This document is intended to provide you with a copy of the questions that are asked in the Small Development Grant Proposal Submission [form](#), so that you can prepare, share, and edit your answers prior to submission.

Please note: All proposals for the SDG program must be submitted through the [form](#) to be considered for funding.

Name of Submitter: Thomas Pike

Your Email: thomas.pike42@gmail.cm

Is your project Sponsored or Affiliated? Affliated

Select Your Project: Mesa

Proposal Title: Python Frontend for Mesa

Two Sentence Summary of Proposal:

The goal is to build a python based frontend for Mesa that is easy to use, fast to develop and can be easily customized by users according to their project needs.

Description of Proposal:
No more than 750 words (4,500 characters max)

Mesa's current frontend is written in JavaScript. With a heavy academic user community, this has presented significant hurdles, over the years, for users who are just learning Agent Based Models and sometimes even coding, and for users who want minimal coding hurdles as they conduct esoteric research that need unique customizations. This project is an effort to mitigate these complications.

The plan is to select an open source python frontend framework (e.g. Dash, Panel, StreamLit) as evidenced by Mesa [discussion #1622](). Once selected, then the plan is to build a standard data interface that allows exchange of information and signaling between Mesa simulations and the frontend.

Deliverables:
A python frontend, once implemented, will allow Mesa users to build custom dashboards that can be used to:
1. Start/stop a simulation.
2. Analyze simulation data and visualize parameters in real time.
3. Generate interactive plots with tooltips/zoom/filtering features to provide useful Information.
4. Re-create the dashboard elements(charts/plots/tables) without re-running the Simulation.
5. Develop interactive apps inside Jupyter notebooks.

This will provide an additional python based front end that provides the same features with enhancements (i.e. interactive apps inside jupyter) to make Mesa more accessible to our diverse user community.

Please explain the benefit of this proposal including:
-Impact to the project
-Impact to the scientific ecosystem
-Impact to the community
No more than 400 words (2,500 characters max)

This project will benefit the user community by making Mesa significantly more accessible, allowing users across its diverse community greater ability to develop, customize and share their models.

This project will benefit the scientific ecosystem, by increasing rigor of research as visualizations are a critical tool in validating the complex dynamics which are occurring in the models. It will also benefit the ecosystem by reducing obstacles to visualizations, allowing researchers to focus more on the dynamics of interest, as opposed to the coding, and making it easier to build unique customizations that are relevant to their field of study. It will also make models easier to communicate and discuss allowing for improved collaboration across disciplines.

This project will benefit Mesa by providing a pure python end to end option, making it easier for more people to contribute to any aspect of Mesa.

Amount Requested:
$5,400

Brief Budget Justification: (Please include hours and/or pay rates)
How will the money be spent?

This project developed for Google Summer of Code (GSoC), however, due to the reduced number of supported interns and Mesa not being randomly picked in the NUMFOCUS selection process, this request is based on GSoCs pay rate and timeline.

Timeline of Deliverables:
Please include specific timelines showing when you will achieve the proposed work.

With notification of selection on July 28th. Timeline is intended to go from 1 August 2023, to 1 January 2024. Specifics dates are based on projected Mesa development meetings. Discussions will be continuous via github discussions and merge requests.

12 August - Python Frontend Framework Selected
9 September - Basic skeleton of front end created
14 October - Working prototype with desired features
11 November - Develop test, refine and ensure code is complaint with contributor standards
9 December - Update tutorials and education support
1 January - Final clean up and release new Mesa version

Has someone been identified to carry out the work in the proposal?

If YES:
Ankit Kumar. Student in Germany who demonstrated capability through [developing proposal and research in preparation for GSoC](#)

If NO: How will someone be identified to carry out the work?

Please list the name and email address of a project leader(s) who has approved this proposal.
Jackie Kazil - jackiekazil@gmail.com
Rht - rhtbot@protonmail.com
You Wang - boyu.wby@gmail.com

For OFF-CYCLE proposals ONLY:
Why isn't it possible to submit this proposal during a regular funding round? Why is this an urgent request?
i.e. - if you are submitting a request outside of the three formal calls for proposals, what is the justification?