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1. The probability of a hit is 0.18, there are 8 at-bats

$P(0) = C(8,0)(0.18)^0(0.82)^8 = 1\,(0.18)^0(0.82)^8 = 0.2044$

$P(1) = C(8,1)(0.18)(0.82)^7 = 8\,(0.18)^1(0.82)^7 = 0.3590$

$P(2) = C(8,2)(0.18)^2(0.82)^6 = 28\,(0.18)^2(0.82)^6 = 0.2758$

$P(3) = C(8,3)(0.18)^3(0.82)^5 = 56\,(0.18)^3(0.82)^5 = 0.1211$

$P(4) = C(8,4)(0.18)^4(0.82)^4 = 70\,(0.18)^4(0.82)^4 = 0.0332$

$P(5) = C(8,5)(0.18)^5(0.82)^3 = 56\,(0.18)^5(0.82)^3 = 0.0058$

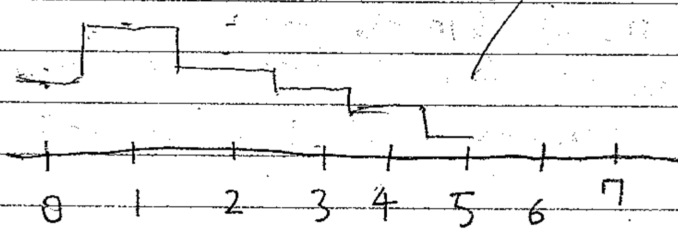
$P(6) = C(8,6)(0.18)^6(0.82)^2 = 28\,(0.18)^6(0.82)^2 = 0$

$P(7) = C(8,7)(0.18)^7(0.82)^1 = 8\,(0.18)^7(0.82)^1 = 0$

$P(8) = C(8,8)(0.18)^8(0.82)^0 = 1\,(0.18)^8(0.82)^0 = 0$

$M = 8\cdot(0.18) = 1.44$

$\sigma = \sqrt{8\cdot 0.18\cdot 0.82} = 1.0866$



2. The mean number of lightning strikes is 3.7 per season.

$P(\text{no}) = e^{-3.7} = 0.0247$

$P(1) = 3.7\cdot e^{-3.7} = 0.0914$

$P(2) = [3.7^2/2]e^{-3.7} = 0.1691$

$P(3) = [3.7^3/3!]e^{-3.7} = 0.2085$

· probability of no lightning in a 2 season

everage $= 3.7\cdot 2 = 7.4$ $\quad e^{-7.4} = 0.0061125$

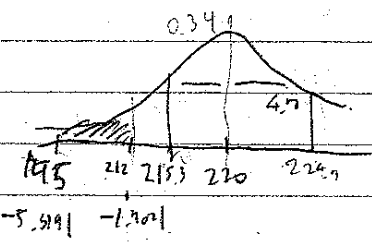
· probability of 4 lightning in a 3 season

everage $= 3.7\cdot 3 = 11.1$

$[(11.1)^4/4!]\cdot e^{-11.1} = 0.0096$

3. the average resistance is 220 ohms.
the standard deviation is 4.7 ohms.
what percentage of the resistors have resistances bet 195 and 212 ohms ?

The Z-scores of 195 and 212 are $(195-220)/4.7 = -5.3191$
and $(212-220)/4.7 = -1.7021$ $\rightarrow$ 0.4554
= Table A give



$= 0.5 - 0.4554 = 0.446$

$\therefore 0.5 - 0.3 = 0.2$ Z-score of -0.52
$\rightarrow 220 - 0.52(4.7) = 217.556$ ohms

The middle 95% have resistances between what two values?
Z-scores ± 1.96. Convert to $220 \pm 1.96(4.7) = 220 \pm 9.16$

4 a 5% rate of no-shows
126 seats, airline books 130,

$\mu = 6.5$ and $\sigma = \sqrt{130 \cdot 0.05(1-0.05)} = 2.485$

The Z-score of 3.5 is $(3.5 - 6.5)/2.485 = -1.2072$
and the probability approximation is $0.5 - 0.3849 = 0.1151$

The actual answer is the sum of four binomial probabilities.

$$\frac{130!}{127!3!}(0.05)^3(0.95)^{127} + \frac{130!}{128!2!}(0.05)^2(0.95)^{128} + 130(0.5)(0.95)^{129}$$
$$+ (0.95)^{130} = 0.1095$$