**1.0 Agent Based Modelling/Introduction**

This readme file outlines the instructions in order to run this Agent Based Model (ABM) which produces a GUI (**Graphical User Interface**). The purpose of this code is to demonstrate the movement of randomised agents within python environments, where the created agents run freely within a defined space/environment until the number of iterations have been met. Furthermore, to integrate user interaction “Asynchronous programming”, the results will be orchestrated by the use of a GUI; asking the user to call upon the code to show the movement of the created agents until the stopping condition is met. This project has been undertaken throughout the past two months of learning python throughout academic lead sessions and further research by forking examples of code on GitHub and online tutorials to fix any minuscule syntax errors. – would normally be code intending problems or undefined calls or functions.

**The broad uses and objectives:**

• Creates randomised agents (x and y co-ordinates) whilst applying within a statistical context

• The creation of lists to enables clear communication between agent locations

• Creating a localised environment exclusive to the set of created agents

• Agent will eat around created environments derived from “in.txt” file and agent framework (set of agent rules and parameters)

• Collaborate both environments by matplotlib.plot

•Using tkinter, create a GUI that shows agents eating into environments and save results.

**2.0 Getting Started/How to source my code**

These instructions will get you a copy of the project up and running on your local machine for development and testing purposes. See deployment for notes on how to deploy the project on a live system.

1. Download all files under OliverSmith95.github.io or files found in TurnitIn submission(ONLY for Andy Turner and Nick Gould)

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

PLEASE NOTE: Due to problems with my original Github username including upper cases, this will not work. My second account (shown above) has been flagged and therefore is not public. Until Github unflag my account, my resources will be unavailable.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**Files should contain**

(Essential) [ABM\_Final.py](file:///\\ds.leeds.ac.uk\student\student13\gy18os\Programming\OliverSmith95.github.io\ABM_Final.py)

(Essential [Agent\_Framework\_2.py](file:///\\ds.leeds.ac.uk\student\student13\gy18os\Programming\OliverSmith95.github.io\Agent_Framework_2.py)

[In.txt](file:///\\ds.leeds.ac.uk\student\student13\gy18os\Programming\OliverSmith95.github.io\in.txt)

README.txt (This document)

License.txt

Project Overview.doc

**3.0 Prerequisites/Operating system requirements**

1. In order to run this project, one requires the use of Anaconda 3.7 – Using Spyder (Python 3.7) with the computer system requirements as follows (copied from <https://docs.anaconda.com/anaconda/install/>)

Windows - <https://docs.anaconda.com/anaconda/install/windows/>

MacOS - <https://docs.anaconda.com/anaconda/install/mac-os/>

* License: Free use and redistribution under the terms of the [End User License Agreement](https://docs.anaconda.com/anaconda/eula/).
* Operating system: Windows 7 or newer, 64-bit macOS 10.10+, or Linux, including Ubuntu, RedHat, CentOS 6+, and others.
* If your operating system is older than what is currently supported, you can find older versions of the Anaconda installers in our [archive](https://repo.anaconda.com/archive/) that might work for you. Check our [FAQ](https://docs.anaconda.com/anaconda/user-guide/faq/#old-systems) for version recommendations.
* System architecture: Windows- 64-bit x86, 32-bit x86; MacOS- 64-bit x86; Linux- 64-bit x86, 32-bit x86, 64-bit Power8/Power9.
* Minimum 5 GB disk space to download and install.

**Instructions to run the code**

1. Ensuring all “(Essential)” files are open on Python from 2.0
2. To ensure the code will create a functional GUI one needs to adjust the IPython graphic functionality. Tools>Preferences>IPython console> Graphics> Inline. By default, this may be set to Automatic revert this otherwise.
3. Run the code (press R5) and a pop up will appear “Model”. Click the drop down button and select “Model” (under the feather and “--------“)
4. Model RUNS.
5. On closure of the model (which should run between 2-10 movements depending the agent scores to the stopping criteria) the model output will be displayed in the kernel console showing the number of movements.

**Running the tests**

There are some evidence of testing the final code provided in the folder. For example, to ensure at the end of project all items of code were being accounted for, I have inserted tests where I ask the code print a value or flush the system/create a forced buffer to execute.

For example sys.stdout.flush()

For 6.1 and 7.1, I have asked python to print a value. This was to ensure the code in the latter end of the script was contributing towards the output. This was because at times the GUI or figure would not display the agent environments. Despite this problem which would not resolve, some parts of the code were placed towards the top of script.

This is highlighted within the ABM\_Final.py script.

print(test)

print(test + test2)

**Versioning**

Version 1.10 of ABM\_Final.py (14/12/2018) **No intention of updating**

Version 1.2 of Agent\_Framework\_2.py (14/12/2018) **No intention of updating**

**Authors**

* **Oliver Smith** - *Initial work* – OliverSmith95

**License**

This project is licensed under the Python’s Terms and conditions for accessing or otherwise using Python License - see the LICENSE.txt file for details

**Acknowledgments**

* I commend Andy Turner, Nick Gould and practical demonstrators for their patience and work throughout these past months