

hw-11: Find The Exp. Value (mean), and The Variance of the number of underinflated tires, if the mass density is the one specified in exercise 1.26 a (ii) on page 32 of text.

$$P(x) : P(x=0) = 0.4$$

$$P(x=1) = P(x=2) = P(x=3) = 0.1$$

$$P(x=4) = 0.3$$

Note: $\sum_{x=0}^4 P(x) = 0.4 + 0.1 + 0.1 + 0.1 + 0.3 = 1$ ✓
So, $P(x) =$ density.

$$E[x] = \sum_x x P(x) = 0(0.4) + 1(0.1) + 2(0.1) + 3(0.1) + 4(0.3) = 1.8$$

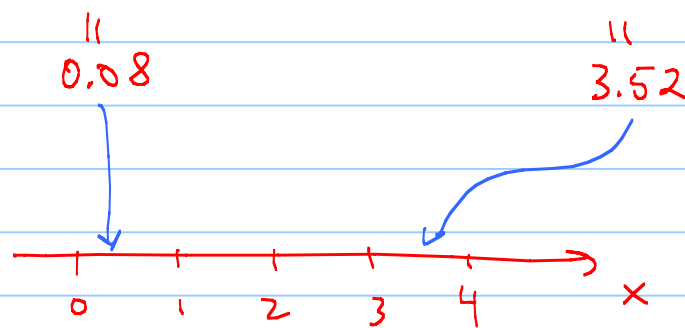
$$V[x] = \sum_x (x - E[x])^2 P(x) = (0 - 1.8)^2(0.4) + (1 - 1.8)^2(0.1) + (2 - 1.8)^2(0.1) + (3 - 1.8)^2(0.1) + (4 - 1.8)^2(0.3) = 2.96$$

Note: The std. dev. of x is $\sqrt{2.96} = 1.72$

For what proportion of such cars will the no. of under inflated tires be within 1 std. dev. of the mean?

The mean is 1.8, and the std. dev is $\sqrt{2.96} = 1.72$. So, we are looking for the area under $p(x)$ between

$(1.8 - 1.72)$ and $(1.8 + 1.72)$



I.e. $p(x=1) + p(x=2) + p(x=3)$

$$= 0.1 + 0.1 + 0.1 = 0.3$$