```
close all
clc
clear
```

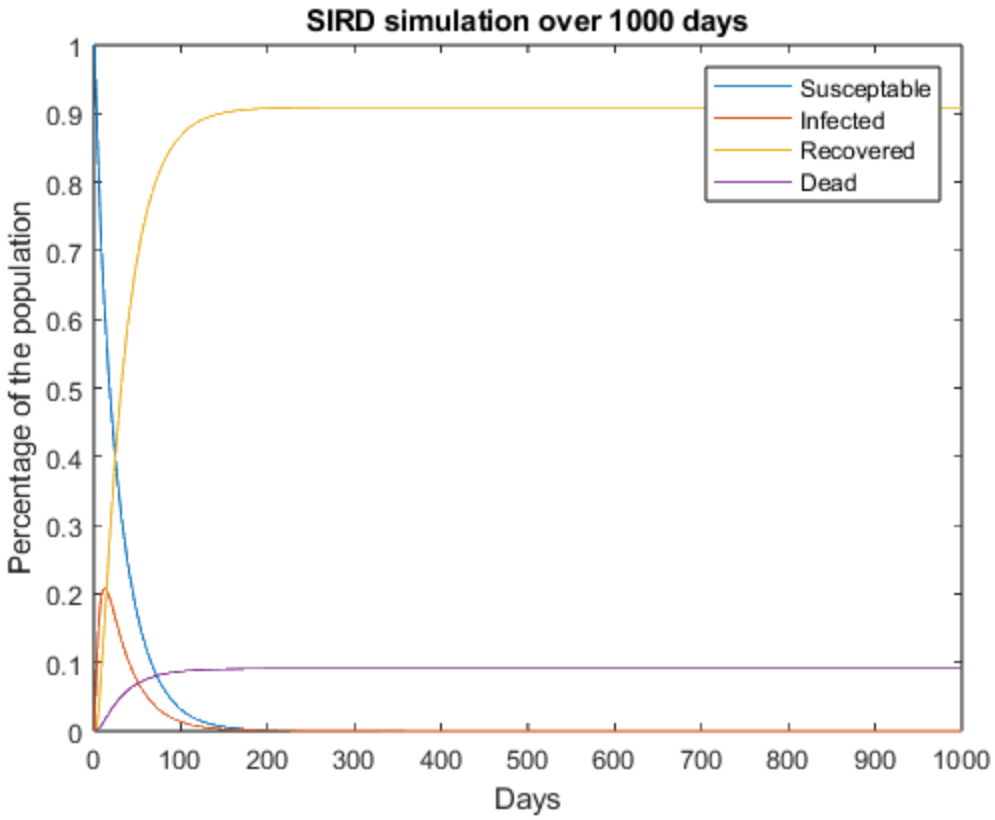
Basic SIRD

```
%create an A matrix with the parcentage of SIRD
A = [0.95 0.04 0 0; 0.05 0.85 0 0; 0 0.1 1 0; 0 0.01 0 1];


%create a vector which holds the proportions of SIRD at state t
X = [1 0 0 0];
t = 1000;
Simulation = zeros(4,t);
Simulation(:,1) = X;

for i = 1:t-1
    Simulation(:,i+1) = A*Simulation(:,i);
end

figure
plot(Simulation');
title("SIRD simulation over 1000 days")
legend("Susceptable", "Infected", "Recovered","Dead")
xlabel("Days")
ylabel("Percentage of the population")
```



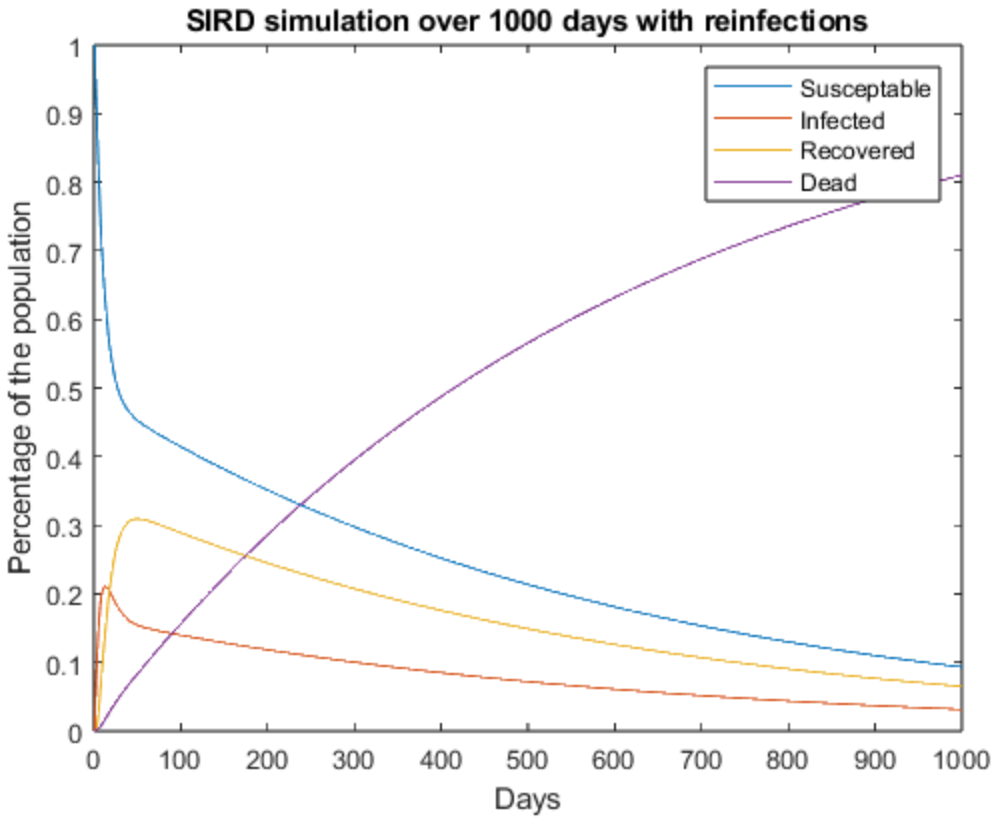
Modifieded SIRD

```
%create an A matrix with the parcentage of SIRD with reinfections
A_reinfect = [0.95 0.04 0.05 0; 0.05 0.85 0 0; 0 0.1 0.95 0; 0 0.01 0 1];

%create a new simulation matrix for the reinfections
ReSimulation = zeros(4,t);
ReSimulation(:,1) = X;

%create a vector which holds the proportions of SIRD at state t
for i = 1:t-1
    ReSimulation(:,i+1) = A_reinfect*ReSimulation(:,i);
end

figure
plot(ReSimulation');
title("SIRD simulation over 1000 days with reinfections")
legend("Susceptable", "Infected", "Recovered","Dead")
xlabel("Days")
ylabel("Percentage of the population")
```



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