



3.兩組樣本(獨立或相關),

以

兩個獨立常態母體平均數的假設與檢定：

第一個常態母體  $N(\mu_1, \sigma_1^2)$  抽取樣本， $X_i \sim N(\mu_1, \sigma_1^2), i=1,2,\dots,n_1, X_1, \dots, X_{n_1}$  獨立隨機樣本。

第二個常態母體  $N(\mu_2, \sigma_2^2)$  抽取樣本， $Y_j \sim N(\mu_2, \sigma_2^2), j=1,2,\dots,n_2, X_{21}, \dots, X_{2n_2}$

獨立隨機樣本。 $\bar{X}_1 = \frac{X_{11} + \dots + X_{1n_1}}{n_1}, \bar{X}_2 = \frac{X_{21} + \dots + X_{2n_2}}{n_2}$

$\sigma_1, \sigma_2$  未知，但是大樣本， $n_1 \geq 30, n_2 \geq 30, \mu_1 - \mu_2$  為例。

Input data

X1	X2	X1	X2	X1	X2
27.13605226	7.592452695	3.927845	4.700561	19.14034	-9.16687
24.67938858	4.522286067	9.712067	-1.18115	14.67433	9.646217
1.020789764	4.199935495	15.45405	15.15994	5.814859	5.590595
17.05926471	2.26321259	0.931629	19.41747	11.89196	6.199856
1.587614591	-1.756290864	25.26773	-2.80924	7.497899	17.9293
6.124633459	3.936124941	11.20903	-21.0838	15.01318	8.562572
24.75918447	21.66616682	-4.16231	18.86818	3.798781	0.610247
14.3345909	-19.1412902	1.992077	1.154222	5.20758	-8.91721
26.73899507	7.190999529	7.403747	11.3113	6.902755	16.68535
27.13605226	7.592452695	3.927845	4.700561	19.14034	-9.16687

X1 is Normal(mu=10.000000,sigma\*sigma=100.000000),

X2 is Normal(mu=5.000000,sigma\*sigma=100.000000),

X1 is mean=10.6443201416, s.d.= 8.7477630358, variance= 76.5233581312,  
skewed coefficient= 0.4968395586, kurtosis coefficient= 2.0864769286, MAD= 7.2654620198,  
Q1= 3.9278446104, median= 7.7867307559, Q3= 16.2566581112,  
MIN= -4.1623145979, MAX= 27.1360522624, Range= 31.2983668603,  
Mid-Range= 11.4868688323, C.V.= 0.8218244960, sample size=30  
X2 is mean= 4.3430498710, s.d.= 11.4231054960, variance= 130.4873391719,  
skewed coefficient= -0.3413488054, kurtosis coefficient= 2.5606425720, MAD= 8.6491099448,  
Q1= -1.7562908636, median= 4.6114235279, Q3= 13.2356204873,  
MIN= -21.0837533958, MAX= 24.1821899484, Range= 45.2659433442,  
Mid-Range= 1.5492182763, C.V.= 2.6302036208, sample size=30



選項，

The random variables are X1 and X2

\* Suppose two population distributions are the normal distribution.

population	X1	X2
sample size	30	30
sample mean	10.64432	4.34305
sample Variance	76.52336	130.48734
sample s.d.	8.74776	11.42311

----- two sample data -----

~~~~~ Two populations are independent and random sampling data ~~~~~

- Two population means test when the population variances are known.
- Two population means test when the population variances are unknown, but the sample sizes are more than 30.
- Two population means test when the population variances are unknown, but the population variances are equal and small sample sizes.
- Two population means test when the population variances are unknown, but the population variances are not equal and small sample sizes.
- Two population variances test when the population means are unknown,

~~~~~ Two populations are dependent and paired sampling ~~~~~

- Two population means test when the population variances are unknown.
- Two population correlation coefficient (rho) test.

~~~~~ one sample data analysis ~~~~~

- Selecting one sample from two samples and analysis the sample data.
- return

two sample populations mu test when sigmas are unknown

$H_0: 1.000000 \cdot \mu(X1) + 1.000000 \cdot \mu(X2) = 0.000000$

X1 sample s.d.=8.747763, X2 sample s.d.=11.423105

[ X1 與 X2 檢定值樣本產生 作業特性曲線,檢力函數與檢定值的圖形 ]

~~~~~ choose one ~~~~~

- 雙尾檢定的作業特性曲線
- 雙尾檢定的檢力函數
- 右尾檢定的作業特性曲線
- 右尾檢定的檢力函數
- 左尾檢定的作業特性曲線
- 左尾檢定的檢力函數
- 檢定值的圖形
- 返回

The two population mues test when variance unknown,  $H_0 a \cdot \mu(X1) + b \cdot \mu(X2) = c$

|    |                                |
|----|--------------------------------|
| a= | <input type="text" value="1"/> |
| b= | <input type="text" value="1"/> |
| c= | <input type="text" value="0"/> |



Output ,

|   |   |
|---|---|
| <p>The significant level(0.5-0.005)=<br/> <input type="text" value="0.05"/><br/> <input type="button" value="確定"/> <input type="button" value="取消"/></p> <p>H0: 1.000000*mu(X1)+1.000000*mu(X2)=0.000000,two tailed test ,O.C. curve<br/> type II error</p> <p>left critical value=-5.148650 right critical value=5.148650<br/> The accept region is [-5.148650,5.148650] at the significant level=0.050000</p> <p>The horizon axis is <math>\mu_1 + \mu_2</math></p> | <p>The significant level(0.5-0.005)=<br/> <input type="text" value="0.05"/><br/> <input type="button" value="確定"/> <input type="button" value="取消"/></p> <p>H0: 1.000000*mu(X1)+1.000000*mu(X2)=0.000000,two tailed test ,Power function<br/> 1-type II error</p> <p>left critical value=-5.148650 right critical value=5.148650<br/> The accept region is [-5.148650,5.148650] at the significant level=0.050000</p> <p>The horizon axis is <math>\mu_1 + \mu_2</math></p> |
| <p>The significant level(0.5-0.005)=<br/> <input type="text" value="0.05"/><br/> <input type="button" value="確定"/> <input type="button" value="取消"/></p> <p>H0: 1.000000*mu(X1)+1.000000*mu(X2)=0.000000,right tail test ,O.C. curve<br/> error(type I,type II)</p> <p>right critical value=4.320923<br/> The accept region is [-1*infinite,4.320923] at the significant level=0.050000</p> <p>The horizon axis is <math>\mu_1 + \mu_2</math></p>                     | <p>The significant level(0.5-0.005)=<br/> <input type="text" value="0.05"/><br/> <input type="button" value="確定"/> <input type="button" value="取消"/></p> <p>H0: 1.000000*mu(X1)+1.000000*mu(X2)=0.000000,right tail test ,Power function<br/> 1-type II error</p> <p>right critical value=4.320923<br/> The accept region is [-1*infinite,4.320923] at the significant level=0.050000</p> <p>The horizon axis is <math>\mu_1 + \mu_2</math></p>                             |
| <p>The significant level(0.5-0.005)=<br/> <input type="text" value="0.05"/><br/> <input type="button" value="確定"/> <input type="button" value="取消"/></p> <p>H0: 1.000000*mu(X1)+1.000000*mu(X2)=0.000000,left tail test ,O.C. curve<br/> error(type I,type II)</p> <p>left critical value=-4.320923<br/> The accept region is [-4.320923,-1*infinite] at the significant level=0.050000</p> <p>The horizon axis is <math>\mu_1 + \mu_2</math></p>                     | <p>The significant level(0.5-0.005)=<br/> <input type="text" value="0.05"/><br/> <input type="button" value="確定"/> <input type="button" value="取消"/></p> <p>H0: 1.000000*mu(X1)+1.000000*mu(X2)=0.000000,left tail test ,Power function<br/> 1-type II error</p> <p>left critical value=-4.320923<br/> The accept region is [-4.320923,-1*infinite] at the significant level=0.050000</p> <p>The horizon axis is <math>\mu_1 + \mu_2</math></p>                             |



