KIE2003 Probability and Random Signals
Semester 1, Session 2020/2021

Assignment (20%): Modeling of Covid-19 Spreading Pattern

LECTURER IN-CHARGE: ASSOC. PROF. IR. DR. CHOW CHEE ONN

Submission Date: **15 January 2021 (Friday) 12PM via email AND Spectrum.**

To: **um.chow@gmail.com**

Subject: **KIE2003_Asgn_StudentID1_StudentID2_ StudentID3_ StudentID4**

Contents:

Dear Sir,

This is the submission for KIE2003 Assignment from

1. Student Name 1 (student ID1)

2. Student Name 2 (Student ID2)

3. Student Name 3 (Student ID3)

4. Student Name 4 (Student ID4)

Then attached the following files

1. Report: **`KIE2003_Asgn_StudentID1_StudentID2_StudentID3_StudentID4.pdf`**

2. Codes(zipped): **`KIE2003_Asgn_StudentID1_StudentID2_StudentID3_StudentID4.rar`**

Note: Use the 8-digit student ID only (without /1 or /2)

Also, Student 1 please upload one copy of the Submission in Spectrum.

A medical research company has engaged a software company to develop a tool that will assist them in studies related to the recent spreading of covid-19. Specifically, this tool contains model that simulate the spreading pattern of corona virus, taking into account various factors that may affect this virus.

Mathematical analysis and modelling play an important role in many prediction and analysis models for various applications, such as computer network simulation, power system distribution planning, and infectious disease epidemiology. In this assignment, you are required to develop a mathematical model for covid-19 spreading pattern, and use this model to perform some basic simulations.

Some relevant readings:

1. https://en.wikipedia.org/wiki/Mathematical_modelling_of_infectious_disease
2. https://en.wikipedia.org/wiki/Brownian_motion
3. https://www.mathworks.com/ (Sample MATLAB codes)
4. https://www.medrxiv.org/content/10.1101/2020.04.12.20062927v1.full.pdf

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Guidelines:

1. It is recommended to use Matlab for the development. You may use other software as well.
2. Contents of Report (not more than 10 pages):
    a. Problem Formulation – describe the model that you would like to develop. For example, you are going to create a model that simulates the virus spreading pattern in a society considering various factors, such as density of the population, the level of social activities of the population, the level of health and hygiene aware, and etc.
    b. Model Development – Select suitable stochastic processes for various processes in the proposed model, and justify your selections.
    c. Coding – explain the architecture of your program, and the functions of every modules in your program.

Evaluation Rubrics (20%)

Criteria		Weightage (%)	Rubric				
			1	**2**	3	4	5
1	Problem Formulation (Report)	5	Demonstrate **poor** understanding on the problem given and **fail** to identify the right factors to formulate the mathematical model.		Demonstrate **moderate** understanding on the problem and able to identify a few factors to create a **simple** mathematical model	Demonstrate **good** understanding on the problem and able to identify **important** factors that are sufficient to create an **appropriate** mathematical model.	
2	Mathematical Modeling – Spreading Model (Report)	10	Develop a **wrong** model for the given problem		Develop an **oversimplified** model for the given problem, and lack of support from relevant literatures	Develop a suitable mathematical model that represents the problem **accurately** and with support from a **comprehensive** list of **relevant** literatures.	
4	Results and Discussion (Report)	5	**Insufficient and irrelevant** results presented and analyzed **poorly**.		**Sufficient and relevant** results are presented in an appropriate way with **simple** analysis.	**Sufficient and relevant** results are presented in an appropriate way with **comprehensive** analysis.	
5	GUI and Presentation of Outputs	Bonus (max 3)					
	Total:	**20 (max)**					

i. **Plagiarism (project with more than 50% similarity) will be given zero mark.**
ii. Late Submission – minus 5% per day.
iii. Wrong Submission Format – minus 25%.

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