**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**

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**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.**

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

> 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 0.0840 .

wt -9.14947 4.15332 -2.203 0.0276 \*

cyl 0.48760 1.07162 0.455 0.6491

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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



**POISSON REGRESSION ANALYSIS IN R**

**Exercise :**

**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**.

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

> summary(model)

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:

Estimate Std. Error z value Pr(>|z|)

(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 \*\*\*

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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: 493.06

Number of Fisher Scoring iterations: 4

