

CSS 458

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Population Playground User Manual

To install the Population Playground program, you must first install python3 and pygame.

To install python3, please download it from here: <https://www.python.org/downloads/>

To install pygame, please follow this tutorial:

<https://www.pygame.org/wiki/GettingStarted>

Next, please open a terminal window or your Python editor of choice. Then navigate to the PopulationPlayground folder located inside the same folder as this manual. If you chose to use a terminal window, you can run the simulation using python3 model.py.

The simulation should then appear in a pygame visualization window. The red dots represent predators, the blue dots represent prey, and the green and yellow dots represent plants at various stages of growth. Occasionally, either all of the predators or all of the prey will die out, in which case you can rerun the simulation.

To change constants, open the model.py file and scroll down to the configurable constants. Each constant is described in the file, but notably, you can create plots of the populations over time and lag-correlation plots between the populations by changing "simulation": from False to True on lines 129 and 130. You can also change the pixel size, FPS, and simulation length.

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If you instead wish to run multiple simulations, then scroll down to the end of the file. By changing `runSimulation(True)` to `runSet()`, `runSets()`, or `plotChangingSets()`, you can run more simulations and perform analysis.

As you scroll through `model.py`, you may notice that the `t('x.y.z')` function is used frequently. This is to measure the amount of time that passes in various stages of the program, to help determine what should be sped up.

If you would like to test some of the various functions in the model, then open and run the `test.py` file in the same folder.