Monday, October 17, 2016

Intro

* Project
* HWs
  + 9 size font
  + Name, Course, Questions, solutions, analogy,
* Most stuff on compass
* Stella -> program

Notes: variables

* State variables : box
* Control var: cloud + arrow
* Input variables: circle
* Red line: information flow

Define the problem:

- We have an island, not sure how many people present

- We have seen people come to shore

-We know how big is the island

With the current amount of people living on the island, how many will be present after 10years.

X(t) =x(t-Dt) + delta\_x \* DT

(x(t)-x(t-Dt))/Dt = delta\_x

* Runspecs : parameter DT= how finite/ discrete
  + <dt 🡪 more accurate
  + >dt 🡪 less accurate/ faster runtimes/ more coarse parsing of area under the curve

Dynamic models

* loops
* feedbacks
* delays
* stochasticity
* model

Wednesday, October 19, 2016

Fundamentals of models:

1. Define the goal/ question.
2. Translate reality into math, break down the problem into a model.
3. If model can be negative use bi-flow control var.

Population Dynamics Equations:

Growth rate = R\* N – (R\*N2 )/K

Wednesday, October 26, 2016

**Law of Mass action**

How to relate amounts of Hydrogen and Oxygen to find the velocity of the two combining to form water?

Rate H20 = K\*H\*O

2H2 + 02 -> 2H20

\* above is under constant temp and pressure

Under changing temp and pressure

Rate H20 = K\*Hα \*Oβ

**Economics Production Function**

Production rate = A\*Kα\*Lβ

**Ecology**

Plant growth rate = Rmax\*TE\*HE

**Epidemics**

Rate of Epidemics = Contagious \* Susceptible \* K

**Catalysis**

D= substrate

E= enzyme

I = Intermediate

F = Product

D+ E K2<->K1 I ->K3 E + F