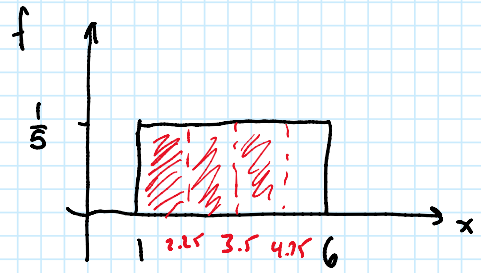
Monday, September 26, 2022 5:28 PM

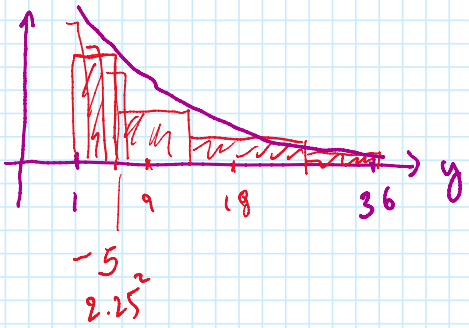


$$E(x) = \int_1^6 \frac{1}{5} x \, dx = 3.5$$

$$Var(x) = \int_1^6 \frac{1}{5} (x-3.5)^2 \, dx = \frac{25}{12}$$

$$Var(x) = E(x^2) - E^2(x)$$

$y = x^2$ pdf (y) E(y)



$\int pdf = cdf$

cdf (x) $pr(x < x_0) = \frac{x_0 - 1}{5}$

cdf (y) $pr(y < y_0)$

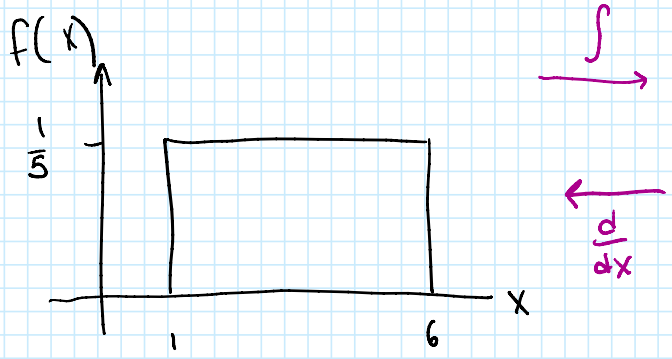
$pr(x < \sqrt{y_0})$

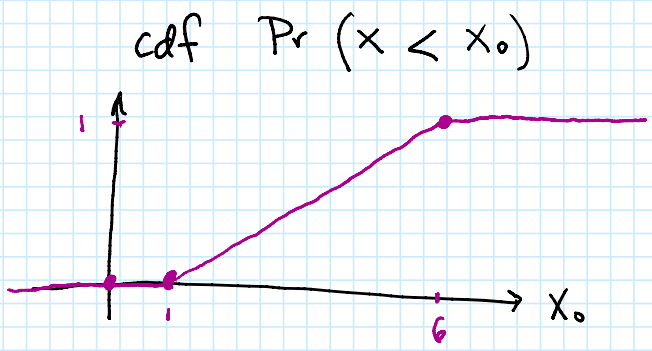
$\frac{\sqrt{y_0} - 1}{5}$

$$pdf(y) = \frac{d}{dy_0} \frac{\sqrt{y_0} - 1}{5}$$

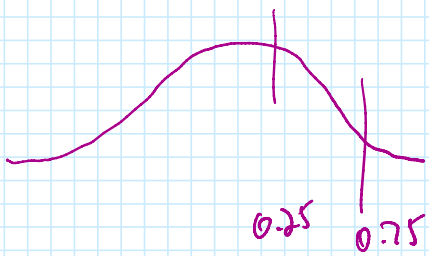
$$= \frac{1}{10\sqrt{y}}$$

$$E(y) = \int_1^{36} \frac{1}{10\sqrt{y}} \times y \; dy = \frac{43}{3}$$





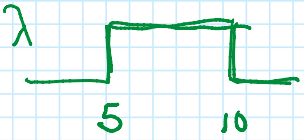
$Pr(2 < x < 3)$ $\int_2^3 f(x)$ $cdf(3) - cdf(2)$



e^{-x^2} $erf(0.75) - erf(0.25)$

Prob 3

prior



arrivals per minute

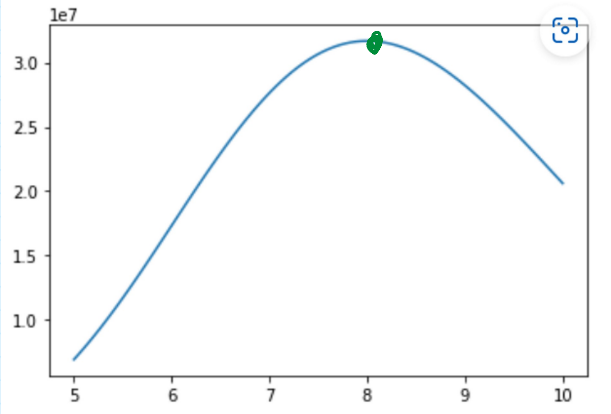
$$pdf(\lambda \mid obs) = \frac{pr(obs \mid \lambda) * prior}{prob(obs)}$$

$$prob(obs) \rightarrow \int_{\lambda} prob(obs \mid \lambda)\ prior(\lambda)$$

$t = 1$

$$= k \cdot \frac{(\lambda t)^7 e^{-\lambda t}}{7!} \cdot \frac{(\lambda t)^9 e^{-\lambda t}}{9!} \qquad 5 < \lambda < 10$$

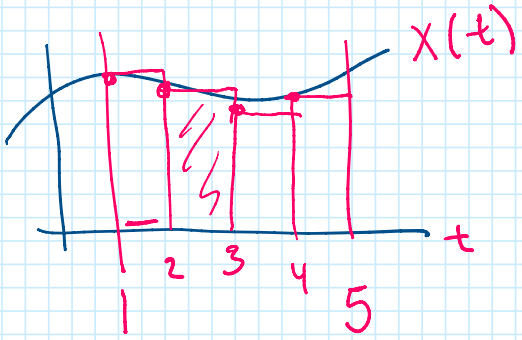
$$= K\ \lambda^{16} e^{-2\lambda}$$



$$16\lambda^{15} e^{-2\lambda} - 2\lambda^{16} e^{-2\lambda} = 0$$

$$16 = 2\lambda$$

$$\lambda = 8$$



$X(1) \cdot \Delta t$
$+ X(2) \cdot \Delta t$
$\vdots$
$\sum X \cdot \Delta t$

$$= \frac{1}{7!}\frac{1}{9!}\frac{1}{\int_5^{10} \frac{\lambda^{16} e^{-2\lambda}}{16!}\frac{1}{5}d\lambda} \quad ?$$

- 9%
- 7%

$$Pr(1) = \frac{\frac{1}{12}^{1} e^{-\frac{1}{12}}}{1!}$$

1 | 1 (5m) | 1 (2m) | 1 (5m) | avg = 12

heights given: 2 groups

6'
5'11"

can I separate data into

6'1"

4'7"

5'2"

two groups based on value

K-means

1 d data

k = 2 clusters (group)

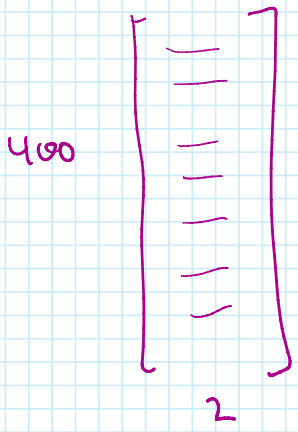
start with guess for the center of each cluster

for each data point

determine closer to cluster 0 or cluster 1

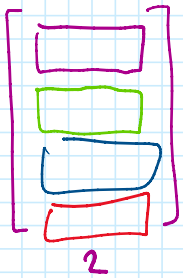
then, recompute avg of each cluster

data

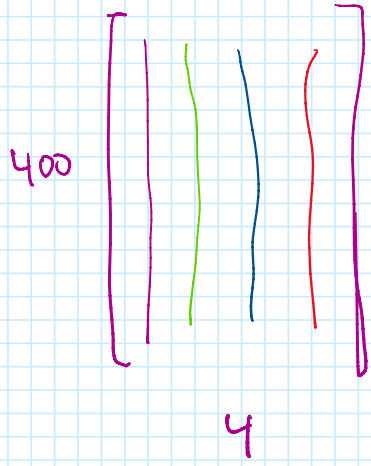


k = 4

ctrs



dist



arg min (dist)