**APPLIED STATISTICS EXAM**

**DATE:** 12/07/2022

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**EXERCISE NUMBER 3**

Let’s build the linear model requested. We estimate from the model the coefficients and the standard deviation of the error, sigma:

beta0 =

beta.1=

beta.2 =

beta.3 =

sigma =

**Assumption of the model: Eps ~ N(0, sigma^2)**

We check if residuals are normal through a shapiro test (pvalue =[PVALUE]) and we conclude that they are,

the VIFs are:

and they’re good enough to say that there’s not so much collinearity.

[DIAGNOSTICS PLOT]

The diagnostic is good, we can see how the residuals are homoschedastic.

I can try to see if [VAR] have an effect on [Y] performing a test based on comparison between the previous model and a linearly restricted model without the [N] regressors.

The p-value of test is: [P-VALUE] so I can say that there is statistical evidence to affirm that [VARS] cannot be discarded both from the model at level [ALPHA]%.

I try removing this regressor from the model: I don’t lose much in terms of R^2 (which is still low), from [R^2] to [R^2] and so I decide to keep this model since it’s simpler and more easily interpretable.

The new coefficients are:

Sigma:

Checking model assumptions again:

Residuals are still normal with p-value = [P\_VALUE]. VIFs improved :

So we reduced the collinearity and the diagnostic is pretty good except.

[DIAGNOSTIC PLOT]

**POINT A)**

**POINT B)**

**POINT C)**

**POINT D)**

**POINT E)**