CMPG322 – Applied assignment C

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| **Submission date**: 28/10/2022 | |  |
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| Instructions | |  |
| 1. This document serves as a portfolio report relating to changes in your virtual business. | |  |
| 1. Open the accompanying Excel file, click on “Enable macros”; select the approximate price of one of the products that your business provides; click on “Generate data”. **Important**: click on “Save as” and save this file as an “.xlsx” file to prevent your problem values from changing when you reopen or make changes to the file. 2. Use the Excel file for your calculations and submit it together with this report. 3. Save your report as <studentno>.docx and the Excel file as <studentno>.xlsx. submit both files.   When you have completed this report, go to your virtual business student page. Add a comment about the initial market share vector for your business and its main competitors. Then comment on the time it will take to reach steady state. | |  |

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| 1. **Monte Carlo simulation** | | | | | | | | | | | | | | | |
| Consider the past market share data for your business provided in the Excel file. | | | | | | | | | | | | | |  | |
| 1. Do a Monte Carlo simulation to simulate 20 trials for the market share of your business. NB: Use these random numbers in cells B18:B37: 45, 49, 78, 44, 87, 47, 18, 37, 85, 96, 100, 48, 91, 42, 60, 49, 77, 89, 6, 74. | | | | | | | | | | | | | | (4) | |
| 1. Use the average simulated market share for (you should find this value in cell M15) of the starting vector and set . Complete: | | | | | | | | | | | | | |  | |
|  |  | |  | | |  | |  | | |  | | |  | |
|  |  | | 0.745 | | | 0.1275 | | 0.1275 | | |  | | | (1) | |
|  | | | | | | | | | | | | | |  | |
| 1. **Markov analysis** | | | | | | | | | | | | | | | |
| Consider the diagram indicating the market share of your business and its two main competitors:    Generate transition probabilities a-i (indicated on the diagram) in Excel. | | | | | | | | | | | | | |  | |
| 1. Complete the state transition matrix below: | | | | | | | | | | | | | |  | |
| P = | | Your business | | | Competitor 1 | | | | Competitor 2 | | | |  | | |
| 0.8 | | | 0.1 | | | | 0.1 | | | |  | | |
| 0.2 | | | 0.8 | | | | 0 | | | |  | | |
| 0.4 | | | 0.2 | | | | 0.4 | | | | (9) | | |
| 1. What is the steady state for the three businesses? Work with three decimals. | | | | | | | | | | | | | |  | |
| at: | |  | | |  | | |  | |  | | | |
|  | | 0.673 | | | 0.202 | | | 0.126 | | (3) | | | |
| 1. How long will it take for the market to reach stability? | | | | | | | | | | | | | | |  |
| 15 periods | | | | | | | | | | | | | | | (1) |

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| 1. **Conclusion** | |
| Consider your answers for the preceding sections. Are you selling your (virtual) business? Explain. |  |
| I wouldn’t sell my virtual business because it doesn’t take long for the market to reach stability. 15 periods is not as long if you take it as days or weeks. | (2) |
|  |  |
| **Total:** | **[20]** |