ul style="list-style-type: none"> ❖ Economics <ul style="list-style-type: none"> ◦ Forecasting ◦ Demographics 	<ul style="list-style-type: none"> ❖ Engineering <ul style="list-style-type: none"> ◦ Construction ◦ Materials
<ul style="list-style-type: none"> ❖ Sports <ul style="list-style-type: none"> ◦ Individual & Team Performance 	<ul style="list-style-type: none"> ❖ Business <ul style="list-style-type: none"> ◦ Consumer Preferences ◦ Financial Trends

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Statistics in Decision Making


- ❖ Statistical literacy is necessary today to make informed decisions at work
- ❖ Requires statistical thinking to critically assess data and the inferences drawn from it

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Statistical Software Packages

- ❖ **Typical Software**
 - SPSS
 - MINITAB
 - MS-EXCEL
- ❖ **Need Statistical Understanding**
 - Assumptions
 - Limitations




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Why Excel?

- ❖ The EXCEL software was chosen because of the combination of its power and ease with which we can learn to use it.
- ❖ Also, since the EXCEL software comes loaded on most new computers, it is important to have some hands-on experience with it since the software may be used in our work environment.

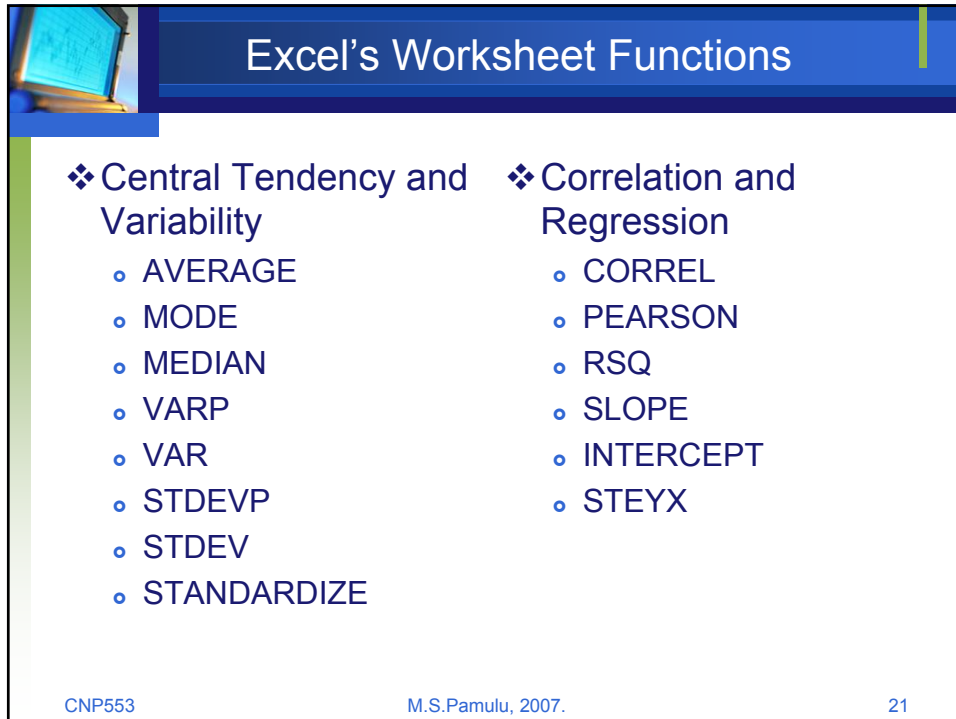
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Statistics in Excel

- ❖ Excel's statistical features are built into its
 - Worksheet functions
 - Array functions
 - Data Analysis tools
- ❖ Excel Statistical functions calculate all the standard measures.

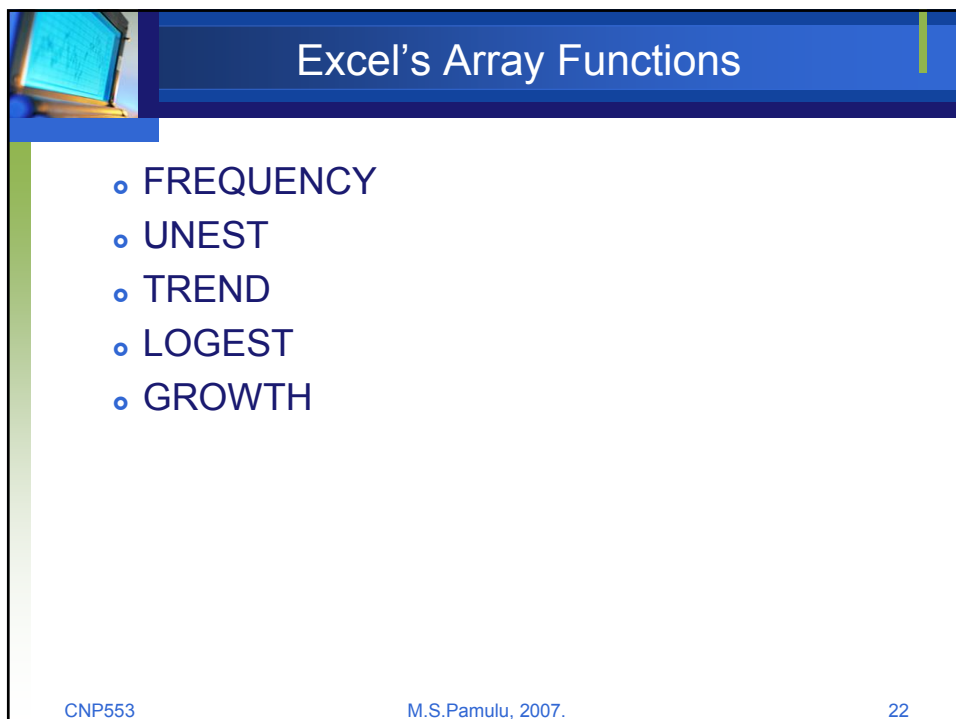
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Excel's Worksheet Functions

- ❖ Central Tendency and Variability
 - AVERAGE
 - MODE
 - MEDIAN
 - VARP
 - VAR
 - STDEVP
 - STDEV
 - STANDARDIZE
- ❖ Correlation and Regression
 - CORREL
 - PEARSON
 - RSQ
 - SLOPE
 - INTERCEPT
 - STEYX

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Excel's Array Functions

- FREQUENCY
- UNEST
- TREND
- LOGEST
- GROWTH

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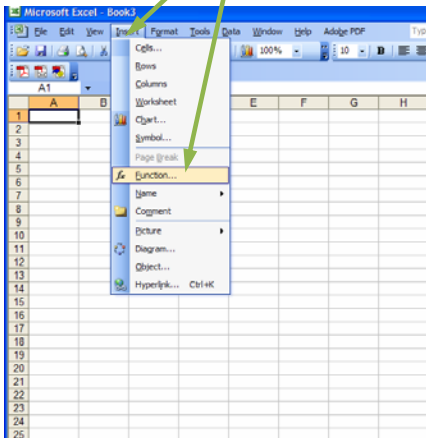
Excel's Data Analysis Tools

- ❖ ANOVA-Single
- ❖ ANOVA-Two Factors
- ❖ CORRELATION
- ❖ COVARIANCE
- ❖ DESCRIPTIVE STATISTICS
- ❖ F-TEST
- ❖ HISTOGRAM
- ❖ MOVING AVERAGE
- ❖ RANDOM NUMBER GENERATION
- ❖ RANK PERCENTILE
- ❖ REGRESSION
- ❖ SAMPLING
- ❖ T-TEST
- ❖ Z-TEST

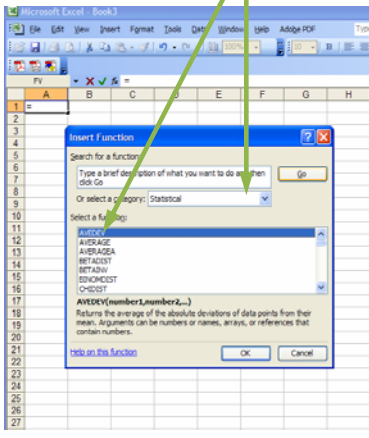
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80 Statistical Functions


Insert Function Button



80 Functions




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Using Functions versus Formulas

- ❖ In general, use functions instead of formulas
 - Functions are adjusted as rows or columns are deleted or added within the range referenced by the function
 - With formulas
 - Adding a row adjusts the cell references in the formula, but does not include the new row in the formula
 - Deleting a row causes a #REF error message


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80 Statistical Functions

- ❖ AVEDEV Returns the average of the absolute deviations of data points from their mean
- ❖ AVERAGE Returns the average of its arguments
- ❖ AVERAGEA Returns the average of its arguments, including numbers, text, and logical values
- ❖ BETADIST Returns the beta cumulative distribution function
- ❖ BETAINV Returns the inverse of the cumulative distribution function for a specified beta distribution
- ❖ BINOMDIST Returns the individual term binomial distribution probability
- ❖ CHIDIST Returns the one-tailed probability of the chi-squared distribution
- ❖ CHIINV Returns the inverse of the one-tailed probability of the chi-squared


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80 Statistical Functions

- ❖ **CHITEST** Returns the test for independence
- ❖ **CONFIDENCE** Returns the confidence interval for a population mean
- ❖ **CORREL** Returns the correlation coefficient between two data sets
- ❖ **COUNT** Counts how many numbers are in the list of arguments
- ❖ **COUNTA** Counts how many values are in the list of arguments
- ❖ **COUNTBLANK** Counts the number of blank cells within a range
- ❖ **COUNTIF** Counts the number of nonblank cells within a range that meet the given criteria
- ❖ **COVAR** Returns covariance, the average of the products of paired deviations
- ❖ **CRITBINOM** Returns the smallest value for which the cumulative binomial distribution is less than or equal to a criterion value


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80 Statistical Functions

- ❖ **DEVSQ** Returns the sum of squares of deviations
- ❖ **EXPONDIST** Returns the exponential distribution
- ❖ **FDIST** Returns the F probability distribution
- ❖ **FINV** Returns the inverse of the F probability distribution
- ❖ **FISHER** Returns the Fisher transformation
- ❖ **FISHERINV** Returns the inverse of the Fisher transformation
- ❖ **FORECAST** Returns a value along a linear trend
- ❖ **FREQUENCY** Returns a frequency distribution as a vertical array
- ❖ **FTEST** Returns the result of an F-test
- ❖ **GAMMADIST** Returns the gamma distribution


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80 Statistical Functions

- ❖ GAMMAINV Returns the inverse of the gamma cumulative distribution
- ❖ GAMMALN Returns the natural logarithm of the gamma function, $\Gamma(x)$
- ❖ GEOMEAN Returns the geometric mean
- ❖ GROWTH Returns values along an exponential trend
- ❖ HARMEAN Returns the harmonic mean
- ❖ HYPGEOMDIST Returns the hypergeometric distribution
- ❖ INTERCEPT Returns the intercept of the linear regression line
- ❖ KURT Returns the kurtosis of a data set
- ❖ LARGE Returns the k-th largest value in a data set
- ❖ LINEST Returns the parameters of a linear trend


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80 Statistical Functions

- ❖ LOGEST Returns the parameters of an exponential trend
- ❖ LOGINV Returns the inverse of the lognormal distribution
- ❖ LOGNORMDIST Returns the cumulative lognormal distribution
- ❖ MAX Returns the maximum value in a list of arguments
- ❖ MAXA Returns the maximum value in a list of arguments, including numbers, text, and logical values
- ❖ MEDIAN Returns the median of the given numbers
- ❖ MIN Returns the minimum value in a list of arguments
- ❖ MINA Returns the smallest value in a list of arguments, including numbers, text, and logical values


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80 Statistical Functions

- ❖ **MODE** Returns the most common value in a data set
- ❖ **NEGBINOMDIST** Returns the negative binomial distribution
- ❖ **NORMDIST** Returns the normal cumulative distribution
- ❖ **NORMINV** Returns the inverse of the normal cumulative distribution
- ❖ **NORMSDIST** Returns the standard normal cumulative distribution
- ❖ **NORMSINV** Returns the inverse of the standard normal cumulative distribution
- ❖ **PEARSON** Returns the Pearson product moment correlation coefficient
- ❖ **PERCENTILE** Returns the k-th percentile of values in a range
- ❖ **PERCENTRANK** Returns the percentage rank of a value in a data set


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80 Statistical Functions

- ❖ **PERMUT** Returns the number of permutations for a given number of objects
- ❖ **POISSON** Returns the Poisson distribution
- ❖ **PROB** Returns the probability that values in a range are between two limits
- ❖ **QUARTILE** Returns the quartile of a data set
- ❖ **RANK** Returns the rank of a number in a list of numbers
- ❖ **RSQ** Returns the square of the Pearson product moment correlation coefficient
- ❖ **SKEW** Returns the skewness of a distribution
- ❖ **SLOPE** Returns the slope of the linear regression line
- ❖ **SMALL** Returns the k-th smallest value in a data set
- ❖ **STANDARDIZE** Returns a normalized value


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80 Statistical Functions

- ❖ **STDEV** Estimates standard deviation based on a sample
- ❖ **STDEVA** Estimates standard deviation based on a sample, including numbers, text, and logical values
- ❖ **STDEVP** Calculates standard deviation based on the entire population
- ❖ **STDEVPA** Calculates standard deviation based on the entire population, including numbers, text, and logical values
- ❖ **STEYX** Returns the standard error of the predicted y-value for each x in the regression
- ❖ **TDIST** Returns the Student's t-distribution
- ❖ **TINV** Returns the inverse of the Student's t-distribution
- ❖ **TREND** Returns values along a linear trend
- ❖ **TRIMMEAN** Returns the mean of the interior of a data set


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80 Statistical Functions

- ❖ **TTEST** Returns the probability associated with a Student's t-test
- ❖ **VAR** Estimates variance based on a sample
- ❖ **VARA** Estimates variance based on a sample, including numbers, text, and logical values
- ❖ **VARP** Calculates variance based on the entire population
- ❖ **VARPA** Calculates variance based on the entire population, including numbers, text, and logical values
- ❖ **WEIBULL** Returns the Weibull distribution
- ❖ **ZTEST** Returns the one-tailed probability-value of a z-test


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16 Data Analysis

1. ANOVA-Single Factors
Analysis of variance for two or more samples
2. ANOVA-Two factor with replication
3. ANOVA-Two factor without replication
4. Correlation
5. Descriptive Statistics
6. Exponential Smoothing
7. Exponential Smoothing
8. F-Test: Two sample for variance
9. Histogram
10. Moving Average
11. Random Number Generation
12. Rank & Percentile
13. Regression
14. Sampling
15. T-Test: Two sample
16. Z-Test: Two sample for Means

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Using Microsoft Excel

- ❖ Descriptive Statistics can be obtained from Microsoft® Excel
 - Use menu choice:
tools / data analysis / descriptive statistics
 - Enter details in dialog box

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Descriptive Statistics Example

Use menu choice:
tools / data analysis /
descriptive statistics

Workgroup	Group Leader	Defects	Units	% Defective
A	Hammond	8	969	0.8%
B	Brimson	4	816	0.5%
C	Reilly	14	1,625	0.9%
D	Richardson	3	1,453	0.2%
E	Durbin	9	767	1.2%
F	O'Donoghue	10	1,024	1.0%
G	Voyatzis	15	1,256	1.2%
H	Granick	8	782	1.0%
I	Aster	13	999	1.3%
J	Shore	9	1,172	0.8%
K	Fox	0	936	0.0%
L	Bolter	7	1,109	0.6%
M	Renaud	8	1,022	0.8%
N	Ibbitson	6	812	0.7%
O	Harper	11	978	1.1%
P	Ferry	5	1,183	0.4%
Q	Richens	7	961	0.7%
R	Munson	12	690	1.7%
S	Little	10	1,105	0.9%
T	Jones	19	1,309	1.5%

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Using Excel

(continued)

- ❖ Enter dialog box details
- ❖ Check box for summary statistics
- ❖ Click OK

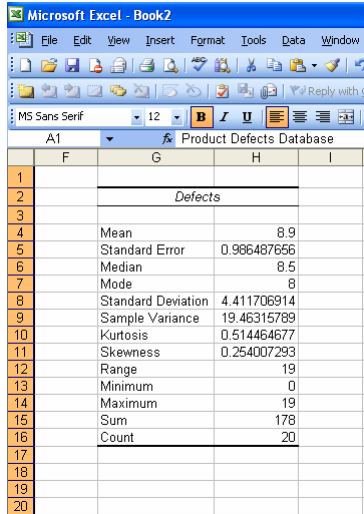
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S	Little	10	1,105
T	Jones	19	1,309

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Excel output

Microsoft Excel
descriptive statistics output,
using the product defect data:

Workgroup	Group Leader	Defects	Units
A	Hammond	8	969
B	Brimson	4	816
C	Reilly	14	1,625
D	Richardson	3	1,453
E	Durbin	9	767
F	O'Donoghue	10	1,024
G	Voyatzis	15	1,256
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I	Aster	13	999
J	Shore	9	1,172
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Summary Descriptive Measures

Describing Data Numerically

Central Tendency

Quartiles

Variation

Shape

- Arithmetic Mean
- Median
- Mode
- Geometric Mean

- Range
- Interquartile Range
- Variance
- Standard Deviation
- Coefficient of Variation

- Skewness

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Descriptive Statistics Example

- ❖ In Excel, we calculate the mean using the AVERAGE() function

=AVERAGE(C3:C22)

Microsoft Excel - Book2

File Edit View Insert Format Tools Data Window Help

Formula Bar: =AVERAGE(C3:C22)

1	A	B	C	D	E
2	Product Defects Database				
3	Workgroup	Group Leader	Defects	Units	% Defective
4	A	Hammond	8	969	0.8%
5	B	Brimson	4	816	0.5%
6	C	Reilly	14	1,625	0.9%
7	D	Richardson	3	1,453	0.2%
8	E	Durbin	9	767	1.2%
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22	S	Little	10	1,105	0.9%
23	T	Jones	19	1,309	1.5%
24			=AVERAGE(C3:C22)		
25					

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Using Functions versus Formulas

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Frequency Distributions

What is a Frequency Distribution?

- ❖ A frequency distribution is a **list or a table** ...
- ❖ containing **class groupings** (categories or ranges within which the data falls) ...
- ❖ and the **corresponding frequencies** with which data falls within each grouping or category

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Types of Data

```

graph TD
    Data[Data] --> Categorical[Categorical]
    Data --> Numerical[Numerical]
    Numerical --> Discrete[Discrete]
    Numerical --> Continuous[Continuous]
  
```

Tabulating Numerical Data:
Frequency Distributions

Categorical

Examples:

- Marital Status
- Political Party
- Eye Color

(Defined categories)

Discrete

Examples:

- Number of Children
- Defects per hour

(Counted items)


Continuous

Examples:

- Weight
- Voltage

(Measured characteristics)


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Why Use Frequency Distributions?

- ❖ A frequency distribution is a way to summarize data
- ❖ The distribution condenses the raw data into a more useful form...
- ❖ and allows for a quick visual interpretation of the data

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Class Intervals and Class Boundaries

- ❖ Each class grouping has the same width
- ❖ Determine the width of each interval by

$$\text{Width of interval} \cong \frac{\text{range}}{\text{number of desired class groupings}}$$

- ❖ Use at least 5 but no more than 15 groupings
- ❖ Class boundaries never overlap
- ❖ Round up the interval width to get desirable endpoints

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Frequency Distribution Example

Example: A manufacturer of insulation randomly selects 20 winter days and records the **daily high temperature**

24, 35, 17, 21, 24, 37, 26, 46, 58, 30, 32, 13, 12, 38, 41, 43, 44, 27, 53, 27

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Frequency Distribution Example

(continued)

- ❖ **Sort raw data in ascending order:**
12, 13, 17, 21, 24, 24, 26, 27, 27, 30, 32, 35, 37, 38, 41, 43, 44, 46, 53, 58
- ❖ Find range: **$58 - 12 = 46$**
- ❖ Select number of classes: **5 (usually between 5 and 15)**
- ❖ Compute class interval (width): **10 (46/5 then round up)**
- ❖ Determine class boundaries (limits): **10, 20, 30, 40, 50, 60**
- ❖ Compute class midpoints: **15, 25, 35, 45, 55**
- ❖ Count observations & assign to classes

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Frequency Distribution Example

(continued)

Data in ordered array:
12, 13, 17, 21, 24, 24, 26, 27, 27, 30, 32, 35, 37, 38, 41, 43, 44, 46, 53, 58

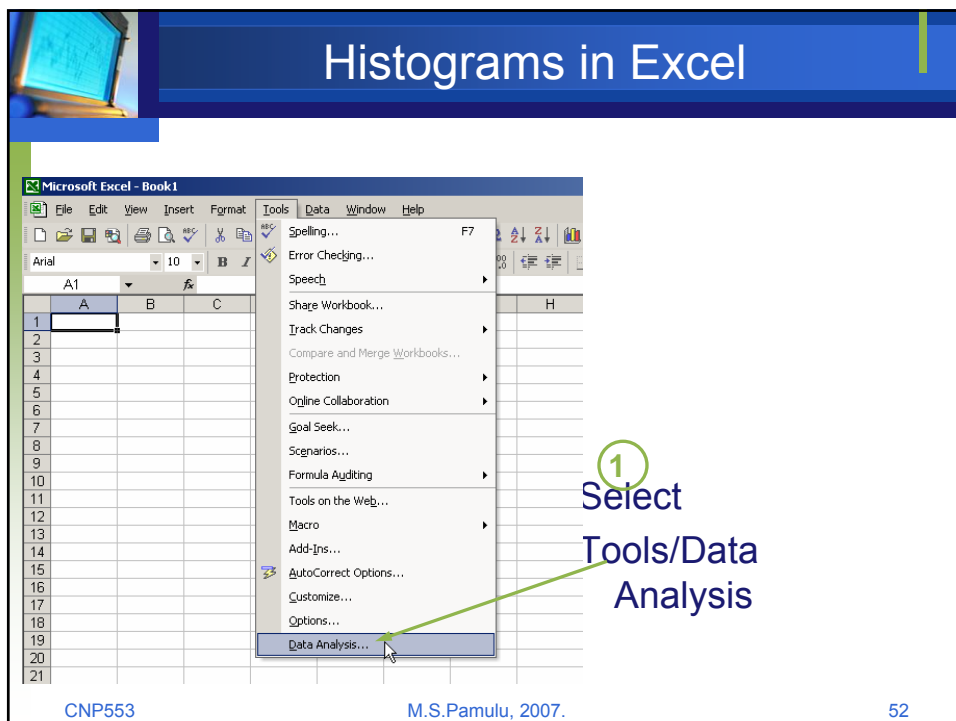
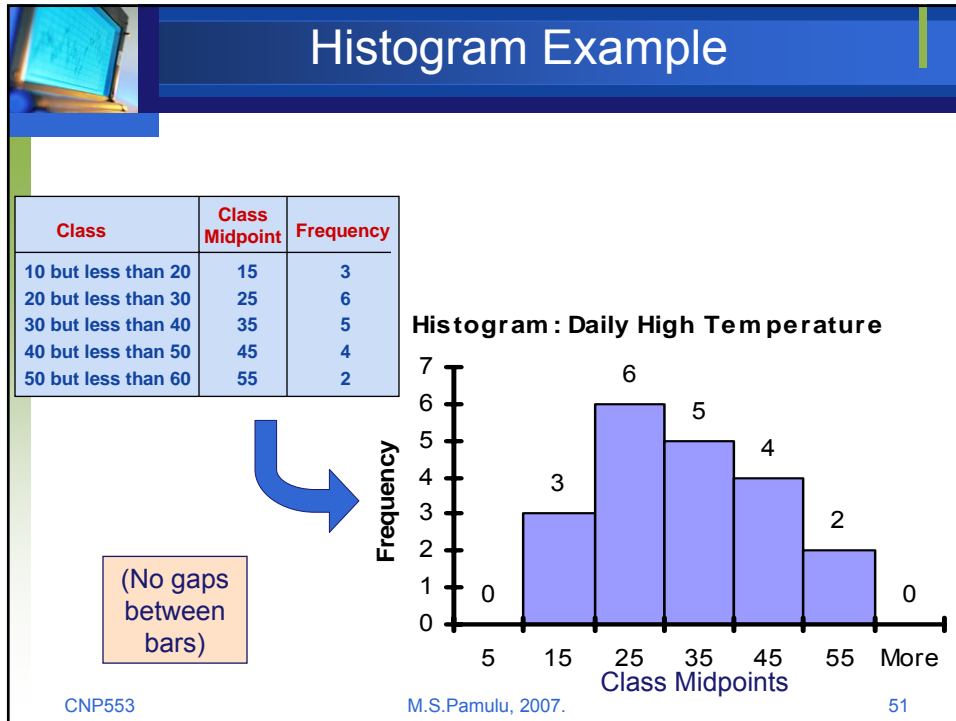
Class	Frequency	Relative Frequency	Percentage
10 but less than 20	3	.15	15
20 but less than 30	6	.30	30
30 but less than 40	5	.25	25
40 but less than 50	4	.20	20
50 but less than 60	2	.10	10
Total	20	1.00	100

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Graphing Numerical Data: The Histogram

- ❖ A graph of the data in a frequency distribution is called a **histogram**
- ❖ The **class boundaries** (or **class midpoints**) are shown on the **horizontal axis**
- ❖ the **vertical axis** is either **frequency, relative frequency, or percentage**
- ❖ Bars of the appropriate heights are used to represent the number of observations within each class

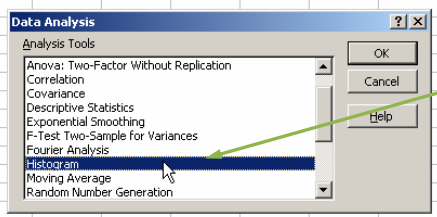
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Histograms in Excel

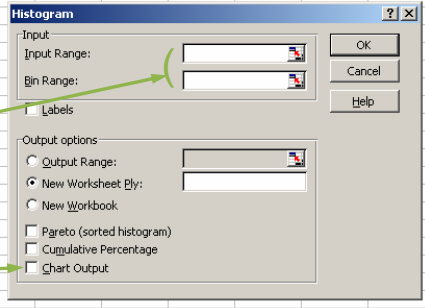
(continued)

2 Choose Histogram



3 Input data range and bin range (bin range is a cell range containing the upper class boundaries for each class grouping)

Select Chart Output and click "OK"

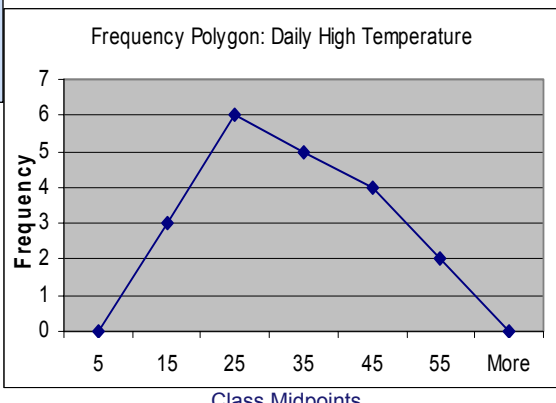


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The Frequency Polygon

Class	Class Midpoint	Frequency
10 but less than 20	15	3
20 but less than 30	25	6
30 but less than 40	35	5
40 but less than 50	45	4
50 but less than 60	55	2

(In a percentage polygon the vertical axis would be defined to show the percentage of observations per class)



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Cumulative Frequency

Data in ordered array:
12, 13, 17, 21, 24, 24, 26, 27, 27, 30, 32, 35, 37, 38, 41, 43, 44, 46, 53, 58

Class	Frequency	Percentage	Cumulative Frequency	Cumulative Percentage
10 but less than 20	3	15	3	15
20 but less than 30	6	30	9	45
30 but less than 40	5	25	14	70
40 but less than 50	4	20	18	90
50 but less than 60	2	10	20	100
Total	20	100		

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Graphing Cumulative Frequencies:

Class	Lower class boundary	Cumulative Percentage
Less than 10	10	0
10 but less than 20	20	15
20 but less than 30	30	45
30 but less than 40	40	70
40 but less than 50	50	90
50 but less than 60	60	100

Ogive: Daily High Temperature

Cumulative Percentage

Class Boundaries (*Not Midpoints*)

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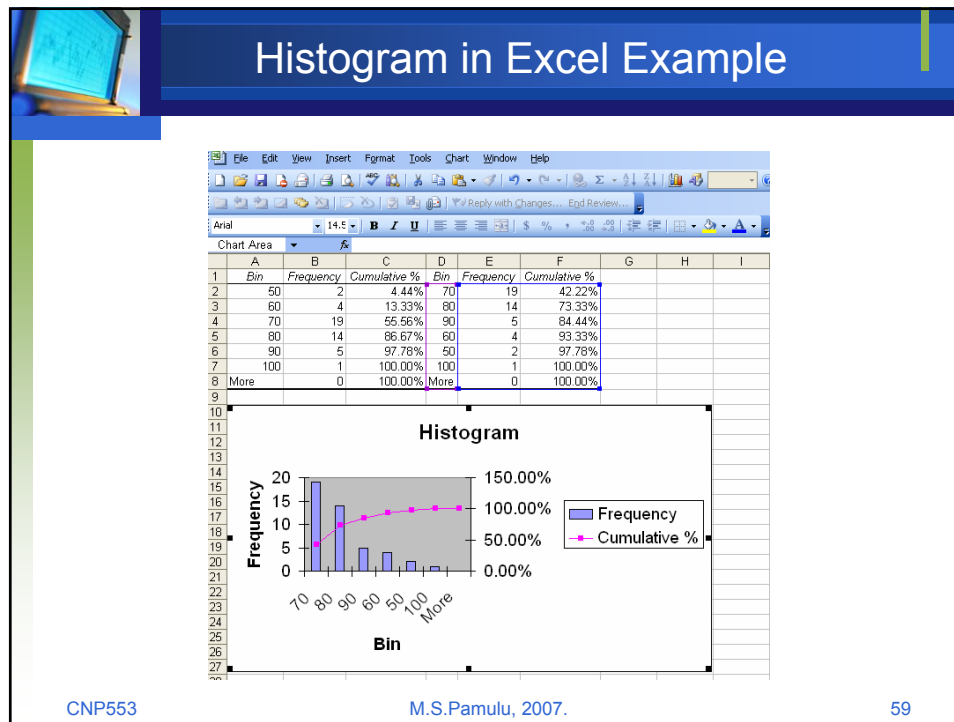
Histogram in Excel Example

Student ID	Grade	Bin
26324	82	50
51675	66	60
25233	52	70
29994	94	80
96129	40	90
45021	62	100
54052	88	
65664	75	
45604	67	
51578	62	
72996	71	
16613	53	
12485	74	
80026	65	
59729	66	
18926	67	
92929	68	
78390	69	
86729	69	
83812	68	
34980	71	

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Student ID	Grade	Bin
26324	82	50
51675	66	60
25233	52	70
29994	94	80
96129	40	90
45021	62	100
54052	88	
65664	75	
45604	67	
51578	62	
72996	71	
16613	53	
12485	74	
80026	65	
59729	66	
18926	67	
92929	68	
78390	69	
86729	69	
83812	68	
34980	71	
63067	72	
526	75	
84680	58	

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What-If Analysis

- ❖ Enables decision making in a worksheet
- ❖ What-If analysis is perhaps the most basic method for interrogating the worksheet data.
- ❖ The simplest what-if analysis involves changing worksheet variables and watching the result.

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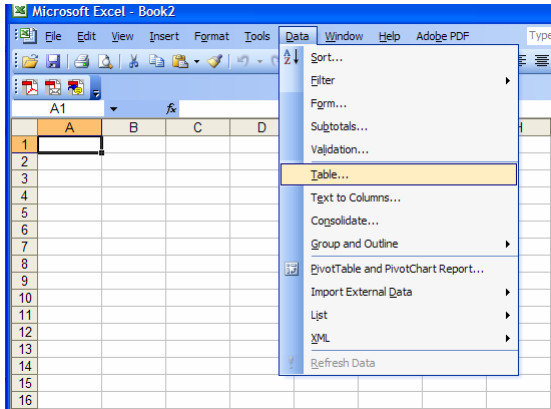
What-IF Analysis

❖ With what-if analysis, we first calculate a formula D, based on the input variables A, B, and C. We then say, “what if we change variable A? Or B or C? What happens to the result?”

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What-IF Analysis in Excel

❖ It is **Data Table** Function in Excel



The screenshot shows the Microsoft Excel interface with the 'Data' menu open. The 'Table...' option is highlighted in yellow. The spreadsheet below the menu shows columns A, B, C, and D, and rows 1 through 16. The 'Table...' option is the correct choice for performing a what-if analysis in Excel.

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What-IF in Excel Example

❖ For Example, Following figure shows a worksheet that calculates the future value of an investment based on the five variables: the interest rate, period, annual deposit, initial deposit, and deposit type. Cell C9 shows the result of the financial FV() function.

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What-IF in Excel Example

The screenshot displays an Excel worksheet with the following data:

	A	B	C	D	E	F	G	H
1								
2		Interest Rate	5%					
3		Period	10					
4		Annual Deposit	(\$10,000)					
5		Initial Deposit	(\$25,000)					
6		Deposit Type	1					
7								
8		Future Value						
9			\$172,790					
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								

The 'Function Arguments' dialog box for the FV function is open, showing the following values:

- Rate: C2 = 0.05
- Nper: C3 = 10
- Pmt: C4 = -10000
- Pv: C5 = -25000
- Type: C6 = 1

The dialog box also displays the formula result: = 172790.2373. Below the dialog box, the text reads: "Returns the future value of an investment based on periodic, constant payments and a constant interest rate. Type is a value representing the timing of payment: payment at the beginning of the period = 1; payment at the end of the period = 0 or omitted." The formula result is shown as "General".

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What-IF in Excel Example

- ❖ Now the question begin:
 - What if you deposited \$8,000 per year? Or \$12,000?
 - What if you reduced the initial deposit?
- ❖ Answering these questions is straightforward matter of changing the appropriate variables and watching the effect on the result

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What-IF in Excel Example

The screenshot displays the following data in the spreadsheet:

Input Cells	
Interest Rate	5%
Period	10
Annual Deposit	(\$10,000)
Initial Deposit	(\$25,000)
Deposit Type	1

Annual Deposit	Future Value
(\$7,000)	\$172,790
(\$8,000)	
(\$9,000)	
(\$10,000)	
(\$11,000)	
(\$12,000)	
(\$13,000)	

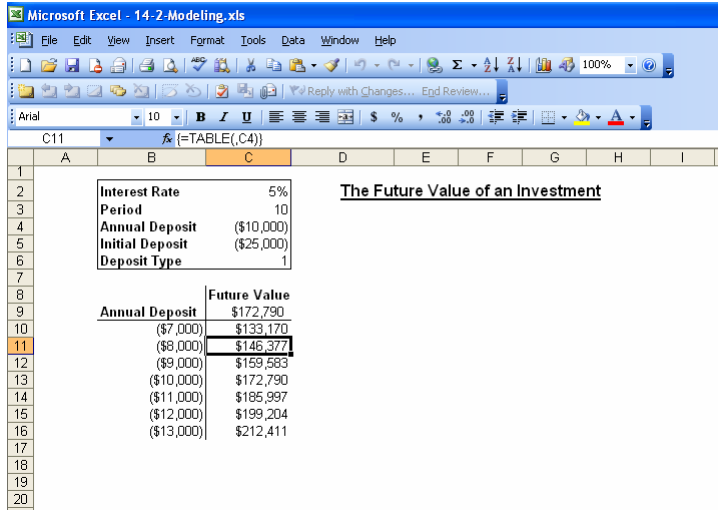
The 'Table' dialog box shows the following settings:

- Row input cell: [Empty]
- Column input cell: \$C\$4

Annotations in the image include a green arrow pointing from the 'Input Cell' label to the Annual Deposit cell, and another green arrow pointing from the 'Input Values' label to the table of Annual Deposits.

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What-IF in Excel Example

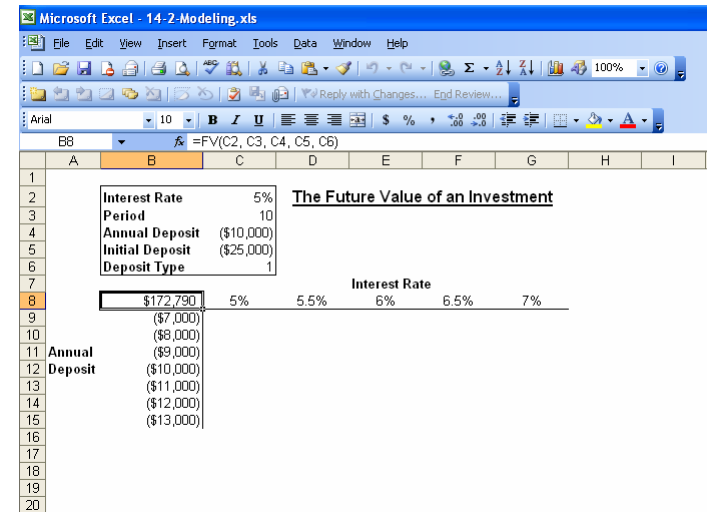


The screenshot shows an Excel spreadsheet titled "Microsoft Excel - 14-2 Modeling.xls". The active cell is C11, containing the formula `=TABLE(C4)`. The spreadsheet displays the following data:

		<u>The Future Value of an Investment</u>	
Interest Rate	5%		
Period	10		
Annual Deposit	(\$10,000)		
Initial Deposit	(\$25,000)		
Deposit Type	1		
	Annual Deposit	Future Value	
	(\$7,000)	\$172,790	
	(\$8,000)	\$146,377	
	(\$9,000)	\$159,583	
	(\$10,000)	\$172,790	
	(\$11,000)	\$185,997	
	(\$12,000)	\$199,204	
	(\$13,000)	\$212,411	

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What-IF in Excel Example



The screenshot shows the same Excel spreadsheet as slide 67, but with a data table for interest rates. The active cell is B8, containing the formula `=FV(C2, C3, C4, C5, C6)`. The spreadsheet displays the following data:

		<u>The Future Value of an Investment</u>		<u>Interest Rate</u>			
Interest Rate	5%						
Period	10						
Annual Deposit	(\$10,000)						
Initial Deposit	(\$25,000)						
Deposit Type	1						
	Annual Deposit	Future Value					
	(\$7,000)	\$172,790	5%	5.5%	6%	6.5%	7%
	(\$8,000)						
	(\$9,000)						
	(\$10,000)						
	(\$11,000)						
	(\$12,000)						
	(\$13,000)						

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What-IF in Excel Example

The screenshot shows an Excel spreadsheet with the following data in cells B2 through B6:

Interest Rate	5%
Period	10
Annual Deposit	(\$10,000)
Initial Deposit	(\$25,000)
Deposit Type	1

The formula bar shows: `=FV(C2, C3, C4, C5, C6)`

The 'Table' dialog box is open with the following settings:

- Row input cell: `C2`
- Column input cell: `C4`

The spreadsheet shows a partial table of results for interest rates 5%, 5.5%, 6%, 6.5%, and 7%.

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What-IF in Excel Example

The screenshot shows the completed table of results in cells B8 through B15:

	5%	5.5%	6%	6.5%	7%
Annual Deposit	\$172,790				
(\$7,000)					
(\$8,000)					
(\$9,000)					
(\$10,000)					
(\$11,000)					
(\$12,000)					
(\$13,000)					

The formula bar shows: `=TABLE(C2,C4)`


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References

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- ❖ McFedries, P. 2005. ***Formulas and Functions with Microsoft Excel 2003***. Indiana: Sam Publishing
- ❖ Schmuller, J. 2005. ***Statistical Analysis with Excel for Dummies***. New Jersey: Wiley

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Q&A

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