FIT3139 2024-S1: Final project
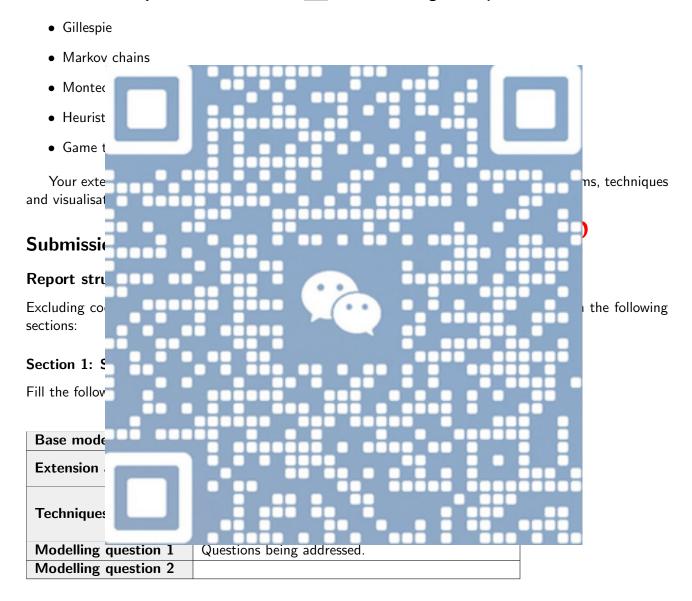## (Due by 11:55pm, Friday, 14 June 2024)

This final project has the purpose of assessing all learning outcomes in the unit. The learning outcomes are as follows:

1. Explain and apply the process of computational scientific model building, verification and interpretation;

2. Analy_____versus Analytical; Linea_____c);

3. Evalu

4. Ratio

5. Apply_____entific disciplines.

What to

The final re_____ject mark) and a **final writte**_____ode, appropiately documented_____s on the different sections of

Follow t

The assignr_____ocedure:

- Accep_____/program will be scann_____cademic Integrity policy

- All yo

  - _____

  - Your submitted archive must extract to a directory named as your student ID.

  - This directory should contain all elements of the submission including

    * The report (in PDF format)
    * The source code for the model and analysis, appropriately documented with comments.
    * The video of your presentation in MP4 format
    * The slides used for your presentation in PDF format

- Submit your zipped file electronically via Moodle.

Task description

To demonstrate all learning outcomes, you will develop an **extension of a model discussed in the classroom**. An extension addresses the same problem, but adds or relaxes specific assumptions about the model. For example, taking a deterministic model and introducing assumptions to do a stochastic analysis, or providing stochastic analysis for a simulation.

Your extension should address the same problem, but contain some different assumptions that may or may not lead to different conclusions — an analysis should be presented comparing the results of the original model and the extended model. The model extension should be explained, interpreted an analysed, and it should allow you to showcase **at least <u>two</u> of the following techniques**:

- Gillespie

- Markov chains

- Monte

- Heurist

- Game t

Your exte‌ms, techniques
and visualisat

Submissi

Report stru

Excluding co the following
sections:

Section 1:

Fill the follow

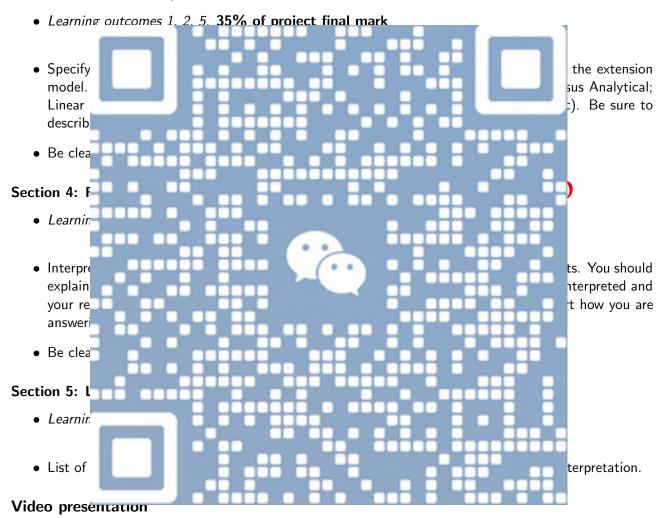|	
Base mode	
Extension	
Techniques	
Modelling question 1	Questions being addressed.
Modelling question 2	

Important: This table should be briefly discussed and signed by your demonstrator on week 11 and week 12, during the lab session – not via email or forum post, please plan accordingly.

Section 2: Introduction

- *Learning outcomes 1, 5.* **10% of project final mark**

- Identify the problem you want to solve and its motivation, describe what the extension will be and identify questions your model will answer. In other words, this section takes the information in the specification table and develops it providing more detail and a motivation of your questions, and how your techniques are appropriate.

- Write clearly. Your mark is based on what we can understand so spend time crafting the text.

Section 3: Model description

- *Learning outcomes 1, 2, 5.* **35% of project final mark**

- Specify   the extension
  model.   sus Analytical;
  Linear   c). Be sure to
  describ

- Be clea

Section 4: R

- *Learnin*

- Interpre   ts. You should
  explain   nterpreted and
  your re   t how you are
  answeri

- Be clea

Section 5: L

- *Learnin*

- List of   terpretation.

Video presentation

You should submit a presentation where you discuss your extended model. The presentation should be no longer that 10 minutes, and use slides to enhance the description of the model and the explanation of your results. It is suggested the presentation keep a similar structure to that of the report. The presentation is worth **15% of project final mark**.

A simple procedure to record the presentation using zoom can be found here: `https://www.youtube.com/watch?v=P6cTbnUPwfY`

Source code

All code should be submitted and **appropriately commented**. It will be checked for correctness and be part of the marking in the model section (if the code is used to *produce* results, or in the results section if the code is used to *analyze* results). Clarity is in your best interest.

You can use any of the standard libraries we used in the class as long as you can explain what the library is doing.

Feedback opportunities

- **Workshop 1 of week 9** will discuss the project task and provide examples. There will be no pre-workshop video, use the time to start thinking about what you want to do.

- **Week 10's applied**: You are welcome to have a very brief discussion of topic with lab demonstrator – they

- **Week** or and explain what y

- **Week**

We will also tivities above. Plan ahead a