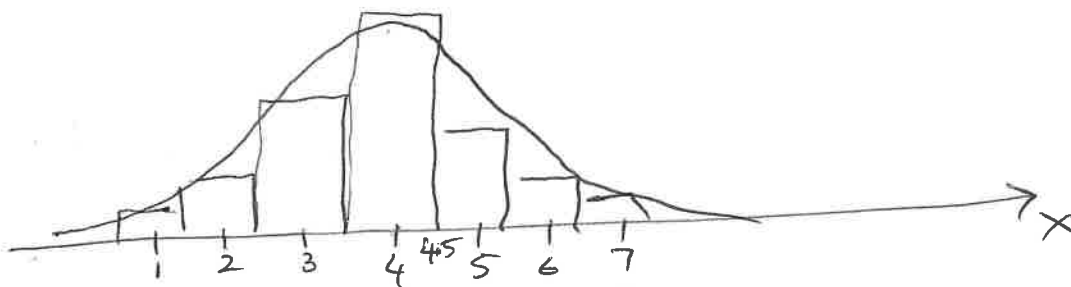


Continuity correction

Suppose $X \sim \text{Discrete}$, say like a Binomial etc see ch4 distributions.

Then we may be interested in using a Normal density to approximate a discrete distribution (Normal approx to the Binomial for example).

How we can do it!



Say we want to use the Normal to approximate

$$P(X > 4) ?$$

What is to be considered a 4 in the discrete scale is different on the continuous scale. (D=discrete, C=cont)

$$\begin{aligned} P(X_D > 4) &= P(X_C > 4.5) \\ &= 1 - P(X_C \leq 4.5) \\ &= 1 - \text{pnorm}(4.5, -, -) \end{aligned}$$

$X_D = 4$ corresponds to $X_C > 3.5$ and $X_C < 4.5$
see picture above

$$\begin{aligned} P(X_D \leq 3) &= P(X_C \leq 3.5) \\ &= \text{pnorm}(3.5, -, -) \end{aligned}$$

RAR