A python framework for multi-agent simulation of networked resource systems

ePortfolio task

Read the article by Knox et al. (2018) and answer the following questions:

1. What is Component-based modelling?
2. Upon which do component-based modelling frameworks depend?
3. Within the context of the work presented in this paper, what is Pynsim?
4. How does Pynsim achieve its goal when using object-oriented Python programming?

1. Component-based modelling is used to approach model integration. The integrated model processes are demonstrated through pluggable model components. These models are also known as Integrated Environmental Models or IEMs. They offer abstraction to specify input and output models and the operation area of the model.

2. Environmental Modelling Frameworks (EMFs) provide libraries with core modules and reusable tools. These libraries are applied for conversion, language interoperability, data manipulation, analysis, and visualisation tasks.

3. Pynsim is a Python network simulation framework that includes a Python package with abstract classes which is modifiable. It has a modular design that allows several users to

plug in their code, and through the central network structure, it supplies a corporate interface. Pynsim is an object-oriented framework and uses existing modelling frameworks to build on the design of these. The aim is to facilitate model integration, agent-based modelling and the use of a ‘component-based’ design.

4. The attempt of using existing modelling to integrate their code or model helps users add and remove components easily. It also incorporates component-based model integration through pluggable modules and supports agent-based modelling by allowing elements (link, node, or institution) to execute code individually.

Referencing:

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