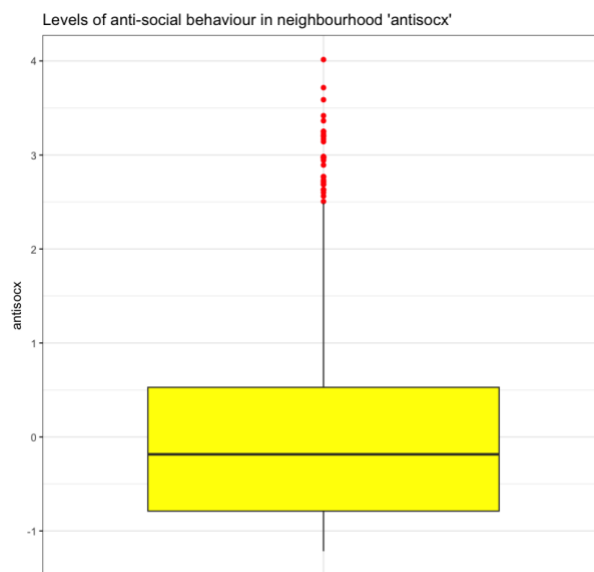


Reflection essay

When I started this module, I didn't know R programming language before. The data activities throughout this semester were demanding and necessitated long working hours during the week and occasionally on the weekends. However, after the numerical analysis course, R programming is now the most language I can manage the Data with.

Every little success was followed by excitement as I dedicated more time to practice and inquiry. I well recall the joy I had after creating my first successful R code, summarizing a dataset in a meaningful manner, and graphing the results. Each accomplishment strengthened my will to work more, and I was anxious to dig into more challenging subjects.



Because I had studied them in my undergraduate course, the reading assignments and additional reading were easy for the first four weeks. However, from week five onward, the material became increasingly hard. You may find a Jupyter notebook of the R code I wrote for the weekly data activity on my website (https://aiqura.github.io/ahmedqura/Numerical_Analysis.html).

The null hypothesis and its tests were the hardest for me to study because I had to go through a lot of theoretical justifications before learning how to apply those theoretical approaches in the R language. I enjoyed Bayesian Data Analysis and Regression Analysis so much Because I was previously familiar with the basics, non-parametric testing was easier for me than parametric ones.

The numerical analysis module was divided into three sections, after which you can fully understand statistics. I learned in the numerical module about many data types and sampling techniques in the first section's descriptive analysis, as well as how to calculate metrics like mean, median, and standard deviation. I also learned about data visualization, an effective method for making information visually through various plot types.

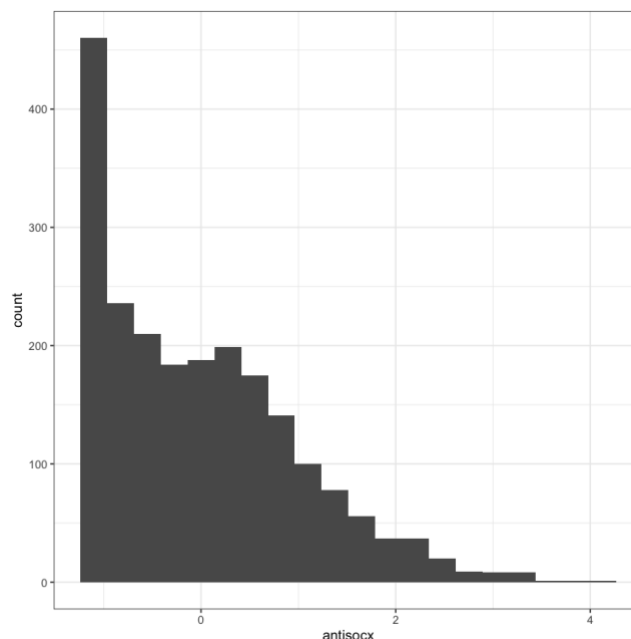
As I advanced through the numerical analysis modules's section on inferential analysis, I entered the world of probabilities and probability distributions where i can use the the analysis to further generalize over the population. The foundation for knowing how to extrapolate study sample analyses to a wider population was created by this. Although hard, the idea of null hypothesis testing turned out to be a key part of inferential analysis. It enabled me to evaluate the importance of the

discovered connections and to make inferences about a population from a sample as mentioned in Berenson, Levine and Szabat (2019) .

The third component of the course, which covered models, turned out to be an incredibly hard section. Regression analysis enabled me to make inferences from the data and establish relationships between variables, which opened up an entirely new predictive modeling dimension. The Bayesian Data Analysis provided a unique perspective that was different from traditional methodologies with its Bayesian approach to statistical reasoning, the book that was used in that was Gelman et al. (2014).

The program's Models section elevated statistical analysis to a completely new level. Regression analysis in particular caught my interest specially the data activity of the week, because it allowed me to develop prediction models and look into the relationships between dependent and independent variables. Through the Bayesian Data Analysis, I was introduced to a unique approach to statistical modeling, which gave me a new perspective and an effective instrument for my analytical toolbox, that I previously worked with before using WEKA tool.

The practical portion of the course including data activities was one element that really enhanced my learning experience. I had the opportunity to work with two datasets: the university's health dataset and the online-accessible Crime dataset. The Health dataset provided me with a significant problem, but the Crime dataset was rather simple to deal with. I had to aggregate data from six columns with various distributions for a chi-test, which was one of the tasks I had to do.



I must applaud the course format for include three books that were crucial to my learning process. The first book which is Introductory Business Statistics (Holmes, Illowsky and Dean, 2017) provided a solid theoretical foundation for the concepts being studied, and the second book provided approaches for solving problems based on these notions. Finally, the third book which is Practical Statistics for Data Scientists provided me with R code, which has been invaluable for practical coding and putting difficult issue solutions into practice.

Each of the three companion books deepened my understanding by adding new dimensions, enhancing the module's curriculum. I was able to tackle a variety of data analysis difficulties because

to the theoretical basis, useful problem-solving approaches offered by Bruce and Bruce (2017), and ready-to-use R code.

In addition, the numerical analysis module difficulties has boosted my tenacity and resilience. There were times when I encountered difficulties and felt overwhelmed by the complexity of some things. But the constant support from my tutor and my drive to succeed encouraged me to persevere and overcome these challenges. It has been incredibly fulfilling to overcome difficult concepts, and that sense of accomplishment has given me the courage to take on difficult projects in the future.

I can say with confidence that over my 12-week journey, I not only learned practical technical information but also grew as a person. The program helped me discover how much I enjoy data analysis, and I now plan to make it my career. I want to learn more advanced statistical techniques and apply them to real-world problems.

In conclusion, the 12-week course at Essex University has been a truly positive experience for me in my academic career. I had no prior knowledge in R programming when I started, but by the time I was done, I felt confident in my ability to manage data and carry out statistical analysis. Although challenging at times, the course material was well-structured, and the real-world data exercises provided students with a foundation for applying what they had learned.

As I move toward my academic and professional aspirations, the information and comprehension I've gained from this program will undoubtedly serve as a strong foundation. The experience has ignited a passion for data analysis in me, and I'm eager to learn more and contribute to the field.

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