3) Two dependent population distributions are normal distribution $N(\mu_1, \sigma_1^2)$, $N(\mu_2, \sigma_2^2)$ and the sample sizes are same which is n.

The paired sample data is $(X_1, Y_1), \ldots, (X_n, Y_n)$.

3.1)Two dependent normal population means test and confidence interval when the parameters $\mu_1, \mu_2, \sigma_1^2, \sigma_2^2, \rho$ are unknown.

The sample data need change to $d_i = a \times X_i - b \times Y_i, i = 1, 2, \ldots, n,$

$$\bar{d} = \frac{\sum_{i=1}^{n} d_i}{n} = a \times \bar{X} + b \times \bar{Y}, S_d^2 = \frac{\sum_{i=1}^{n} (d_i - \bar{d})^2}{n-1},$$

3.1.1)*two-tailed test* (*two-sided test*)：

(i) $H_0 : a \times \mu_1 + b \times \mu_2 = c, H_1 : a \times \mu_1 + b \times \mu_2 \neq c$, a, b, c is known value.

(ii) $\alpha = P(reject \quad H_0 | H_0 : a \times \mu_1 + b \times \mu_2 = c)$

(iii) $t_{n-1} = \dfrac{\bar{d} - c}{S_d / \sqrt{n}}$,

(iv)test statistic：

a)Z test statistic：

$$t_{n-1} = \frac{\bar{d} - c}{S_d / \sqrt{n}}, \quad \left| \frac{\bar{d} - c}{S_d / \sqrt{n}} \right| > t_{\alpha/2, n-1} \Rightarrow reject \quad H_0,$$

b)P-value：From sample value to get

t test statistic value= $\dfrac{\bar{d} - c}{S_d / \sqrt{n}} = t^*$,

$$P(t_{n-1} > |t^*|) = \frac{P - value}{2} \text{ 。 } P - value < \alpha \Rightarrow reject \quad H_0.$$

c) Critical value)：

$|\bar{d} - c| > t_{\alpha/2, n-1} \times S_d / \sqrt{n}$ is reject H_0，

$\Rightarrow \bar{d} > c + t_{\alpha/2, n-1} \times S_d / \sqrt{n} = C_1, \bar{d} < c - t_{\alpha/2, n-1} \times S_d / \sqrt{n} = C_2$ is reject H_0.

v) type II error and the powerful test：

type II error $= \beta$

$$= P(C_2 \leq \bar{d} \leq C_1 | H_1 : a \times \mu_1 + b \times \mu_2 = k (\neq c))$$

$$= P(\bar{d} \leq C_1 | a \times \mu_1 + b \times \mu_2 = k) - P(\bar{d} \leq C_2 | a \times \mu_1 + b \times \mu_2 = k)$$

$$= P\left(t_{n-1} = \frac{\bar{d} - k}{S_d / \sqrt{n}} \leq \frac{C_1 - k}{S_d / \sqrt{n}} \right) - P\left(t_{n-1} \leq \frac{C_2 - k}{S_d / \sqrt{n}} \right)$$

powerful test $=1-\beta$

$$=1-P\left(\overline{d}\le C_1 \middle| a\times\mu_1+b\times\mu_2=k(>c)\right)+P\left(\overline{d}\le C_2 \middle| a\times\mu_1+b\times\mu_2=k\right)$$

$$=1-P\left(t_{n-1}=\frac{\overline{d}-k}{S_d/\sqrt{n}}\le\frac{C_1-k}{S_d/\sqrt{n}}\right)+P\left(t_{n-1}\le\frac{\overline{d}-k}{S_d/\sqrt{n}}\right)$$

vi) $(1-\alpha)\times 100\%\quad C.I.\quad for\quad a\times\mu_1+b\times\mu_2$

$$1-\alpha=P\left(\left|\overline{d}-(a\times\mu_1+b\times\mu_2)\right|\le t_{\alpha/2,n-1}\times S_d/\sqrt{n}\right)$$

$$\overline{d}-t_{\alpha/2,n-1}\times S_d/\sqrt{n}\le a\times\mu_1+b\times\mu_2\le\overline{d}+t_{\alpha/2,n-1}\times S_d/\sqrt{n},$$

3.1.2)*right-tailed test* (*right-sided test*)：

(i) $H_0: a\times\mu_1+b\times\mu_2\le c, H_1: a\times\mu_1+b\times\mu_2>c$, a,b,c is known value.

(ii) $\alpha=P\left(reject\quad H_0 \middle| H_0: a\times\mu_1+b\times\mu_2=c\right)$

(iii) $t_{n-1}=\dfrac{\overline{d}-c}{S_d/\sqrt{n}}$,

(iv)test statistic：

a)t test statistic：

$$t_{n-1}=\frac{\overline{d}-c}{S_d/\sqrt{n}}>t_{\alpha,n-1}\Rightarrow reject\, H_0,$$

b)P-value：From sample value to get

t test statistic value= $\dfrac{\overline{d}-c}{S_d/\sqrt{n}}=t^*$, $P\left(t_{n-1}>t^*\right)=P-value$ 。

$P-value<\alpha\Rightarrow reject\quad H_0$.

c) Critical value)：

$\dfrac{\overline{d}-c}{S_d/\sqrt{n}}>t_{\alpha,n-1}$ is reject H_0 ，

$\Rightarrow\overline{d}>c+t_{\alpha,n-1}\times S_d/\sqrt{n}=C$ is reject H_0.

v) type II error and the powerful test：

type II error $=\beta$

$$=P\left(\overline{d}\le C \middle| H_1: a\times\mu_1+b\times\mu_2=k(>c)\right)=P\left(t_{n-1}=\frac{\overline{d}-k}{S_d/\sqrt{n}}\le\frac{C-k}{S_d/\sqrt{n}}\right)$$

powerful test $=1-\beta$

$$=P\left(\overline{d}>C \middle| H_1: a\times\mu_1+b\times\mu_2=k(>c)\right)$$

$$=P\left(t_{n-1}=\frac{\overline{d}-k}{S_d/\sqrt{n}}>\frac{C-k}{S_d/\sqrt{n}}\right)$$

3.1.3)*left-tailed test* (*left-sided test*)：

(i) $H_0 : a\times\mu_1 + b\times\mu_2 \ge c, H_1 : a\times\mu_1 + b\times\mu_2 < c$, a,b,c is known value.

(ii) $\alpha = P\left(reject \quad H_0 \middle| H_0 : a\times\mu_1 + b\times\mu_2 = c\right)$

(iii) $t_{n-1} = \dfrac{\bar{d} - c}{S_d / \sqrt{n}}$,

(iv)test statistic：

a)t test statistic：

$$t_{n-1} = \frac{\bar{d} - c}{S_d / \sqrt{n}} < -t_{\alpha,n-1} \Rightarrow reject\, H_0 ,$$

b)P-value：From sample value to get

t test statistic value= $\dfrac{\bar{d} - c}{S_d / \sqrt{n}} = t^*$, $P\left(t_{n-1} < t^*\right) = P - value$ 。

$P - value < \alpha \Rightarrow reject \quad H_0$.

c) Critical value)：

$\dfrac{\bar{d} - c}{S_d / \sqrt{n}} < -t_{\alpha,n-1}$ is reject H_0 ，

$\Rightarrow \bar{d} < c - t_{\alpha,n-1} \times S_d / \sqrt{n} = C$ is reject H_0.

v) type II error and the powerful test：

type II error $= \beta$

$$= P\left(\bar{d} \ge C \middle| H_1 : a\times\mu_1 + b\times\mu_2 = k(< c)\right) = P\left(t_{n-1} = \frac{\left(a\times\bar{X} + b\times\bar{Y}\right) - k}{S_d / \sqrt{n}} \ge \frac{C - k}{S_d / \sqrt{n}} \right)$$

powerful test $= 1 - \beta$

$$= P\left(\bar{d} < C \middle| H_1 : a\times\mu_1 + b\times\mu_2 = k(< c)\right) = P\left(t_{n-1} = \frac{\left(a\times\bar{X} + b\times\bar{Y}\right) - k}{S_d / \sqrt{n}} < \frac{C - k}{S_d / \sqrt{n}} \right)$$

3.2)The variance of linear combination with two dependent normal populations that test and confidence interval .

when the parameters are $\mu_1, \mu_2, \sigma_1^2, \sigma_2^2, \rho$ are unknown.

The sample data need change to $d_i = a \times X_i - b \times Y_i, i = 1,2,...,n,$

$$\overline{d} = \frac{\sum_{i=1}^{n} d_i}{n} = a \times \overline{X} + b \times \overline{Y}, S_d^2 = \frac{\sum_{i=1}^{n}\left(d_i - \overline{d}\right)^2}{n-1},$$

$$\sigma_d^2 = a^2 \times \sigma_1^2 + b^2 \times \sigma_2^2 + 2 \times a \times b \times \rho \times \sigma_1 \times \sigma_2 .$$

3.2.1)*two-tailed test* (*two-sided test*)：

(i) $H_0 : \sigma_d = \sigma_0, H_1 : \sigma_d \neq \sigma_0$, σ_0 is known value.

(ii) $\alpha = P\left(reject \quad H_0 \middle| H_0 : \sigma = \sigma_0\right)$

(iii) χ^2 test statistic, $\chi_{n-1}^2 = \frac{\sum_{i=1}^{n}\left(d_i - \overline{d}\right)^2}{\sigma_0^2}$,

$$\frac{\sum_{i=1}^{n}\left(d_i - \overline{d}\right)^2}{\sigma_0^2} < \chi_{\alpha/2,n-1}^2, \frac{\sum_{i=1}^{n}\left(d_i - \overline{d}\right)^2}{\sigma_0^2} > \chi_{1-\alpha/2,n-1}^2$$ is reject H_0.

(iv) $(1-\alpha)\times 100\% \quad C.I. \quad for \quad \sigma^2$

$$\frac{\sum_{i=1}^{n}\left(d_i - \overline{d}\right)^2}{\chi_{\alpha/2,n-1}^2} \leq \sigma^2 \leq \frac{\sum_{i=1}^{n}\left(d_i - \overline{d}\right)^2}{\chi_{1-\alpha/2,n-1}^2}$$

3.2.2)*right-tailed test* (*right-sided test*)：

(i) $H_0 : \sigma_d \leq \sigma_0, H_1 : \sigma_d > \sigma_0$, σ_0 is known value.

(ii) $\alpha = P\left(reject \quad H_0 \middle| H_0 : \sigma = \sigma_0\right)$

(iii) χ^2 test statistic, $\chi_{n-1}^2 = \frac{\sum_{i=1}^{n}\left(d_i - \overline{d}\right)^2}{\sigma_0^2}$,

$$\frac{\sum_{i=1}^{n}\left(d_i - \overline{d}\right)^2}{\sigma_0^2} > \chi_{\alpha,n-1}^2$$ is reject H_0.

3.2.3)*left-tailed test* (*left-sided test*)：

(i) $H_0 : \sigma_d \geq \sigma_0, H_1 : \sigma_d < \sigma_0$, σ_0 is known value.

(ii) $\alpha = P\left(reject \quad H_0 \middle| H_0 : \sigma = \sigma_0\right)$

(iii) χ^2 test statistic, $\chi_{n-1}^2 = \frac{\sum_{i=1}^{n}\left(d_i - \overline{d}\right)^2}{\sigma_0^2}$,

$$\frac{\sum_{i=1}^{n}\left(d_i - \overline{d}\right)^2}{\sigma_0^2} < \chi_{1-\alpha,n-1}^2$$ is reject H_0.

3.3) $\rho(X,Y)=\dfrac{Cov(X,Y)}{\sqrt{Var(X)Var(Y)}}$ is the population correlation coefficient of (X,Y).

$$r(X,Y)=\frac{\sum_{i=1}^{n}(X_i-\overline{X})(Y_i-\overline{Y})}{\sqrt{\sum_{i=1}^{n}(X_i-\overline{X})^2\times\sum_{i=1}^{n}(Y_i-\overline{Y})^2}}$$ is the sample correlation coefficient of paired sample data $(X_1,Y_1),....,(X_n,Y_n)$.

3.3.1)*two-tailed test* (*two-sided test*)：

(i) $H_0:\rho(X,Y)=\rho_0, H_1:\rho(X,Y)\neq\rho_0$, ρ_0 is known value.

(ii) $\alpha=P(reject\quad H_0|H_0:\rho(X,Y)=\rho_0)$

(iii) test statistic,

The sampling distribution of sample correlation coefficient will be gotten by simulating and the sampling distribution is according to the X,Y distribution and the sample size and the null hypothesis.

3.3.2)*right-tailed test* (*right-sided test*)：

(i) $H_0:\rho(X,Y)\leq\rho_0, H_1:\rho(X,Y)>\rho_0$, ρ_0 is known value.

(ii) $\alpha=P(reject\quad H_0|H_0:\rho(X,Y)=\rho_0)$

(iii) test statistic,

The sampling distribution of sample correlation coefficient will be gotten by simulating and the sampling distribution is according to the X,Y distribution and the sample size and the null hypothesis.

3.3.3)*left-tailed test* (*left-sided test*)：

(i) $H_0:\rho(X,Y)\geq\rho_0, H_1:\rho(X,Y)<\rho_0$, ρ_0 is known value.

(ii) $\alpha=P(reject\quad H_0|H_0:\rho(X,Y)=\rho_0)$

(iii) test statistic,

The sampling distribution of sample correlation coefficient will be gotten by simulating and the sampling distribution is according to the X,Y distribution and the sample size and the null hypothesis.

.

3.4)Two populations are dependent.
The first population is Nomral(mu=10,sigma*sigma=25) and
the second population is Nomral(mu=15,sigma*sigma=16).
X1~ Nomral(mu=10,sigma*sigma=25),
X2|x1~Normal(15+0.5*(X1-10)=b0+b1*X1,9.75=(3.1225)^2), b0=10,b1=0.5,
rho(X1,X2)=0.5*4/5=0.4,
The sample size of two populations are 26.

Please input the sample size of the following random variables

1.X1	26
2.X2	26

X1	X2
9.7060057204	8.5084238334
8.2373744154	11.8745959206
-0.7091731883	8.5431652629
3.2459460532	11.7935650373
6.3280098224	16.9229415942
2.4928637319	11.0595515518
12.6952331837	16.5892441194
13.7429745529	15.9385676710
11.7688355867	14.7055688889
12.2211486944	17.6882728649
5.4358202120	7.8323760520
7.1111337637	17.4299876196
8.7653682742	18.0394135786
6.7339155028	12.6055236866
17.4363616394	13.6080528068
12.7277380013	17.2470211365
14.5859315946	16.5120560259
8.5493965987	15.3272448252
11.5761683922	16.7724020015
5.9185917124	15.8316164095
5.9792256958	12.2729498405
13.4792319566	16.3511641734
9.9972773717	12.6145286305
14.5957840811	21.2708169354
9.9733051475	16.6320170187
12.4618789392	14.2858682228

X1 is Normal(mu=10.000000,sigma*sigma=25.000000),
X2 is Normal(mu=H1,sigma*sigma=9.750006),
H1(X1)= 10.000000+0.500000*X1.

X1 is mean= 9.4252441329, s.d.= 4.2704830174, variance= 18.2370252015,
skewed coefficient= -0.3658300385, kurtosis coefficient= 2.5012767394, MAD=
3.4626505385,
Q1= 6.3280098224, median= 9.8396554340, Q3= 12.7114855925,
MIN= -0.7091731883, MAX= 17.4363616394, Range= 18.1455348277,
Mid-Range= 8.3635942255, C.V.= 0.4530899102, sample size=26
X2 is mean= 14.5483436811, s.d.= 3.2950601832, variance= 10.8574216112,
skewed coefficient= -0.3955865628, kurtosis coefficient= 2.4512800609, MAD=
2.6948599728,
Q1= 12.2729498405, median= 15.5794306173, Q3= 16.8476717979,
MIN= 7.8323760520, MAX= 21.2708169354, Range= 13.4384408834,
Mid-Range= 14.5515964937, C.V.= 0.2264904002, sample size=26

after storing the sample data is below

	X1	X2
1	-0.7091731883	7.8323760520
2	2.4928637319	8.5084238334
3	3.2459460532	8.5431652629
4	5.4358202120	11.0595515518
5	5.9185917124	11.7935650373
6	5.9792256958	11.8745959206
7	6.3280098224	12.2729498405
8	6.7339155028	12.6055236866
9	7.1111337637	12.6145286305
10	8.2373744154	13.6080528068

11	8.5493965987	14.2858682228
12	8.7653682742	14.7055688889
13	9.7060057204	15.3272448252
14	9.9733051475	15.8316164095
15	9.9972773717	15.9385676710
16	11.5761683922	16.3511641734
17	11.7688355867	16.5120560259
18	12.2211486944	16.5892441194
19	12.4618789392	16.6320170187
20	12.6952331837	16.7724020015
21	12.7277380013	16.9229415942
22	13.4792319566	17.2470211365
23	13.7429745529	17.4299876196
24	14.5859315946	17.6882728649
25	14.5957840811	18.0394135786
26	17.4363616394	21.2708169354

===

The sample data rank is below

	X1	rank(X1)	X2	rank(X2)
1	9.7060057204	13.000	8.5084238334	2.000
2	8.2373744154	10.000	11.8745959206	6.000
3	-0.7091731883	1.000	8.5431652629	3.000
4	3.2459460532	3.000	11.7935650373	5.000
5	6.3280098224	7.000	16.9229415942	21.000
6	2.4928637319	2.000	11.0595515518	4.000
7	12.6952331837	20.000	16.5892441194	18.000
8	13.7429745529	23.000	15.9385676710	15.000
9	11.7688355867	17.000	14.7055688889	12.000
10	12.2211486944	18.000	17.6882728649	24.000
11	5.4358202120	4.000	7.8323760520	1.000
12	7.1111337637	9.000	17.4299876196	23.000
13	8.7653682742	12.000	18.0394135786	25.000
14	6.7339155028	8.000	12.6055236866	8.000
15	17.4363616394	26.000	13.6080528068	10.000
16	12.7277380013	21.000	17.2470211365	22.000
17	14.5859315946	24.000	16.5120560259	17.000
18	8.5493965987	11.000	15.3272448252	13.000
19	11.5761683922	16.000	16.7724020015	20.000
20	5.9185917124	5.000	15.8316164095	14.000
21	5.9792256958	6.000	12.2729498405	7.000
22	13.4792319566	22.000	16.3511641734	16.000
23	9.9972773717	15.000	12.6145286305	9.000
24	14.5957840811	25.000	21.2708169354	26.000
25	9.9733051475	14.000	16.6320170187	19.000
26	12.4618789392	19.000	14.2858682228	11.000

--------------- inference statistiscs ------------------

* Suppose two population distributions are the normal distribution.

population	X1	X2
sample size	26	26
sample mean	9.42524	14.54834
sample Variance	18.23703	10.85742
sample s.d.	4.27048	3.29506

A. X1 and X2 are independent random samples

two population variances ratio test and confidence interval when population means are unknown
H0: sigma(X1)=sigma(X2) , sigma(X1),sigma(X2) are population sigma
F(25,25)=1.679683 which formula is F=sample variance(X1)/sample variance(X2)
left tail test p-value= 0.8991
right tail test p-value= 0.1009
two tailes test p-value= 0.2018

The significant level =0.201800 , two population variances are equal.
Spool =((25*S(X1)^2+25*S(X2)^2)/50)^0.5=3.814082,
the degree of freedom=50
The Variance(X1)=Variance(X2)=population variance
The common population standard deviation and variance confidence interval
90% confidence interval for population variance
[10.775055 , 20.922549]
90% confidence interval for population standard deviation
[3.282538 , 4.574117]
95% confidence interval for population variance

[10.184363 , 22.478887]
95% confidence interval for population standard deviation
[3.191295 , 4.741191]
99% confidence interval for population variance
[9.150402 , 25.985205]
99% confidence interval for population standard deviation
[3.024963 , 5.097569]
two population means test and confidence interval when populations sigma is unknown
H0: mu(X1)=mu(X2) , mu(X1),mu(X2) are population means
Suppose the population variances are equal. sigma(X1)=sigma(X2)
t(df=50)=-4.842999 which formula is t=(X1 sample mean-X2 sample mean)/standard error
Spool =((25*S(X1)^2+25*S(X2)^2)/50)^0.5=3.814082,
the standard error=Spool*(1/26+1/26)^0.5=1.057836
X1 sample size=26, X2 sample size=26
the degree of freedom=50
left tail test p-value= 0.0001
right tail test p-value= 0.9999
two tailes test p-value= 0.0002
90% confidence interval for mu(X1)-mu(X2)
[-6.896009 , -3.350190]
95% confidence interval for mu(X1)-mu(X2)
[-7.248132 , -2.998067]
99% confidence interval for mu(X1)-mu(X2)
[-7.954710 , -2.291489]

B. X1 and X2 are paired samples, and rho(X1,X2) is not 0.

two population means test and confidence interval when populations sigma is unknown
H0: mu(X1)=mu(X2) , mu(X1),mu(X2) are population means
t(df=25)=-7.248458 which formula is t=(X1 sample mean-X2 sample mean)/standard error
standard error=((S(X1-X2)^2/26)^0.5,
df=25
left tail test p-value= 0.0001
right tail test p-value= 0.9999
two tailes test p-value= 0.0002
90% confidence interval for mu(X1)-mu(X2)
[-6.330370 , -3.915829]
95% confidence interval for mu(X1)-mu(X2)
[-6.578924 , -3.667275]
99% confidence interval for mu(X1)-mu(X2)
[-7.093264 , -3.152936]

Sd=S(X1-X2)=3.603909
the degree of freedom=25
The Variance(X1-X2)=population variance
90% confidence interval for population variance
[8.623766 , 22.221000]
90% confidence interval for population standard deviation
[2.936625 , 4.713916]
95% confidence interval for population variance
[7.988011 , 24.744832]
95% confidence interval for population standard deviation
[2.826307 , 4.974418]
99% confidence interval for population variance
[6.918681 , 30.866309]
99% confidence interval for population standard deviation
[2.630339 , 5.555746]

two populations correlation coefficient test
H0: rho(X1,X2)=0
r(X1,X2)=0.572302 ,n=26
Zr(X1,X2)=3.121793 ,n=26
left tail test p-value= 0.9992
right tail test p-value= 0.0008
two tailes test p-value= 0.0016
90% confidence interval for rho(X1,X2)
[0.298573 , 0.759031]
95% confidence interval for rho(X1,X2)
[0.237619 , 0.785522]
99% confidence interval for rho(X1,X2)
[0.113287 , 0.829989]

The random variables are X1 and X2

* Suppose two population distributions are the normal distribution.

population	X1	X2
sample size	26	26
sample mean	9.42524	14.54834
sample Variance	18.23703	10.85742
sample s.d.	4.27048	3.29506

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

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

1. Two population means test when the population variances are knwon.
2. Two population means test when the population variances are unknwon, but the sample sizes are more than 30.
3. Two population means test when the population variances are unknwon, but the population variances are equal and small sample sizes.
4. Two population means test when the population variances are unknwon, but the population variances are not equal and small sample sizes.
5. Two population variances test when the population means are unknwon,

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

6. Two population means test when the population variances are unknwon.
7. Two population correlation ceofficient (rho) test.

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

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

確定 取消
~~~~~~

select 6:

The two population mues test when variance unknwon,H0 a*mu(X1)+b*mu(X2)=c

a=	1
b=	-1
c=	-5

two sample populations mu test , the paired samples

H0: 1.000000*mu(X1)+-1.000000*mu(X2)=-5.000000

The correlation coefficient of two populations is not 0.

[The sample data X1 and X2 test O.C. curve, P.F. and test value image]

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

1. two tailes Operation characteristic curve
2. two tailes Power function
3. right tail Operation characteristic curve
4. right tail Power function
5. left tail Operation characteristic curve
6. left tail Power function
7. test value image
8. return

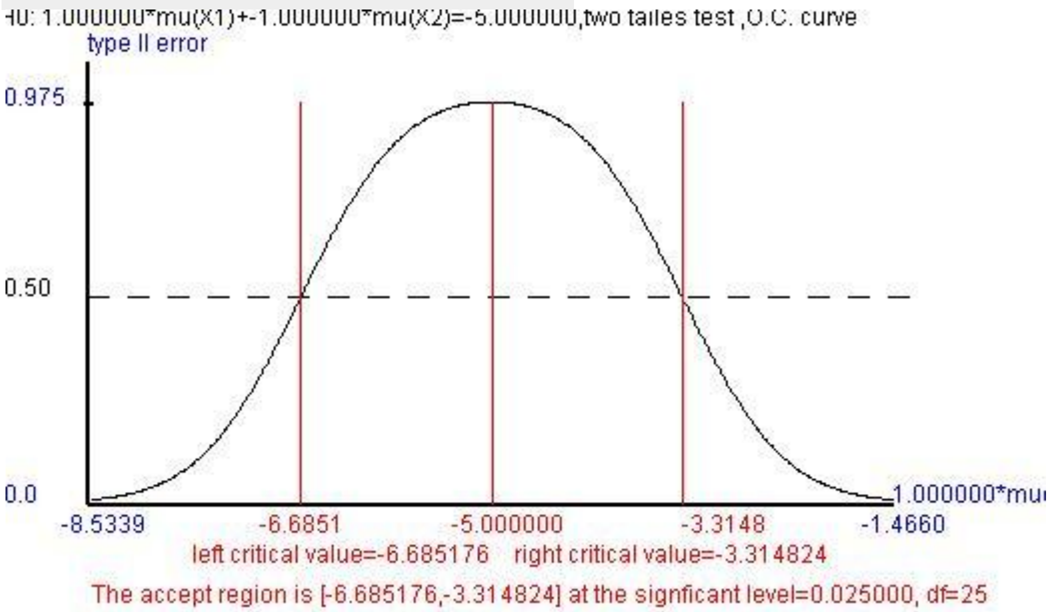
確定 取消

select 1:

The significant level(0.5~0.005)=

0.025

確定 取消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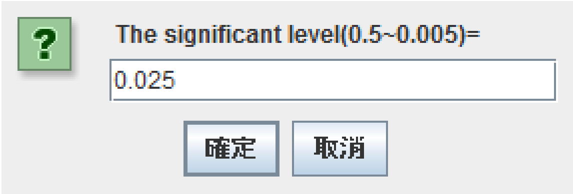

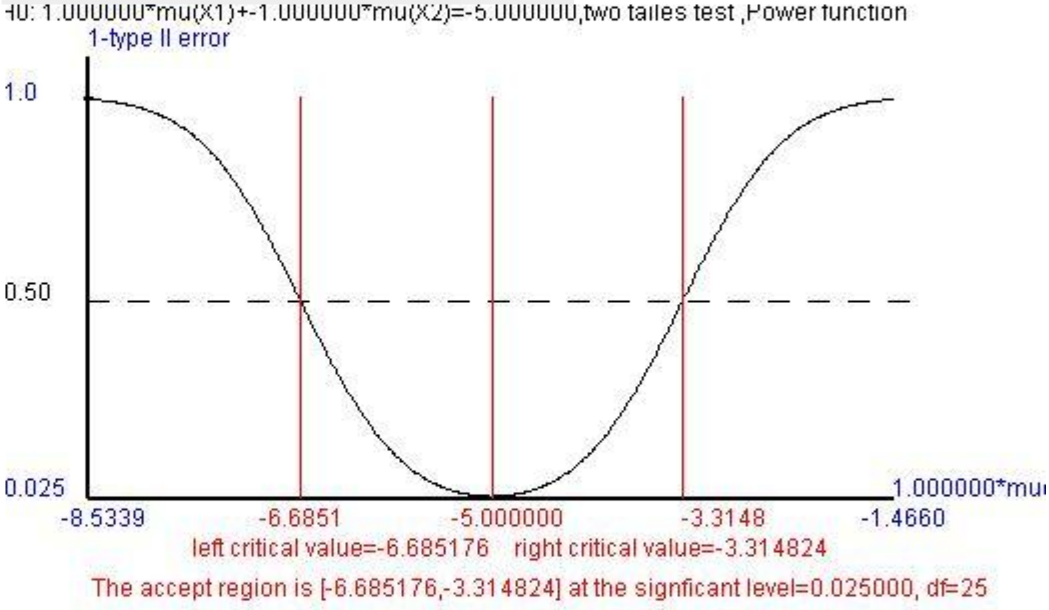

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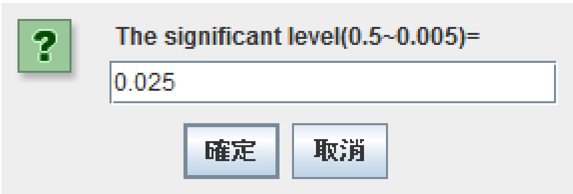

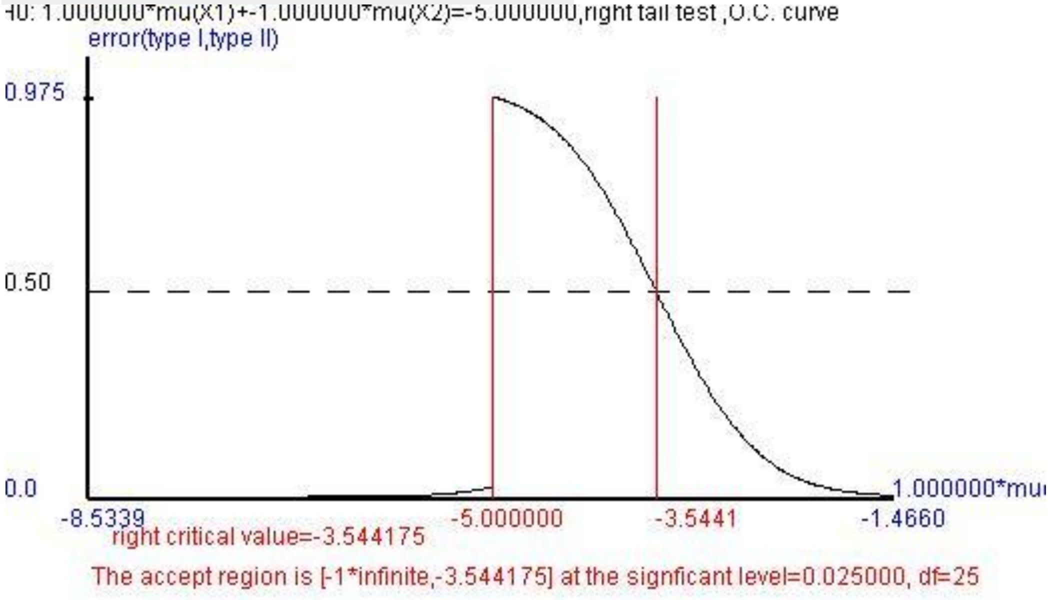

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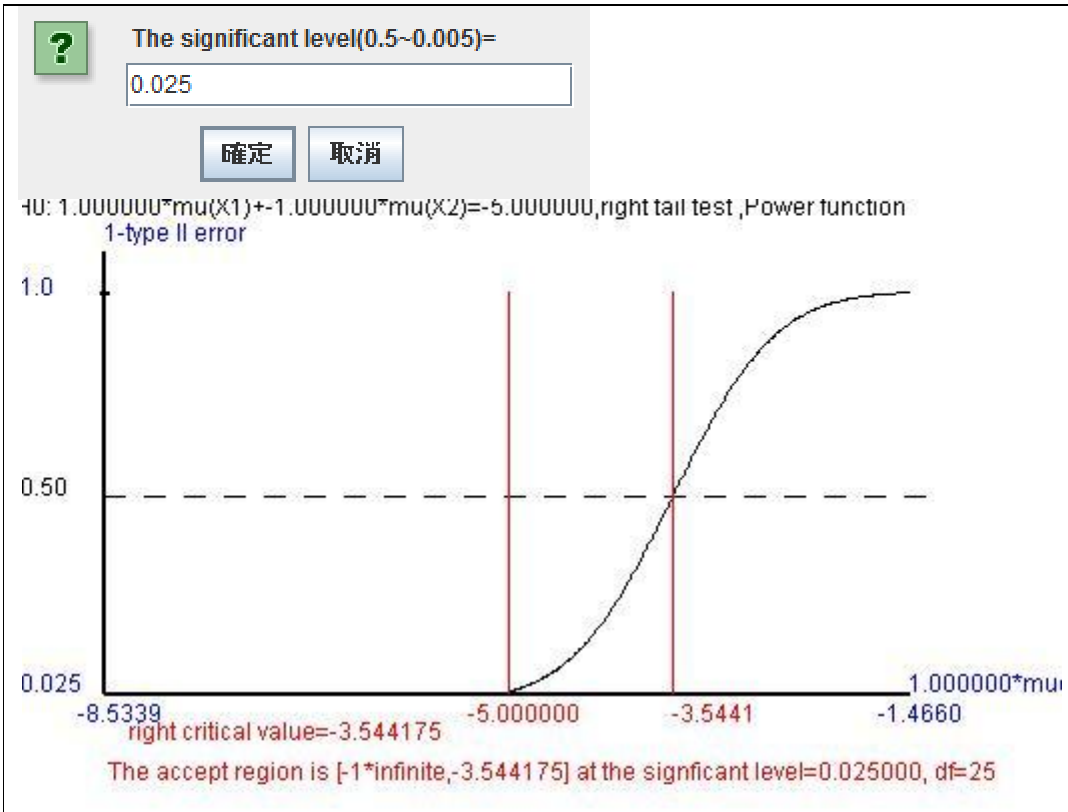

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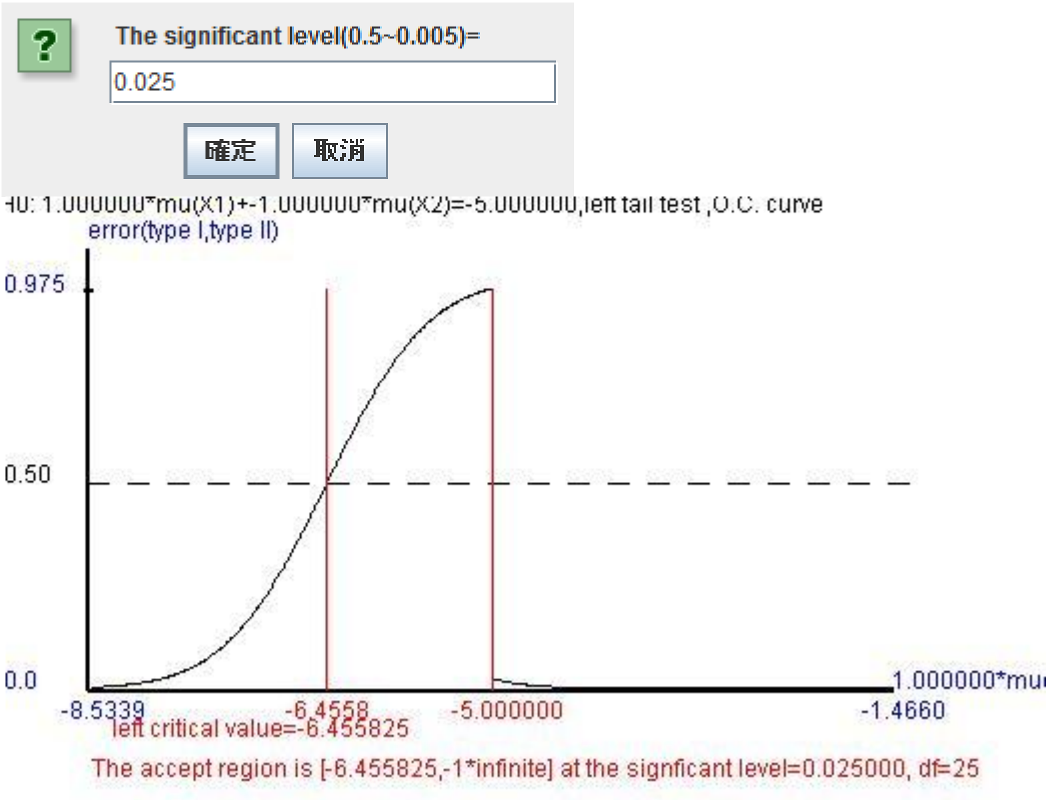

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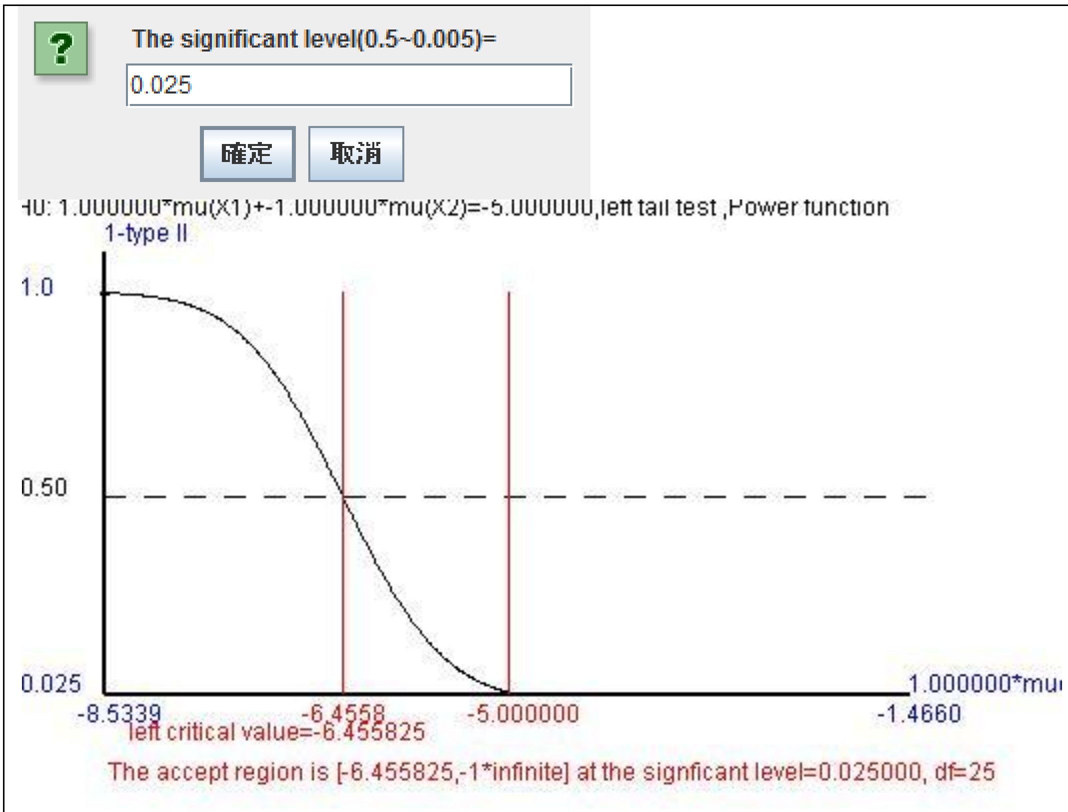

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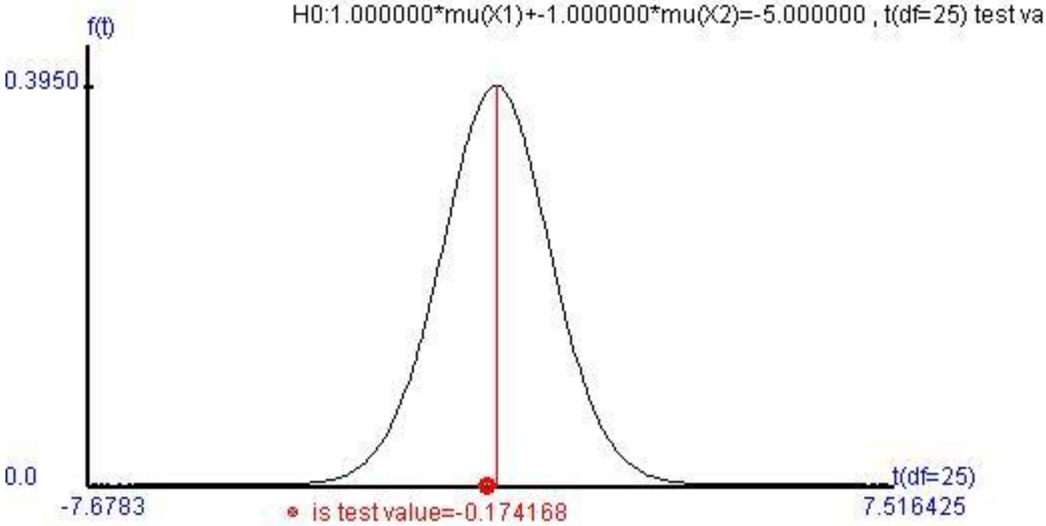
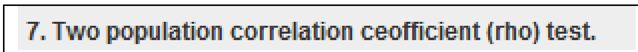


The paired samples analysis
Two population means test and population standard deviations is unknown
H0: 1.000000*mu(X1)+-1.000000*mu(X2)=-5.000000
X1 sample size=26, X2 sample size=26, paired samples

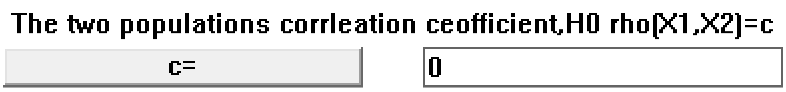
two population means test and confidence interval when populations sigma is unknown
t(df=25)=-0.174168 which formula is t=(1.000000*X1 sample mean+-1.000000*X2 sample mean--5.000000)/standard error
standard error=((S(1.000000*X1+-1.000000*X2)^2/26)^0.5,
df=25
left tail test p-value= 0.4316
right tail test p-value= 0.5684
two tailes test p-value= 0.8632
90% confidence interval for 1.000000*mu(X1)+-1.000000*mu(X2)
[-6.330370 , -3.915829]
95% confidence interval for 1.000000*mu(X1)+-1.000000*mu(X2)
[-6.578924 , -3.667275]
99% confidence interval for 1.000000*mu(X1)+-1.000000*mu(X2)
[-7.093264 , -3.152936]

Sd=S(X1-X2)=3.603909
the degree of freedom=25
The Variance(1.000000*X1+-1.000000*X2)=population variance
90% confidence interval for population variance
[8.623766 , 22.221000]
90% confidence interval for population standard deviation
[2.936625 , 4.713916]
95% confidence interval for population variance
[7.988011 , 24.744832]
95% confidence interval for population standard deviation
[2.826307 , 4.974418]

99% confidence interval for population variance
[6.918681 , 30.866309]
99% confidence interval for population standard deviation
[2.630339 , 5.555746]



select 7:



two populations correlation coefficient test

H0: rho(X1,X2)=0.000000

r(X1,X2)=0.572302 ,n=26

left tail test p-value= 0.9989

right tail test p-value= 0.0011

two tailes test p-value= 0.0022

90% confidence interval for r(X1,X2) under rho(X1,X2)=0.000000

[-0.329751 , 0.329794]

95% confidence interval for r(X1,X2) under rho(X1,X2)=0.000000

[-0.388264 , 0.388319]

99% confidence interval for r(X1,X2) under rho(X1,X2)=0.000000

[-0.495793 , 0.495856]

The two populations corrleation ceofficient,H0 rho(X1,X2)=c

c= 0.4

two populations correlation coefficient test

H0: rho(X1,X2)=0.400000

r(X1,X2)=0.572302 ,n=26

left tail test p-value= 0.8551

right tail test p-value= 0.1449

two tailes test p-value= 0.2898

90% confidence interval for r(X1,X2) under rho(X1,X2)=0.400000

[0.089838 , 0.649379]

95% confidence interval for r(X1,X2) under rho(X1,X2)=0.400000

[0.022999 , 0.686555]

99% confidence interval for r(X1,X2) under rho(X1,X2)=0.400000

[-0.110406 , 0.751016]