

## R output for Exercise 8, Question 1

```

> y <- c(911, 538, 44, 456, 3, 43, 2, 279)
> a <- factor(c(1, 1, 1, 1, 2, 2, 2, 2))
> c <- factor(c(1, 1, 2, 2, 1, 1, 2, 2))
> m <- factor(c(1, 2, 1, 2, 1, 2, 1, 2))
> glm1 <- glm(y ~ a * c + c * m + a * m, family = poisson)
> glm1$dev

[1] 0.3739859

> summary(glm1)

Call:
glm(formula = y ~ a * c + c * m + a * m, family = poisson)

Deviance Residuals:
    1     2     3     4     5     6     7     8 
0.02044 -0.02658 -0.09256  0.02890 -0.33428  0.09452  0.49134 -0.03690

Coefficients:
            Estimate Std. Error z value Pr(>|z|)
(Intercept)  6.81387    0.03313 205.699 < 2e-16 ***
a2           -5.52827    0.45221 -12.225 < 2e-16 ***
c2           -3.01575    0.15162 -19.891 < 2e-16 ***
m2           -0.52486    0.05428  -9.669 < 2e-16 ***
a2:c2         2.05453    0.17406  11.803 < 2e-16 ***
c2:m2         2.84789    0.16384  17.382 < 2e-16 ***
a2:m2         2.98601    0.46468   6.426 1.31e-10 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

    Null deviance: 2851.46098  on 7  degrees of freedom
Residual deviance:   0.37399  on 1  degrees of freedom
AIC: 63.417

Number of Fisher Scoring iterations: 4

> glm2 <- glm(y ~ a * c + c * m, family = poisson)
> glm2$coef

(Intercept)          a2          c2          m2          a2:c2          c2:m2
  6.7865780 -3.4499875 -3.4039037 -0.4530798  2.8737341  3.2243089

```

```

> glm2$dev

[1] 92.01836

> glm3 <- glm(y ~ c * m + a * m, family = poisson)
> glm3$coef

(Intercept)          c2          m2          a2          c2:m2          m2:a2
  6.8126086 -2.9891892 -0.7284728 -5.2522734  3.2243089  4.1250878

> glm3$dev

[1] 187.7543

> glm4 <- glm(y ~ a * c + a * m, family = poisson)
> glm4$coef

(Intercept)          a2          c2          m2          a2:c2          a2:m2
  6.56526858 -6.91714944 -1.06402084  0.04002587  2.87373412  4.12508777

> glm4$dev

[1] 497.3693

```