PART 1

Basically, there are three approaches to **check for heteroscedasticity**. They are as follows.

1. Check residual plot.

Below is the original residual plot which I assume heteroscedasticity presents. The regression results show that population density is significant, and the number of major airports is significant at a 90% confidence level.

A screenshot of a cell phone

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2. Use White test

I tried White test but it doesn’t work in my case. Because the whites.htest() function implements White test for heteroskedasticity for vector autoregressions (VAR). It requires a varest object as input. However, my model is not a VAR (vector autoregression).

3. Use Breusch-Pagan test

I learned about this method from here <https://rpubs.com/cyobero/187387>

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PART 2

Generally, there are three approaches to **eliminate heteroscedasticity**.

1. Use log function on the data.

Firstly, I only use log function on the dependent variable which is the number of infections. Please see the residual plot below. The regression results show that population density, the number of healthcare workers and the mileage of freight railroad are significant.

A picture containing table, photo, sitting, desk

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A close up of text on a white background

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Then I use log function on the whole data (both IVs and DV). Please see the residual plot below. I get the best residual plot so far. The regression results show that population density is significant, and the number of major airports and the number of healthcare workers are significant at a 90% confidence level.

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2. Use regression with Robust Standard Errors

I learned about this method from here <https://rpubs.com/cyobero/187387>

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Please see the residual plot below. The regression results show that only the number of major airports is significant.

A picture containing keyboard

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A screenshot of a cell phone

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3. Use Feasible Generalized Least Squares (FGLS) regression. I haven’t tried with one yet.