COSC 4320 System Modeling and Simulation

Spring 2020

Due Date: February 28th

What to submit:

- Text description of your model you plan to use
- Mathematical model
- Documented Python code implementation. Include your full name at the top of the code
- Graphical output

1. Liverpool is a very good football/ soccer team in English premium league. The stadium holds 15,000 people. **The number of people attending one of their games** is **related to the number of people attending the previous game** and **the results from the previous two game in the following manner**

    - The attendance increases according to **a logistic model** when the team has won both of its previous game
    - If the team wins one and draws one of its last two games, the crowed will increase in a **linear fashion**
    - If the team loses both games, the crowd size will decrease geometrically
    - Any other possibilities result in a linear decrease
    - The result of 2108/2019 season were as follows

3-0	1-0	6-4	4-0	4-1	4-1	0-2	2-1	1-1	2-2	2-1	0-1	1-2	6-0	4-1	0-2	3-0	4-1

    - Develop a discrete time model that illustrates the attendance for the season. Make the following assumptions
        - The attendance in the first game was 8,000
        - The initial growth rate for logistic and linear components is 10 %
        - Decay rate for losing both games is 10 %
    - Provide functionality Python code to implement the model and graphical output to show the results