

SAVEETHA SCHOOL OF ENGINEERING

SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES ITA 0443 - STATISTICS WITH R PROGRAMMING FOR REAL TIME PROBLEM

DAY 4– LAB MANUAL Part 2

Reg No:192125063

Name: KRISHVANTH KUMAR E

LOGISTIC REGRESSION ANALYSIS IN R

Exercise

5. Create a logistic regression model using the “mtcars” data set with the information given below.

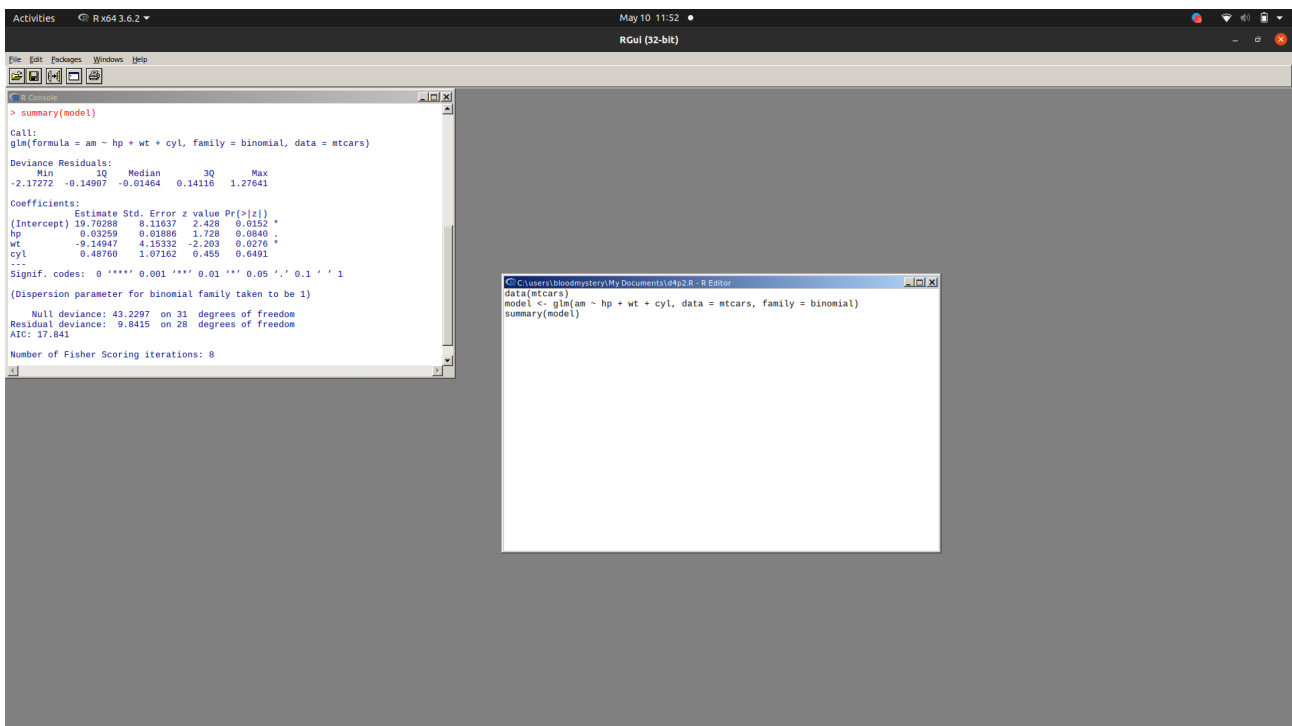
The in-built data set “mtcars” describes different models of a car with their various engine

specifications. In “mtcars” data set, the transmission mode (automatic or manual) is described

by the column am which is a binary value (0 or 1). Create a logistic regression model between the columns “am” and 3 other columns - hp, wt and cyl.

PROGRAM:

```
data(mtcars)
model <- glm(am ~ hp + wt + cyl, data = mtcars, family = binomial)
summary(model)
```



The screenshot shows an R console window with the following output:

```
> summary(model)

Call:
glm(formula = am ~ hp + wt + cyl, family = binomial, data = mtcars)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-2.17272  -0.14907  -0.01464   0.14116   1.27641

Coefficients:
            Estimate Std. Error z value Pr(>|z|)
(Intercept) 19.70288    8.11637   2.428  0.0152 *
hp           0.03259    0.01886   1.728  0.0846 .
wt          -0.14047    4.15332  -2.203  0.0276 *
cyl          0.48760    1.07162   0.455  0.6491

---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 43.2297  on 31  degrees of freedom
Residual deviance:  9.8415  on 28  degrees of freedom
AIC: 17.841

Number of Fisher Scoring iterations: 8
```

A separate window titled "RGui (32-bit)" shows the R script being executed:

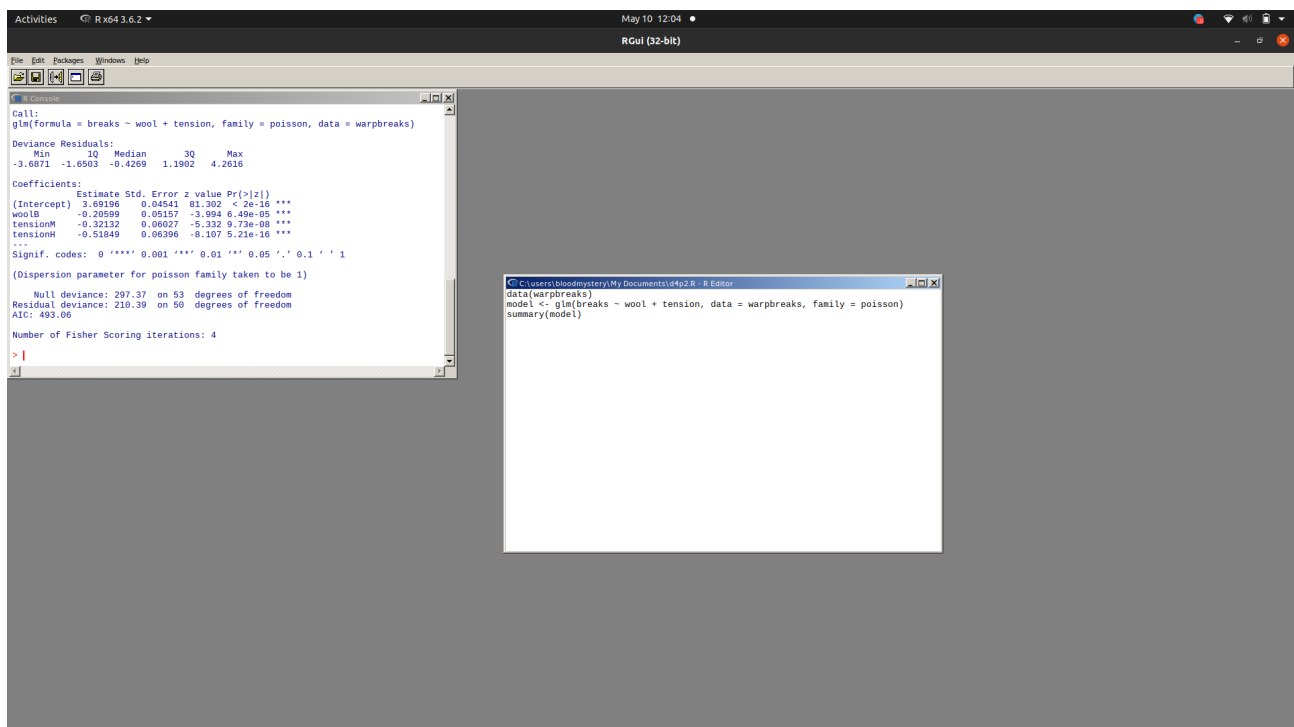
```
data(mtcars)
model <- glm(am ~ hp + wt + cyl, data = mtcars, family = binomial)
summary(model)
```

6. Create a Poisson regression model using the in-built data set “warpbreaks” with information given below.

In-built data set “warpbreaks” describes the effect of wool type (A or B) and tension (low, medium or high) on the number of warp breaks per loom. Consider “breaks” as the response variable which is a count of number of breaks. The wool “type” and “tension” are taken as predictor variables.

PROGRAM:

```
data(warpbreaks)
model <- glm(breaks ~ wool + tension, data = warpbreaks, family =
poisson)
summary(model)
```



The screenshot shows an R console window with the following output:

```
Call:
glm(formula = breaks ~ wool + tension, family = poisson, data = warpbreaks)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-3.6871 -1.6503 -0.4269  1.1902  4.2616

Coefficients:
(Intercept)  3.69196    0.04541    81.302   < 2e-16 ***
woolB        -0.20599    0.05157   -3.994   6.49e-05 ***
tensionM     -0.32132    0.06027   -5.332   9.73e-08 ***
tensionH     -0.51849    0.06396   -8.107   5.21e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 297.37  on 53  degrees of freedom
Residual deviance: 210.39  on 50  degrees of freedom
AIC: 483.96

Number of Fisher Scoring iterations: 4

> |
```

A separate window titled "RGui (32-bit)" is also visible, showing the same R code being executed:

```
data(warpbreaks)
model <- glm(breaks ~ wool + tension, data = warpbreaks, family = poisson)
summary(model)
```