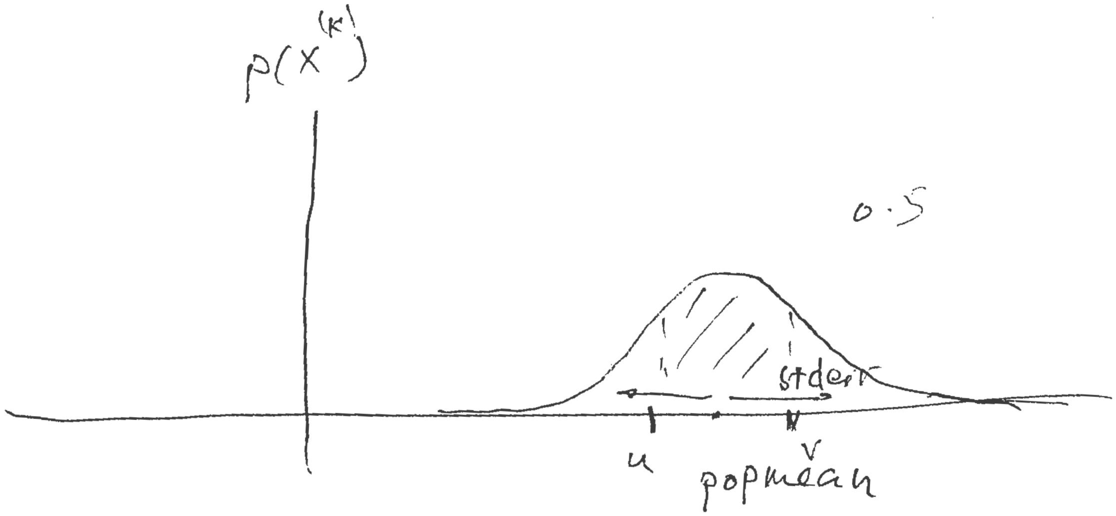
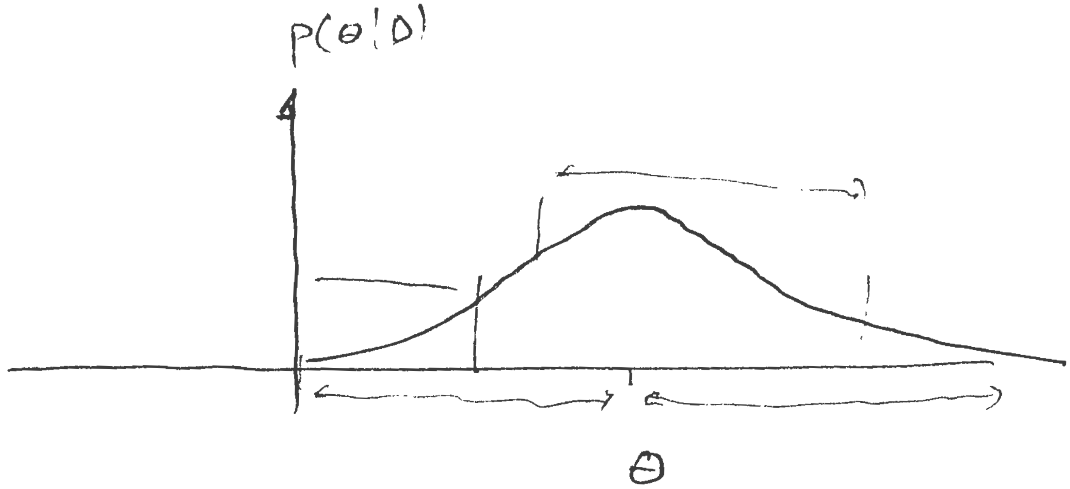
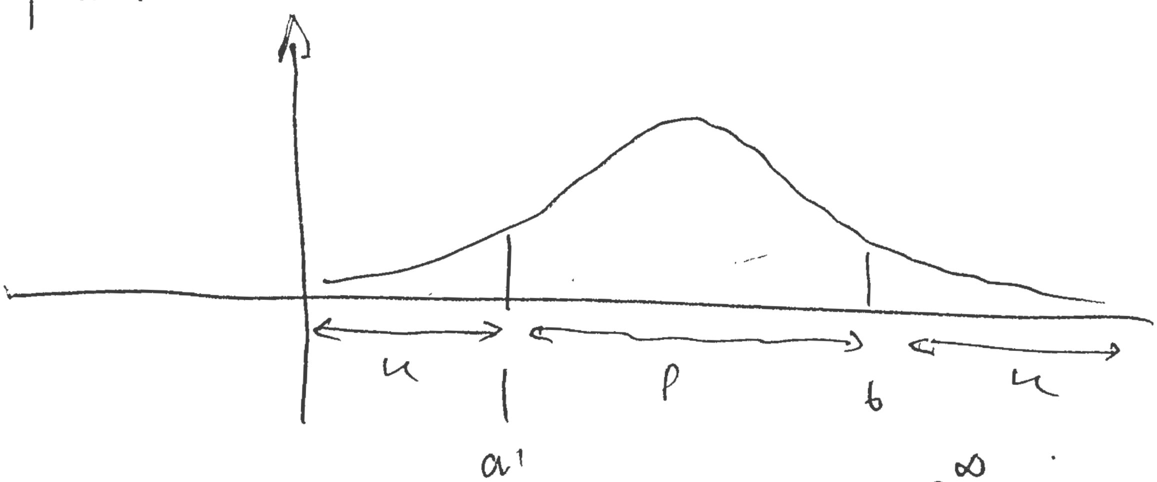


$$\int_u^v \text{Normal}\left(\text{mean}(X^k), \text{stderr}\right) dx = 0.5$$

$p(\theta \mid D)$



$p = 1 - 2u$



$$\int_{-\infty}^{a} p(\theta \mid D) = u$$

$$\int_{b}^{\infty} p(\theta \mid D) = u$$

D

model

$$P(D|\theta)$$

$$\hat{\theta} = \arg\max_{\theta} P(D|\theta)$$

$$p(D_{new}|\hat{\theta})$$

$$p(D_2|\hat{\theta})$$

$\vdots$

mean length 12 cm

36 toads

sample mean 13cm

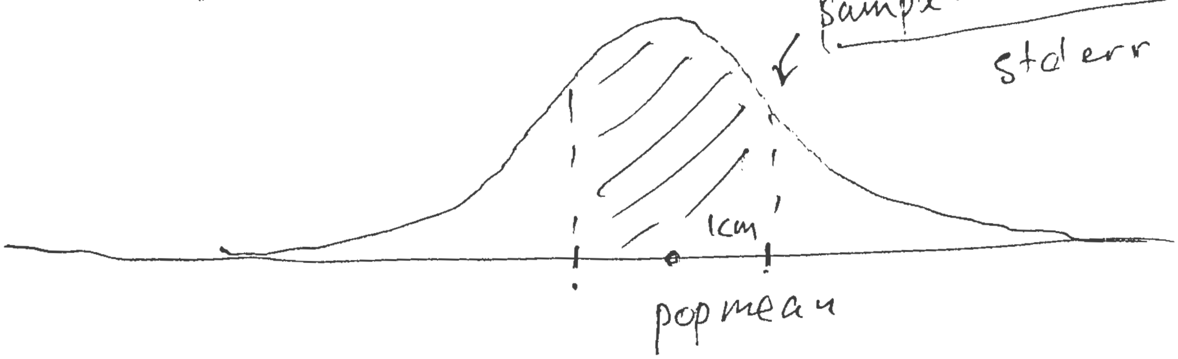
std of length 6cm :

Q: what fraction of all possible samples would be closer to mean _if_ hyp is true?

A: compute stderr

$$\frac{\text{std}}{\sqrt{K}} = 1\,\text{cm}$$

$$\frac{\text{samplemean} - \text{popmean}}{\text{stderr}} =$$



12 cm

$$\frac{(\text{samplemean} - \text{popmean})}{\text{stderr}}$$

Hyp length 10 cm.

25
mean length 8 cm
std length 5 cm

Q: what fraction of samples has the mean length closer to hyp. mean?

$$\text{stderr} = \frac{5}{\sqrt{25}} = 1$$

$$\frac{|\text{sample mean} - \text{pop mean}|}{\text{stderr}} = 2$$

Beards

40% of total pop wears beards

225 people

45 beards   180 no beards

Q: what fraction of samples has mean % of beards closer if hyp true

Sample mean = 0.2

std $= \sqrt{\frac{\sum_i (x_i - 0.2)^2}{N}} = \sqrt{\frac{45(1-0.2)^2 + 180(0-0.2)^2}{225}}$

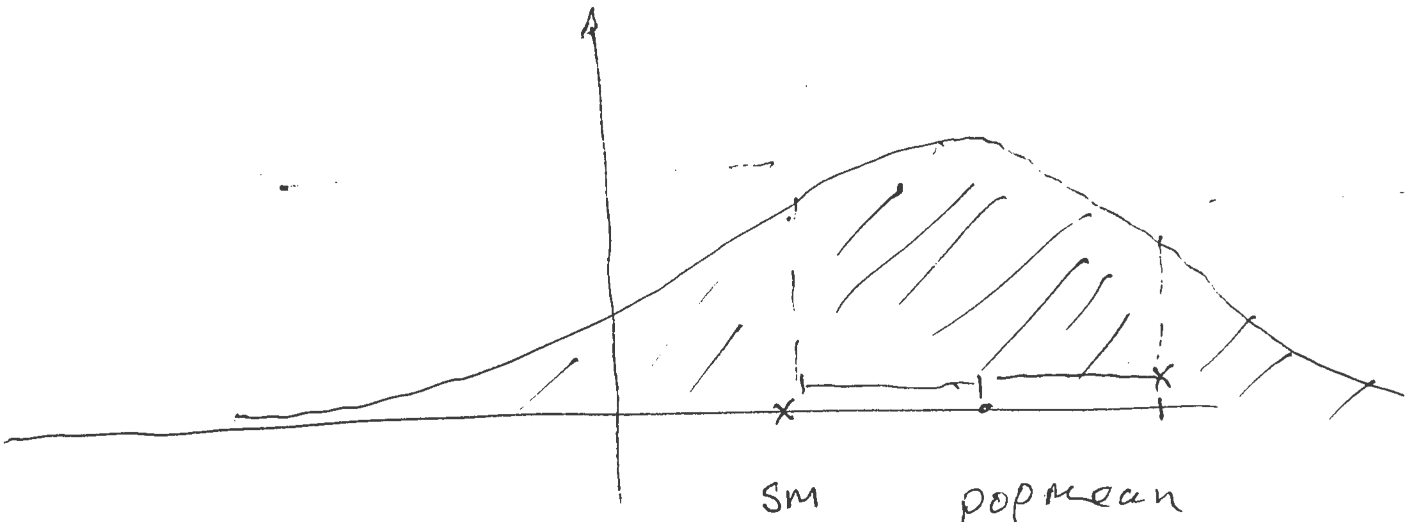
$= 0.4$

stderr $= \frac{0.4}{15} \approx 0.03$

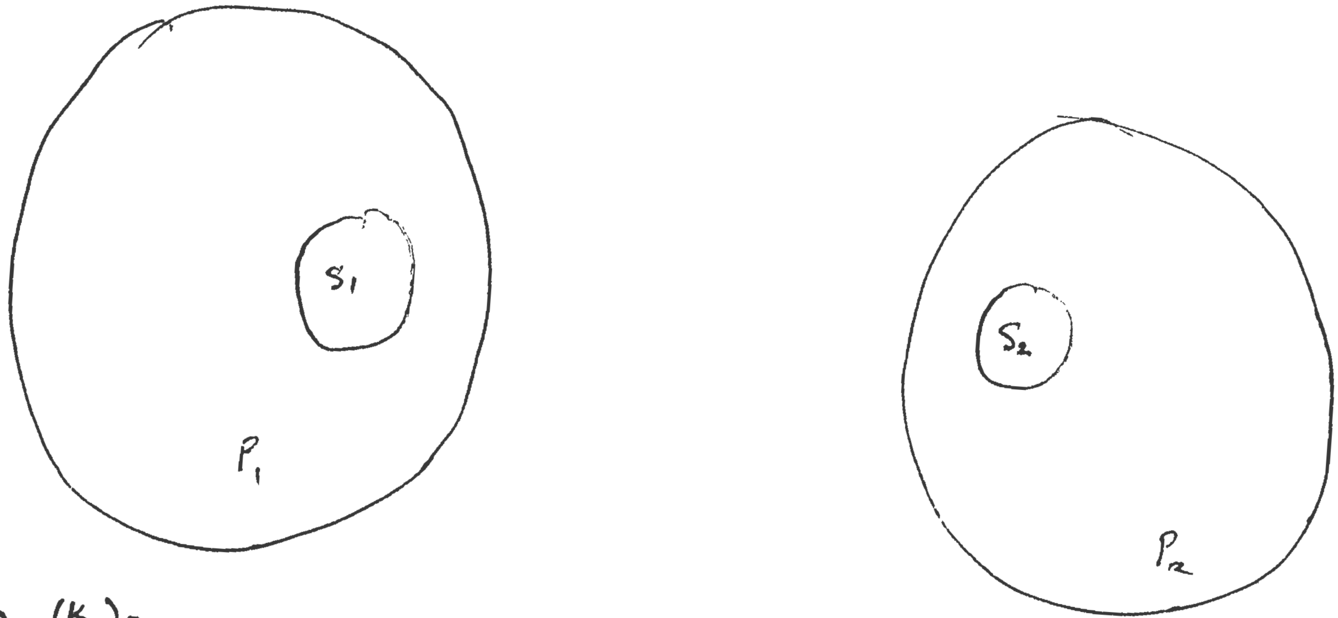
$\frac{|\text{samplemean} - \text{popmean}|}{\text{stderr}} \approx 7$

A: $1 - \varepsilon$

very small



P_{value} = 1 - (our number)



Y

$E[X^{(k_1)}]$ = pop mean

std[ ] = stderr

$X^{(k_1)}$ is Normal

if true

$$E\left[X^{(k_1)} - Y^{(k_2)}\right] = 0$$

$$\text{std}[\ ] = \sqrt{\text{stderr}(X)^2 + \text{stderr}(Y)^2}$$

Lion

mean 200 kg

25 std 50 kg

stderr 10 kg

Tiger

mean 300 kg

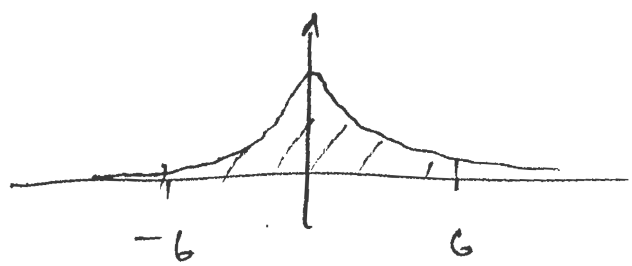
36 std 72 kg

stderr 12 kg

diff: 100 kg

$$\text{stderr}\left(X^{(k_1)} - Y^{(k_2)}\right) = \sqrt{10^2 + 12^2} \approx 15.6$$

$$\frac{100}{15.6} \approx 6$$



county A :

♀ 500   sm 0.467 $\sqrt{\frac{124.}{1070}}$ |

♂ 570

county B

♀ 320

♂ 310   sm .508

$$\frac{(0.467 - .508)}{0.025} \approx 1.6$$

χ - ^{2}

$$
\begin{array}{l}
1 \\
\\
\\
c
\end{array}
\begin{bmatrix} \; \\ \; \\ \; \\ \; \end{bmatrix}
\qquad
\begin{bmatrix} 20 \\ 20 \\ 20 \\ 20 \\ 20 \\ 20 \end{bmatrix}
\qquad
\begin{bmatrix} 21 \\ 19 \\ \vdots \\ \; \end{bmatrix}
$$

$$p_i \qquad f_t \qquad f_o$$

$$\sum_{\text{cases}} \frac{[f_t - f_o]^2}{f_t}$$

χ^2 significance $\qquad P(\{\cancel{\text{comple}}\ X_{\chi^2} \geq \text{number}\})$

12 H $\qquad$ .5 ?

11 T

$$\underbrace{\begin{bmatrix} 11.5 \\ 11.5 \end{bmatrix}}_{f_t} \qquad \begin{bmatrix} 12 \\ 11 \end{bmatrix}$$

$= 0.04$

0.84

$$\begin{bmatrix} 46 \\ 13 \\ 12 \\ 11 \\ 9 \\ 9 \end{bmatrix}$$

f_o

$$\begin{bmatrix} 16\,2/3 \\ \cdot \\ \cdot \\ \cdot \\ \cdot \end{bmatrix}$$

f_e

$K = 6$

$K - 1$

62.7

$3e^{-12}$