**STAT 652 Assignment 1**

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Lecture 4 B

R-code with Answers:

# B. Categorical Explanatories

#1

##(a)

ins=read.csv('/Users/dhruv/Downloads/Insurance-1.csv',header=TRUE)

ins$zone = as.factor(ins$zone)

ins$make=as.factor(ins$make)

ins = ins[ins$claims>0,]

dim(ins)

# [1] 1797 7

ins\_per\_lm = lm(per ~ ., data = ins)

summary(ins\_per\_lm)

Call:

lm(formula = per ~ ., data = ins)

Residuals:

Min 1Q Median 3Q Max

-4.0994 -0.7170 0.0734 0.8393 3.7574

Coefficients:

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

(Intercept) 1.186e+01 1.321e-01 89.770 < 2e-16 \*\*\*

km -3.434e-01 2.064e-02 -16.641 < 2e-16 \*\*\*

zone2 -1.376e-01 9.717e-02 -1.416 0.157

zone3 -2.143e-02 9.753e-02 -0.220 0.826

zone4 4.317e-01 9.692e-02 4.454 8.95e-06 \*\*\*

zone5 -1.042e+00 1.043e-01 -9.983 < 2e-16 \*\*\*

zone6 -4.440e-01 1.009e-01 -4.401 1.14e-05 \*\*\*

zone7 -2.862e+00 1.378e-01 -20.767 < 2e-16 \*\*\*

bonus 2.301e-01 1.405e-02 16.381 < 2e-16 \*\*\*

make2 -1.403e+00 1.140e-01 -12.314 < 2e-16 \*\*\*

make3 -1.710e+00 1.189e-01 -14.382 < 2e-16 \*\*\*

make4 -1.834e+00 1.240e-01 -14.789 < 2e-16 \*\*\*

make5 -1.317e+00 1.138e-01 -11.568 < 2e-16 \*\*\*

make6 -8.253e-01 1.129e-01 -7.312 3.95e-13 \*\*\*

make7 -1.716e+00 1.153e-01 -14.878 < 2e-16 \*\*\*

make8 -2.070e+00 1.199e-01 -17.260 < 2e-16 \*\*\*

make9 1.459e+00 1.209e-01 12.071 < 2e-16 \*\*\*

insured -5.724e-05 1.151e-05 -4.975 7.15e-07 \*\*\*

claims 3.029e-03 3.519e-04 8.608 < 2e-16 \*\*\*

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.179 on 1778 degrees of freedom

Multiple R-squared: 0.6477, Adjusted R-squared: 0.6442

F-statistic: 181.6 on 18 and 1778 DF, p-value: < 2.2e-16

plot(ins\_per\_lm)

length(ins\_per\_lm$coefficients)

# [1] 19

#### (i) 19 parameters are estimated.

#### (ii) Intercept when make1 and zone1 is 1.186e+01.

#### (iii) Intercept at make9 = 1.459e+00 and zone7 = -2.862e+00

Summary plots

![Chart, scatter chart

Description automatically generated]()

![Chart, line chart

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![Chart, scatter chart

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![Chart

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