Example 3.14

$$\mathbb{E}\sum_{i=1}^{100} X_i = 50 \qquad \mathrm{Var}\sum_{i=1}^{100} X_i = \frac{100}{12}$$

$X_i \sim U(0,1)$

$$P\left(\sum_{i=1}^{100} X_i \leq 60\right) = P\left(\sum_{i=1}^{100} X_i - 50 \leq 10\right)$$

$$= P\left(\frac{\sum_{i=1}^{100} X_i - 50}{10/\sqrt{12}} \leq \frac{10}{10/2\sqrt{3}}\right) \approx \Phi(2\sqrt{3})$$

$2\sqrt{3} \approx 3{,}46$

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From a table of the standard normal distribution, we get $\Phi(2\sqrt{3}) \approx 0.999734$