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STAT 401 – Data Analytics

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Normal Distribution Curve

Normal Distribution, also known as the “bell shaped curve” is used to represent data clusters around the mean through different frequencies. The area under the curve shows the probability, and the area under the curve adds up to one. One of the properties of this curve is that the ends of the curve are asymptotic, meaning that the values at the ends of the curve will approach but will never touch the x-axis. To have a perfectly normal distribution, the mean, median, and mode will be the same value. The shape of the normal distribution is the reason for its nickname. The shape of the curve is bell-shaped.

Normal distribution is one of the most important distributions of probability that is used in statistics. Many different sets of data of various types typically create this bell shape when graphed altogether. Many different measures of data all end up making the same bell-shaped curve, even things as simple as people’s heights and weights with enough participants to make inferences about probability. The most powerful parametric statistical tests used by psychologists even require the data recorded to be distributed normally. If it isn’t bell-shaped then they will often use a less powerful test that is non-parametric.

There’s a formula that allows us to find the ranges of probabilities from the mean underneath the curve, it’s the empirical rule formula. There is also a way to find the specific values underneath the curve which requires us to convert raw data values into normal distribution, turning the raw data into z-scores.