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Spatial Analysis

Practice Exam #2

1. B
2. A
3. A: Sill, B: Range, C: Nugget, D: Partial Sill
4. B
5. A
6. B, the red line, is a better fit because it has a lower RMSE and it follows the data better than the black line.
7. The test does indicate spatial autocorrelation because the p-value is less than 0.05.
8. The p-value indicates a significant relationship between c250m\_d and fuel loading. The indicated relationship is that as c250m\_d increases, fuel loading increases as well.
9. The second model with an AIC of -143.3376 is a better model because the p-value still indicates a high level of significance and the AIC is much lower than the first model’s AIC.
10. B
11. B
12. C
13. C
14. A
15. A
16. It may depend on your dataset and whether you have some other reason to cluster your data.
17. B
18. yes it could be done, but the assumption would be that the centroids reflect the data collection distance.
19. C
20. Roger Bivand, who is not a geographer. He is an economist. Wikipedia says he is a geographer though. <https://en.wikipedia.org/wiki/Roger_Bivand>
21. Spatial autocorrelation is the principle which states that the value of a variable at one point is related to values at nearby points due to a spatial relationship between those points. Understanding the spatial autocorrelation between our data allows us to better understand how certain variables will change over space, and can help inform our models of certain spatial processes so that we can avoid assuming things such as spatial independence which we would know not to be true.
22. Spatial analysis allows us to understand not just whether there is a relationship between 2 variables, but how those variables change over space. It also helps us address spatial autocorrelation and account for that non-independence.
23. There is significant spatial autocorrelation in this dataset, and you can tell because the p-value for the likelihood ratio test is below 0.05.
24. Based on the parameter estimates listed in the model output, disease prevalence increases as exposure increases, since the parameter estimate for exposure is positive. However, the p-value indicates that this relationship is not statistically significant. The p-value for home ownership indicates that there is a statistically significant relationship between home ownership and disease prevalence. The parameter estimate for home ownership is negative, which indicates that as home ownership increases, disease prevalence decreases.