System Simulation

- Homework 1: Simulation of a Difference Equation
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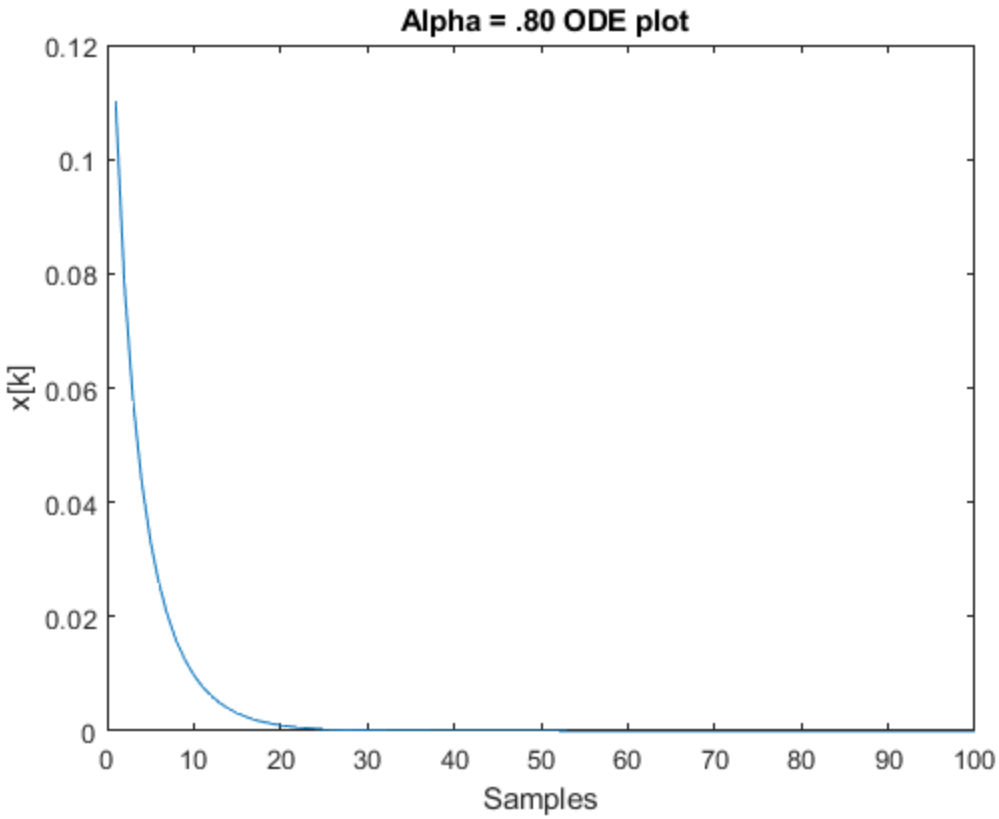
INITIAL CONDITIONS

```
clc; clear;

x = zeros(1,100); % Pre-Allocate
x(1) =.11; % Initial Condition

alpha = [.80 1.35 2.75 3.20 3.52 3.75 4.0]; %Alpha Array
```

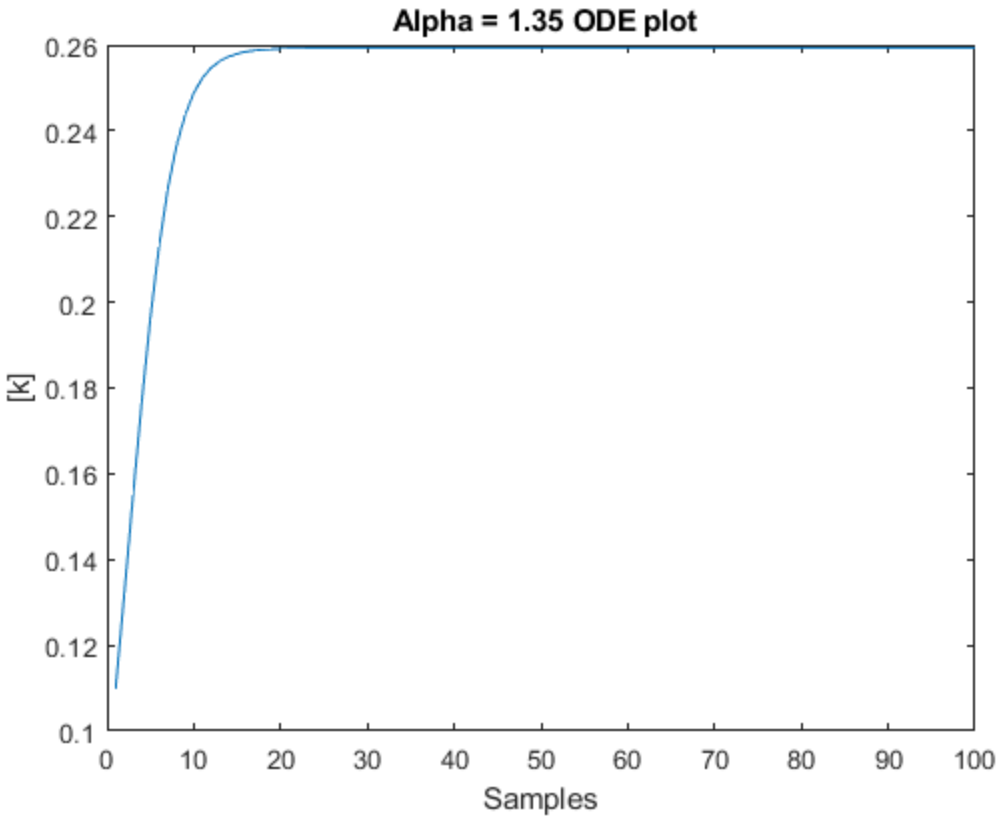
Alpha = .80

```
for k = 1:99
    x(k+1) = alpha(1)*(1-x(k))*x(k);
end

plot(x)
title(" Alpha = .80 ODE plot")
xlabel("Samples")
ylabel("x[k]")
```



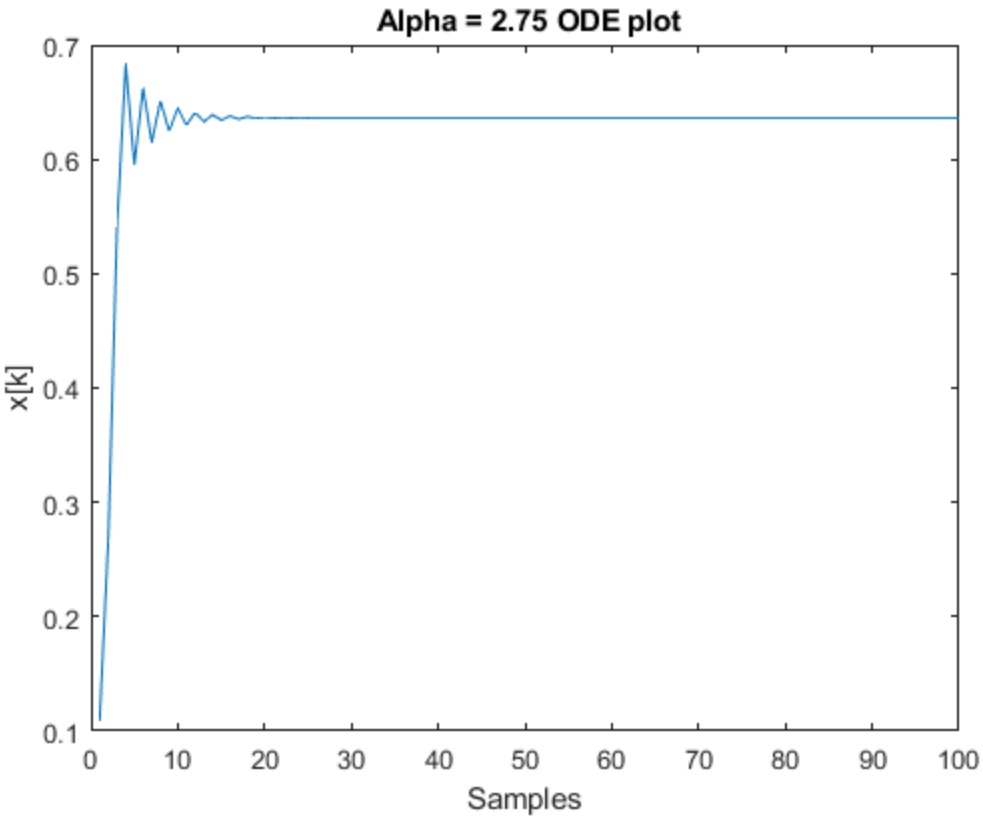
Alpha = 1.35

```
for k = 1:99
    x(k+1) = alpha(2)*(1-x(k))*x(k);
end

plot(x)
title(" Alpha = 1.35 ODE plot")
xlabel("Samples")
ylabel("[k]")
```



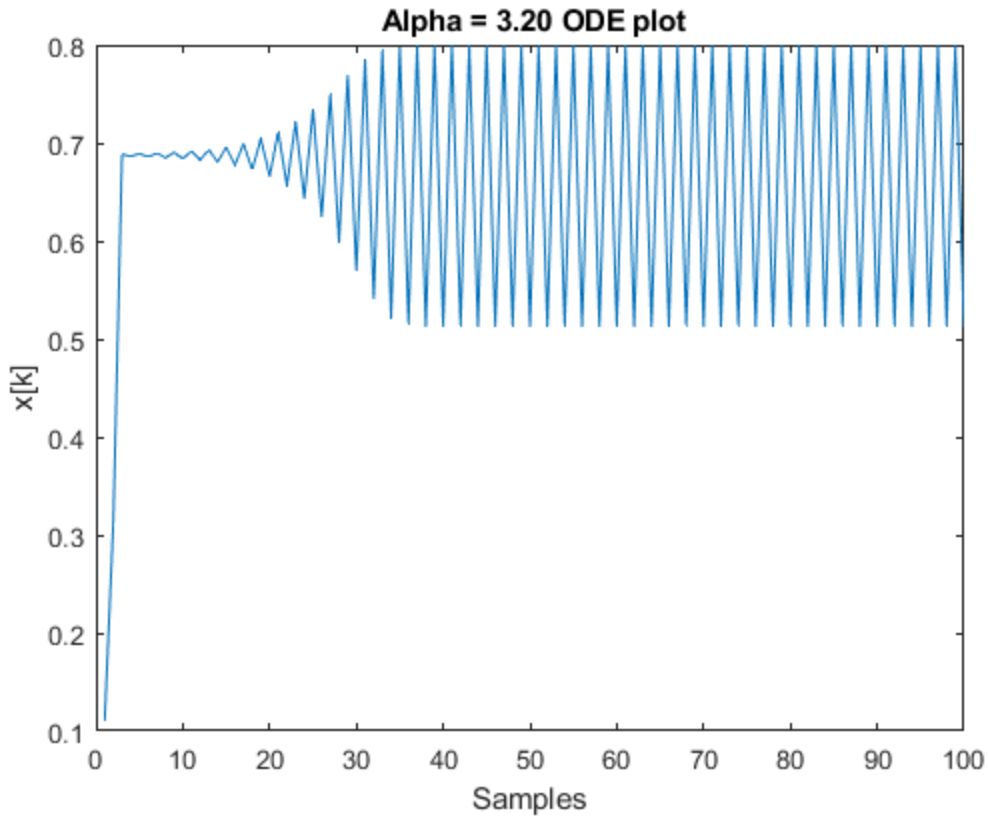
Alpha = 2.75

```
for k = 1:99
    x(k+1) = alpha(3)*(1-x(k))*x(k);
end

plot(x)
title(" Alpha = 2.75 ODE plot")
xlabel("Samples")
ylabel("x[k]")
```



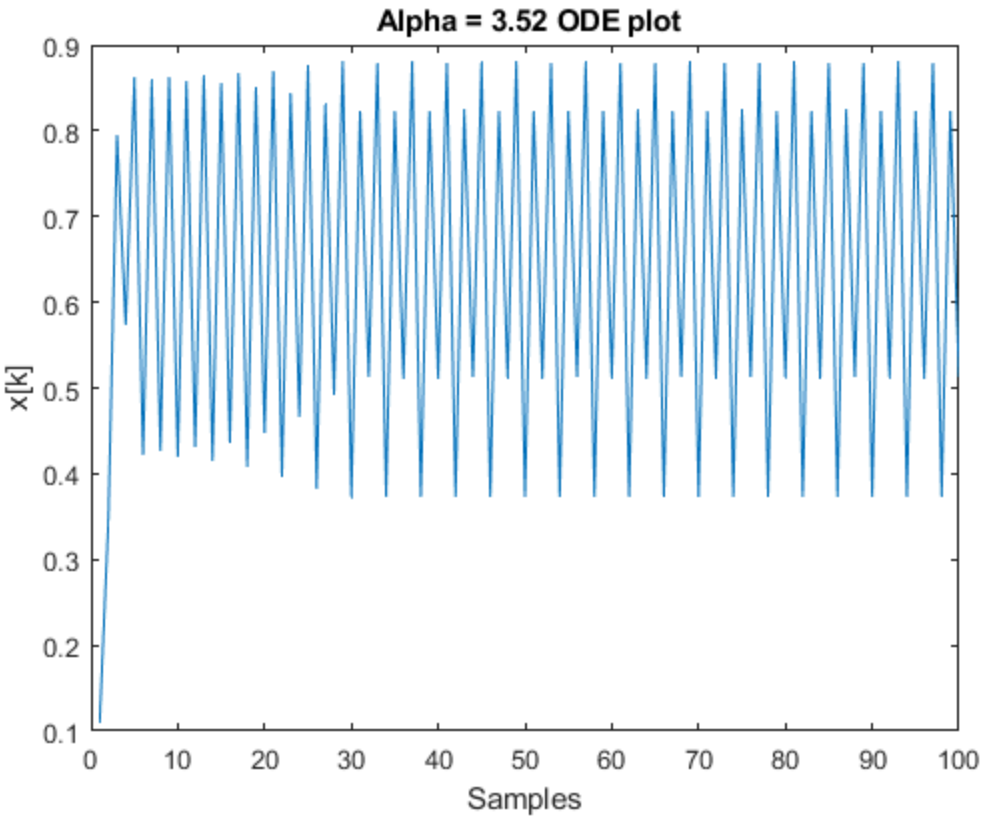
Alpha = 3.20

```
for k = 1:99
    x(k+1) = alpha(4)*(1-x(k))*x(k);
end

plot(x)
title(" Alpha = 3.20 ODE plot")
xlabel("Samples")
ylabel("x[k]")
```



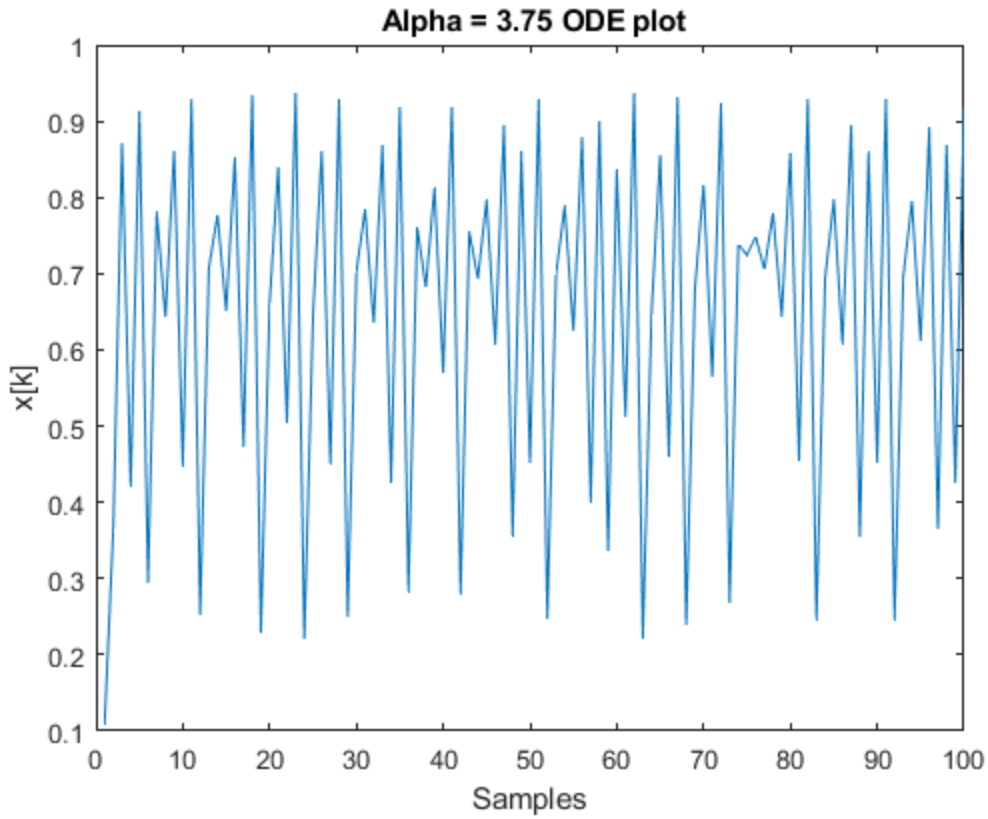
Alpha = 3.52

```
for k = 1:99
    x(k+1) = alpha(5)*(1-x(k))*x(k);
end

plot(x)
title(" Alpha = 3.52 ODE plot")
xlabel("Samples")
ylabel("x[k]")
```



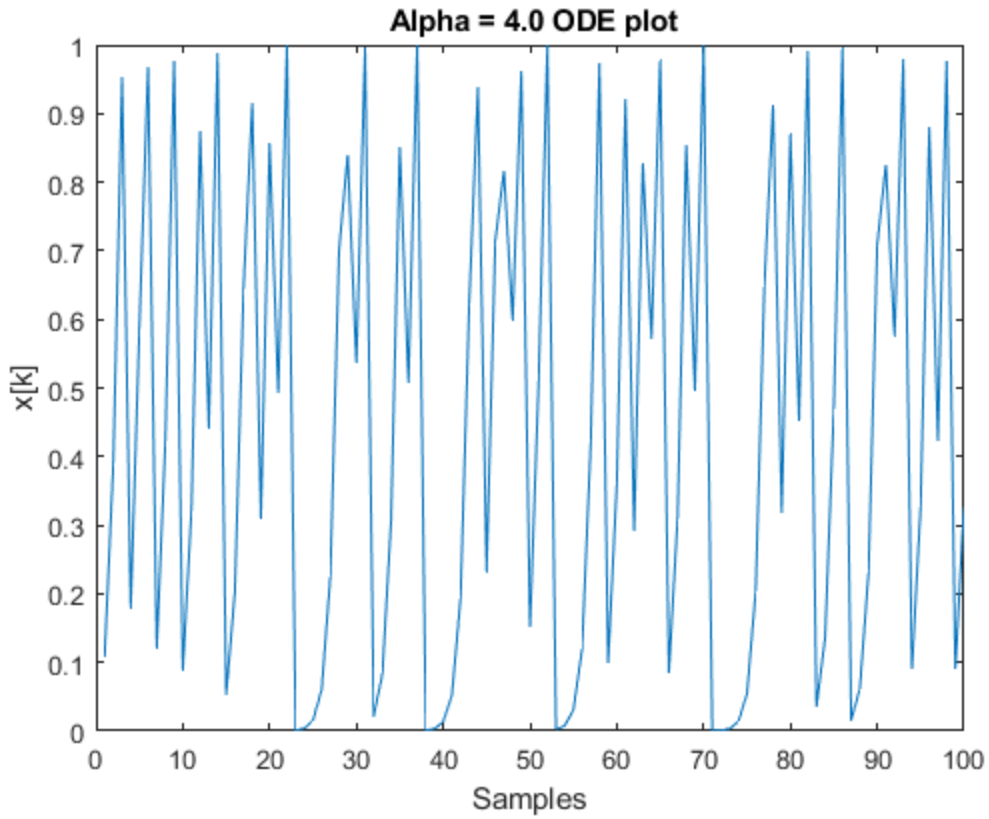
Alpha = 3.75

```
for k = 1:99
    x(k+1) = alpha(6)*(1-x(k))*x(k);
end

plot(x)
title(" Alpha = 3.75 ODE plot")
xlabel("Samples")
ylabel("x[k]")
```



Alpha = 4.0

```
for k = 1:99
    x(k+1) = alpha(7)*(1-x(k))*x(k);
end

plot(x)
title(" Alpha = 4.0 ODE plot")
xlabel("Samples")
ylabel("x[k]")
```



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