Statistical Inference Theory - Lab 9

Code

CB.SC.I5DAS20032

Problem 1

In order to determine the possible effect of a chemical treatment on the rate of germination of cotton seeds, a pot culture was conducted. The results are given below. Significance at 0.05.

Solution

Hide

```
Sample2 = matrix(c(118, 120, 22, 40), nrow = 2, ncol = 2)

Sample2
```

```
     [,1] [,2]
[1,]  118   22
[2,]  120   40
```

Hide

```
chisq.test(Sample2)
```

```

    Pearson's Chi-squared test with Yates' continuity correction

data:  Sample2
X-squared = 3.3808, df = 1, p-value = 0.06596
```

As p = 0.06596 > 0.05, h0: Attributes are independent is **not rejected**.

Problem 2

The severity of a disease and blood group were studied in a research project.

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```
DisxBlood = matrix(c(51, 105, 384, 40, 103, 527, 10, 25, 125, 9, 17, 104), nrow = 3, ncol = 4)

DisxBlood
```

```
     [,1] [,2] [,3] [,4]
[1,]   51   40   10    9
[2,]  105  103   25   17
[3,]  384  527  125  104
```

Solution

Hide

```
chisq.test(DisxBlood)
```

```
    Pearson's Chi-squared test

data:  DisxBlood
X-squared = 12.237, df = 6, p-value = 0.05689
```

As p = 0.2003 > 0.05, h0: Attributes are independent is **not rejected**.

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```
qchisq(0.95, df = 6)
```

```
[1] 12.59159
```

As chisq = 12.237 < chisq(table) = 12.59159, h0: Attributes are independent is **not rejected**.

Problem 3

A public opinion poll surveyed a simple random sample of 1000 voters.

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```
GenxParty = matrix(c(220, 270, 170, 320, 70, 70), nrow = 2, ncol = 3)

GenxParty
```

```
     [,1] [,2] [,3]
[1,]  220  170   70
[2,]  270  320   70
```

Solution

Hide

```
chisq.test(GenxParty)
```

```
    Pearson's Chi-squared test

data:  GenxParty
X-squared = 15.81, df = 2, p-value = 0.0003688
```

As p = 0.0003688 < 0.05, h0: Attributes are independent is **rejected**.

Hide

```
qchisq(0.95, df = 2)
```

```
[1] 5.991465
```

As chisq = 15.81 < chisq(table) = 5.991465, h0: Attributes are independent is **rejected**.