Analysing 2x2 Tables in R

Example 1

```
> freqs <- scan()
1: 9 3 4 9
5:
> freqMat <- matrix(freqs,byrow=TRUE,ncol=2)
>
# Print row percents (in R the row of an array or matrix is the
# dimension 1
>
> percents(freqMat,denom=1)
     [,1]        [,2]
[1,] 9/12(75.0%) 3/12(25.0%)
[2,] 4/13(30.8%) 9/13(69.2%)
>
>
# Examine differences in the row proportions - The prop.test() function
# automates inference proportions for 1 row (single sample), 2 rows
# (two samples),or more ("k" sample comparison).  In addition, the
# default in prop.test() is to use a correction for small samples.  Whether or
# not to use this correction is still a subject of controversy amongst
# statisticians.  It is probably wise to use this when any of the counts
# are less than 5 in a two by two table as a conservative measure.
>
> prop.test(freqMat)

       2-sample test for equality of proportions with continuity correction

data:  freqMat
X-squared = 3.2793, df = 1, p-value = 0.07016
alternative hypothesis: two.sided
95 percent confidence interval:
 0.01151032 0.87310506
sample estimates:
   prop 1    prop 2
0.7500000 0.3076923

>
# result without a continuity correction
> prop.test(freqMat,correct=FALSE)

       2-sample test for equality of proportions without continuity correction

data:  freqMat
X-squared = 4.8909, df = 1, p-value = 0.027
alternative hypothesis: two.sided
95 percent confidence interval:
 0.09163853 0.79297686
sample estimates:
   prop 1    prop 2
0.7500000 0.3076923

>
# Fisher's exact test for comparing proportions
> fisher.test(freqMat)

       Fisher's Exact Test for Count Data

data:  freqMat
p-value = 0.04718
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
  0.9006803 57.2549701
sample estimates:
odds ratio
  6.180528
```

Example 2

```
# You can insert the scan() function directly into the matrix function
> freqMat <- matrix(scan(),byrow=TRUE,ncol=2)
1: 8 1 2 5
5:
> percents(freqMat,denom=1)
     [,1]       [,2]
[1,] 8/9(88.9%) 1/9(11.1%)
[2,] 2/7(28.6%) 5/7(71.4%)
>
# Fisher's exact test for comparing proportions
> fisher.test(freqMat)

       Fisher's Exact Test for Count Data

data:  freqMat
p-value = 0.03497
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
    1.008849 1049.791446
sample estimates:
odds ratio
  15.46969


> prop.test(freqMat)

       2-sample test for equality of proportions with continuity correction

data:  freqMat
X-squared = 3.8095, df = 1, p-value = 0.05096
alternative hypothesis: two.sided
95 percent confidence interval:
 0.08356876 1.00000000
sample estimates:
   prop 1    prop 2
0.8888889 0.2857143
```

Example 3

```
> freqMat <- matrix(scan(),byrow=TRUE,ncol=2)
1: 41 28 19 32
5:
Read 4 items
>
> # Fisher's exact test for comparing proportions
> fisher.test(freqMat)

       Fisher's Exact Test for Count Data

data:  freqMat
p-value = 0.02625
alternative hypothesis: true odds ratio is not equal to 1
95 percent confidence interval:
 1.101151 5.560219
sample estimates:
odds ratio
  2.447101
```