Logic Modeling

Requirements

- numpy
- cython
- pypar

Can download files from github at https://github.com/LoLab-VU/LogicalModel
Models directory contains 5 models.

```
Models/core_iron_6variables_3states.txt
Models/final_continuous_model_21_nodes.txt
Models/func-example.txt
Models/IRP2_overexp_functions_1.txt
Models/IRP2_overexp_functions_2.txt
Models/core_iron_6variables_3states.txt
```

Example Usage

For this example we will use the core_iron_6variables_3states.txt model. The main program is called main_attractor_synch_cython.py. The option are

```
usage: main_attractor_synch_cython.py [-h] [-n NSTATES] [-s START] [-e END]usage:
main_attractor_synch_cython.py [-h] [-n NSTATES] [-s START] [-e END]
                                    [-m MODEL] [-v VERBOSE] [-p PARALLEL]

optional arguments:
  -h, --help            show this help message and exit
  -n NSTATES, --nstates NSTATES
                        provide a number of states
  -s START, --start START
                        starting string to convert to base Nstates
  -e END, --end END     ending string to convert to based Nstates
  -m MODEL, --model MODEL
                        model to run simulation, assumes file to end in .txt
  -v VERBOSE, --verbose VERBOSE
                        if you want verbose updates (use with single
                        processor)
  -p PARALLEL, --parallel PARALLEL
                        run in parallel, use 0 or 1
```

The only required arguements are the number of states (-n) and the model file (-f)

```
python main_attractor_synch_cython.py -n 3 -m Model/core_iron_6variables_3states.txt
```

```
pinojc@LoLab-760:~/Projects/LogicalModel$ python main_attractor_synch_cython.py -n 3
 -m Models/core_iron_6variables_3states.txt
Running on single CPU
Started
Computed 729 samples 0.0034 minutes
Attractors  ['002211', '111111', '011111']
Frequencies  [266, 29, 434]
Total  729
```

Running on multiple processors/across nodes

To run on a multi core or cluster, you need to comment the main() (line 105) and uncomment all the multiprocessing lines below that. In python it is just the two lines that contain '"""', line 111 and 191.
Then you run using mpirun

```
mpirun -n #proc /path/to/python main_attractor_synch_cython.py -n 3 -p 1
```

```
pinojc@LoLab-760:~/Projects/LogicalModel$ mpirun -np 4 python
main_attractor_synch_cython.py -n 3  -m Models/core_iron_6variables_3states.txt -p 1
Processor 3 initialised on node LoLab-760
main_attractor_synch_cython.py:54: UserWarning: Shared object file
'core_iron_6variables_3states.so' already exists: moving on.
  warnings.warn(warning_string + 'moving on.')
Processor 1 initialised on node LoLab-760
Processor 0 initialised on node LoLab-760
samplesize =  728
split up into 72 segments
Processor 2 initialised on node LoLab-760
Computed 729 samples in 0.0012 minutes
Attractors  ['002211', '111111', '011111']
Frequencies  [266, 29, 434]
Total  729
```