

# Charts

Scatter Charts

Recommended Charts in Excel

Line Charts

Bar Charts and Column Charts

A Note on Pie Charts and  
Three-Dimensional Charts

Bubble Charts

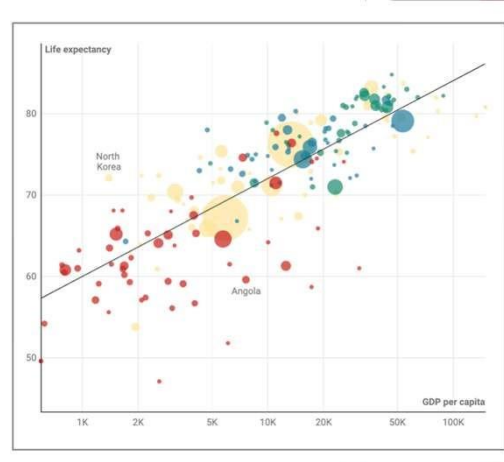
Heat Maps

Additional Charts for Multiple  
Variables

PivotCharts in Excel

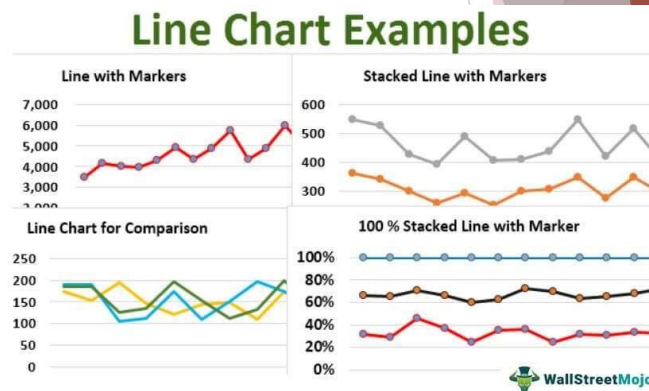
# Charts

- ▶ **Charts (or graphs):** Visual methods of displaying data.
- ▶ **Scatter chart:**
  - ▶ Graphical presentation of the relationship between two quantitative variables.
- ▶ **Trendline:**
  - ▶ A line that provides an approximation of the relationship between the variables.



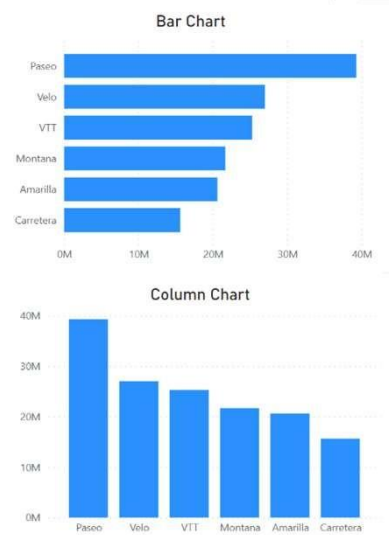
## Charts

- ▶ **Line chart:** A line connects the points in the chart.
  - ▶ Useful for time series data collected over a period of time (minutes, hours, days, years, etc.).



## Charts

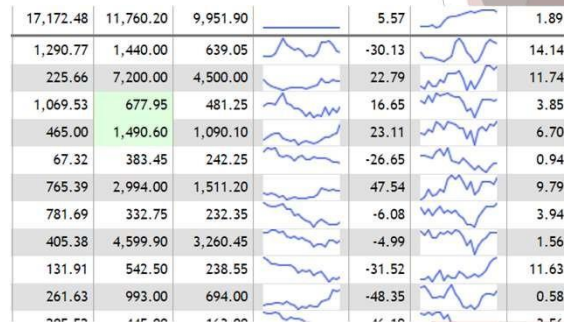
- ▶ **Bar Charts:**
  - ▶ Use horizontal bars to display the magnitude of the quantitative variable.
- ▶ **Column Charts:**
  - ▶ Use vertical bars to display the magnitude of the quantitative variable.
- ▶ Bar and column charts are very helpful in making comparisons between categorical variables.



## Charts

**Sparkline:** Special type of line chart:

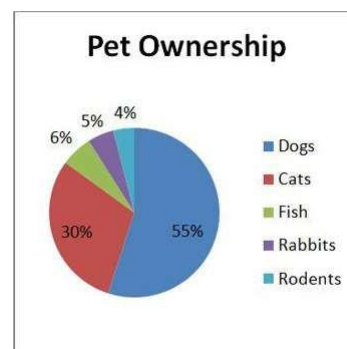
- ▶ Minimalist type of line chart that can be placed directly into a cell in Excel.
- ▶ Contains no axes; they display only the line for the data.
- ▶ Takes up very little space and can be effectively used to provide information on overall trends for time series data.



## Charts

### ▶ Pie chart:

- ▶ Common form of chart used to compare categorical data.
- ▶ Try to avoid 3-D pie charts
- ▶ 3-D Charts:
  - ▶ Lower data-ink ratio
  - ▶ Make it harder to read sometimes
  - ▶ Not necessary when a 2-D graph will do



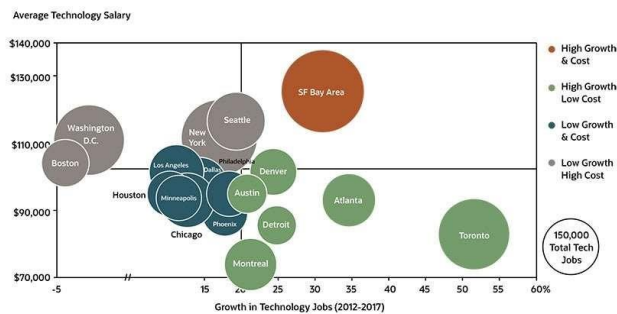
## Charts

### ► Bubble chart:

- Graphical means of visualizing three variables in a two-dimensional graph
- Sometimes is a preferred alternative to a 3-D graph.

## Technology Markets In North America

While San Francisco is still the largest market for technology jobs, Toronto is the fastest growing and it offers companies significantly lower wage costs.



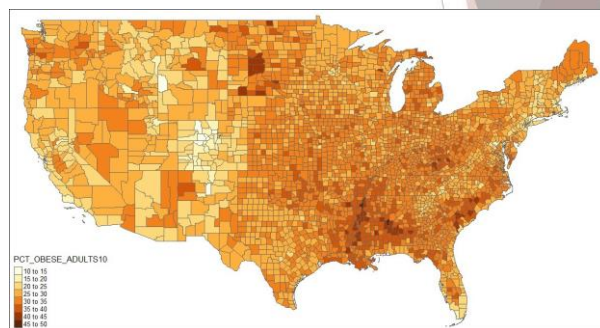
## Charts

### ► Heat map:

- A two-dimensional graphical representation of data
- Uses different shades of color to indicate magnitude.

Heat Map in Excel

|    | A                                     | B     | C     | D     | E     | F     | G     | H     | I     |
|----|---------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1  |                                       |       |       |       |       |       |       |       |       |
| 2  | Average precipitation by decade, inch |       |       |       |       |       |       |       |       |
| 3  | City                                  | 1940  | 1950  | 1960  | 1970  | 1980  | 1990  | 2000  | 2010  |
| 4  | Portland                              | 38.57 | 41.21 | 40.82 | 46.54 | 45.70 | 45.71 | 50.85 | 48.95 |
| 5  | Burlington                            | 33.38 | 34.28 | 33.04 | 35.76 | 36.63 | 35.74 | 37.96 | 39.80 |
| 6  | Albany                                | 32.94 | 36.13 | 30.90 | 40.10 | 37.44 | 38.23 | 42.28 | 41.86 |
| 7  | Philadelphia                          | 41.40 | 40.84 | 38.06 | 45.36 | 40.85 | 39.91 | 43.78 | 48.49 |
| 8  | Washington                            | 41.90 | 39.16 | 36.47 | 40.99 | 38.40 | 38.65 | 42.09 | 43.21 |
| 9  | Lynchburg                             | 41.38 | 38.89 | 34.70 | 46.15 | 41.86 | 41.82 | 40.92 | 42.73 |
| 10 | Savannah                              | 31.38 | 49.06 | 51.16 | 48.92 | 47.63 | 52.29 | 43.91 | 47.82 |
| 11 | Raleigh                               | 46.31 | 43.09 | 39.59 | 42.52 | 42.08 | 44.43 | 43.41 | 49.79 |
| 12 | Nashville                             | 46.31 | 46.85 | 45.68 | 53.49 | 42.76 | 47.96 | 50.97 | 52.57 |
| 13 | Atlanta                               | 49.63 | 44.40 | 51.08 | 50.39 | 50.84 | 49.17 | 48.85 | 51.47 |
| 14 | Pensacola                             | 66.18 | 65.37 | 61.40 | 61.79 | 65.32 | 68.14 | 64.31 | 73.99 |
| 15 | Birmingham                            | 53.25 | 49.24 | 56.65 | 57.59 | 49.55 | 54.83 | 56.79 | 56.58 |
| 16 | Miami                                 | 60.14 | 59.58 | 59.85 | 53.93 | 54.72 | 67.46 | 68.57 | 69.18 |
| 17 | Buffalo                               | 35.08 | 38.03 | 34.06 | 40.42 | 41.30 | 39.94 | 40.08 | 42.15 |
| 18 | Pittsburgh                            | 38.00 | 37.05 | 33.86 | 38.41 | 38.12 | 36.77 | 39.57 | 42.97 |
| 19 | Detroit                               | 32.21 | 31.25 | 30.72 | 31.49 | 34.64 | 32.85 | 33.65 | 37.00 |
| 20 | Columbus                              | 37.41 | 35.01 | 36.67 | 39.31 | 38.28 | 37.89 | 41.63 | 44.49 |
| 21 | Louisville                            | 43.83 | 40.43 | 42.99 | 47.23 | 41.00 | 47.23 | 50.09 | 53.89 |
| 22 | Madison                               | 30.23 | 31.55 | 29.13 | 31.68 | 31.78 | 35.42 | 36.19 | 39.78 |
| 23 | Chicago                               | 34.35 | 33.79 | 35.26 | 37.32 | 38.63 | 34.41 | 37.62 | 41.78 |
| 24 | Indianapolis                          | 39.07 | 39.16 | 37.94 | 40.24 | 41.70 | 40.91 | 44.01 | 45.32 |

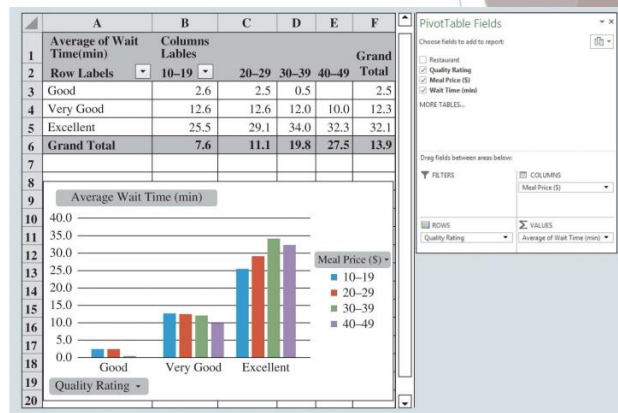


## Charts

### PivotCharts in Excel:

#### PivotChart:

- ▶ Summarize and analyze data with both a crosstabulation and charting
- ▶ Excel pairs PivotCharts with PivotTables.

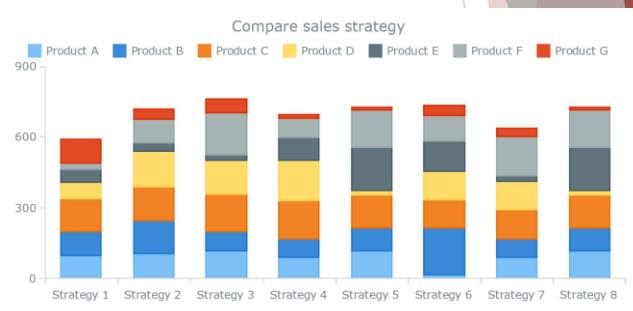


## Charts

### Additional Charts for Multiple Variables:

#### ▶ Stacked-column chart:

- ▶ Allows the reader to compare the relative values of quantitative variables for the same category in a bar chart.
- ▶ Sometimes other charts (i.e. clustered bar charts are preferred)
  - ▶ Clustered bar charts are typically easier to read

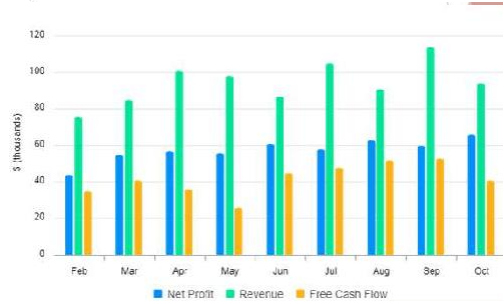
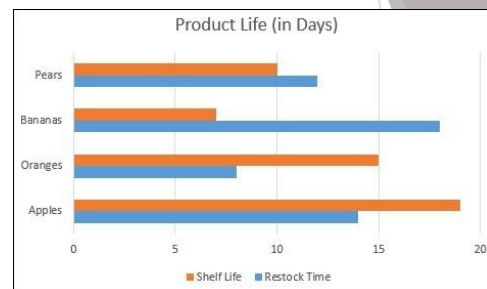


## Charts

### Additional Charts for Multiple Variables:

► **Clustered-column (or bar) chart:**

- An alternative chart to stacked-column chart for comparing quantitative variables.
- Do you think they are easier to read?

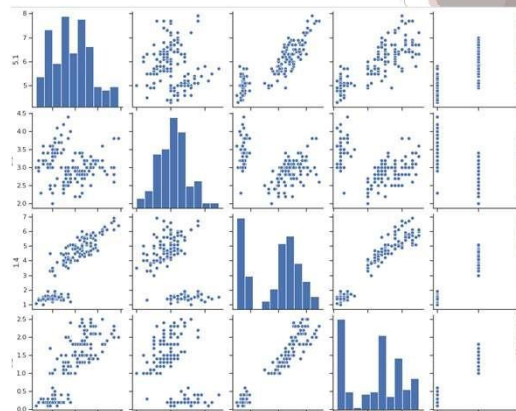


## Charts

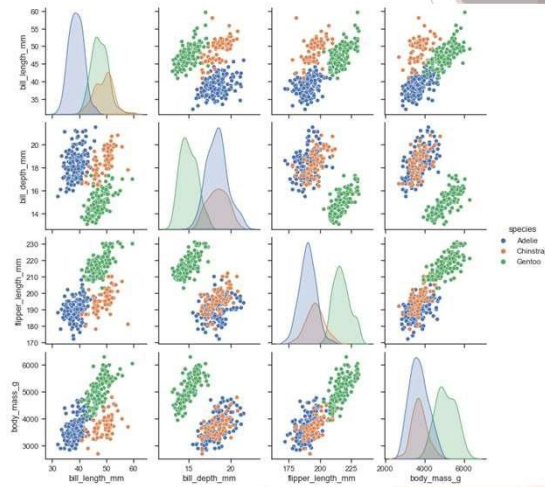
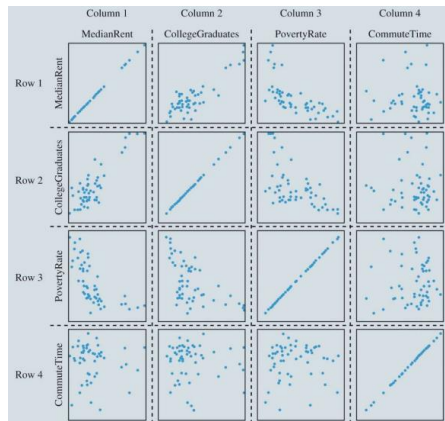
### Additional Charts for Multiple Variables:

► **Scatter-chart matrix:**

- Useful chart for displaying multiple variables.
- Shows relationship between 2 variables on the peripheral
- On the diagonal:
  - Histograms/distributions, or
  - Relationships between variables and themselves
- UNFORTUNATELY - Can't make these in Excel.



## Scatter-Chart Matrix



## Charts in Excel

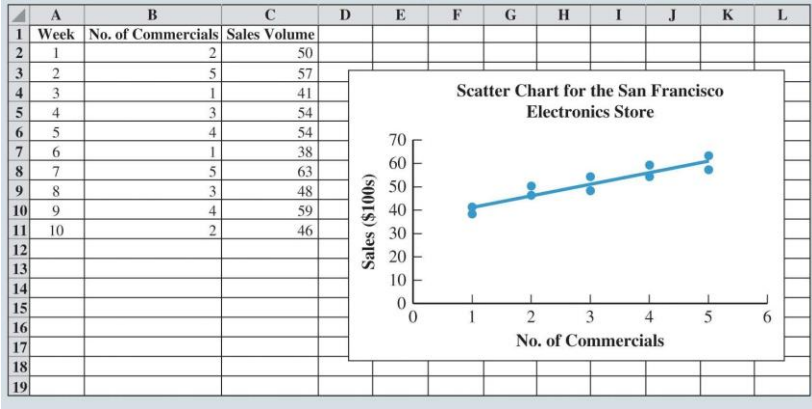
Table 3.8: Sample Data for the San Francisco Electronics Store

| Week | No. of Commercials<br><i>x</i> | Sales (\$100s)<br><i>y</i> |
|------|--------------------------------|----------------------------|
| 1    | 2                              | 50                         |
| 2    | 5                              | 57                         |
| 3    | 1                              | 41                         |
| 4    | 3                              | 54                         |
| 5    | 4                              | 54                         |
| 6    | 1                              | 38                         |
| 7    | 5                              | 63                         |
| 8    | 3                              | 48                         |
| 9    | 4                              | 59                         |
| 10   | 2                              | 46                         |



# Charts

Figure 3.17: Scatter Chart for the San Francisco Electronics Store



# Charts

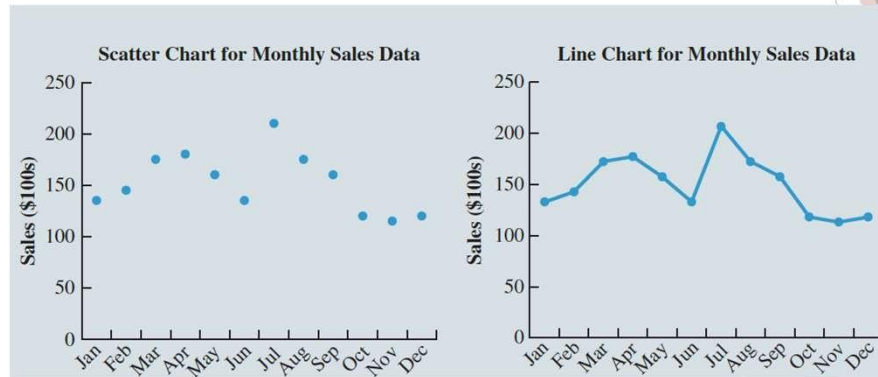
Table 3.9: Monthly Sales Data of Air Compressors at Kirkland Industries

| Month | Sales (\$100s) |
|-------|----------------|
| Jan   | 135            |
| Feb   | 145            |
| Mar   | 175            |
| Apr   | 180            |
| May   | 160            |
| Jun   | 135            |
| Jul   | 210            |
| Aug   | 175            |
| Sep   | 160            |
| Oct   | 120            |
| Nov   | 115            |
| Dec   | 120            |



## Charts

Figure 3.19: Scatter Chart and Line Chart for Monthly Sales Data at Kirkland Industries



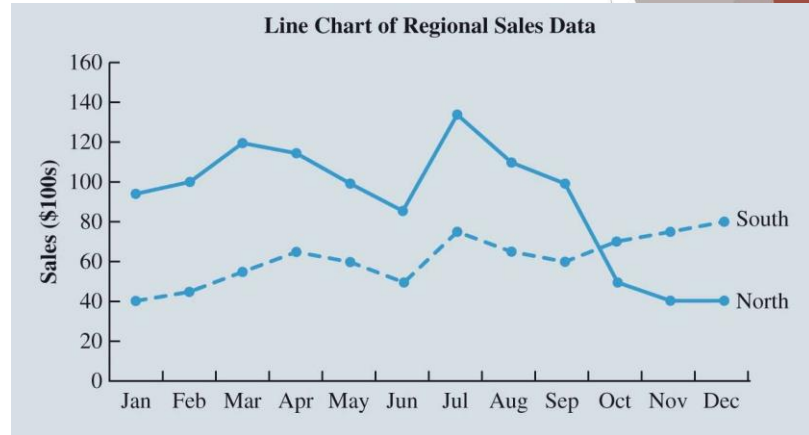
## Charts

Table 3.10: Regional Sales Data by Month for Air Compressors at Kirkland Industries

| Month | Sales (\$100s) North | Sales (\$100s) South |
|-------|----------------------|----------------------|
| Jan   | 95                   | 40                   |
| Feb   | 100                  | 45                   |
| Mar   | 120                  | 55                   |
| Apr   | 115                  | 65                   |
| May   | 100                  | 60                   |
| Jun   | 85                   | 50                   |
| Jul   | 135                  | 75                   |
| Aug   | 110                  | 65                   |
| Sep   | 100                  | 60                   |
| Oct   | 50                   | 70                   |
| Nov   | 40                   | 75                   |
| Dec   | 40                   | 80                   |

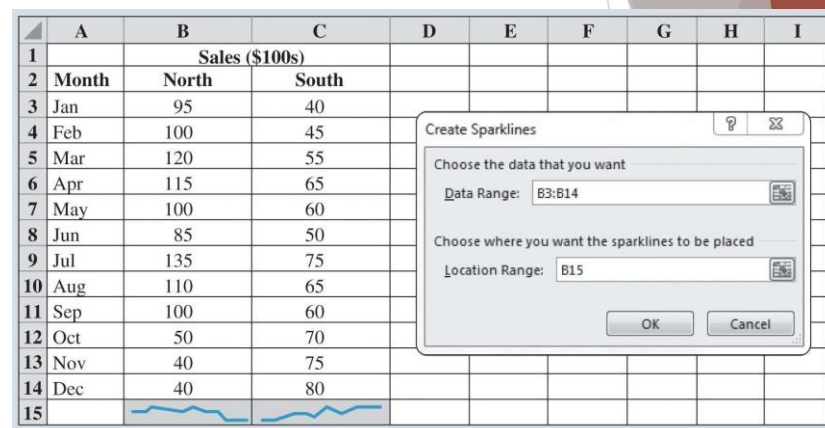
## Charts

Figure 3.21: Line Chart of Regional Sales Data at Kirkland Industries



## Charts

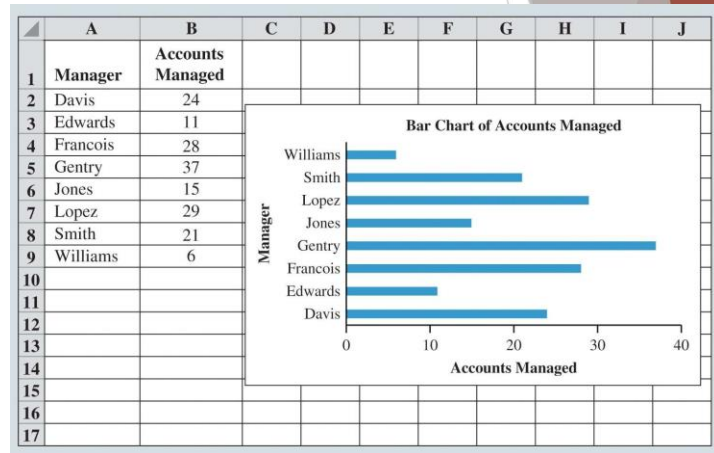
Figure 3.22: Sparklines for the Regional Sales Data at Kirkland Industries



## Charts

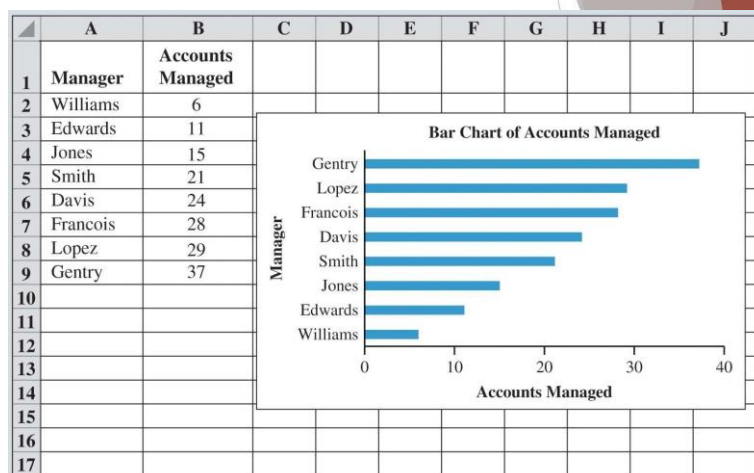
Figure 3.23: Bar Charts for Accounts Managed Data

Gentry manages the greatest number of accounts and Williams the fewest.



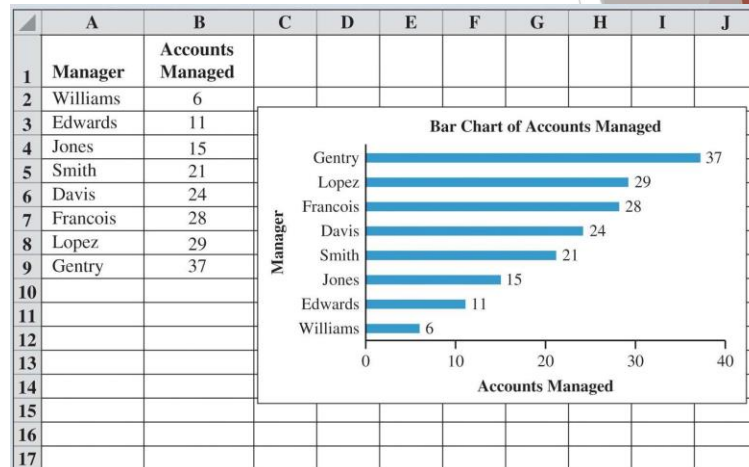
## Charts

Figure 3.24: Sorted Bar Chart for Accounts Managed Data



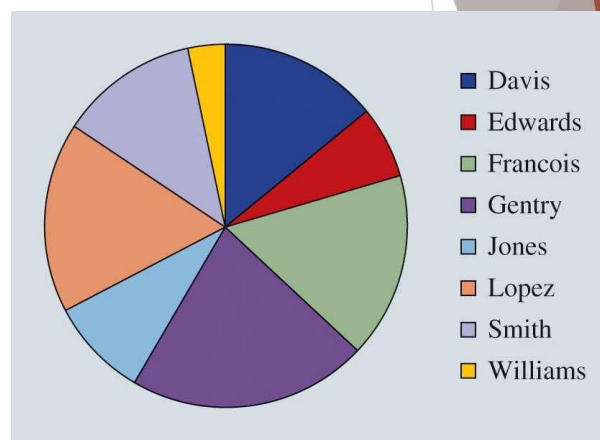
## Charts

Figure 3.25: Bar Chart with Data Labels for Accounts Managed Data



## Charts

Figure 3.26: Pie Chart of Accounts Managed



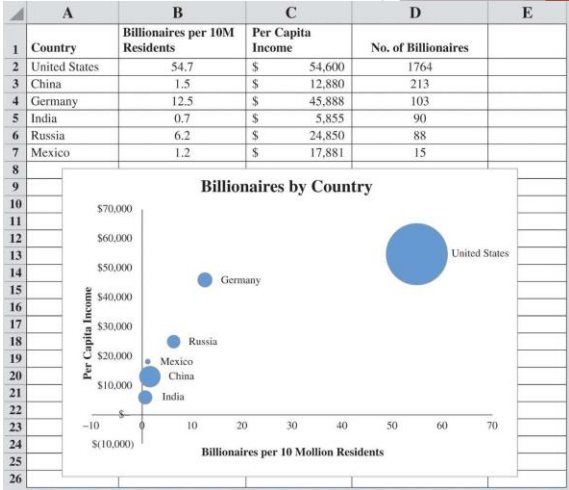
# Charts

Table 3.11: Sample Data on Billionaires per Country

| Country       | Billionaires per 10M Residents | Per Capita Income | No. of Billionaires |
|---------------|--------------------------------|-------------------|---------------------|
| United States | 54.7                           | \$54,600          | 1,764               |
| China         | 1.5                            | \$12,880          | 213                 |
| Germany       | 12.5                           | \$45,888          | 103                 |
| India         | 0.7                            | \$ 5,855          | 90                  |
| Russia        | 6.2                            | \$24,850          | 88                  |
| Mexico        | 1.2                            | \$17,881          | 15                  |

# Charts

Figure 3.27: Bubble Chart  
Comparing Billionaires by Country



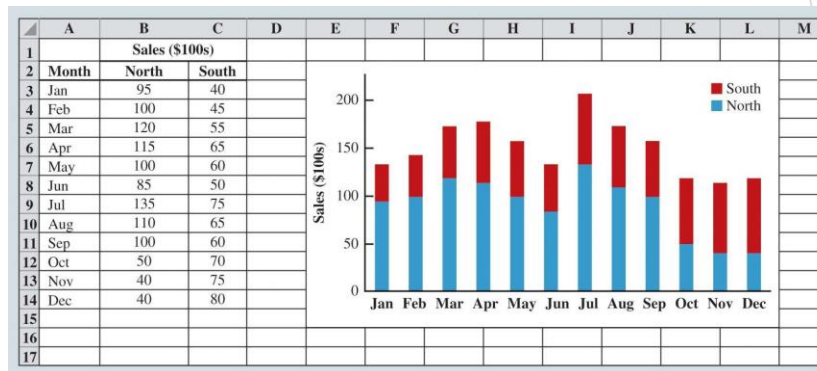
## Charts

Figure 3.28: Heat Map and Sparklines for Same-Store Sales Data

|    | A              | B   | C   | D   | E   | F   | G   | H   | I   | J    | K    | L    | M    | N          |
|----|----------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------------|
| 1  |                | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP  | OCT  | NOV  | DEC  | SPARKLINES |
| 2  | St. Louis      | -2% | -1% | -1% | 0%  | 2%  | 4%  | 3%  | 5%  | 6%   | 7%   | 8%   | 8%   |            |
| 3  | Phoenix        | 5%  | 4%  | 4%  | 2%  | 2%  | -2% | -5% | -8% | -6%  | -5%  | -7%  | -8%  |            |
| 4  | Albany         | -5% | -6% | -4% | -5% | -2% | -5% | -5% | -3% | -1%  | -2%  | -1%  | -2%  |            |
| 5  | Austin         | 16% | 15% | 15% | 16% | 18% | 17% | 14% | 15% | 16%  | 19%  | 18%  | 16%  |            |
| 6  | Cincinnati     | -9% | -6% | -7% | -3% | 3%  | 6%  | 8%  | 11% | 10%  | 11%  | 13%  | 11%  |            |
| 7  | San Francisco  | 2%  | 4%  | 5%  | 8%  | 4%  | 2%  | 4%  | 3%  | 1%   | -1%  | 1%   | 2%   |            |
| 8  | Seattle        | 7%  | 7%  | 8%  | 7%  | 5%  | 4%  | 2%  | 0%  | -2%  | -4%  | -6%  | -5%  |            |
| 9  | Chicago        | 5%  | 3%  | 2%  | 6%  | 8%  | 7%  | 8%  | 5%  | 8%   | 10%  | 9%   | 8%   |            |
| 10 | Atlanta        | 12% | 14% | 13% | 17% | 12% | 11% | 8%  | 7%  | 7%   | 8%   | 5%   | 3%   |            |
| 11 | Miami          | 2%  | 3%  | 0%  | 1%  | -1% | -4% | -6% | -8% | -11% | -13% | -11% | -10% |            |
| 12 | Minneapolis    | -6% | -6% | -8% | -5% | -6% | -5% | -5% | -7% | -5%  | -2%  | -1%  | -2%  |            |
| 13 | Denver         | 5%  | 4%  | 1%  | 1%  | 2%  | 3%  | 1%  | -1% | 0%   | 1%   | 2%   | 3%   |            |
| 14 | Salt Lake City | 7%  | 7%  | 7%  | 13% | 12% | 8%  | 5%  | 9%  | 10%  | 9%   | 7%   | 6%   |            |
| 15 | Raleigh        | 4%  | 2%  | 0%  | 5%  | 4%  | 3%  | 5%  | 5%  | 9%   | 11%  | 8%   | 6%   |            |
| 16 | Boston         | -5% | -5% | -3% | 4%  | -5% | -4% | -3% | -1% | 1%   | 2%   | 3%   | 5%   |            |
| 17 | Pittsburgh     | -6% | -6% | -4% | -5% | -3% | -3% | -1% | -2% | -2%  | -1%  | -2%  | -1%  |            |

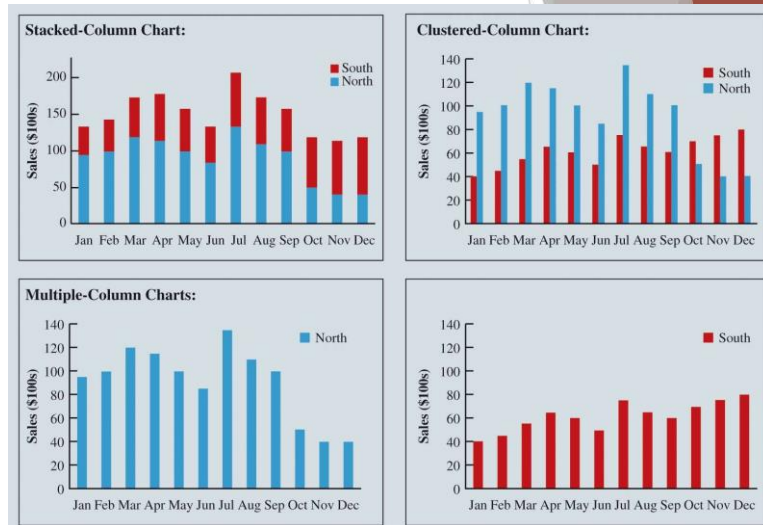
## Charts

Figure 3.29: Stacked-Column Chart for Regional Sales Data for Kirkland Industries



## Charts

Figure 3.30: Comparing Stacked-, Clustered-, and Multiple-Column Charts for the Regional Sales Data for Kirkland Industries



## Charts

Table 3.12: Data for New York City Sub-boroughs

| Area                | Median Monthly Rent (\$) | Percentage College Graduates (%) | Poverty Rate (%) | Travel Time (min) |
|---------------------|--------------------------|----------------------------------|------------------|-------------------|
| Astoria             | 1,106                    | 36.8                             | 15.9             | 35.4              |
| Bay Ridge           | 1,082                    | 34.3                             | 15.6             | 41.9              |
| Bayside/Little Neck | 1,243                    | 41.3                             | 7.6              | 40.6              |
| Bedford Stuyvesant  | 822                      | 21.0                             | 34.2             | 40.5              |
| Bensonhurst         | 876                      | 17.7                             | 14.4             | 44.0              |
| Borough Park        | 980                      | 26.0                             | 27.6             | 35.3              |



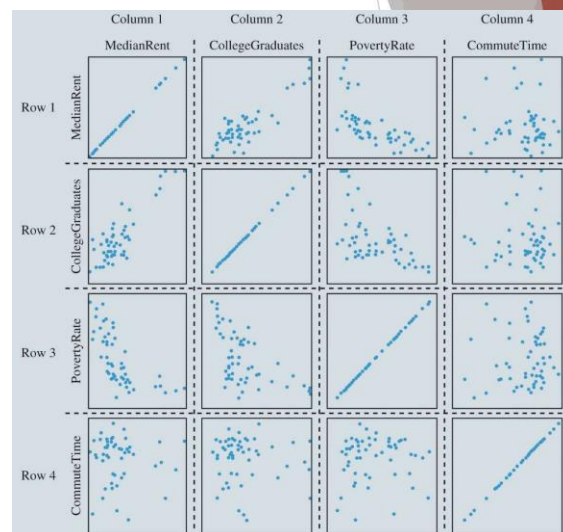
## Charts

Table 3.12: Data for New York City Sub-boroughs (cont.)

| Area                         | Median Monthly Rent (\$) | Percentage College Graduates (%) | Poverty Rate (%) | Travel Time (min) |
|------------------------------|--------------------------|----------------------------------|------------------|-------------------|
| Brooklyn Heights/Fort Greene | 1,086                    | 55.3                             | 17.4             | 34.5              |
| Brownsville/Ocean Hill       | 714                      | 11.6                             | 36.0             | 40.3              |
| Bushwick                     | 945                      | 13.3                             | 33.5             | 35.5              |
| Central Harlem               | 665                      | 30.6                             | 27.1             | 25.0              |
| Chelsea/Clinton/Midtown      | 1,624                    | 66.1                             | 12.7             | 43.7              |
| Coney Island                 | 786                      | 27.2                             | 20.0             | 46.3              |

## Charts

Figure 3.31: Scatter-Chart Matrix for New York City Rent Data



## Charts

Figure 3.32: PivotTable and PivotChart for the Restaurant Data

