

ST 502 Final

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Introduction

What is the general idea of testing for homogeneity? Perhaps also explain the purpose and outline of this project.

Data Example

Use hospital data given to conduct a χ^2 test for homogeneity.

```
#create and print matrix of hospital data
rows <- rbind(a=c(41, 27, 51), b=c(36,3,40), c=c(169, 106, 109))
(hospDat <- matrix(data=rows, nrow = 3, ncol = 3,
                    dimnames = list(c("A", "B", "C"),
                                     c("Surgical Site Infections",
                                       "Pneumonia Infections",
                                       "Bloodstream Infections"))))
```

```
##   Surgical Site Infections Pneumonia Infections Bloodstream Infections
## A                41                27                51
## B                36                 3                40
## C               169               106               109
```

Deriving the Likelihood Ratio Test

Derive the LRT test for homogeneity; some work already done on page 151 of our notes. Pages 129, 132, 137, 139 may also be useful?

Simulation

Simulate test with data. Potentially make use of code already given in notes. Two multinomial case only, with 3 categories in each multinomial. Plot summaries of simulations. Set seed for reproduction purposes.

Goal:

Process:

```
#set seed for reproduction
set.seed(17)
```