STAT 217: Chi-Squared Tests 3-6

1. A random sample of Brazilians aged 18 and older was taken, and each subjects Age - (Under 30, 30-49, 50 and over) and Political Ideology-(Liberal, Moderate, Conservative) were noted.

```
PolAge <- as.table(rbind(c(83,140,73), c(119,280,161), c(88,284,214)))
dimnames(PolAge) <- list(age=c("underthirty","thirtytofortynine","fiftyandOver"),
party=c("Liberal","Moderate", "Conservative"))
PolAge
```

```
##                     party
## age                  Liberal Moderate Conservative
##   underthirty             83      140           73
##   thirtytofortynine      119      280          161
##   fiftyandOver            88      284          214
```

(a) Would this be a test of independence or homogeneity?

```
  Pearson's Chi-squared test

data:  PolAge
X-squared = 27.9743, df = , p-value = 1.262e-05
```

(b) Above is the output for the chisquared test. What is your conclusion?

Below is the table of expected counts generated by R. Are all of the assumptions and conditions met for the chi squared test?

```
chisq.test(PolAge)$expected
```

```
##                     party
## age                  Liberal Moderate Conservative
##   underthirty          59.53    144.5        91.96
##   thirtytofortynine   112.62    273.4       173.98
##   fiftyandOver        117.85    286.1       182.06
```

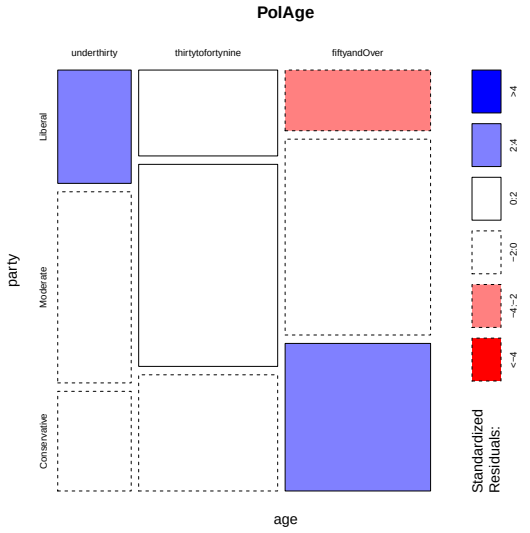
A. Yes.
B. No, age is not categorical.
C. No, the table of expected counts is too similar to the table of observed counts.
D. No, the normality assumption is not met.

Below is a table and a plot of standardized residuals.

```
chisq.test(PolAge)$residuals
```

```
##                     party
## age                  Liberal Moderate Conservative
##   underthirty         3.0421  -0.3752      -1.9773
##   thirtytofortynine   0.6011   0.3993      -0.9841
##   fiftyandOver       -2.7497  -0.1237       2.3673
```

```
mosaicplot(PolAge,shade=T)
```



(c) The top left segment on the plot is blue. What does this tell us about the Liberal underthirty group? Use the appropriate value from the table of standardized residuals to support your answer.(*Hint: You can also compare the table of expected and observed counts on the previous page*)

(d) The top right segment on the plot is red. What does this tell us about the Liberal fifty and Over group? Use the table to support your answer

(e) The bottom middle segment is white with dashed borders. What does this tell us about the Conservative thirty to fortynine group? Use the table to support your answer.