

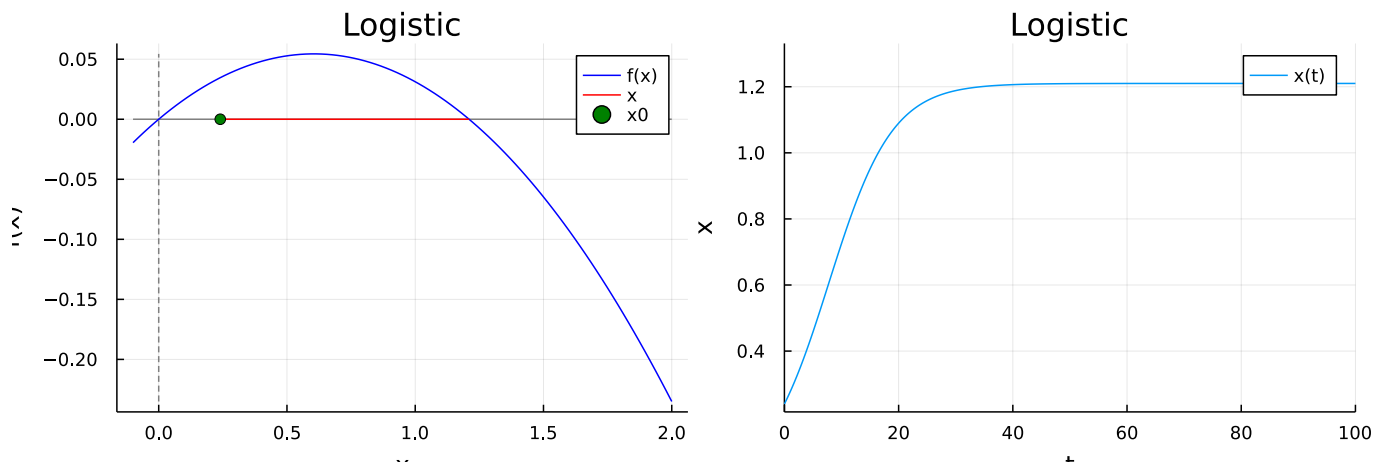
• using PlutoUI, Plots, DifferentialEquations, NonLinearDynamicsCourse

Logistic Equation

$$\dot{x} = Rx \left(1 - \frac{x}{K}\right)$$

logistic (generic function with 1 method)

• `logistic(x,p,t)=p[1]*x*(1.0-x/p[2])`



R: 0.18

K: 1.21

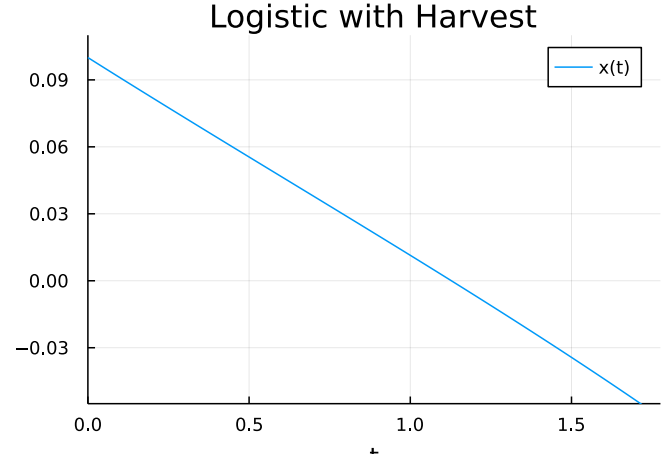
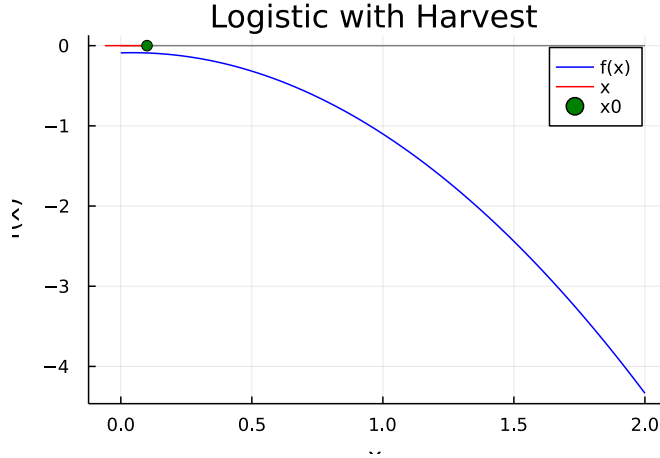
x0: 0.24

Logistic Equation with Harvest

$$\dot{x} = Rx \left(1 - \frac{x}{K}\right) - H$$

logharvest1 (generic function with 1 method)

• `logharvest1(x,p,t)=p[1]*x*(1.0-x/p[2])-p[3]`



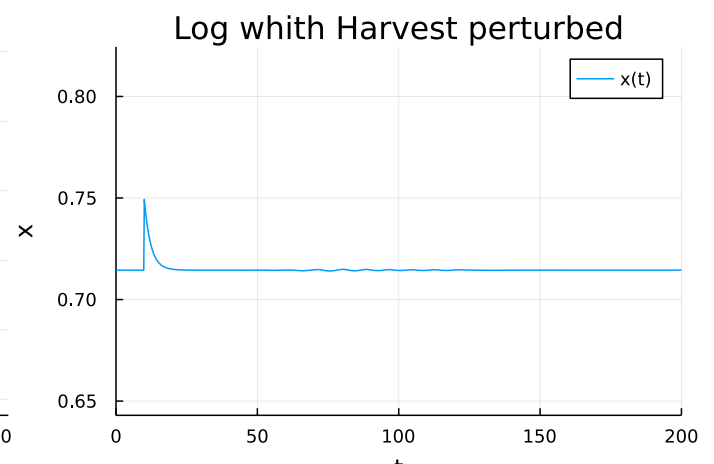
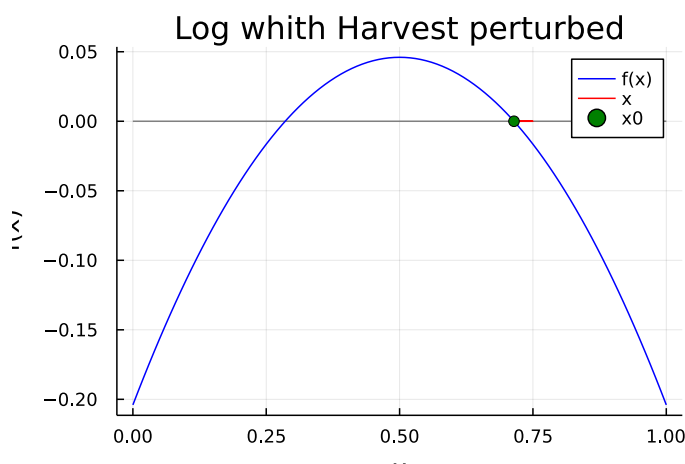
R: 0.1

K: 0.09

H: 0.09

x_0 : 0.1

Critical Slowing Down



```
• flux1D(logharvest1,0.5+sqrt(0.25-pars_csd[1]),200.0,
[1.0,1.0,pars_csd[1]],10.0,pars_csd[2],(u)->(u<0);xlims=[0.0,1.0],title="Log with
Harvest perturbed")
```

H: 0.204

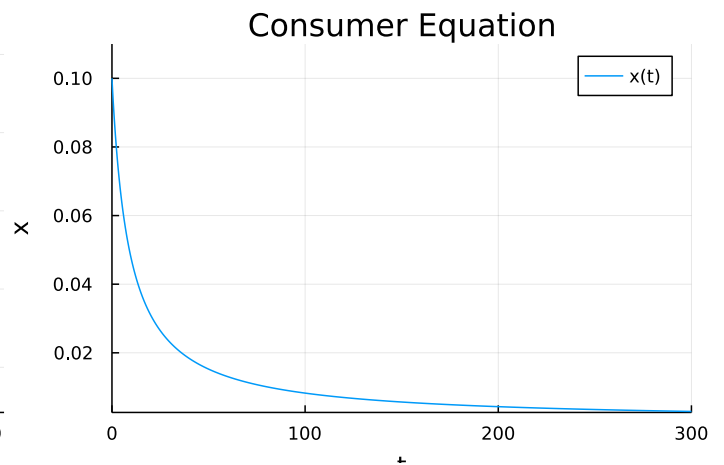
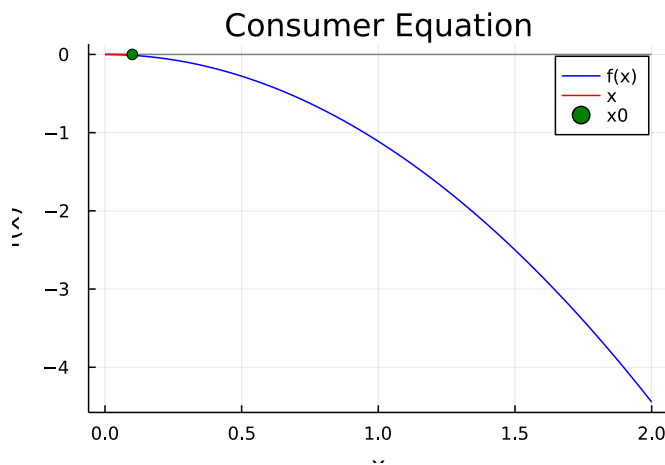
S: 0.035

Consumer Equation

$$\dot{x} = Rx \left(1 - \frac{x}{K} \right) - Px$$

consumer (generic function with 1 method)

- `# Consumer Equation`
- `consumer(x,p,t)=p[1]*x*(1.0-x/p[2])-p[3]*x`



R: 0.1

K: 0.09

P: 0.1

x0: 0.1

Logistic Equation with Outbreak

$$\dot{x} = Rx \left(1 - \frac{x}{K}\right) - P \frac{x^2}{1 + x^2}$$

logoutbreak (generic function with 1 method)

- `logoutbreak(x,p,t)=p[1]*x*(1.0-x/p[2])-p[3]*x*x/(1+x*x)`

