Exercise 1

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Lecture Sequence due Dec 15, 2022 07:30 +08 Completed

Exercise 1-1

6/6 points (graded)

For the following explanations of different types of programmatic models, fill in the blank with the appropriate model the definition describes.

1. A _____ model is one whose behavior is entirely predictable. Every set of variable states is uniquely determined by parameters in the model and by sets of previous states of these variables. Therefore, these models perform the same way for a given set of initial conditions, and it is possible to predict precisely what will happen.

   deterministic ✔

2. A _____ model is one in which randomness is present, and variable states are not described by unique values, but rather by probability distributions. The behavior of this model cannot be entirely predicted.

   stochastic ✔

3. A _____ model does not account for the element of time. In this type of model, a simulation will give us a snapshot at a single point in time.

   static ✔

4. A _____ model does account for the element of time. This type of model often contains state variables that change over time.

   dynamic ✔

5. A _____ model does not take into account the function of time. The state variables change only at a countable number of points in time, abruptly from one state to another.

   discrete ✔

6. A _____ model does take into account the function of time, typically by modelling a function f(t) and the changes reflected over time intervals. The state variables change in an unbroken way through an infinite number of states.

   continuous ✔

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Exercise 1-2

3/3 points (graded)

If you are using differential equations to model a simulation, are you more likely to be doing a discrete or continuous model?

- ○ Discrete
- ◉ Continuous ✔

Let's say you run a stochastic simulation 100 times. How many times do you need to run the simulation again to get the same result?

- ○ 1 time
- ○ 99 times

Calculator

100 times

101 times

All of the above will give you the same result.