Modeling and Simulation, CS302

Lab-6

This is the last lab on ODE model and hence on purpose is being kept open ended.

1. **(Modeling Malaria)**Read the chapter Modeling a persistent plague: Malaria. The following should give you an idea of how to proceed with your study.

   (a) First construct the mathematical model. Think about all the assumptions that go into the model and list them.

   (b) Calculate the basic reproduction number R_0 using the next generation method for the malaria model.

   (c) First analyze the model without any public health interventions. Discuss the observed behavior.

   (d) Think of the possible health interventions. In your model, include them systematically. It would be best to use parameter values such that they are, in principle, representative of the actual scenario. Examine and discuss the role of different health interventions.

   (e) Our campus usually sees Dengue outbreak that persists over a long time. Apart from advocating hygiene and preventive measures, the institute's administration also does limited fumigation. Based on your model analysis, do you think this would significantly affect the Dengue outbreak on-campus? What would be your suggestions to the administration? Your suggestions should be an outcome of your model analysis and not just random thoughts.