

給定資料如下

- (93) (140) (8) (120) (3) (120) (33) (170) (91) (61)  
 (7) (100) (19) (98) (110) (23) (14) (94) (57) (9)  
 (66) (53) (28) (76) (58) (9) (73) (49) (37) (92)

令  $\alpha = 0.01$  之下, 視檢是是否為常態分配?

$H_0 = X \sim N(\mu, \sigma^2)$      $\mu, \sigma^2$  未知, 用  $\bar{x} \xrightarrow{\text{估計}} \mu$   
 $H_1 = X \sim N(\mu, \sigma^2)$      $S^2 \xrightarrow{\text{估計}} \sigma^2$

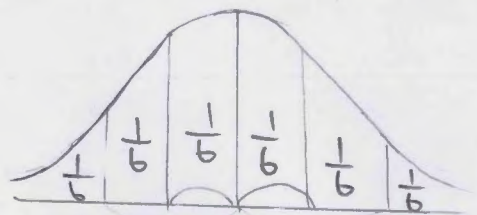
$\bar{x} = \frac{93+140+8+111+92}{30} = 60.367$

$S^2 = (29.622)^2 \xrightarrow{\text{估計}} \sigma^2$

3. 令  $k = 6$  組;  $e_i = np_i = n \cdot \frac{1}{k} = 30 \cdot \frac{1}{6} = 5$

$p_i = \frac{1}{6} = \frac{1}{6}$

4.  $k = 6, N(60.367, 29.622^2)$



$a_5 \ a_4 \ a_3 \ a_2 \ a_1$   
 "    "    "    "    "  
 21.934 43.33 60.367 77.404 98.8

$a_2 - a_3 = a_3 - a_4, a_4 = 2a_3 - a_2 = 43.33$

$a_1 - a_3 = a_3 - a_5, a_5 = 2a_3 - a_1 = 21.934$

$P(X > a_1) = \frac{1}{6} = 0.167$

$P(Z > \frac{a_1 - 60.367}{29.622}) = 0.167$

$\frac{a_1 - 60.367}{29.622} = 0.97, a_1 = 98.80$

$P(X > a_2) = \frac{2}{6} = 0.333$

$P(Z > \frac{a_2 - 60.367}{29.622}) = 0.333, \frac{a_2 - 60.367}{29.622} = 0.43$

$a_2 = 77.404$

分組	$O_i$	$E_i$
21.934 ~ 43.33	IF 7	5
43.33 ~ 60.367	IF 4	5
60.367 ~ 77.404	IF 5	5
77.404 ~ 98.8	IF 4	5
98.8 ~ 111.2	IF 6	5

拒絕  $H_0$  if  $\sum_{i=1}^k \frac{(O_i - E_i)^2}{E_i} > \chi^2_{\alpha}(k-1-r), r=2$

$\chi^2 = \sum_{i=1}^k \frac{(O_i - E_i)^2}{E_i} = \frac{4+1+1+0+1+1}{5} = 1.6$

$\chi^2_{\alpha}(k-1-r) = \chi^2_{0.01}(6-1-2) = \chi^2_{0.01}(3) = 11.34$

從  $\sum_{i=1}^k \frac{(O_i - E_i)^2}{E_i} > \chi^2_{\alpha}(k-1-r)$

1.6  $\neq$  11.34

結論: 在  $\alpha = 0.01$  之下, 資料顯示無法推翻資料來自常態分配  
不拒絕  $H_0$