

Answer on Question #80742 – Math – Statistics and Probability

Question

The staff car park at the hospital has 330 spaces, and parking is restricted to permit holders. Data collected earlier indicate that only 85% of the permit holders will be at the hospital on a given day. As a result, the hospital has decided to issue 380 permits. Calculate the probability that, on a given day, at least one of the permit holders will not obtain a parking space in this car park.

Solution

$$P=0.85$$

$$N_2=380$$

$$N_1=330+1=331$$

$$\begin{aligned} P(331 \leq X \leq 380) &= P\left(\frac{331 - 380 * 0.85}{\sqrt{380 * 0.85(1 - 0.85)}} \leq Z \leq \frac{380 - 380 * 0.85}{\sqrt{380 * 0.85(1 - 0.85)}}\right) = \\ &= P\left(\frac{8}{6.96} \leq Z \leq \frac{57}{6.96}\right) = P(1.15 \leq Z \leq 8.19) = 0.4999 - 0.3749 = 0.125 \end{aligned}$$

Answer:

The probability that on a given day, at least one of the permit holders will not obtain a parking space in this car park is 0.125.