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10/31/2022
       Confidence Interval for percentiles lotistribution free)
                                     m(X) = man ft = Fx (t) = = = 1
       X is continuous RV
                                     median
                                     TIP (X) = min ft: Fx(t) = P4
                                     pth quantile / 100p% parcountile.
                                     P= = 2 = 0.5 10% Percentile = me otion
                                    P= = = 0.3 25%, percentale = 1st quantile
                                    P=====0.75 /2% preentile = 2nd quantile.
     X_1, X_2, \dots, X_s Y_1 < Y_2 < \dots < X_s estimate m(X) (p = \frac{1}{2})
                                                     estimate Tip (XI)
     (N+1)\cdot \frac{1}{2} = (5+1)\cdot \frac{1}{2} = 3
           Y3 = sample mectican.
     sample percentile \widehat{\pi}_p = y_k + 8(y_{k+1} - y_k) if (n+1)p = k+8 integer To, 1).
     Given CI for m(X), Ttp(X)
      Simple Idea: just use (Y1, Y5)
        \mathbb{P}(m|X)\in(Y_1,\ Y_2|)=?=1-X
Given: P(Y_1 < m \text{ and } Y_2 > m) = 1 - P(Y_1 > m) - P(Y_2 > m) X_1, X_2, X_4, X_5
                                                                                    Y = 2000 (X1, ..., X5)
                                 -Y_1 < m means at least one of X_1's < m
    W=0 W=1 W=2 W=3 W=4 W=5
     Is >m means at least one of Xi's > m
                                                                                     /5 = mox (X1, ..., X5)
                                 -W = number of Xi's that are < m
                                      = \frac{1}{\sqrt{2}} \frac{1}{3} \chi_i \leq m_i = \text{Binom}(n, \frac{1}{2})
            X1, . . . , X5
                                                  7. T. d. Sum of Bemaulti (=)
           / m
     , "success": X2 < m P(X2 cm) = = > W= K < > Yu < m < Yu+1
    - 皇 P(w= K)
                                                                    =P(1=W=4)
                                                                    =1-P(W-1)-P(W-4)=1-1-25-25
   Generalize: X1, X2, ..., Xn Y1 < Y2 < ... < Yn
            want to fand CI for Top
          If use (Y_i, Y_j) as my (2, P(\pi p e(Y_i, Y_j)) = 1 - \alpha = ?
          W = \# X_i's that are \langle \pi_p \rangle = \beta i n \sigma m \langle n, p \rangle \approx \mathcal{N}(np, np (1-p))
         "success" = X_{\overline{c}} < \pi_{\overline{p}}  \mathbb{P}(X_{\overline{c}} < \pi_{\overline{p}}) > \overline{p}
         "failuve" = Xi > Tp | P(Xi > Tp) = 1-P
       W=0 W=1 W=K W=N-1 W=N

Y, Y2 ... Yk / Yk+1 ... Yh-1 Yu Top
```

```
=> W = K <=> YK < TTP < YK+1
      P(\pi_{P} \in \{Y_{2}, Y_{3}\}) = 1- \alpha
= \sum_{k=1}^{J-1} P(\pi_{P} \in \{Y_{k}, Y_{k+1}\})
       = 5-1 P(w=k) = P(i < W < j-1)
         = \mathbb{P}(\bar{c} - \alpha z \leq w \leq \bar{j} - \alpha z) \approx \mathbb{P}(\bar{c} - \alpha z \leq N | np, np (1-p) \leq \bar{j} - \alpha z)
         = \mathbb{P}\left(\frac{z - as - np}{Nnp(1-p)} \le \mathcal{N}(0, 1) \le \frac{\overline{z} - as - np}{Nnp(1-p)}\right)
Example: n = 27 samples want C2 for TTax

Let's compute \hat{\pi}_{ab} = y_7

(n+1)p = 28 \times 0.21 = 28 \times 4 = 7
                                                                                                                                 np = 27 \times 4 = 6.75
\sqrt{np(1-p)} = \sqrt{2} \times 4 \times \frac{2}{4} = \sqrt{\frac{21}{16}} = \frac{9}{4} = 2.25
                        one reasonable choice for C2 7s (y, y,)
                         P(Tax 6( /4, /10) = P(4 = W = 9) = P(4-01 = W = 10-015))

\begin{array}{c}
\nearrow \mathbb{P}\left(\frac{6-0.5-675}{2.\cancel{1}} \leq \cancel{2} \land N(0,1) \leq \frac{10-0.5-6.75}{2.\cancel{1}}\right)
\end{array}
```

Suppose we're interested in an QU $\times \sim N(\mu, 3h)$ . Bressed on oriented information. When chase the competing $\cdot$ Null importance happointers $\cdot M \cdot \mu = xx$ .  Alternative happointers $\cdot M \cdot \mu = xx$ .  The up of $\cdot N \cdot \mu = xx$ $\cdot N \cdot \mu = xx$ .  The set of open $\cdot N \cdot \mu = xx$ $\cdot N \cdot \mu = xx$ .  The set of outcomes $\cdot N \cdot \mu = xx$ $\cdot N \cdot \mu = xx$ .  It is specified by the east system $\cdot N \cdot \mu = xx$ .  It is specified by the east contact $\cdot X \cdot \mu = xx$ .  It is specified by the east contact $\cdot X \cdot \mu = xx$ .  It is specified by the east contact $\cdot X \cdot \mu = xx$ .  It is specified by the east contact $\cdot X \cdot \mu = xx$ .  It is specified by the east contact $\cdot X \cdot \mu = xx$ .  It is specified by the east contact $\cdot X \cdot \mu = xx$ .  It is specified by the east contact $\cdot X \cdot \mu = xx$ .  It is specified by the east contact $\cdot X \cdot \mu = xx$ .  It is specified by the east contact $\cdot X \cdot \mu = xx$ .  It is specified by the east contact $\cdot X \cdot \mu = xx$ .  It is specified by the east contact $\cdot X \cdot \mu = xx$ .  It is specified by the east $\cdot x \cdot $	
*Alternative hypothesis H. $\mu$ is the connect? How can we set which one is some listly to be correct?  How $\mu$ is or H. $\mu$ is $\chi$ is in a N/ $\mu$ , $\chi$ is a N/ $\mu$ , $\chi$ is a N/ $\mu$ , $\chi$ is an invariant of the set of the set of the set of actions the short of $\chi$ is an example of a test street $\chi$ is a specified by the test street $\chi$ is a specified by the example of $\chi$ is a sum of $\chi$ in a sum of $\chi$ in a sum of $\chi$ is a sum of $\chi$ in a sum of $\chi$ in a sum of $\chi$ is a sum of $\chi$ in a sum of $\chi$ in a sum of $\chi$ in a sum of $\chi$ is a sum of $\chi$ in a sum of $\chi$ in a sum of $\chi$ in a sum of $\chi$ is a sum of $\chi$ in a sum of	ypothesis.
*Alternative hypothesis: M. $\mu$ -SSS How likely to be correct?  How can we set which one is now likely to be correct?  How $\mu$ -SO or $\mu$ -West value on the state of $\mu$ -SSS How $\mu$ -SSSS How $\mu$ -SSSSS How $\mu$ -SSSSS How $\mu$ -SSSSSS How $\mu$ -SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	
How can we test which one is more librally to be connect?  Mo. $\mu$ =50 or $H$ : $\mu$ =55	
He $\mu$ = 50 or H: $\mu$ = 50 $\chi$ H: $\chi$ = 50 $\chi$ = 50 $\chi$ H: $\chi$ = 50 $\chi$	
Interestically larger $\overline{X}$ form $H$ our $H_0$ Set up a "rejection threshold" $M = 13$ .  This is Reject to (in four of $H_1$ ) if $\overline{X} \ge M_0 = 53$ produce we "accept" (do not reject) $H_0$ .  This an example of a test for the sample real improbation $H_0 : M \in \mathbb{C}^0$ against the simple alternative improfuncts $H_1 : M \in \mathbb{C}^0$ .  The sect of outcomes $C := \int [N_1, N_2,, N_m] : \overline{X} \ge M_0 = 13\overline{1}$ is the critical assign for the feet.  It's specified by the test estroctate $\overline{X}$ . $X := P(\text{type I error}) = P(N_1,, N_m) \notin C : H_1) = P(\overline{X} = 53, M = 53)$ $X := P(\text{type I error}) = P(N_1,, N_m) \notin C : H_1) = P(\overline{X} = 53, M = 53)$ or is the "significance lead" of this test.  To compute those potablishings $O(\beta)$ , we need to know the distribution of the test specific $\overline{X}$ under the $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1, \frac{1}{M})$ $\overline{X} = \frac{1}{M} [X + + X_m] \sim M(M_1,$	
Set up a "rejection threshold" $M = 13$ .  Fest: Deject $M$ in four of $M$ ) if $\overline{X} \ge M = 53$ or otherwise we "accept" (do not reject) $M$ .  This an example of a test for the sample null importants $M$ is specified by the test statistic $\overline{X}$ .  It's specified by the test statistic $\overline{X}$ . $X := P \text{tope 1 error} = P(X_1,, X_m) \in C; M = P(\overline{X} \le X), \mu = \Sigma 1$ At $\overline{X} := P \text{tope 1 error} = P(X_1,, X_m) \in C; M = P(\overline{X} \le X), \mu = \Sigma 1$ At $\overline{X} := P \text{tope 1 error} = P(X_1,, X_m) \in C; M = P(\overline{X} \le X), \mu = \Sigma 1$ At $\overline{X} := P \text{tope 1 error} = P(X_1,, X_m) \in C; M = P(\overline{X} \le X), \mu = \Sigma 1$ At $\overline{X} := P \text{tope 1 error} = P(X_1,, X_m) \in C; M = P(\overline{X} \le X), \mu = \Sigma 1$ At $\overline{X} := P \text{tope 1 error} = P(X_1,, X_m) \in C; M = P(\overline{X} \le X), \mu = \Sigma 1$ At $\overline{X} := P(\overline{X} := P$	
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The set of outcomes $C := \begin{cases} (N_1 \cdot N_2 \cdot N_3) : N_1 \cdot N_2 \cdot N_3 = 23 \end{cases}  \text{The critical region for this text.}$ $H'' = \begin{cases} (N_1 \cdot N_3 \cdot N_3 \cdot N_3 \cdot N_3) : N_2 \cdot N_3 = 23 \end{cases}  \text{The critical region for this text.}$ $(N_1 \cdot N_2 \cdot N_3 \cdot N_3 \cdot N_3 \cdot N_3 \cdot N_3 = 23 \end{cases}  \text{The critical region for this text.}$ $(N_2 \cdot N_3 \cdot N_3 \cdot N_3 \cdot N_3 \cdot N_3 \cdot N_3 = 23 \end{cases}  \text{The critical region for this text.}$ $(N_3 \cdot N_3 \cdot N_3$	
The set of outcomes $C := \int (N_1, N_2, \dots, N_n) : \overline{X} \geqslant J_{N_0} = \Sigma \geqslant \frac{1}{3} \text{ is the critical section for this text.}$ $Ho \text{ is graphed by the text statistic } \overline{X}.$ $X := P \text{ type I error} := P(N_1, \dots, N_n) \in C: H_1) = P(\overline{X} \geqslant J_2, \mu = \Sigma)$ $P := P \text{ type I error} := P(N_1, \dots, N_n) \in C: H_1) = P(\overline{X} \geqslant J_2, \mu = \Sigma)$ $X := P \text{ type I error} := P(N_1, \dots, N_n) \in C: H_1) = P(\overline{X} \geqslant J_2, \mu = \Sigma)$ $X := P \text{ type I error} := P(N_1, \dots, N_n) \in C: H_1) = P(\overline{X} \geqslant J_2, \mu = \Sigma)$ $X := P \text{ type I error} := P(N_1, \dots, N_n) \in C: H_1) = P(\overline{X} \geqslant J_2, \mu = \Sigma)$ $X := P \text{ the "significance level" of this text.}$ $P  the "significanc$	
The set of outcomes $C:=\int (x_1,x_2,,x_n): \overline{X}\geqslant \mu_n=\Sigma^{\frac{n}{2}}  \text{is the critical segion for this feet.}$ $H's specified by the test stockize \overline{X}.$ $X:=\Pr type \ 1 \text{ ornor})=\Pr (x_1,,x_n)\in C; H_0)=\Pr (\overline{X}>\Sigma^{\frac{n}{2}},\mu=\Sigma^{\frac{n}{2}})$ $X:=\Pr type \ 1 \text{ ornor})=\Pr (x_1,,x_n)\in C; H_0)=\Pr (\overline{X}<\Sigma^{\frac{n}{2}},\mu=\Sigma^{\frac{n}{2}})$ $X:=\Pr type \ 1 \text{ ornor})=\Pr (x_1,,x_n)\in C; H_0)=\Pr (\overline{X}<\Sigma^{\frac{n}{2}},\mu=\Sigma^{\frac{n}{2}})$ $X:=\Pr (x_1,x_2,,x_n)\in C; H_0)=\Pr (\overline{X}<\Sigma^{\frac{n}{2}},\mu=\Sigma^{\frac{n}{2}})$ $X:=\Pr (x_1,x_2,,x_n)\in C; H_0)=\Pr (x_1,x_2,,x_n)\in C; H_0)=\Pr (x_1,x_2,,x_n)$ $X:=\Pr (x_1,x_2,,x_n)\in C; H_0:=\Pr (x_1,x_2,,x_n)$ $X:=\Pr (x_1,x_2,,x$	
$C:=\frac{\sqrt{(x_1,x_2,\dots,x_n)}}{\sqrt{x_1}} \xrightarrow{x_1} \xrightarrow{x_1} \xrightarrow{x_2} \xrightarrow{x_3} \xrightarrow{x_4} \text{ or fical region for this text.}} \qquad \qquad Ho is forced unrectly region for this specified by the itest statistic \overline{x}. X:=\frac{\sqrt{(x_1,x_2,\dots,x_n)}}{\sqrt{x_2}} = \frac{\sqrt{(x_1,\dots,x_n)}}{\sqrt{x_2}} + \frac$	
$C:=\frac{\sqrt{(x_1,x_2,\dots,x_n)}}{\sqrt{x_1}} \xrightarrow{x_1} \xrightarrow{x_1} \xrightarrow{x_2} \xrightarrow{x_3} \xrightarrow{x_4} \text{ or fical region for this text.}} \qquad \qquad Ho is forced unrectly region for this specified by the itest statistic \overline{x}. X:=\frac{\sqrt{(x_1,x_2,\dots,x_n)}}{\sqrt{x_2}} = \frac{\sqrt{(x_1,\dots,x_n)}}{\sqrt{x_2}} + \frac$	
H's specified by the test statistic $\bar{x}$ . $x := P(type \ 1 \text{ error}) = P(x_1,, x_n) \in C; H_1) = P(\bar{x} > 5, \mu = 50)$ $\bar{x} > 5 \Rightarrow 10$ $\bar{x} = P(type \ 1 \text{ error}) = P(x_1,, x_n) \in C; H_1) = P(\bar{x} < 5, \mu = 55)$ $\bar{x} > 5 \Rightarrow 10$ $\bar{x} = P(type \ 1 \text{ error}) = P(x_1,, x_n) \in C; H_1) = P(\bar{x} < 5, \mu = 55)$ $\bar{x} < 5 \Rightarrow 10$ $\bar{x} = P(type \ 1 \text{ error}) = P(x_1,, x_n) \in C; H_1) = P(\bar{x} < 5, \mu = 55)$ $\bar{x} < 5 \Rightarrow 10$ $x$	
$X := \text{Ptope I error} \} = \text{P(x_1, \dots, x_n)} \in C; \text{ (h)} = \text{P(x} \Rightarrow \text{x}), \mu = \text{x})$ $\Rightarrow := \text{Ptope I error} \} = \text{P(x_1, \dots, x_n)} \notin C; \text{ (h)} = \text{P(x} \Rightarrow \text{x}), \mu = \text{x})$ $\Rightarrow := \text{Ptope I error} \} = \text{P(x_1, \dots, x_n)} \notin C; \text{ (h)} = \text{P(x_1, \dots, x_n)} \notin C;  (h)$	we
$\beta:=\text{Pttype I arim'})=\text{Ptx},,x_n\} \notin C; \text{Mi})=\text{Ptx} < 23, \text{M}=22}$ $0 \times \text{Ts. the "significance level of this test.}$ $0 \times Ts. the "significance level of this this this this this the "significance level of this this this this this this this this$	
The injection of this test.  The injection of this test.  To compute these probabilities $(x,\beta)$ , we need to know the distribution of the test stactic $\overline{x}$ under the injection $\overline{x}$ and $\overline{x}$ and $\overline{x}$ in $(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_n) \sim \mathcal{N}(\mu, \frac{1}{2n})$ $\overline{x} = \frac{1}{n}(x_1 + \cdots + x_$	0
** To compute these probabilities $(x, \beta)$ , we need to know the distribution of the test static $\overline{x}$ under the probabilities $(x, \beta)$ , we need to know the distribution of the test static $\overline{x}$ under the probabilities $(x, \beta)$ , we need to know the distribution of the test static $\overline{x}$ under the probabilities $(x, \beta)$ , we need to know the distribution of the test static $\overline{x}$ under the probabilities $(x, \beta)$ , we need to know the distribution of the distribut	omor"
Mo, M, respectively. $ \begin{array}{ll} \overline{X} = \frac{1}{N} \left[ X_{1} + \cdots + X_{N} \right] \sim \mathcal{N} \left[ M_{1}, \frac{\lambda h}{2h} \right] \\ \overline{X} = \frac{1}{N^{2} \sqrt{N}} \sim \mathcal{N} \left[ (0, 1) \right] = 2 \end{array} $ $ \begin{array}{ll} \overline{X} = P(\overline{X} > \Sigma_{2}), M = \Sigma_{0} \\ \overline{X} = P(\overline{X} > \Sigma_{3}), M = \Sigma_{0} \end{array} $ $ = P(\overline{X} > M), M = \Sigma_{0} $ $ = P(\overline{X} > M), M = \Sigma_{0} $ $ = P(\overline{X} > M), M = \Sigma_{0} $ $ = P(\overline{X} > M), M = \Sigma_{0} $ $ = P(\overline{X} > M), M = \Sigma_{0} $ $ = P(\overline{X} > M), M = \Sigma_{0} $ $ = P(\overline{X} > M), M = \Sigma_{0} $ $ = P(\overline{X} > M), M = \Sigma_{0} $ $ = P(\overline{X} > M), M = \Sigma_{0} $ $ = P(\overline{X} > M), M = \Sigma_{0} $ $ = P(\overline{X} > M), M = \Sigma_{0} $ $ = P(\overline{X} > M), M = \Sigma_{0} $ $ = P(\overline{X} > M), M = \Sigma_{0} $ $ = P(\overline{X} > M), M = \Sigma_{0} $ $ = P(\overline{X} > M), M = \Sigma_{0} $ $ = P(\overline{X} > M) $	
$ \begin{array}{lll}                                   $	J
$ \frac{\overline{X} - \mu}{\overline{M36/n}} \sim N(0,1) = 2 $ $   X - \mu  = 0 $	
$ \begin{array}{lll}                                   $	
$ \begin{array}{lll}                                   $	
$= P(\frac{x-\mu}{A \ni b/n} \Rightarrow \frac{x \ni -\mu}{A \ni b/n}; \mu = x_0)$ $= P(\frac{x-\mu}{A \ni b/n} < \frac{x \ni -\mu}{A \ni b/n}; \mu = x_0)$ $= P(\frac{x-\mu}{A \ni b/n} < \frac{x \ni -\mu}{A \ni b/n})$ $= P(\frac{x-\mu}{A \ni b/n} < \frac{x \ni -\mu}{A \ni b/n})$ $= P(\frac{x-\mu}{A \ni b/n} < \frac{x \ni -\mu}{A \ni b/n})$ $= P(\frac{x-\mu}{A \ni b/n} < \frac{x \ni -\mu}{A \ni b/n})$	
$= P(\frac{x-\mu}{A \ni b/n} \Rightarrow \frac{x \ni -\mu}{A \ni b/n}; \mu = x_0)$ $= P(\frac{x-\mu}{A \ni b/n} < \frac{x \ni -\mu}{A \ni b/n}; \mu = x_0)$ $= P(\frac{x-\mu}{A \ni b/n} < \frac{x \ni -\mu}{A \ni b/n})$ $= P(\frac{x-\mu}{A \ni b/n} < \frac{x \ni -\mu}{A \ni b/n})$ $= P(\frac{x-\mu}{A \ni b/n} < \frac{x \ni -\mu}{A \ni b/n})$ $= P(\frac{x-\mu}{A \ni b/n} < \frac{x \ni -\mu}{A \ni b/n})$	
$= \mathbb{P}\left(2 > \frac{52 - 50}{\sqrt{30/m}}\right) = \mathbb{P}\left(\frac{\sqrt{3-10}}{\sqrt{30/m}} < \frac{-2 - 55}{\sqrt{30/m}}\right) = \mathbb{P}\left(2 > \frac{1}{\sqrt{30/m}}\right) = \mathbb{P}\left(2 > \frac{1}{\sqrt{30/m}}\right) = \mathbb{P}\left(2 > \frac{1}{\sqrt{30/m}}\right) = \mathbb{P}\left(2 > \frac{1}{\sqrt{30/m}}\right)$	
$= \mathbb{P}(2 \ge \frac{53 \cdot 50}{\sqrt{30/m}}) = \mathbb{P}(\frac{\sqrt{N-M}}{\sqrt{30/m}} < \frac{52 \cdot 55}{\sqrt{30/m}}) = \mathbb{P}(\frac{\sqrt{N-M}}{\sqrt{30/m}} < \frac{1}{\sqrt{30/m}}) = \mathbb{P}(2 \ge \frac{1}{\sqrt{N}} \sqrt{m}) = \mathbb{P}(2 \ge \frac{1}{\sqrt{N}} \sqrt{m}) = \mathbb{P}(2 \ge \frac{1}{\sqrt{N}} \sqrt{m})$	
$= \mathbb{P}(\mathbb{Z} \Rightarrow \frac{1}{\sqrt{N}})$ $= \mathbb{P}(\mathbb{Z} \Rightarrow \frac{1}{\sqrt{N}})$ $= \mathbb{P}(\mathbb{Z} \Rightarrow \frac{1}{\sqrt{N}})$ $= \mathbb{P}(\frac{\mathbb{Z} - \mu}{\sqrt{N} + \sqrt{N}})$	
$= \mathbb{P}\left(2 \ge \frac{1}{2}\sqrt{n}\right) = \mathbb{P}\left(\frac{\overline{x} \cdot \mu}{\sqrt{35/m}} < -\frac{1}{2}\sqrt{n}\right)$	
$= \mathbb{P}\left(\mathbb{Z} \geqslant \frac{1}{2}\sqrt{n}\right) \qquad = \mathbb{P}\left(\frac{\sqrt{N}}{N} - \frac{1}{2}\sqrt{n}\right)$	
$H_0: \overline{X} \sim \mathcal{N}(\Sigma_0, \frac{3b}{N})$ $H_1: \overline{X} \sim \mathcal{N}(\Sigma_0, \frac{3b}{N})$	
No: X ~ N(20, \frac{\pi}{\pi})	
22=U	
. Fixed sample size n. if we move up up. then decrease x or the cost of increasing β.	
o Fixed $M_{\rm th}$ , if we movesse sample size $m_{\rm t}$ -than $M_{\rm t}$ $\beta$ both decrease . In fact, $M_{\rm th}$ $\beta$ $\to$ 0 exponentially fast.	

