Example Suppose $X_1, X_2, \ldots, X_{75}$ each have mean 1.5 and variance 2. Find the probability that the sum of the X_j's is less than 95.

$$P(X_1+X_2+\ldots+X_{75}<95) = P\left(\frac{X_1+X_2+\ldots+X_{75}-(75)(1.5)}{\sqrt{75(2)}} < \frac{95-(75)(1.5)}{\sqrt{75(2)}}\right)$$

$$= P(Z<-1.43)$$ where Z is a standard Normal random variable

$$= P(Z>1.43)$$ by symmetry

$$= 1 - P(Z \le 1.43)$$

$$= 1 - F_Z(1.43) = 1 - 0.9236 = 0.0764$$