Exercise Modelling

Generell Information

We recommend using the R package *deSolve* for this exercise.

Task 1

Implement the following epidemiologic SIR model (S=Susceptible, I=Infected, R=Recovered)

$$\frac{dS}{dt} = -\alpha SI$$

$$\frac{dI}{dt} = \alpha SI - \beta I$$

$$\frac{dR}{dt} = \beta I$$

with the parameters $\alpha = 0.2$ and $\beta = 0.03$ and the initial conditions $S(0) = 0.99$, $I(0) = 0.01$, and $R(0) = 0$.

Task 2

Simulate the model until $t = 100$ and plot the curves of $S(t)$, $I(t)$ and $R(t)$.

Task 3

How would you model social distancing?

Task 4

How would you model reinfections?