**SIR model in Excel**

**Introduction to the Model**

Consider an SIR model with parameters

|  |  |  |
| --- | --- | --- |
| Total | 1000 |  |
| Infection Rate | 0.2 | 20 |
| Interaction Rate | 0.0015 | 15 |
| Initial Infected | 1 |  |
| Delta Time | 1 |  |
| Recovery Rate | 0.1 |  |

**Starting the Model**

1. Label cell A4:D4: **Time**, **Susceptible**, **Infected** and **Recovered**. These columns will keep track of the population over time. Each row will represent another time step as the disease progresses.
2. In G4:G9, add labels for the following constants: Total, Infection rate, Interaction rate, Initial infected, Delta time, Recovery rate
3. In H4:H9, enter the following values for these numbers: *total*(1000), infection\_rate(I5/100), *interaction\_rate*(I6/10000), *initial\_infected*(1), delta\_time(1), *recovery\_rate*(0.1). Cell I5=20, I6=15.
4. Initialize: A5=0, B5= total - initial\_infected, C5= initial\_infected, D5=0;
5. **Writing the equations:**

**Time** A6 = A5 + delta\_time

**Susceptible** B6 = B5-B5\*C5\*interaction\_rate\*infection\_rate\*delta\_time

**Infected** C6 = C5+B5\*C5\*interaction\_rate\*infection\_rate\*delta\_time-C5\*recovery\_rate\*delta\_time

**Recovered** D6 = D5+C5\*recovery\_rate\*delta\_time

1. Drag all the cells till time = 100.
2. Plot a S,I,R in same graph.
3. Assess the sensitivity of variation in parameters