COVID19_RL

Setup

The following setup was used in context of macOS

Python version 3.7.8
R version 4.0.2

After cloning the GitHub repository, create virtual environment and install the required packages:

```
$ python3 -m venv venv
$ source venv/bin/activate
$ pip install -r requirements.txt
```

Make sure rpy2 is working and install the required R packages:

```
$ python installing_packages.py
```

COVID19_agents

This folder contains agents that train on COVID19_env. The first is a DQN agent from Stable Baselines (DQN_simple_SIR.py). To train this agent and test it on the simple SIR environment, simply run the python script:

```
$ cd COVID19_agents
$ python DQN_simple_SIR.py
```

Stable Baselines agents use Tensorflow and support the use of Tensorboard to monitor results. To monitor training progress while training an agent, run the following in a separate terminal:

```
$ tensorboard --logdir ./DQN_SIR_tensorboard/
```

Replace './DQN_SIR_tensorboard/' with whatever name is specified for tensorboard_log in the agent's .py file.

COVID19_env

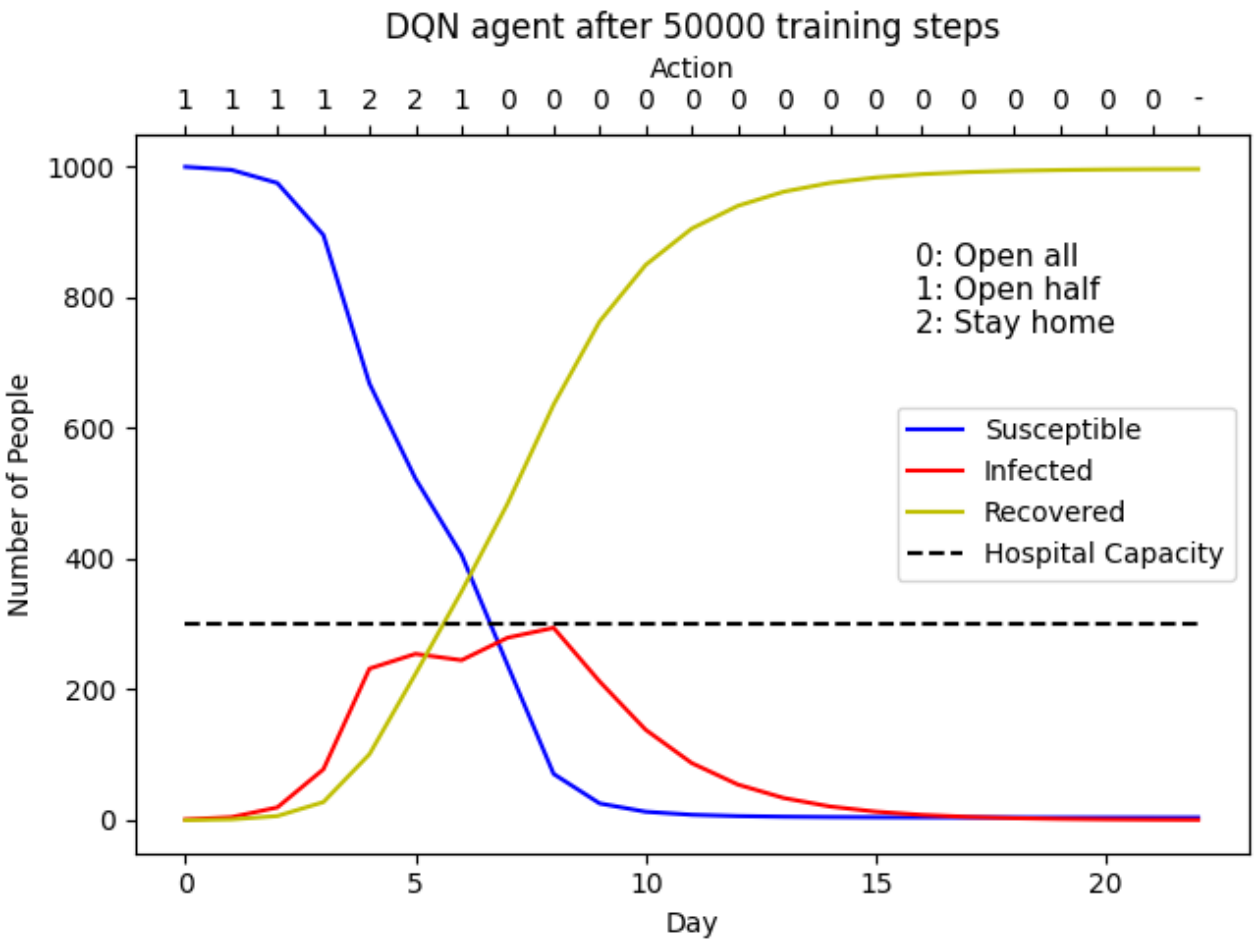
This folder contains RL environments for COVID-19, which are used by COVID19_agents. The first environment is called simple_SIR_env.py and is based on a minimal SIR model.

These environments are written in Python but utilize dynamics models written in R (e.g. simple_SIR_model.R). The conversions between Python and R are handled by rpy2. See the rpy2_examples folder for examples and the following website for more documentation: https://rpy2.github.io/doc/latest/html/index.html

Results

This folder contains images/plots of training results.
See DQN_simple_SIR_results#.png, where the # is the number of training episodes.

Most recent results:



COVID19_models

This folder contains COVID19 spread models in R to be used in the RL environments. The purpose of this folder is to have a place to test the R files before they are integrated into the RL environments.

A simple SIR model is implemented in SIR_example.R and can be tested by running call_model.py.

```
$ cd COVID19_models
$ python call_model.py
```

rpy2_examples

This folder is to test rpy2, such as calling custom R functions.
The custom R functions are located in testFunc.R. They are called by running the Python file call_testFunc.py.

```
$ cd rpy2_examples
$ python call_testFunc.py
```

rpy2 docuentation: https://rpy2.github.io/doc/latest/html/index.html

stable_baselines_examples

This folder contains relevant Stable Baselines RL examples for reference when working on our COVID-19 RL implementation.

Stable Baselines documentation: https://stable-baselines.readthedocs.io/en/master/