Goodness-of-Fit Tests

R Handout

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First Commands

```
> library(NCStats)
```

Goodness-of-Fit Test

Four-o'clocks (*Mirabilis jalapa*) are plants native to tropical America. Individual four-o'clocks can have red, white, or pink flowers. Flower color in this species is thought to be controlled by a single gene locus with two alleles experssing incomplete dominance, so that heterozygotes are pink-flowered, while homozygotes for one allele are white-flowered and homozygotes for the other allele are red-flowered (see this). According to Mendelian genetic principles, self-pollination of pink-flowered plants should produce progeny that have red, pink, and white flowers in a 1:2:1 ratio. A horticulturist allowed several pink-flowered plants to self-pollinate and produce 240 progeny with 55 that were red-flowered, 132 that were pink-flowered, and 53 that were white-flowered. Use the results to determine, at the 5% level, if the theoretical 1:2:1 ratio is upheld with these data.

```
> obs <- c(red=55,pink=132,white=53)
> exp.p <- c(red=1/4,pink=2/4,white=1/4)
> chi1 <- chisq.test(obs,p=exp.p,rescale.p=TRUE,correct=FALSE)
> chi1$expected
```

```
  red  pink white
   60   120    60
```

```
> chi1$observed
```

```
  red  pink white
   55   132    53
```

```
> chi1
```

```
Chi-squared test for given probabilities with obs
X-squared = 2.4333, df = 2, p-value = 0.2962
```

```
> gofCI(chi1,digits=3)
```

```
      p.obs p.LCI p.UCI p.exp
red   0.229 0.181 0.286  0.25
pink  0.550 0.487 0.612  0.50
white 0.221 0.173 0.277  0.25
```