PO12Q: Introduction to Quantitative Political Analysis II

Week 1 - Worksheet Solutions

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1 | Calculations by Hand

Expected Values:

	Mode of Transport			
Year of Study	Bike	Bus	Car	Total
Fresher	7.2	6.8	6	20
Finalist	10.8	10.2	9	30
Total	18	17	15	50

- Calculate the χ^2-value **(2.8867)**
- How many degrees of freedom does this table have? Why? **(2)**
- Using the χ^2 Table, what is the p-value? **(0.236, or between 0.90 and 0.10)**
- Are mode of transport and departmental assignment independent in the population? **(Yes)**

2 | Cross-Tabulations in R – Exercises

1. Let is find out whether the completion of primary school influences youth unemployment rates.

a. State the null and directional alternative hypothesis for this test.
b. Create a new variable `primary_fac` using the `primarycom` variable. Cut it into three categories “low”, “medium”, and “high”, cutting `primarycom` at its first quartile, and its mean.

```
summary(wdi$prim_compl)
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##   37.50   90.71   98.27   92.74  101.50  114.27      83

    wdi <- wdi %>%
      mutate(primary_fac=
               ordered(
                 cut(prim_compl, breaks=c(0,59.868,77.952,135),
                     labels=c("low","medium", "high"))))
```

c. Apply the same procedure to `unemploy`, creating a new variable called `unemp_fac`.

```
summary(wdi$unemploy)
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##   0.170   3.555   6.100   7.646   9.908  27.690      25

        wdi <- wdi %>%
          mutate(unemp_fac=
                   ordered(
                     cut(unemploy, breaks=c(0,3.585,8,38),
                         labels=c("low","medium", "high"))))
```

d. Create a cross-tabulation assessing the dependence of youth unemployment on primary completion rate.

```
ex1_table <- with(wdi, table(primary_fac, unemp_fac))
```

e. Test whether the dependence is statistically significant.

```
Xsq <- chisq.test(ex1_table, correct=FALSE)
Xsq
##
##  Pearson's Chi-squared test
##
## data:  ex1_table
## X-squared = 7.0878, df = 4, p-value = 0.1313
```