**FIZ425E - QUIZ 5**

**(SIR MODEL)**

Think of a population living in an environment with an epidemic disease. A simple model (The SIR Model) can be given as the following:

S: Susceptible (healthy but tends to get the disease)

I: Infected (got the disease, can contaminate S's)

R: Recovered (healthy and cannot be infected again)

At time t we have,

$$S_{t+1}=S_t - a*I_t*S_t$$

$$I_{t+1}=I_t + a*I_t*S_t - b*I_t$$

$$R_{t+1}=R_t + b*I_t$$

where,

a: Contact rate (the probability of getting the disease in a contact between a susceptible and an infectious subject)

b: The rate of recovery

Start at t=0, where S=0.99 (99%), I=0.01 (1%), R=0.00 (0%).

Use a=0.7 and b=0.2,

and simulate 50 days. (Take the time increment as 1 day.)

Check $S_t+I_t+R_t=1$ after each step.

Show (S-t), (I-t), (R-t) graphs all in the same plot.