Wrap-Up (Random Variables)

We have finally reached the end of this section, where we were introduced to the important concept of **random variables**, which are quantitative variables whose value is determined by the outcome of a random experiment.

This section was organized into two parts: one dealing with discrete random variables, and the other dealing with continuous random variables.

We saw that all the information about a **discrete random variable** is packed into its probability distribution. Using that, we can answer probability questions about the random variable and find its **mean and standard deviation**. We ended the part on discrete random variables by presenting a special class of discrete random variables—**binomial** random variables.

As we dove into **continuous random variables**, we saw how calculations can get complicated very quickly, when probabilities associated with a continuous random variable are found by calculating **areas under its density curve**. As an example for a continuous random variable, we presented the **normal random variable**, and discussed it at length. The normal distribution is extremely important, not just because many variables in real life follow the normal distribution, but mainly because of the important role it plays in statistical inference, our ultimate goal of this course.

We learned how we can avoid calculus by using the **standard normal table** to find probabilities associated with the normal distribution, and learned how it can be used as an **approximation to the binomial** distribution under certain conditions. We are now ready to move on to the Sampling Distributions module of probability, which can be viewed in two ways. On the one hand the Sampling Distributions module can be viewed as a special case of the Random Variables module since we are going to discuss two special random variables: the sample mean ($\overline{X}$) and the sample proportion ($\hat{p}$). On the other hand, the Sampling Distributions module can be viewed as the bridge that takes us from probability to statistical inference.