



10.適合度檢定

?

The random variable X1

----- test the population distribution -----

1. Pearson chi square test ,
the frequency table is according the equally probability,
2. Pearson chi square test ,
the frequency table is according the equally probability,
the best fitting method getting the parametes and population distribution.
3. Pearson chi square test ,
the frequency table is used to tradition method.
4. Pearson chi square test ,
the frequency table is used to tradition method.
tthe best fitting method getting the parametes and population distribution.
5. Kolmogorov Simirnov test
6. P-P plot
7. Q-Q plot
8. Likelihood ratio chi square test ,
the frequency table is according the equally probability,
9. Likelihood ratio chi square test ,
the frequency table is used to tradition method.
10. The sample data estimated cumulative relative frequency estimated line.
11. return

確定

取消

11.1)

The Pearson chi square test (goodness of fit) ,the equally probability frequency distribution, please select the population distribution

- | | |
|---------------------------------------|------------------------------------|
| 1.H0:Uniform distribution | 13.H0:Gumbel distribution |
| 2.H0:Normal distribution | 14.H0:Triangular 1 distribution |
| 3.H0:Shifted exponential distribution | 15.H0:Trapezoid distribution |
| 4.H0:Pareto 1 distribution | 16.H0:U-quadractic distribution |
| 5.H0:Pareto 2 distribution | 17.H0:Semi-circle distribution |
| 6.H0:Rayleigh distribution | 18.H0:Logistic distribution |
| 7.H0:Double expoenential distribution | 19.H0:Weibull distribution |
| 8.H0:Log normal distribution | 20.H0:Pareto 3 distribution |
| 9.H0:Gamma distribution | ** Above H0 population all do once |
| 10.H0:Beta distribution | |
| 11.H0:Cauchy distribution | |
| 12.H0:Arcsin distribution | |



Input data

The population distribution is Beta(5,12), alpha=5,beta=12,the sample data from probability distribution simulator and the sample size=50,

0.25375394	0.29830983	0.10211541	0.33273811	0.12864722
0.32960152	0.48083701	0.23527465	0.23181712	0.32270114
0.24696938	0.36916869	0.21909311	0.16735166	0.38120186
0.16757221	0.23959358	0.16546371	0.20873035	0.47838234
0.33269810	0.66312068	0.38441095	0.43865568	0.51108878
0.17996630	0.30121030	0.34630687	0.27385315	0.18253351
0.36537127	0.27657652	0.34963407	0.14283583	0.29666411
0.31631027	0.25148091	0.19613414	0.24965499	0.34935122
0.25210874	0.14534647	0.58298808	0.19808866	0.33249489
0.17678561	0.37707393	0.38010029	0.31884980	0.28380859

X1 is Beta(alpha=5.000000,beta=12.000000),
X1 is mean=0.2962965103, s.d.= 0.1163111058, variance=0.0135282733,
skewed coefficient=0.8541429383, kurtosis coefficient=3.8227413233, MAD=0.0892742804,
Q1=0.2087303476, median=0.2902363533, Q3=0.3575026706,
MIN=0.1021154100, MAX=0.6631206795, Range=0.5610052695,
Mid-Range=0.3826180447, C.V.= 0.3925496984, sample size=50

選擇 all do once ,

Output data

There are 20 continuous population distribution for testing.

pearson goodness of fit						
class	[1]	[2]	[3]	[4]	[5]	[6]
lower limit	0.10212	0.19562	0.28912	0.38262	0.47612	0.56962
upper limit	0.19562	0.28912	0.38262	0.47612	0.56962	0.66312
observed no	10.00000	15.00000	18.00000	2.00000	3.00000	2.00000
probability	0.16667	0.16667	0.16667	0.16667	0.16667	0.16667
expected no	8.33333	8.33333	8.33333	8.33333	8.33333	8.33333
chi square	0.33333	5.33333	11.21333	4.81333	3.41333	4.81333
degree of freedom=3						
H0: X1~Uniform(alpha,beta), alpha,beta are unknown						
alpha point estimated value=0.102115 (MLE)						
beta point estimated value=0.663121 (MLE)						
pearson chi-square test statistic =29.920000						
p-value=0.000000						
pearson goodness of fit						
class	[1]	[2]	[3]	[4]	[5]	[6]
lower limit		0.18375	0.24619	0.29630	0.34637	0.40880
upper limit	0.18375	0.24619	0.29630	0.34637	0.40880	
observed no	10.00000	7.00000	8.00000	11.00000	8.00000	6.00000
probability	0.16667	0.16667	0.16667	0.16667	0.16667	0.16667
expected no	8.33333	8.33333	8.33333	8.33333	8.33333	8.33333
chi square	0.33333	0.21333	0.01333	0.85333	0.01333	0.65333
degree of freedom=3						
H0: X1~Normal(mu,sigma*sigma), mu,sigma are unknown						
population mean(mu) point estimated value=0.296297 (MLE,UMVUE)						
population variance(sigma*sigma) which point estimated value=0.013528 (UMVUE)						
pearson chi-square test statistic =2.080000						
p-value=0.555900						



pearson goodness of fit						
class	[1]	[2]	[3]	[4]	[5]	[6]
lower limit	0.10212	0.13752	0.18085	0.23671	0.31545	0.45004
upper limit	0.13752	0.18085	0.23671	0.31545	0.45004	
observed no	2.00000	7.00000	7.00000	12.00000	17.00000	5.00000
probability	0.16667	0.16667	0.16667	0.16667	0.16667	0.16667
expected no	8.33333	8.33333	8.33333	8.33333	8.33333	8.33333
chi square	4.81333	0.21333	0.21333	1.61333	9.01333	1.33333
degree of freedom=3						
H0: X1~Shifted exponential(lamda,c), lamda,c are unknown						
lamda point estimated value=5.149832 (MLE)						
c point estimated value=0.102115 (MLE)						
pearson chi-square test statistic =17.200000						
p-value=0.000600						
pearson goodness of fit						
class	[1]	[2]	[3]	[4]	[5]	[6]
lower limit	0.00000	0.13693	0.25207	0.36021	0.46404	0.56478
upper limit	0.13693	0.25207	0.36021	0.46404	0.56478	0.66312
observed no	2.00000	18.00000	18.00000	7.00000	3.00000	2.00000
probability	0.16667	0.16667	0.16667	0.16667	0.16667	0.16667
expected no	8.33333	8.33333	8.33333	8.33333	8.33333	8.33333
chi square	4.81333	11.21333	11.21333	0.21333	3.41333	4.81333
degree of freedom=3						
H0: X1~Pareto 1(lamda,c), lamda,c are unknown						
lamda point estimated value=1.135811 (MLE)						
c point estimated value=0.663121 (MLE)						
pearson chi-square test statistic =35.680000						
p-value=0.000000						
pearson goodness of fit						
class	[1]	[2]	[3]	[4]	[5]	[6]
lower limit	0.10212	0.12232	0.15258	0.20288	0.30314	0.60227
upper limit	0.12232	0.15258	0.20288	0.30314	0.60227	
observed no	1.00000	3.00000	8.00000	16.00000	21.00000	1.00000
probability	0.16667	0.16667	0.16667	0.16667	0.16667	0.16667
expected no	8.33333	8.33333	8.33333	8.33333	8.33333	8.33333
chi square	6.45333	3.41333	0.01333	7.05333	19.25333	6.45333
degree of freedom=3						
H0: X1~Pareto 2(lamda,c), lamda,c are unknown						
lamda point estimated value=1.009668 (MLE)						
c point estimated value=0.102115 (MLE)						
pearson chi-square test statistic =42.640000						
p-value=0.000000						
pearson goodness of fit						
class	[1]	[2]	[3]	[4]	[5]	[6]
lower limit	0.10212	0.19851	0.24587	0.29007	0.33874	0.40430
upper limit	0.19851	0.24587	0.29007	0.33874	0.40430	
observed no	12.00000	5.00000	8.00000	10.00000	9.00000	6.00000
probability	0.16667	0.16667	0.16667	0.16667	0.16667	0.16667
expected no	8.33333	8.33333	8.33333	8.33333	8.33333	8.33333
chi square	1.61333	1.33333	0.01333	0.33333	0.05333	0.65333
degree of freedom=3						
H0: X1~Rayleigh(lamda,c), lamda,c are unknown						
lamda point estimated value=19.621691 (MLE)						
c point estimated value=0.102115 (MLE)						
pearson chi-square test statistic =4.000000						
p-value=0.261400						



pearson goodness of fit

class	[1]	[2]	[3]	[4]	[5]	[6]
lower limit		0.19216	0.25404	0.29024	0.32643	0.38831
upper limit	0.19216	0.25404	0.29024	0.32643	0.38831	
observed no	10.00000	12.00000	3.00000	6.00000	13.00000	6.00000
probability	0.16667	0.16667	0.16667	0.16667	0.16667	0.16667
expected no	8.33333	8.33333	8.33333	8.33333	8.33333	8.33333
chi square	0.33333	1.61333	3.41333	0.65333	2.61333	0.65333

degree of freedom=3
H0: X1~Double exponential(lamda,mu), lamda,mu are unknown
lamda point estimated value=11.201434 (MLE)
mu point estimated value=0.290236 (MLE)
pearson chi-square test statistic =9.280000
p-value=0.025700

pearson goodness of fit

class	[1]	[2]	[3]	[4]	[5]	[6]
lower limit		0.18733	0.23177	0.27494	0.32610	0.40343
upper limit	0.18733	0.23177	0.27494	0.32610	0.40343	
observed no	10.00000	4.00000	9.00000	8.00000	13.00000	6.00000
probability	0.16667	0.16667	0.16667	0.16667	0.16667	0.16667
expected no	8.33333	8.33333	8.33333	8.33333	8.33333	8.33333
chi square	0.33333	2.25333	0.05333	0.01333	2.61333	0.65333

degree of freedom=3
H0: X1~Log Normal(mu,sigma*sigma), mu,sigma are unknown
population mean(mu) point estimated value=-1.291227 (MLE)
population variance(sigma*sigma), sigma point estimated value=0.396452 (MLE)
pearson chi-square test statistic =5.920000
p-value=0.115500

pearson goodness of fit

class	[1]	[2]	[3]	[4]	[5]	[6]
lower limit	0.10212	0.16787	0.21505	0.25889	0.30831	0.37816
upper limit	0.16787	0.21505	0.25889	0.30831	0.37816	
observed no	7.00000	6.00000	9.00000	6.00000	13.00000	9.00000
probability	0.16667	0.16667	0.16667	0.16667	0.16667	0.16667
expected no	8.33333	8.33333	8.33333	8.33333	8.33333	8.33333
chi square	0.21333	0.65333	0.05333	0.65333	2.61333	0.05333

degree of freedom=3
H0: X1~Gamma(alpha,beta), alpha,beta are unknown
alpha point estimated value=6.000000 (MME)
beta point estimated value=0.045658 (MME)
pearson chi-square test statistic =4.240000
p-value=0.236600

pearson goodness of fit

class	[1]	[2]	[3]	[4]	[5]	[6]
lower limit	0.00253	0.16997	0.22529	0.27532	0.32943	0.40100
upper limit	0.16997	0.22529	0.27532	0.32943	0.40100	0.89831
observed no	7.00000	7.00000	9.00000	8.00000	13.00000	6.00000
probability	0.16667	0.16667	0.16667	0.16667	0.16667	0.16667
expected no	8.33333	8.33333	8.33333	8.33333	8.33333	8.33333
chi square	0.21333	0.21333	0.05333	0.01333	2.61333	0.65333

degree of freedom=3
H0: X1~Beta(alpha,beta), alpha,beta are unknown
alpha point estimated value=4.000000 (MME)
beta point estimated value=10.000000 (MME)
pearson chi-square test statistic =3.760000
p-value=0.288500



pearson goodness of fit						
class	[1]	[2]	[3]	[4]	[5]	[6]
lower limit		-0.18216	0.13277	0.29024	0.44770	0.76263
upper limit	-0.18216	0.13277	0.29024	0.44770	0.76263	
observed no	0.00000	2.00000	23.00000	20.00000	5.00000	0.00000
probability	0.16667	0.16667	0.16667	0.16667	0.16667	0.16667
expected no	8.33333	8.33333	8.33333	8.33333	8.33333	8.33333
chi square	8.33333	4.81333	25.81333	16.33333	1.33333	8.33333
degree of freedom=3						
H0: X1~Cauchy(mu,sigma), mu,sigma are unknown						
mu point estimated value=0.290236						
sigma point estimated value=0.272738						
pearson chi-square test statistic =64.960000						
p-value=0.000000						
pearson goodness of fit						
class	[1]	[2]	[3]	[4]	[5]	[6]
lower limit	0.10212	0.05337	0.15605	0.29630	0.43655	0.53922
upper limit	0.05337	0.15605	0.29630	0.43655	0.53922	0.66312
observed no	0.00000	4.00000	21.00000	19.00000	4.00000	2.00000
probability	0.16667	0.16667	0.16667	0.16667	0.16667	0.16667
expected no	8.33333	8.33333	8.33333	8.33333	8.33333	8.33333
chi square	8.33333	2.25333	19.25333	13.65333	2.25333	4.81333
degree of freedom=3						
H0: X1~Arcsin(mu,c), mu,c are unknown						
mu point estimated value=0.296297						
c point estimated value=0.280503 (MLE)						
pearson chi-square test statistic =50.560000						
p-value=0.000000						
pearson goodness of fit						
class	[1]	[2]	[3]	[4]	[5]	[6]
lower limit		0.19105	0.23541	0.27718	0.32581	0.39829
upper limit	0.19105	0.23541	0.27718	0.32581	0.39829	
observed no	10.00000	6.00000	8.00000	7.00000	13.00000	6.00000
probability	0.16667	0.16667	0.16667	0.16667	0.16667	0.16667
expected no	8.33333	8.33333	8.33333	8.33333	8.33333	8.33333
chi square	0.33333	0.65333	0.01333	0.21333	2.61333	0.65333
degree of freedom=3						
H0: X1~Gumbel(mu,sigma), mu,c are unknown						
mu point estimated value=0.243942 (MME)						
sigma point estimated value=0.090689 (MME)						
pearson chi-square test statistic =4.480000						
p-value=0.214000						
pearson goodness of fit						
class	[1]	[2]	[3]	[4]	[5]	[6]
lower limit	0.10212	0.06727	0.13435	0.29630	0.45824	0.52533
upper limit	0.06727	0.13435	0.29630	0.45824	0.52533	0.66312
observed no	0.00000	2.00000	23.00000	20.00000	3.00000	2.00000
probability	0.16667	0.16667	0.16667	0.16667	0.16667	0.16667
expected no	8.33333	8.33333	8.33333	8.33333	8.33333	8.33333
chi square	8.33333	4.81333	25.81333	16.33333	3.41333	4.81333
degree of freedom=3						
H0: X1~triangular 1(mu,c), mu,c are unknown						
mu point estimated value=0.296297						
c point estimated value=0.280503 (MLE)						
pearson chi-square test statistic =63.520000						
p-value=0.000000						
pearson goodness of fit						
class	[1]	[2]	[3]	[4]	[5]	[6]
lower limit	0.10212	0.16848	0.23396	0.29630	0.35863	0.42411
upper limit	0.16848	0.23396	0.29630	0.35863	0.42411	0.66312
observed no	7.00000	8.00000	10.00000	13.00000	6.00000	6.00000
probability	0.16667	0.16667	0.16667	0.16667	0.16667	0.16667
expected no	8.33333	8.33333	8.33333	8.33333	8.33333	8.33333
chi square	0.21333	0.01333	0.33333	2.61333	0.65333	0.65333
degree of freedom=3						
H0: X1~trapezoid(mu,c), mu,c are unknown						
mu point estimated value=0.296297						
c point estimated value=0.187002 (MLE)						
pearson chi-square test statistic =4.480000						
p-value=0.214000						



pearson goodness of fit						
class	[1]	[2]	[3]	[4]	[5]	[6]
lower limit	0.10212	0.13756	0.18813	0.38980	0.57709	0.62765
upper limit	0.13756	0.18813	0.38980	0.57709	0.62765	0.66312
observed no	2.00000	8.00000	34.00000	4.00000	1.00000	1.00000
probability	0.16667	0.16667	0.16667	0.16667	0.16667	0.16667
expected no	8.33333	8.33333	8.33333	8.33333	8.33333	8.33333
chi square	4.81333	0.01333	79.05333	2.25333	6.45333	6.45333
degree of freedom=3						
H0: X1~U_quadratic(a,b), a,b are unknown						
a point estimated value=0.102115 (MLE)						
b point estimated value=0.663121 (MLE)						
pearson chi-square test statistic =99.040000						
p-value=0.000000						
pearson goodness of fit						
class	[1]	[2]	[3]	[4]	[5]	[6]
lower limit	0.10212	0.14106	0.22198	0.29630	0.37059	0.45149
upper limit	0.14106	0.22198	0.29630	0.37059	0.45149	0.66312
observed no	2.00000	12.00000	11.00000	15.00000	5.00000	5.00000
probability	0.16667	0.16667	0.16667	0.16667	0.16667	0.16667
expected no	8.33333	8.33333	8.33333	8.33333	8.33333	8.33333
chi square	4.81333	1.61333	0.85333	5.33333	1.33333	1.33333
degree of freedom=3						
H0: X1~Semi-circle(mu,R), mu,R are unknown						
mu point estimated value=0.296297						
R point estimated value=0.280503 (MLE)						
pearson chi-square test statistic =15.280000						
p-value=0.001500						
pearson goodness of fit						
class	[1]	[2]	[3]	[4]	[5]	[6]
lower limit		0.19309	0.25185	0.29630	0.34074	0.39950
upper limit	0.19309	0.25185	0.29630	0.34074	0.39950	
observed no	10.00000	10.00000	5.00000	10.00000	9.00000	6.00000
probability	0.16667	0.16667	0.16667	0.16667	0.16667	0.16667
expected no	8.33333	8.33333	8.33333	8.33333	8.33333	8.33333
chi square	0.33333	0.33333	1.33333	0.33333	0.05333	0.65333
degree of freedom=3						
H0: X1~Logisitic(mu,sigma), mu,sigma are unknown						
mu point estimated value=0.296297 (MME)						
sigma point estimated value=0.064124 (MME)						
pearson chi-square test statistic =3.040000						
p-value=0.385500						
pearson goodness of fit						
class	[1]	[2]	[3]	[4]	[5]	[6]
lower limit	0.10212	0.19851	0.24587	0.29007	0.33874	0.40430
upper limit	0.19851	0.24587	0.29007	0.33874	0.40430	
observed no	12.00000	5.00000	8.00000	10.00000	9.00000	6.00000
probability	0.16667	0.16667	0.16667	0.16667	0.16667	0.16667
expected no	8.33333	8.33333	8.33333	8.33333	8.33333	8.33333
chi square	1.61333	1.33333	0.01333	0.33333	0.05333	0.65333
degree of freedom=3						
H0: X1~Weibull(alpha,beta,gamma=2.000000), alpha,beta are unknown,						
alpha point estimated value=0.102115 (MLE)						
beta point estimated value=0.225752 (MLE)						
gamma value=2.000000 (hypothesis value)						
pearson chi-square test statistic =4.000000						
p-value=0.261400						
pearson goodness of fit						
class	[1]	[2]	[3]	[4]	[5]	[6]
lower limit	0.00000	0.06989	0.14549	0.22892	0.32419	0.44119
upper limit	0.06989	0.14549	0.22892	0.32419	0.44119	0.66312
observed no	0.00000	4.00000	10.00000	17.00000	14.00000	5.00000
probability	0.16667	0.16667	0.16667	0.16667	0.16667	0.16667
expected no	8.33333	8.33333	8.33333	8.33333	8.33333	8.33333
chi square	8.33333	2.25333	0.33333	9.01333	3.85333	1.33333
degree of freedom=3						
H0: X1~Pareto 3(lamda,c), lamda,c are unknown						
lamda point estimated value=1.636902 (MLE)						
c point estimated value=0.663121 (MLE)						
pearson chi-square test statistic =25.120000						
p-value=0.000000						



The Hypothesis population distribution is as follows and the test diagram.

Uniform	Normal	Shifted exponential
Pareto 1	Pareto 2	Rayleigh
Double exponential	Log normal	Gamma
Beta	Cauchy	Arcsin
Gumbel	Triangular 1	Trapezoid
U quadratic	Semi circle	Logistic
Weibull	Pareto 3	



11.2)The discrete population distribution.

<p>? The random variable X1 ----- test the population distribution -----</p> <ol style="list-style-type: none"> 1. Pearson chi square test , the frequency table is used to tradition me 2. The best model of Pearson chi square tes the frequency table is used to tradition me 3. Likelihood ratio chi square test , the frequency table is used to tradition me 4. return <p><input type="text"/></p> <p><input type="button" value="確定"/> <input type="button" value="取消"/></p>	<p>The best model of the pearson chi square goodness</p> <ol style="list-style-type: none"> 1.H0:Bernoulli distribution 2.H0:Binomial distribution 3.H0:Poisson distribution 4.H0:Geometric distribution 5.H0:Negative binomial distribution 6.H0:Multi-nomial distribution 7.H0:Discrete Uniform distribution
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Input data

X1~Poisson(lamda=5.000000)
----- simulating data -----
8,4,5,8,2,6,5,8,4,2,3,3,4,7,8,7,2,5,6,5,3,6,4,8,6,6,3,2,5,5,5,5,3,5,8,5,4,4,4,5,5,4,5,9,
5,8,7,4,6,9

X1 is mean=5.2000000000, s.d.= 7.0000000000, variance=49.0000000000,
skewed coefficient=0.0048979592, kurtosis coefficient=0.0119656810,
MAD=1.4960000000,
Q1= 4.0000000000, median=5.0000000000, Q3=6.5000000000,
MIN=2.0000000000, MAX=9.0000000000, Range=7.0000000000,
Mid-Range=5.5000000000, C.V.= 1.3461538462, sample size=50

Output data

The lamda MLE=5.200000
H0: X1~Poisson(lamda), lamda are unknown
The frequency distribution is modified as follow

pearson goodness of fit

X1 value	[0]	[1]	[2]	[3]	[4]	[5]	[6]
observed no	0.00000	0.00000	4.00000	5.00000	9.00000	14.00000	6.00000
3.00000	7.00000	2.00000					
probability	0.00552	0.02869	0.07458	0.12928	0.16806	0.17479	0.15148
0.11253	0.07314	0.08194					
expected no	0.27583	1.43431	3.72920	6.46394	8.40313	8.73925	7.57402
5.62641	3.65717	4.09675					
chi square	0.27583	1.43431	0.01966	0.33155	0.04240	3.16680	0.32711
1.22601	3.05551	1.07314					

The X1 value from 0 to 9, but expected number >=5 in each cell
The frequency distribution is modified as follow

pearson goodness of fit

X1 value	[2]	[3]	[4]	[5]	[6]	[7]	[8]
observed no	4.00000	5.00000	9.00000	14.00000	6.00000	3.00000	9.00000
probability	0.10879	0.12928	0.16806	0.17479	0.15148	0.11253	0.15508
expected no	5.43933	6.46394	8.40313	8.73925	7.57402	5.62641	7.75392
chi square	0.38087	0.33155	0.04240	3.16680	0.32711	1.22601	0.20025

degree of freedom=5

pearson chi-square test statistic =5.674989
p-value=0.339100

