GSoC 2019
JdeRobot Python Challenge
Shah Nishant
nshah3@wpi.edu

Conway's Game of Life

Instructions to run the program:
Python Version: 3.5.7

Libraries used:
Argparse Version: 1.1
Numpy Version: 1.11.0
Matplotlib Version: 1.5.1
Json Version: 2.0.9

All the possible configurations are stored in configurations.json file and to execute the main program, one of the configuration from the json file can be selected.

Available Configurations:
- block_switch_engine
- boat
- r_pentonimo
- diehard
- pentadecathlon
- infinite
- acorn
- beacon
- Spaceship

Command Line:
python3 program_name.py optional_arguments

For ex:
python3 gsoc_python_challenge.py --grid-size 100,100 --conf infinite -n 500 -interval 500

If you need any help
Run: python3 gsoc_python_challenge.py --help

Output:
A gif will be stored as an output with the name of the configuration.
Ex: infinite.gif

optional arguments:

-h, --help	show this help message and exit
--grid-size GRID_SIZE	Comma Separated dimensions (X, Y)

GSoC 2019
JdeRobot Python Challenge
Shah Nishant
nshah3@wpi.edu

--conf CONF	See Readme List for number of available configurations
-n N	Number of Iterations
-quality QUALITY	Image quality in DPI
-interval INTERVAL	interval (in milliseconds) between iterations
--conf-position CONF_POSITION	Comma Separated coordinated of configuration

Results:

- Block Switch Engine, R_Pentomino (keeps on expanding) keeps on changing its state throughout its life.
- Boat does not change its state throughout its life.

  Understanding Boat configuration:
  As can be seen from the output gif, there are 3 states in V-shape and 2 states diagonally opposite to the two of the three in V-shape. As can be seen from the gif, that each of the state has no more than 2 neighbors are a time and hence it is not possible to produce a new state in this configuration.

- Diehard, Pentadecathlon returns to its original state after some number of iterations.

  In diehard, it can be seen that initially there are two separate entities existing, one with the changing state and the other constant in its life, as soon as the one changing expands it affects the life of the constant state and both the entities start evolving. But after a certain number of generations, it returns to the original state.

- Infinite, Acorn keeps on changing its state throughout its life.
- Spaceships keeps on oscillating between certain states and keeps on moving forward.
- Beacon keeps on oscillating between two states at a fixed position

All the results produced are attached in the folder along with the source code.

References:

1. https://en.wikipedia.org/wiki/Conway's_Game_of_Life