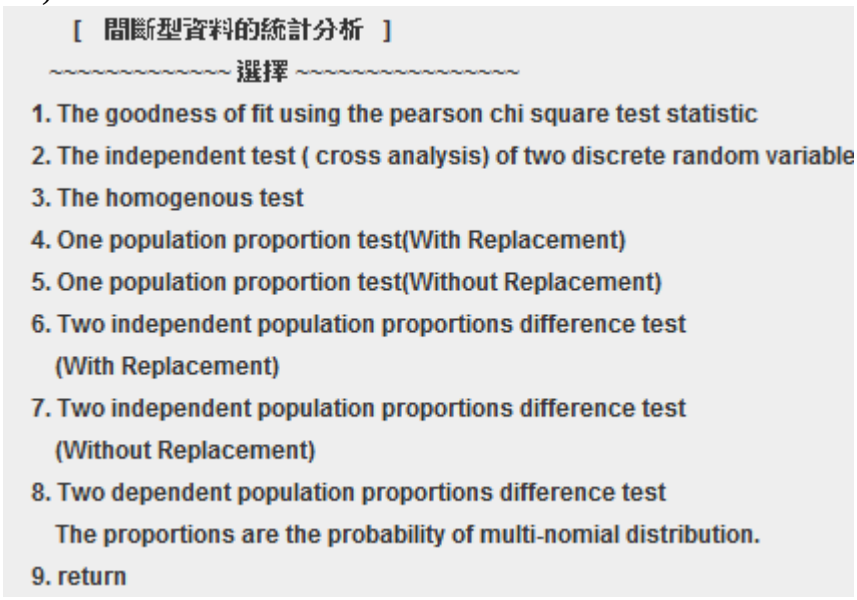
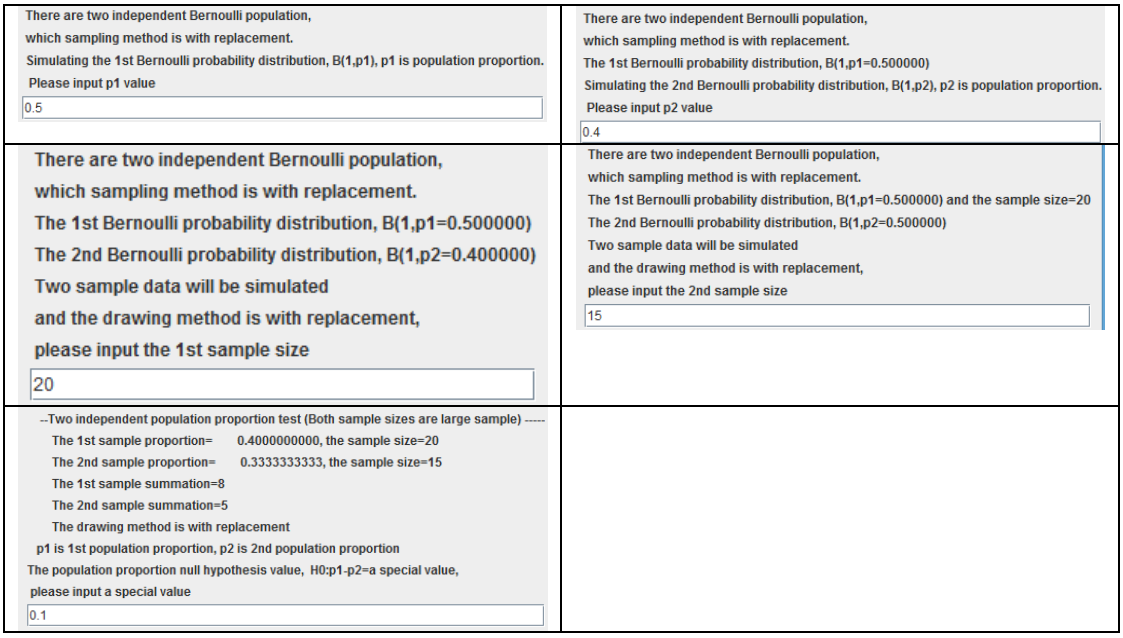
7.兩個母體比例(獨立或相關)

7.1)



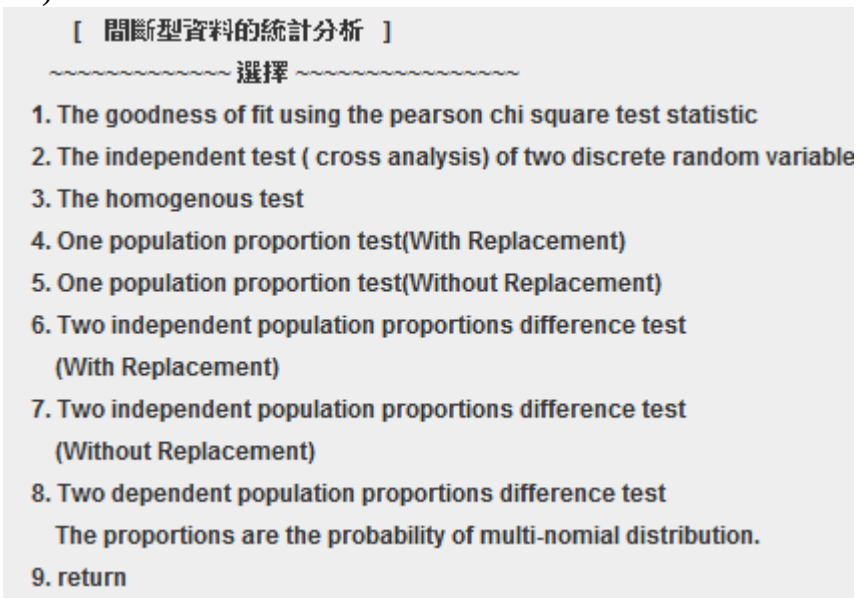
選擇 6，



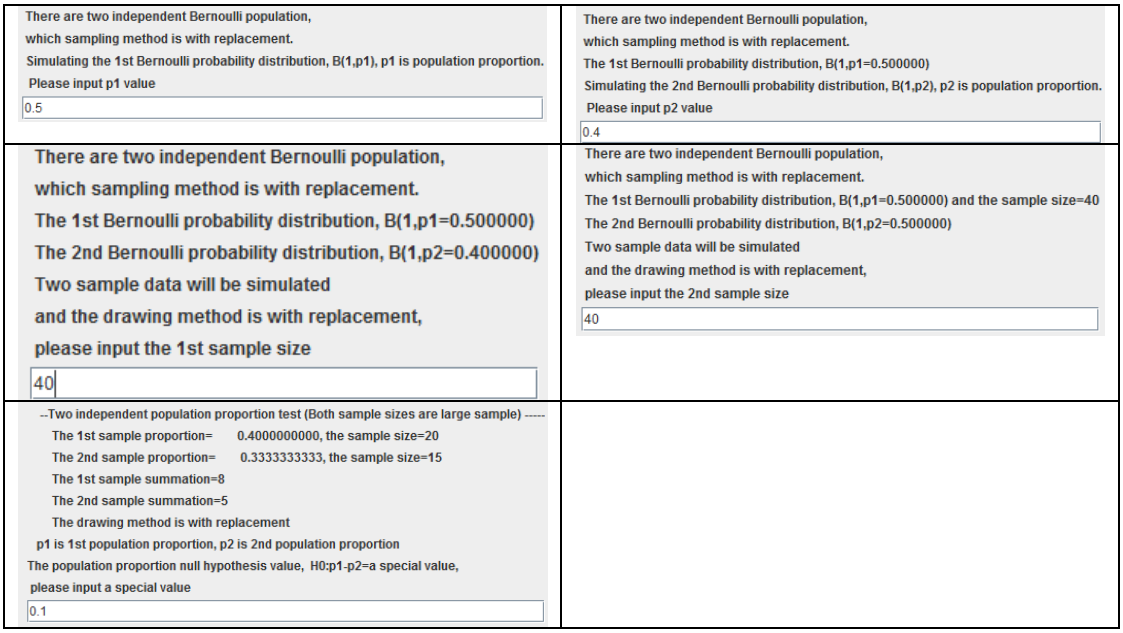
Output data，

```
X1~Bernoulli(p=0.500000)    the sample size=20
X2~Bernoulli(p=0.400000)    the sample size=15
----------- simulating data --------------------
 1   0     1
 2   0     1
 3   0     0
 4   1     0
 5   1     1
 6   1     0
 7   1     1
 8   1     0
 9   0     0
 10   0     0
 11   1     0
 12   0     1
 13   0     0
 14   0     0
 15   0     0
 16   0     XXXX
 17   0     XXXX
 18   1     XXXX
 19   1     XXXX
 20   0     XXXX
      ---------------------- inference statistiscs ------------------------
      --Two independent population proportion test (Both sample sizes are small sample) -----
            The 1st sample proportion=              0.4000000000, the sample size=20
            The 2nd sample proportion=              0.3333333333, the sample size=15
            The 1st sample summation=8
            The 2nd sample summation=5
            The drawing method is with replacement
   H0: p1-p2=0.100000       , p1 is 1st population proportion, p2 is 2nd population proportion
[          This analysis is indepdenent test ( cross analysis)            ]
      There are two discrete type factors A and B.
      The A factor has 2 categories which are populations,
      the B factor has 2 categories which is successful and failure.
      ----   the observed sample number of each cell
                              A1              A2           marginal
   B1                       8.00            5.00           13.00
   B2                      12.00           10.00           22.00
  marginal            20.00           15.00           35.00

      ----   the expected sample number of each cell
                              A1              A2           marginal
   B1                       8.00            4.00           12.00
   B2                      12.00           11.00           23.00
  marginal            20.00           15.00           35.00

  degree of freedom=1

H0: p1=p2+0.100000

  pearson chi-square test statistic =0.340909
  p-value=0.559300
```

7.2)


[間斷型資料的統計分析]
~~~~~~~~~~~~~~~ 選擇 ~~~~~~~~~~~~~~~~~
1. The goodness of fit using the pearson chi square test statistic
2. The independent test (cross analysis) of two discrete random variable
3. The homogenous test
4. One population proportion test(With Replacement)
5. One population proportion test(Without Replacement)
6. Two independent population proportions difference test
(With Replacement)
7. Two independent population proportions difference test
(Without Replacement)
8. Two dependent population proportions difference test
The proportions are the probability of multi-nomial distribution.
9. return

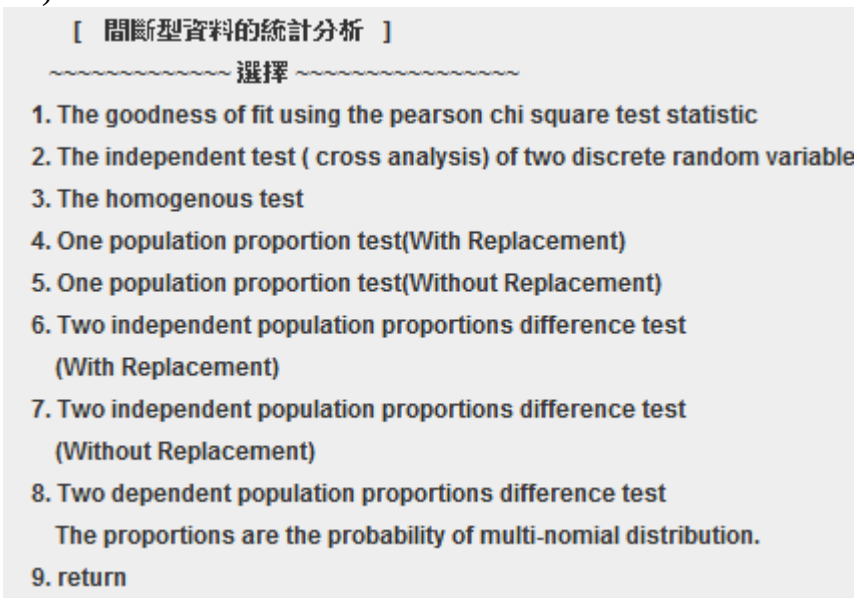
選擇 6，


There are two independent Bernoulli population,
which sampling method is with replacement.
Simulating the 1st Bernoulli probability distribution, B(1,p1), p1 is population proportion.
Please input p1 value
0.5
There are two independent Bernoulli population,
which sampling method is with replacement.
The 1st Bernoulli probability distribution, B(1,p1=0.500000)
Simulating the 2nd Bernoulli probability distribution, B(1,p2), p2 is population proportion.
Please input p2 value
0.4
There are two independent Bernoulli population,
which sampling method is with replacement.
The 1st Bernoulli probability distribution, B(1,p1=0.500000)
The 2nd Bernoulli probability distribution, B(1,p2=0.400000)
Two sample data will be simulated
and the drawing method is with replacement,
please input the 1st sample size
40
There are two independent Bernoulli population,
which sampling method is with replacement.
The 1st Bernoulli probability distribution, B(1,p1=0.500000) and the sample size=40
The 2nd Bernoulli probability distribution, B(1,p2=0.500000)
Two sample data will be simulated
and the drawing method is with replacement,
please input the 2nd sample size
40
--Two independent population proportion test (Both sample sizes are large sample) -----
The 1st sample proportion= 0.4000000000, the sample size=20
The 2nd sample proportion= 0.3333333333, the sample size=15
The 1st sample summation=8
The 2nd sample summation=5
The drawing method is with replacement
p1 is 1st population proportion, p2 is 2nd population proportion
The population proportion null hypothesis value, H0:p1-p2=a special value,
please input a special value
0.1
~~~~~~~~~~~~~~~

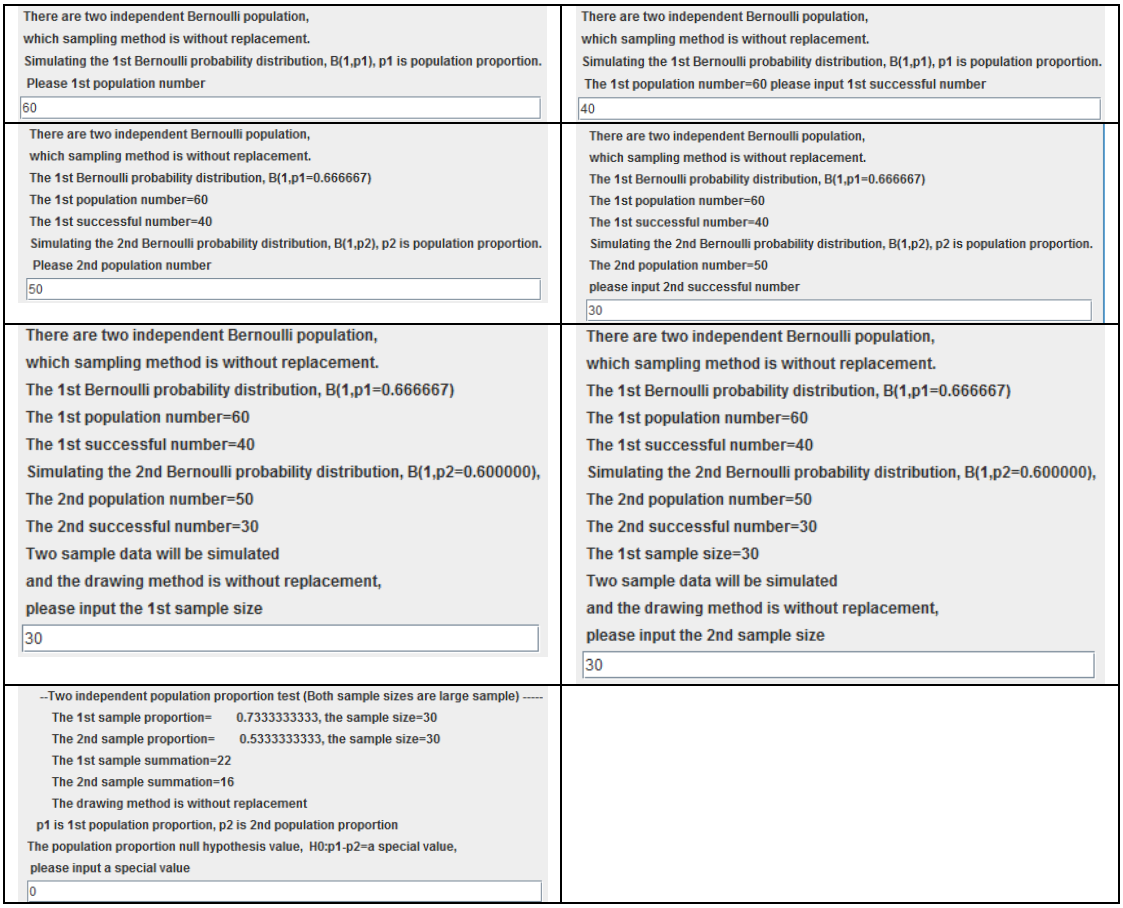
Output data，

```
X1~Bernoulli(p=0.500000)    the sample size=40
X2~Bernoulli(p=0.400000)    the sample size=40
---------- simulating data ---------------------
 1   0     0
 2   0     0
 3   1     0
 4   0     1
 5   1     0
 6   0     0
 7   0     0
 8   0     0
 9   1     0
 10   1     0
 11   0     1
 12   1     1
 13   0     1
 14   1     0
 15   0     1
 16   0     0
 17   1     1
 18   1     1
 19   1     0
 20   0     0
 21   1     0
 22   1     0
 23   1     0
 24   0     0
 25   0     0
 26   1     1
 27   0     1
 28   1     0
 29   1     0
 30   1     0
 31   1     0
 32   1     0
 33   1     0
 34   0     1
 35   0     0
 36   1     0
 37   1     0
 38   1     0
 39   1     0
 40   1     1

      ---------- inference statistiscs ----------
      --Two independent population proportion test (Both sample sizes are large sample) -----
            The 1st sample proportion=              0.6000000000, the sample size=40
            The 2nd sample proportion=              0.2750000000, the sample size=40
            The 1st sample summation=24
            The 2nd sample summation=11
            The 1st sample proportin=0.600000
            The 2nd sample proportin=0.275000
            The drawing method is with replacement
  H0: p1-p2=0.100000        , p1 is 1st population proportion, p2 is 2nd population proportion
Z test value=2.146816
left tail test p-value=        0.9841
right tail test p-value=       0.0159
two tailes test p-value=       0.0318
  90% confidence interval for p1-p2
  [0.152603 ,    0.497397]
  95% confidence interval for p1-p2
  [0.119579 ,    0.530421]
  99% confidence interval for p1-p2
  [0.055003 ,    0.594997]
```

7.3)



選擇 7，

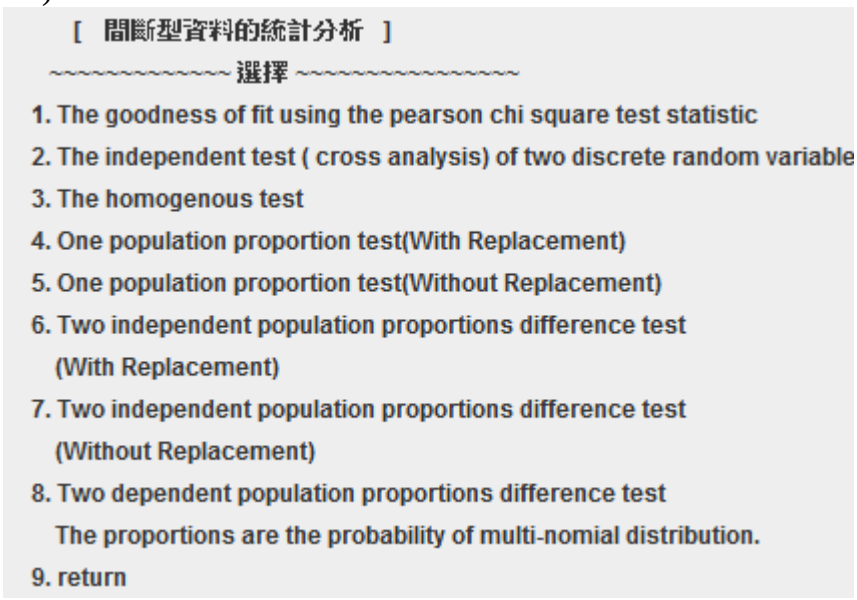


Output data，

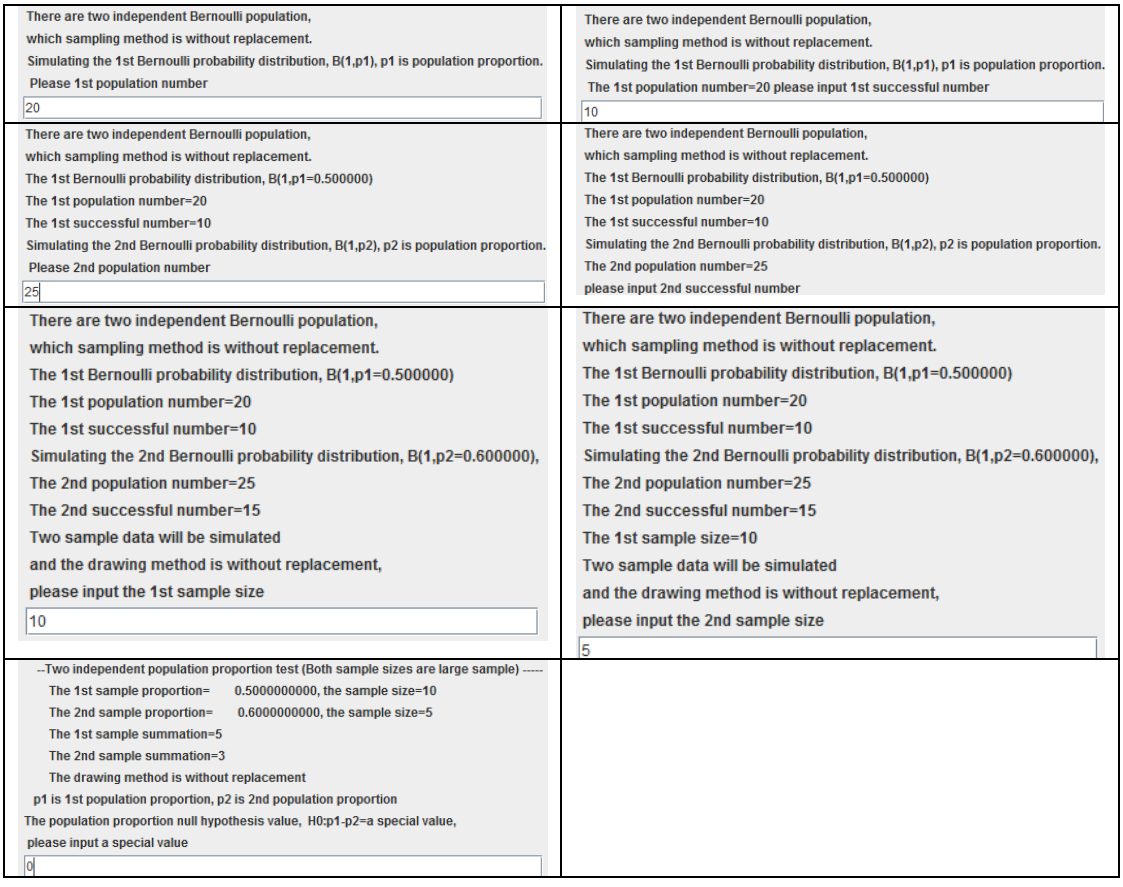
```
There are two independent Bernoulli population,
 which sampling method is withoutout replacement.
 The 1st Bernoulli probability distribution, B(1,p1=0.666667)
 The 1st population number=60
 The 1st successful number=40
 Simulating the 2nd Bernoulli probability distribution, B(1,p2=0.600000),
 The 2nd population number=50
 The 2nd successful number=30
```

```
 The 1st sample size=30
 The 2nd sample size=30
---------- simulating data ----------
 1   1    0
 2   1    0
 3   1    1
 4   1    1
 5   0    0
 6   0    1
 7   1    1
 8   0    0
 9   1    1
 10   1    1
 11   0    0
 12   0    1
 13   1    1
 14   1    0
 15   0    1
 16   1    1
 17   1    0
 18   1    0
 19   1    1
 20   1    0
 21   1    1
 22   1    1
 23   1    0
 24   1    1
 25   0    0
 26   1    0
 27   1    0
 28   0    1
 29   1    1
 30   1    0
      ---------- inference statistiscs ----------
      --Two independent population proportion test (Both sample sizes are small sample) -----
 The 1st Bernoulli probability distribution, B(1,p1=0.666667)
 The 1st population number=60
 The 1st successful number=40
 Simulating the 2nd Bernoulli probability distribution, B(1,p2=0.600000)
 The 2nd population number=50
 The 2nd successful number=30
 The 1st sample size=30
 The 2nd sample size=30
 The 1st sample summation=22
 The 2nd sample summation=16
 The 1st sample porportion=0.733333
 The 2nd sample porportion=0.533333
           The drawing method is without replacement
  H0: p1-p2=0.000000        , p1 is 1st population proportion, p2 is 2nd population proportion
 The common sample proportion=0.633333
 Z test value=2.374323
 left tail test p-value=        0.9913
 right tail test p-value=       0.0087
 two tailes test p-value=       0.0174
  90% confidence interval for p1-p2
  [0.065351 ,    0.334649]
  95% confidence interval for p1-p2
  [0.039558 ,    0.360442]
  99% confidence interval for p1-p2
  [-0.010878 ,    0.410878]
```

7.4)


[間斷型資料的統計分析]
~~~~~~~~~~~~~~~ 選擇 ~~~~~~~~~~~~~~~~~
1. The goodness of fit using the pearson chi square test statistic
2. The independent test (cross analysis) of two discrete random variable
3. The homogenous test
4. One population proportion test(With Replacement)
5. One population proportion test(Without Replacement)
6. Two independent population proportions difference test
(With Replacement)
7. Two independent population proportions difference test
(Without Replacement)
8. Two dependent population proportions difference test
The proportions are the probability of multi-nomial distribution.
9. return

選擇 7，


There are two independent Bernoulli population,
which sampling method is without replacement.
Simulating the 1st Bernoulli probability distribution, B(1,p1), p1 is population proportion.
Please 1st population number
20
There are two independent Bernoulli population,
which sampling method is without replacement.
Simulating the 1st Bernoulli probability distribution, B(1,p1), p1 is population proportion.
The 1st population number=20 please input 1st successful number
10
There are two independent Bernoulli population,
which sampling method is without replacement.
The 1st Bernoulli probability distribution, B(1,p1=0.500000)
The 1st population number=20
The 1st successful number=10
Simulating the 2nd Bernoulli probability distribution, B(1,p2), p2 is population proportion.
Please 2nd population number
25
There are two independent Bernoulli population,
which sampling method is without replacement.
The 1st Bernoulli probability distribution, B(1,p1=0.500000)
The 1st population number=20
The 1st successful number=10
Simulating the 2nd Bernoulli probability distribution, B(1,p2), p2 is population proportion.
The 2nd population number=25
please input 2nd successful number
There are two independent Bernoulli population,
which sampling method is without replacement.
The 1st Bernoulli probability distribution, B(1,p1=0.500000)
The 1st population number=20
The 1st successful number=10
Simulating the 2nd Bernoulli probability distribution, B(1,p2=0.600000),
The 2nd population number=25
The 2nd successful number=15
Two sample data will be simulated
and the drawing method is without replacement,
please input the 1st sample size
10
There are two independent Bernoulli population,
which sampling method is without replacement.
The 1st Bernoulli probability distribution, B(1,p1=0.500000)
The 1st population number=20
The 1st successful number=10
Simulating the 2nd Bernoulli probability distribution, B(1,p2=0.600000),
The 2nd population number=25
The 2nd successful number=15
The 1st sample size=10
Two sample data will be simulated
and the drawing method is without replacement,
please input the 2nd sample size
5
--Two independent population proportion test (Both sample sizes are large sample) -----
The 1st sample proportion= 0.5000000000, the sample size=10
The 2nd sample proportion= 0.6000000000, the sample size=5
The 1st sample summation=5
The 2nd sample summation=3
The drawing method is without replacement
p1 is 1st population proportion, p2 is 2nd population proportion
The population proportion null hypothesis value, H0:p1-p2=a special value,
please input a special value
0
~~~~~~~~~~~~~~~

Output data，

```
There are two independent Bernoulli population,
 which sampling method is withoutout replacement.
 The 1st Bernoulli probability distribution, B(1,p1=0.500000)
 The 1st population number=20
 The 1st successful number=10
 Simulating the 2nd Bernoulli probability distribution, B(1,p2=0.600000),
 The 2nd population number=25
 The 2nd successful number=15
 The 1st sample size=10
 The 2nd sample size=5
---------- simulating data --------------------
 1   0    1
 2   0    1
 3   1    0
 4   1    0
 5   0    1
 6   1    XXXX
 7   0    XXXX
 8   1    XXXX
 9   0    XXXX
 10   1    XXXX
      ---------------------- inference statistiscs ------------------------
      --Two independent population proportion test (Both sample sizes are small sample) -----
 The 1st Bernoulli probability distribution, B(1,p1=0.500000)
 The 1st population number=20
 The 1st successful number=10
 Simulating the 2nd Bernoulli probability distribution, B(1,p2=0.600000),
 The 2nd population number=25
 The 2nd successful number=15
 The 1st sample size=10
 The 2nd sample size=5
 The 1st sample summation=5
 The 2nd sample summation=3
 The 1st sample porportion=0.500000
 The 2nd sample porportion=0.600000
            The drawing method is without replacement
  H0: p1-p2=0.000000        , p1 is 1st population proportion, p2 is 2nd population proportion
 The total sample size which is too small. The statistical analysis cannot be done.
```