**Chapter 3.2 – Describing Relationships: Least-Squares Regression Line**

*Quick Summary*

* Regression line
	+ Straight line that describes how a response variable *y* changes as an explanatory variable *x* changes.
	+ Can be used to predict the value of *y* for any value of *x* by substituting this *x* into the equation of the line.
	+ The equation of the line may be seen in one of two forms:
		- $\hat{y}=a+bx$ where *a* is the y-intercept and *b* is the slope
		- $\hat{y}=b\_{0}+b\_{1}x$ where $b\_{0}$ is the y-intercept and $b\_{1}$is the slope
* Residuals
	+ Vertical distances from observed values of the response variable to predicted values on the regression line.
	+ $residual=observed-predicted=y-\hat{y}$
* Least-Squares Regression Line
	+ Line of best fit for a scatterplot with a linear trend that minimizes the sum of the squares of the vertical distances of the observed points from the line.