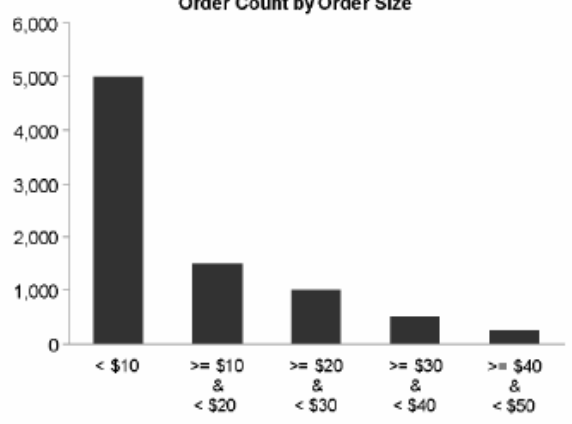

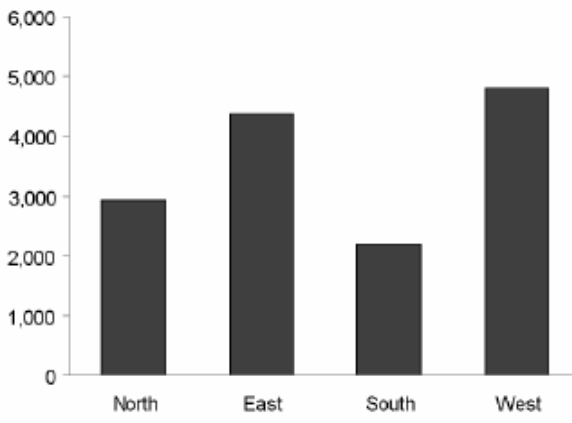


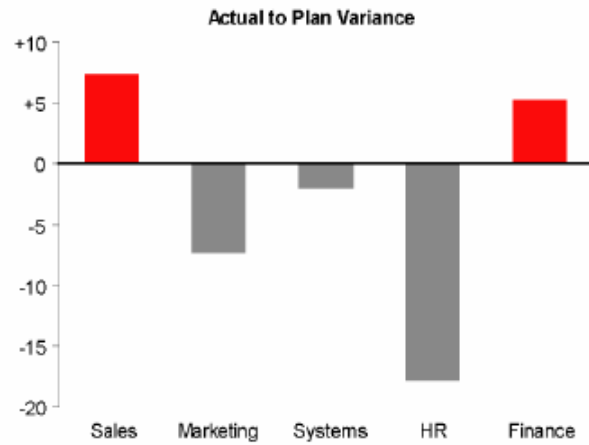
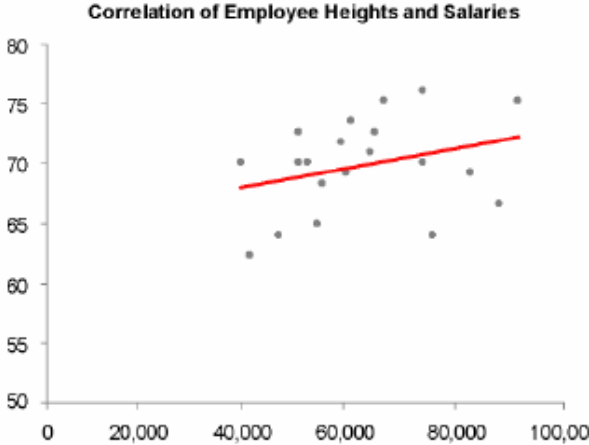
Seven common quantitative relationships in graphs and how to display them ¹

<p>Time Series <i>Expresses the rise and fall of values through time.</i></p> <ul style="list-style-type: none"> • Use lines to emphasize overall pattern • Use bars to emphasize individual values • Use points connected by lines to slightly emphasize individual values while still highlighting the overall pattern • Always place time on the horizontal axis 	<p style="text-align: center;">2003 Sales</p>
<p>Part-to-Whole <i>Expresses the portion of each part relative to the whole</i></p> <ul style="list-style-type: none"> • Use bars only (horizontal or vertical) • Use stacked bars only when you must display measures of the whole as well as the parts 	<p style="text-align: center;">Regional % of Total Expenses</p>
<p>Ranking <i>Expresses values in order by size.</i></p> <ul style="list-style-type: none"> • Use bars only (horizontal or vertical) • To highlight high values, sort in descending order • To highlight low values, sort in ascending order 	<p style="text-align: center;">Headcount</p>

Next Steps: Designing Effective Graphs

<p>Distribution <i>Expresses a range of values as well as the shape of the distribution across that range.</i></p> <p>Single Distribution:</p> <ul style="list-style-type: none"> • Use vertical bars to emphasize individual values • Use lines to emphasize the overall shape <p>Multiple Distributions:</p> <ul style="list-style-type: none"> • Use vertical or horizontal bars (a.k.a. range bars or boxes) to encode the full range from the low value to the high value, or some meaningful portion of the range (for example, 90% of the values) • Use points or lines together to encode measures or center (for example, the median) 	<p>Order Count by Order Size</p>  <p>Salary Ranges</p> 
<p>Nominal Comparison <i>Simply expresses the comparative sizes of multiple related but discrete values in no particular order.</i></p> <ul style="list-style-type: none"> • Use bars only (horizontal or vertical) 	<p>Q1 2003 Calls by Region</p> 

Next Steps: Designing Effective Graphs

<p>Deviation <i>Expresses how and the degree to which one or more things differ from another.</i></p> <ul style="list-style-type: none"> • Use lines to emphasize the overall pattern only when displaying deviation and time-series • relationships together • Use points connected by lines to slightly emphasize individual data points while also highlighting the overall pattern when displaying deviation and time-series relationships together • Use bars to emphasize individual values, but limit to vertical bars when a time-series relationship is included • Always include a reference line to compare the measures of deviation against 	 <table border="1"> <caption>Actual to Plan Variance</caption> <thead> <tr> <th>Department</th> <th>Variance</th> </tr> </thead> <tbody> <tr> <td>Sales</td> <td>+7.5</td> </tr> <tr> <td>Marketing</td> <td>-7.0</td> </tr> <tr> <td>Systems</td> <td>-2.0</td> </tr> <tr> <td>HR</td> <td>-17.0</td> </tr> <tr> <td>Finance</td> <td>+5.0</td> </tr> </tbody> </table>	Department	Variance	Sales	+7.5	Marketing	-7.0	Systems	-2.0	HR	-17.0	Finance	+5.0																																
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<p>Correlation <i>Expresses how two paired sets of values vary in relation to one another.</i></p> <ul style="list-style-type: none"> • Use points and a trend line in the form of a scatter plot. 	 <table border="1"> <caption>Correlation of Employee Heights and Salaries</caption> <thead> <tr> <th>Salary (X)</th> <th>Height (Y)</th> </tr> </thead> <tbody> <tr><td>40,000</td><td>63</td></tr> <tr><td>42,000</td><td>64</td></tr> <tr><td>45,000</td><td>65</td></tr> <tr><td>48,000</td><td>68</td></tr> <tr><td>50,000</td><td>70</td></tr> <tr><td>52,000</td><td>72</td></tr> <tr><td>55,000</td><td>73</td></tr> <tr><td>58,000</td><td>74</td></tr> <tr><td>60,000</td><td>75</td></tr> <tr><td>62,000</td><td>76</td></tr> <tr><td>65,000</td><td>77</td></tr> <tr><td>68,000</td><td>78</td></tr> <tr><td>70,000</td><td>70</td></tr> <tr><td>72,000</td><td>71</td></tr> <tr><td>75,000</td><td>72</td></tr> <tr><td>78,000</td><td>64</td></tr> <tr><td>80,000</td><td>69</td></tr> <tr><td>82,000</td><td>70</td></tr> <tr><td>85,000</td><td>67</td></tr> <tr><td>88,000</td><td>75</td></tr> <tr><td>90,000</td><td>76</td></tr> </tbody> </table>	Salary (X)	Height (Y)	40,000	63	42,000	64	45,000	65	48,000	68	50,000	70	52,000	72	55,000	73	58,000	74	60,000	75	62,000	76	65,000	77	68,000	78	70,000	70	72,000	71	75,000	72	78,000	64	80,000	69	82,000	70	85,000	67	88,000	75	90,000	76
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1: *Show Me the Numbers: Designing Tables and Graphs to Enlighten.* Few, Stephen. 2004. Oakland, CA: Analytics Press.