Normal (Gaussian) distribution

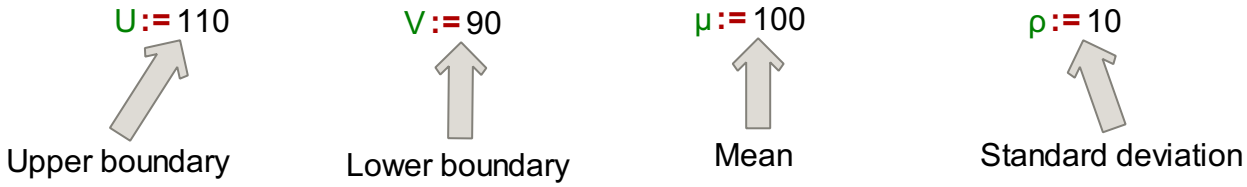
Suppose scores on an IQ test are normally distributed. If the test has a mean of 100 points and a standard deviation of 10 points, what is the probability that a person who takes the test will score between 90 and 110 points?

Solution:

We want to know the probability that the test score falls between 90 and 110. We will find the solution for this problem if we realize the following:

$$P(90 < X < 110) = P(X < 110) - P(X < 90)$$

We will compute the probability on the right side of the equation. Lets mark P(X < 110) with variable **a** and P(X < 90) with variable **b**.



$$P(X < 110)$$

$$a := \text{normaldist}(U, \mu, \rho)$$

$$a = 0.841$$

$$P(X < 90)$$

$$b := \text{normaldist}(V, \mu, \rho)$$

$$b = 0.159$$

$$P(90 < X < 110)$$

$$P := a - b$$

$$P = 0.683$$

About 68.3% of the test scores will fall between 90 and 110 point on IQ test.