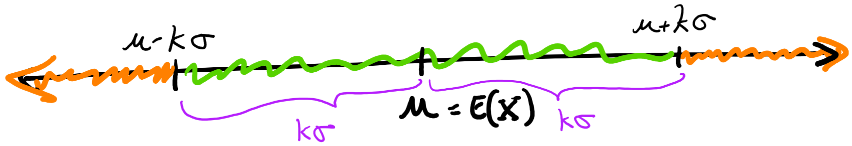
Chebyshev's Inequality: Let X be a discrete random variable with mean μ and standard deviation σ. For any $k \geq 1$,

$$P(|X - \mu| \geq k\sigma) \leq \frac{1}{k^2}.$$

In words, the probability that X is at least k standard deviations away from its mean is at most $\frac{1}{k^2}$.



$P(X \text{ is in orange shaded region}) \leq \frac{1}{k^2}$

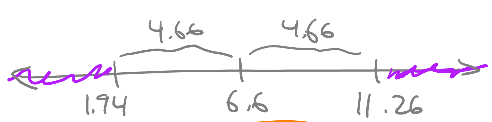
$P(X \text{ is in green shaded region}) \geq 1 - \frac{1}{k^2}$

(2) $P(|X - \mu| \geq k\sigma) \leq \frac{1}{k^2}$

$\mu = 6.6$ $\quad k = 2$ $\quad \sigma = \sqrt{5.44} = 2.33$

$P(|X - 6.6| \geq 2(2.33)) = P(|X - 6.6| \geq 4.66)$

$= P(X \leq 6.6 - 4.66 \text{ or } X \geq 6.6 + 4.66)$



$= P(X \leq 1.94 \text{ or } X \geq 11.26)$

not possible   not possible for this X

$= 0$, which is less than $\frac{1}{k^2} = \frac{1}{4}$

So Chebyshev's inequality holds