

$$1.1. \quad m=5 \quad n=8$$

8.5 8.5 9.5 9.5

1	2	3.5	3.5	5	6	7	8	9.5	9.5	11.5	11.5	13
48	48	49	49	50	51	52	60	61	61	62	62	63
S1	S1	S1	S2	S2	S1	S2	S1	S2	S2	S2	S2	S2
-	-	-	-	-	-	-	-	-	-	-	-	-

$$R_1 = 1 + 2 + 3.5 + 6 + 8 = 20.5$$

$$R_2 = 3.5 + 5 + 7 + 9 + 10 + 11 + 12 + 13 = 70.5$$

$$1. \quad w_{0.05} = 17 \quad w_{0.01} = 21 > 20.5$$

reject H_0 in 0.01 case and
accept H_0 in 0.05

$$2. \quad \bar{R}_1 = 1 + 2 + 3.5 + 6 = 12.5$$

$$\bar{R}_2 = 3.5 + 5 + 7 + 8.5 + 8.5 + 9.5 + 9.5 = 53.5$$

$$\text{when } m=4 \quad n=7, \quad w_{0.05} = 13.$$

H_0 reject H_1 accept.

1.2.

eq 7).

$$f_{T_k} = \frac{(1+t) \cdot \sqrt{1+t^2}}{c(1+t^2)^2 \cdot \sqrt{2\pi}} \cdot \exp \left[-\frac{(t-1)^2}{2c(1+t^2)} \right]$$

$$L(c) = f(t_1, t_2, \dots, t_n; c)$$

$$= \prod_{i=1}^n f(t_i; c)$$

ii d - assumption.

$$= \prod_{i=1}^n \frac{(1+t_i) \cdot \sqrt{1+t_i^2}}{c(1+t_i^2)^2 \cdot \sqrt{2\pi}} \cdot \exp \left[-\frac{(t_i-1)^2}{2c(1+t_i^2)} \right]$$

$$\max_c L(c) = \frac{\partial L}{\partial c} = 0 \iff \frac{\partial(\log L(c))}{\partial c}$$
$$\log(L(c)) = \sum_{i=1}^n \log \frac{(1+t_i) \cdot \sqrt{1+t_i^2}}{c(1+t_i^2)^2 \cdot \sqrt{2\pi}} + -\frac{(t_i-1)^2}{2c(1+t_i^2)}$$
$$\log \frac{A}{c} - \frac{B}{c}$$

$$\frac{\partial(\log L(c))}{\partial c} = 0$$

$$\iff \sum_{i=1}^n -\frac{1}{c} + B_i \cdot \frac{1}{c^2} = 0$$

$$-\frac{n}{c} + \sum_{i=1}^n \frac{Bi}{Cs} = 0 \Leftrightarrow \frac{n}{c} = \sum_{i=1}^n \frac{Bi}{Cs}$$

$$\Leftrightarrow c^2 = \frac{1}{n} \sum_{i=1}^n Bi \Leftrightarrow c = \left[\frac{1}{n} \sum_{i=1}^n Bi \right]^{1/2}$$

$$Bi = \frac{(t_i - 1)^2}{(1 + t_i)^2}$$

b). $\mu = 1$ $\sigma = 0.10$ $c = 0.0043.$

$$\sigma = 0.15 \quad c = 0.0126$$

$$\sigma = 0.2 \quad c = 0.0258 .$$

c increase as σ increase .

1.3.

Part 1.

1. Guess ratio T to be 0.8
2. significant levels $0.05 \Rightarrow T = 0.888\%$.
 $0.01 \Rightarrow T = 0.885$

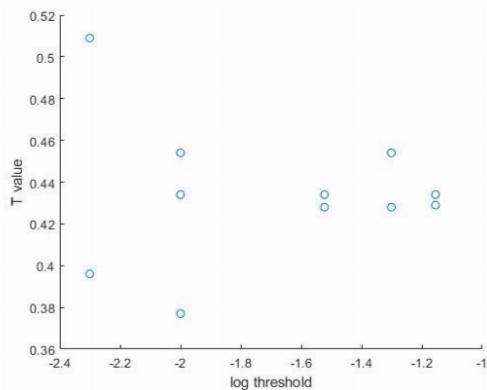
3.
0.885 1.030 1.0437 0.888

X is randomly pick within the sample mask.

Part 2.

1. as significance level increase , mask size increases .

2.



1. 4.

a) $\hat{C} = 0.15$ lower limit = 0.648
upper limit = 1.488

b) $2.06 > 1.488 \Rightarrow$ up regulated.

c) $\hat{C} = 2.3$ lower limit = 0.373
upper limit = 2.442

$2.06 < 2.442 \Rightarrow$ not regulated.

