analysis

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read the file

```r
df<-read.table(file = 'data/all_subjects_transitional_probability.txt', header = TRUE)
```

**linear regression of total counts**

```r
fit <- lm(total ~ Condition+Group, data=df)  # build linear regression model on full data
summary(fit)
```

```
##
## Call:
## lm(formula = total ~ Condition + Group, data = df)
##
## Residuals:
##     Min     1Q Median     3Q    Max
## -50.52 -14.73  -2.56  17.53  49.78
##
## Coefficients:
##                Estimate Std. Error t value Pr(>|t|)
## (Intercept)   7.152e+01  4.392e+00  16.285  < 2e-16 ***
## Conditionemo -1.593e+01  5.805e+00  -2.745 0.007028 **
## ConditionLP  -1.907e-14  5.805e+00   0.000 1.000000
## Conditionsoc -1.130e+01  5.805e+00  -1.947 0.054022 .
## GroupU        1.595e+01  4.259e+00   3.745 0.000284 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 22.48 on 115 degrees of freedom
## Multiple R-squared:  0.1825, Adjusted R-squared:  0.154
## F-statistic: 6.416 on 4 and 115 DF,  p-value: 0.0001071
```

Other useful functions

coefficients(fit) # model coefficients confint(fit, level=0.95) # CIs for model parameters fitted(fit) # predicted values residuals(fit) # residuals anova(fit) # anova table vcov(fit) # covariance matrix for model parameters influence(fit) # regression diagnostics # K-fold cross-validation library(DAAG) cv.lm(df=mydata, fit, m=3) # 3 fold cross-validation

```r
layout(matrix(c(1,2,3,4),2,2)) # optional 4 graphs/page
plot(fit)
```

Residuals vs Fitted

Scale–Location

Normal Q–Q

Residuals vs Leverage
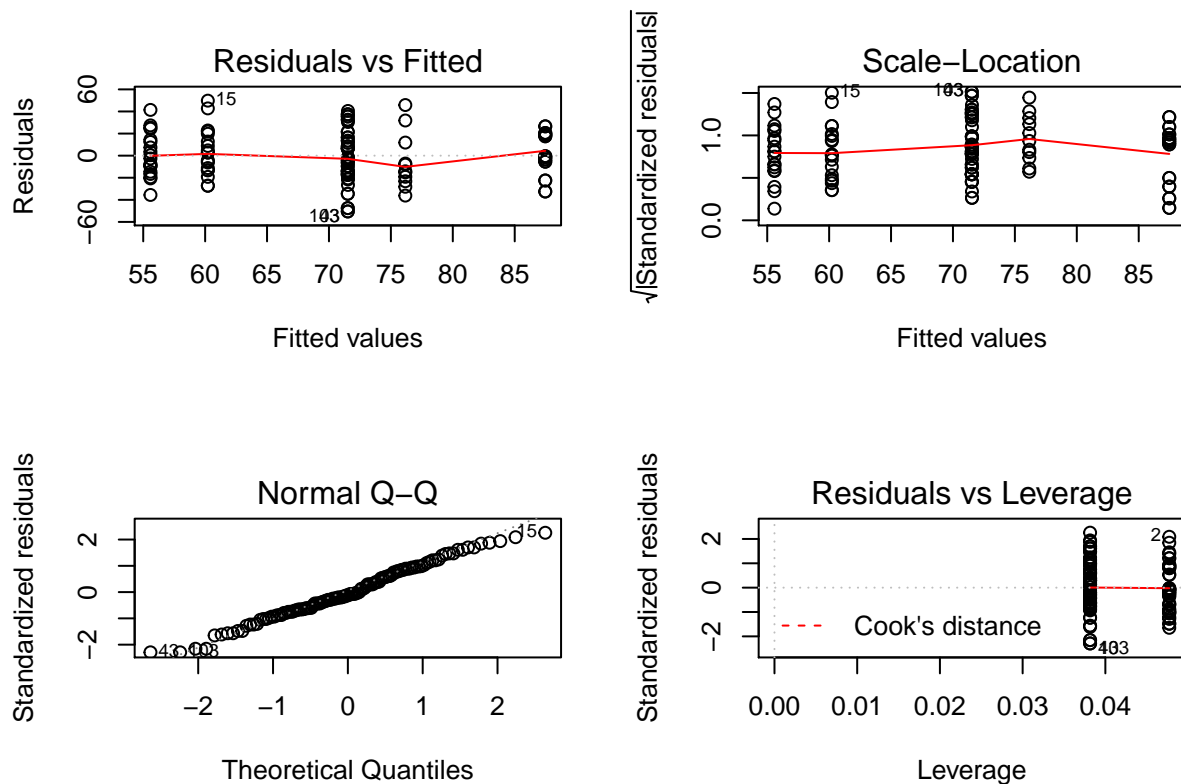

```r
# MANOVA test
res.man <- manova(cbind(AA,AB,AC,AX,BA,BB,BC,BX,CA,CB,CC,CX,XA,XB,XC,XX) ~ Condition+Group, data = df)
summary(res.man)
```

```
##             Df  Pillai approx F num Df den Df     Pr(>F)
## Condition    3 0.65162   1.7689     48    306 0.0023437 **
## Group        1 0.34032   3.2244     16    100 0.0001732 ***
## Residuals  115
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```r
summary.aov(res.man)
```

```
##  Response AA :
##              Df Sum Sq Mean Sq F value  Pr(>F)
## Condition     3  62.07  20.689  2.4122 0.07038 .
## Group         1  33.46  33.455  3.9006 0.05066 .
## Residuals   115 986.34   8.577
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##  Response AB :
##              Df  Sum Sq Mean Sq F value  Pr(>F)
## Condition     3  21.100  7.0333  2.6243 0.05388 .
## Group         1   0.653  0.6533  0.2437 0.62245
## Residuals   115 308.213  2.6801
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##   Response AC :
##              Df Sum Sq Mean Sq F value Pr(>F)
## Condition    3  3.425 1.14167  2.3293 0.0781 .
## Group        1  0.001 0.00100  0.0020 0.9641
## Residuals  115 56.366 0.49014
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##   Response AX :
##              Df  Sum Sq Mean Sq F value  Pr(>F)
## Condition    3  16.425  5.4750  2.0058 0.11705
## Group        1  11.670 11.6699  4.2754 0.04091 *
## Residuals  115 313.897  2.7295
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##   Response BA :
##              Df Sum Sq Mean Sq F value   Pr(>F)
## Condition    3  66.20 22.0667  4.2640 0.006787 **
## Group        1   1.86  1.8603  0.3595 0.549982
## Residuals  115 595.14  5.1751
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##   Response BB :
##              Df Sum Sq Mean Sq F value  Pr(>F)
## Condition    3  165.6  55.186  1.8985 0.13376
## Group        1   89.6  89.593  3.0822 0.08182 .
## Residuals  115 3342.8  29.068
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##   Response BC :
##              Df  Sum Sq Mean Sq F value Pr(>F)
## Condition    3  13.225  4.4083  1.8008 0.1510
## Group        1   4.582  4.5822  1.8718 0.1739
## Residuals  115 281.518  2.4480
##
##   Response BX :
##              Df Sum Sq Mean Sq F value    Pr(>F)
## Condition    3  66.02  22.008  3.0956    0.0297 *
## Group        1 159.97 159.968 22.5005 6.082e-06 ***
## Residuals  115 817.60   7.110
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##   Response CA :
##              Df  Sum Sq Mean Sq F value Pr(>F)
## Condition    3   3.600  1.2000  0.8815 0.4530
## Group        1   2.654  2.6541  1.9497 0.1653
## Residuals  115 156.546  1.3613
##
```

```
##   Response CB :
##               Df Sum Sq Mean Sq F value Pr(>F)
## Condition    3   0.03  0.0083  0.0022 0.9999
## Group        1   0.66  0.6635  0.1712 0.6798
## Residuals  115 445.64  3.8751
##
##   Response CC :
##               Df Sum Sq Mean Sq F value  Pr(>F)
## Condition    3  529.5 176.489  4.3726 0.00592 **
## Group        1   30.3  30.318  0.7512 0.38792
## Residuals  115 4641.7  40.362
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##   Response CX :
##               Df Sum Sq Mean Sq F value   Pr(>F)
## Condition    3  20.90   6.967  0.8608 0.463656
## Group        1  86.39  86.395 10.6755 0.001432 **
## Residuals  115 930.67   8.093
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##   Response XA :
##               Df  Sum Sq Mean Sq F value  Pr(>F)
## Condition    3  27.225  9.0750  3.4471 0.01904 *
## Group        1   0.014  0.0144  0.0055 0.94118
## Residuals  115 302.752  2.6326
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##   Response XB :
##               Df Sum Sq Mean Sq F value    Pr(>F)
## Condition    3 124.02  41.342   6.275 0.0005554 ***
## Group        1 215.91 215.906  32.771   8.4e-08 ***
## Residuals  115 757.66   6.588
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##   Response XC :
##               Df  Sum Sq Mean Sq F value    Pr(>F)
## Condition    3  101.23  33.742  3.7931 0.0122936 *
## Group        1  104.77 104.770 11.7777 0.0008337 ***
## Residuals  115 1023.00   8.896
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##   Response XX :
##               Df Sum Sq Mean Sq F value  Pr(>F)
## Condition    3   38.4   12.80  0.1538 0.92708
## Group        1  504.8  504.76  6.0632 0.01529 *
## Residuals  115 9573.6   83.25
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```