Title: Mesa - ABMs in Python: From Simple Models to a Modular Ecosystem

Description: This tutorial takes attendees from the basics of Agent Based Models through a Mesa building tutorial to a nascent effort to make a robust modular ecosystem.

Structure:

0 - 30 Minutes: ABM and [Mesa Overview](#)

- Attendees will get an overview of the dynamics of complex systems, generative science, and need for Agent Based Models. The tutorial will then overview the Mesa crowd sourced project discussing its intent, cultural principles, and overall effort.

30 - 120 Minutes: Mesa Tutorial

- In this section, attendees will be hands-on building a Mesa model using Google Colab (if no python experience or software) or users preferred IDE. Specifically attendees will build the Boltzmann wealth model starting from agents just exchanging money, to agents exchanging money in space to launching a server to watch the model run in one's browser.

120 – 180 Minutes: Modular Ecosystem and Data Tutorial

- Finally, attendees will learn about efforts to make a modular ABM ecosystem and how it could be a critical enabler for storing knowledge, debating complex dynamics, and replicating research.Next, the tutorial will walk through a tutorial on the [Mesa Data](#) synthetic population pipeline and converting that data into an agent population. The session will end with talking about other parts of the ecosystem in development such as [Mesa Behaviors](#) and [Mesa Packages](#).

Audience: Consistent with the Python ethos, this tutorial is designed to be of interest to both the technical attendees and the non-technical attendees. The technical attendees will find the object-oriented approach and contribution possibilities of Mesa interesting. While non-technical attendees can follow along with the code to learn about ABMs and make their own working model. The modular ecosystem will also appeal to both groups as it explores technical ways to make ABM components more reusable and approachable. While for the non-technical folks it will show data resources that require no coding and how behaviors may be instantiated in code.

Organizers:

Jackie Kazil: Jackie is a co-founder of Mesa and engineering manager for the AI/ML team at Rebellion Defense, She is the co-author of the O'Reilly book, Data Wrangling with Python, a leader in the global Pyladies community as well as a former Director of the Python Software Foundation.

(Primary) Tom Pike: Tom is part of the Mesa Development Team and earned his PhD in Computational Social Science through George Mason University. He is currently at the National Intelligence University and is the Technical Director for the Center for Anticipatory Intelligence and Adaptive Influence. He can be reached at tpike3@gmu.edu or 618-960-1408