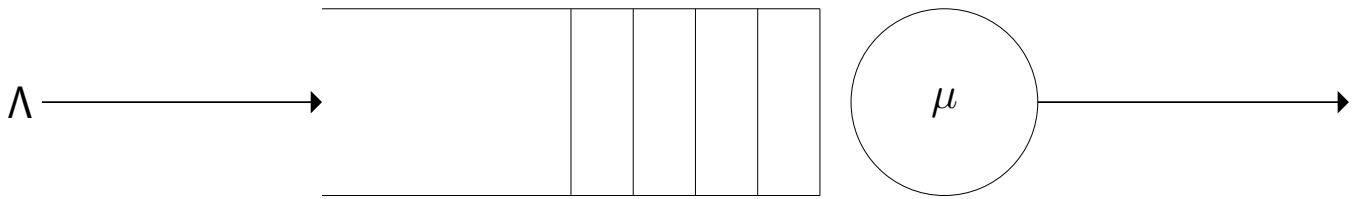
ASQ Simulates Queues

Geraint Palmer

PyCon Namibia 2016

What is a Queue?



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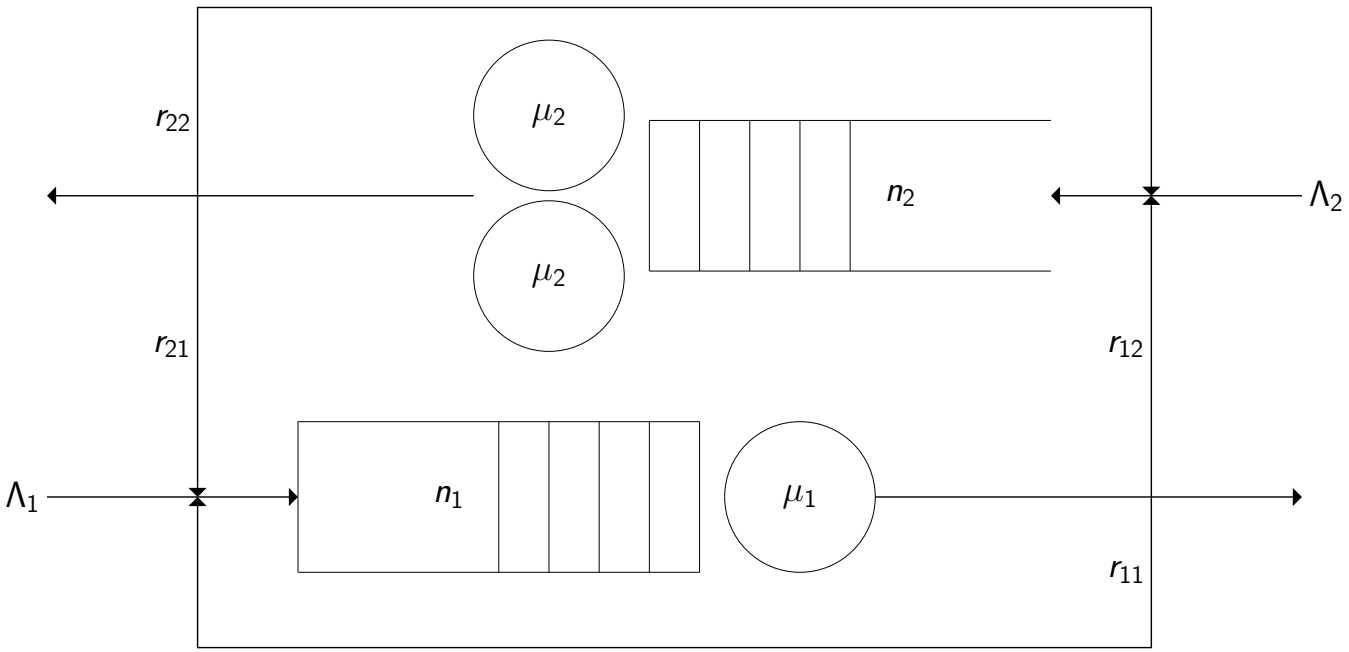

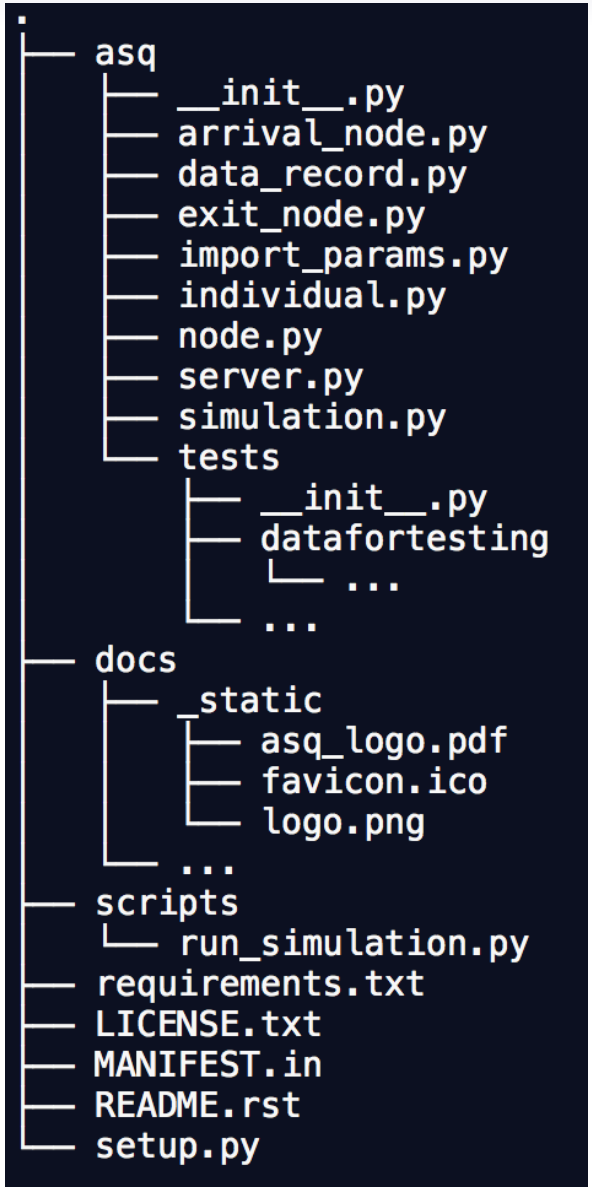
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│   ├── datafortesting
│   │   └── ...
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│   ├── _static
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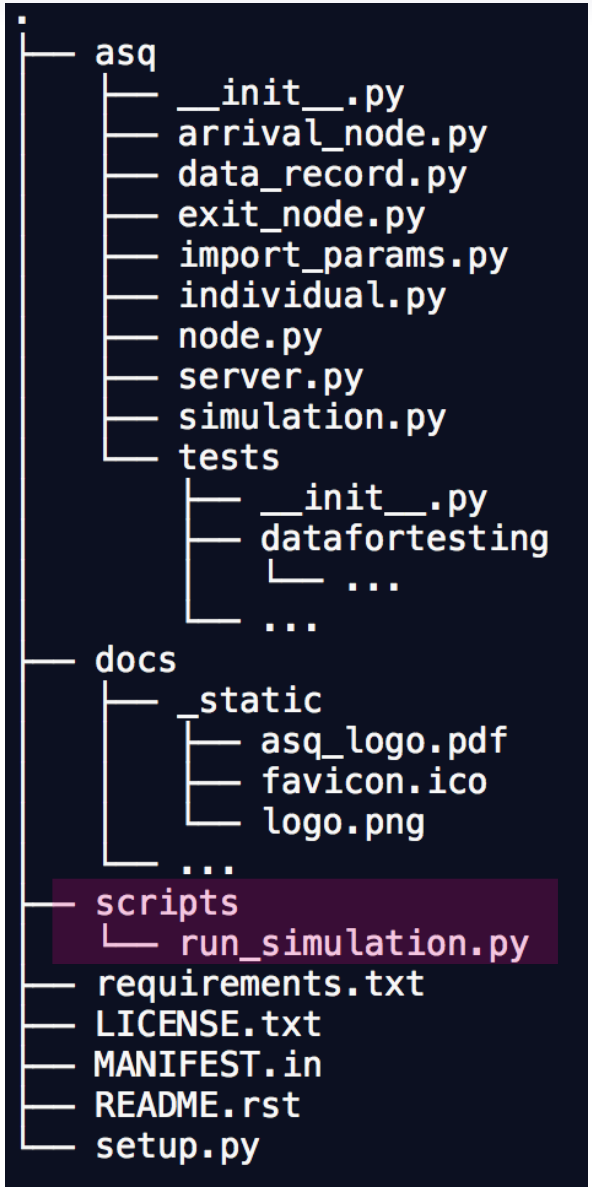
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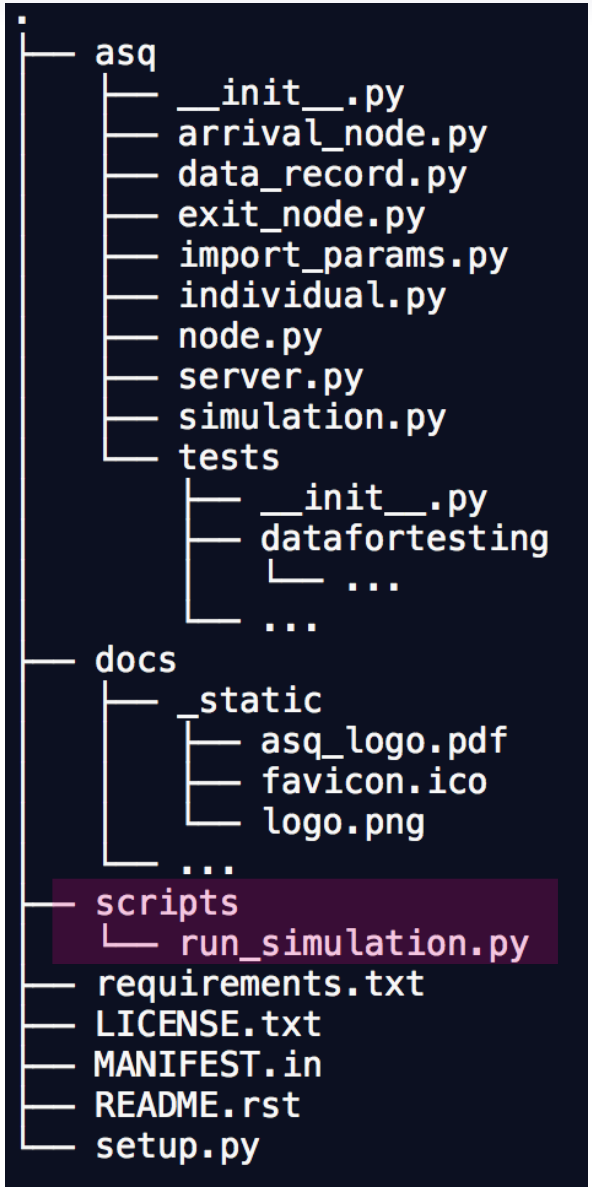
Demo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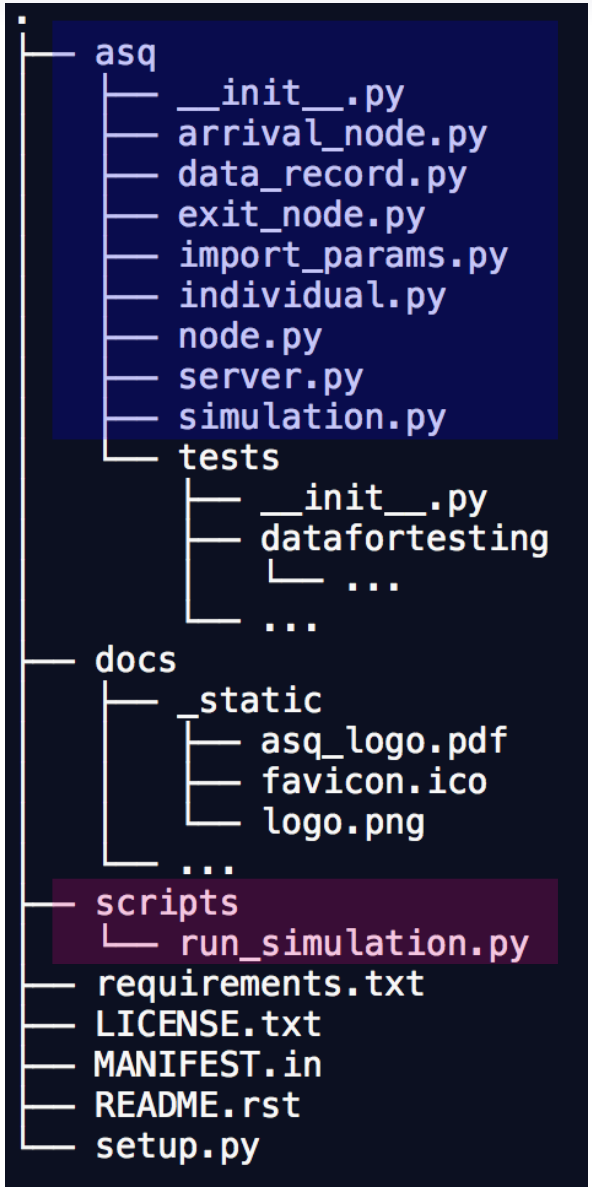
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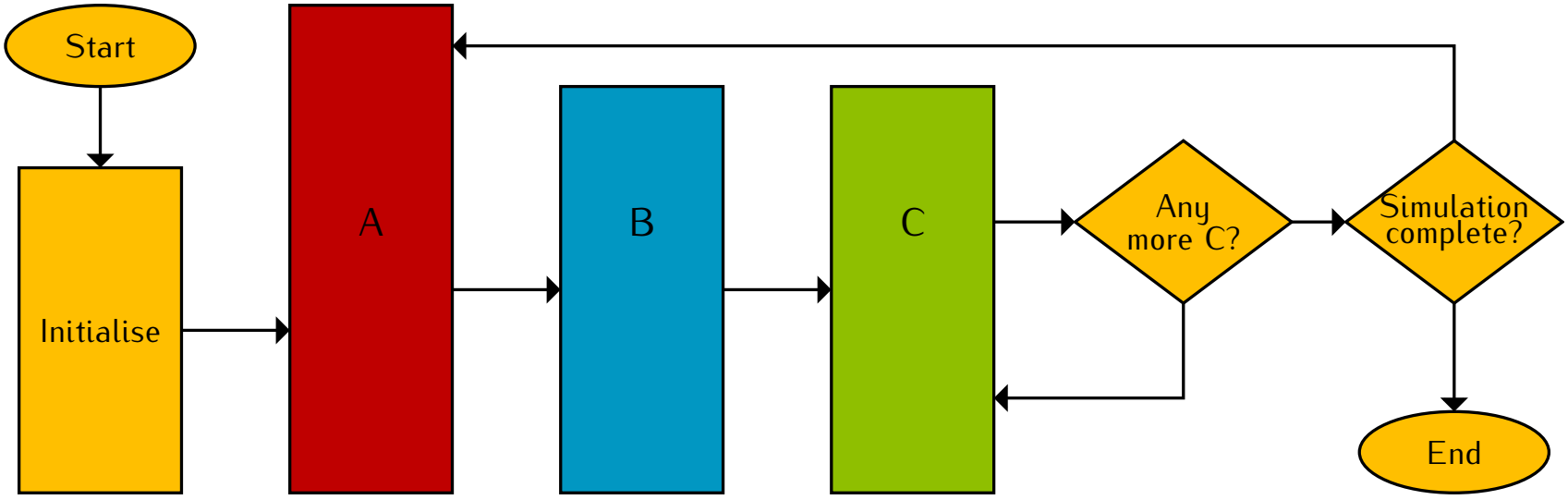
Three-Phase Simulation Approach



Event Types

External Arrival

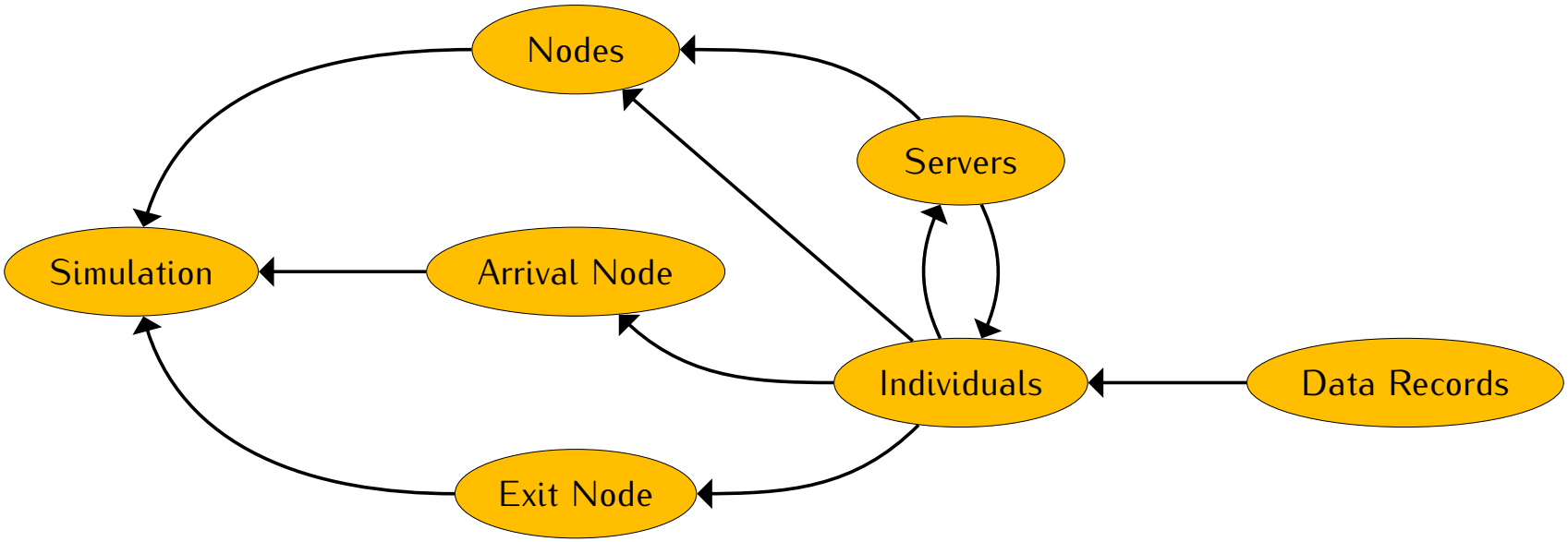
Finish Service

Start Service

Block Customer

Release / Move Customer

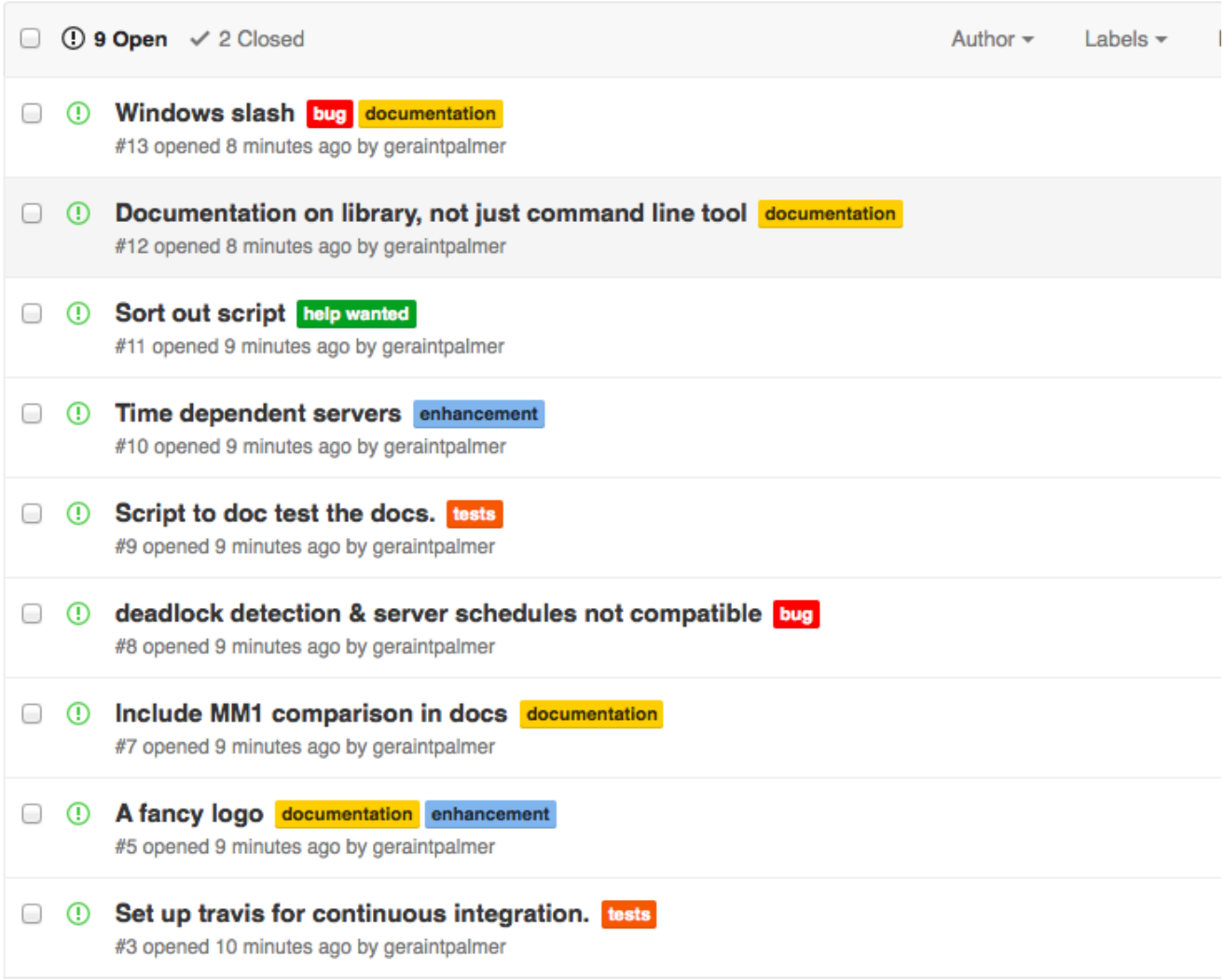
Code Structure

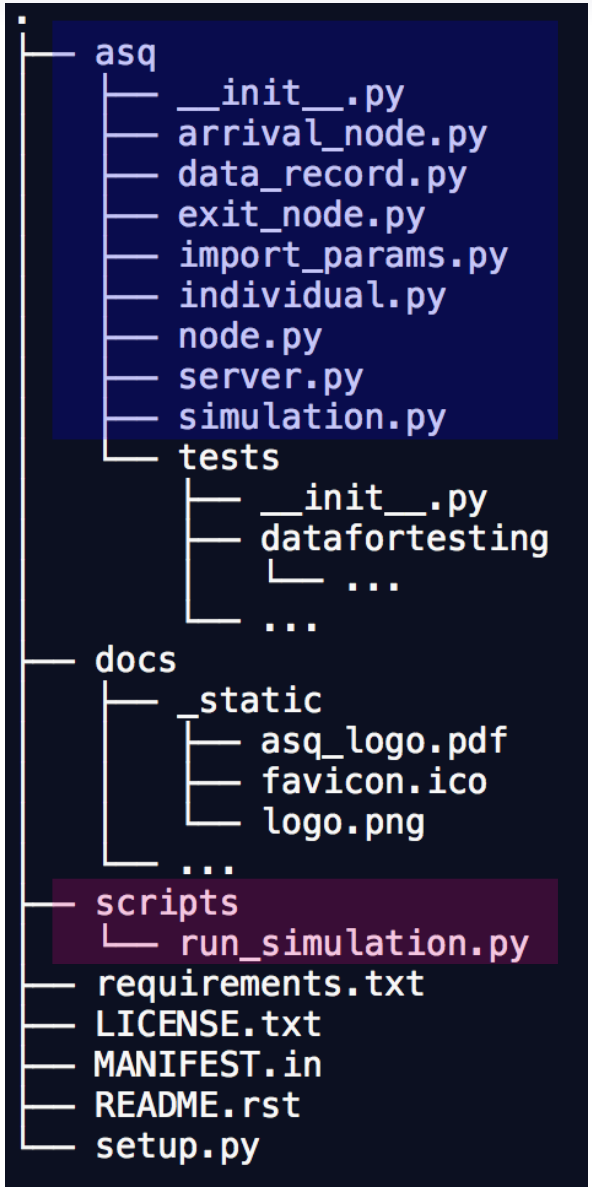


Pair Programing / Collaborative Work

Git & GitHub

GitHub Issues

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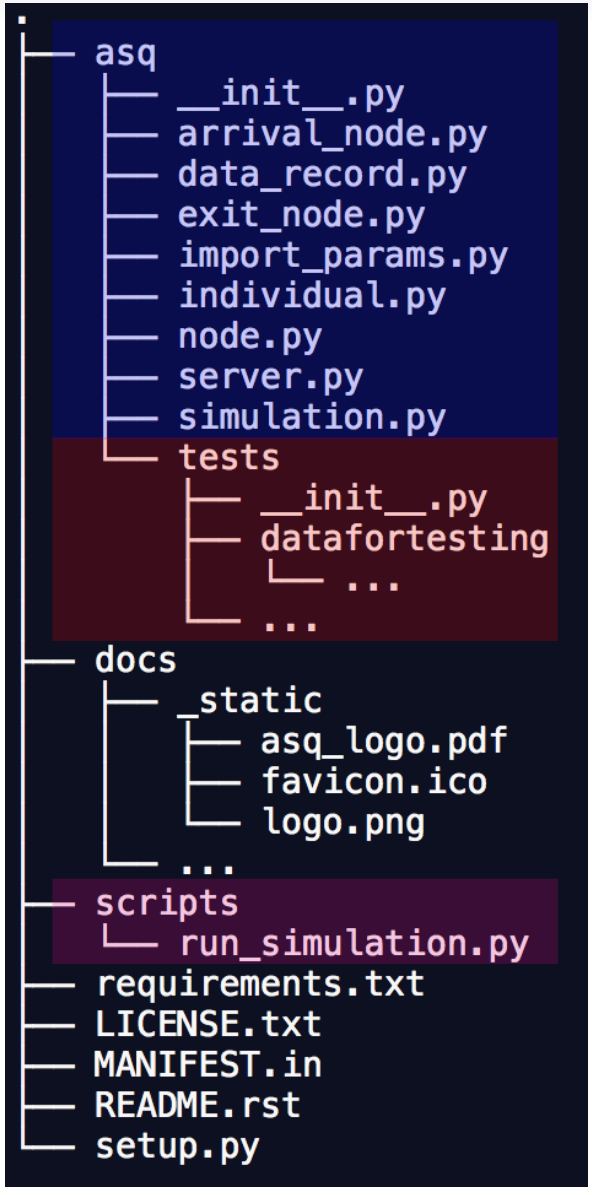
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Doctests

```
def geraints_function(a, b):
    """
    Returns the absolute difference between a and b

        >>> my_amazing_function(7, 9)
        2
        >>> round(geraints_function(20.4, 3.1), 1)
        17.3
    """
    return max(b-a, a-b)
```

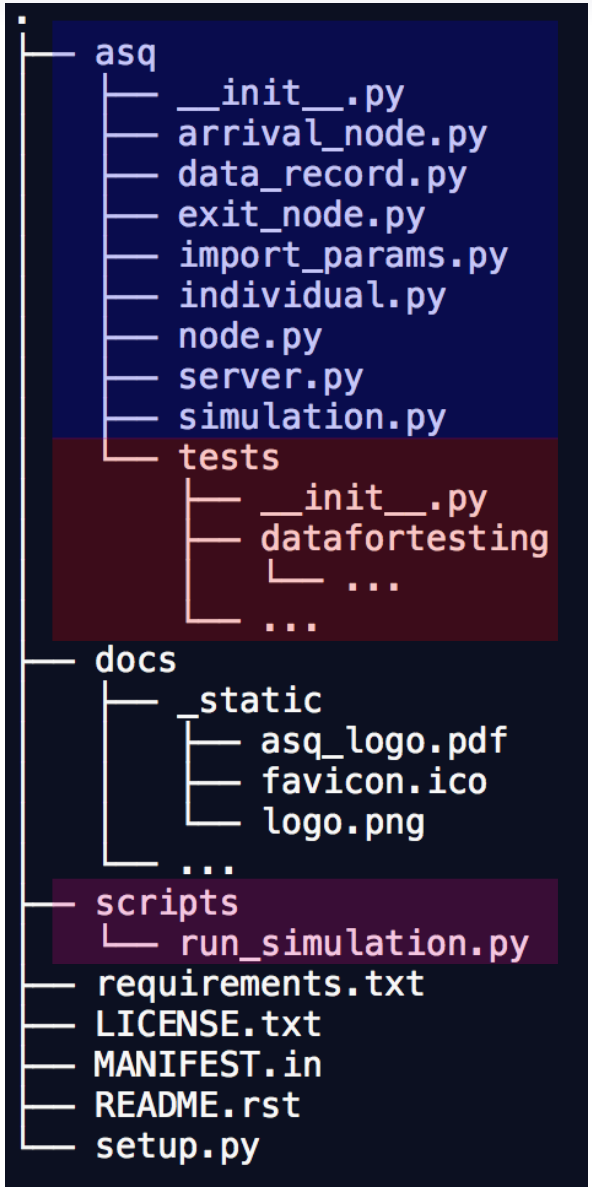
Unittests

```
import unittest
import geraints_function

class TestGeraintsFunction(unittest.TestCase):

    def test_geraints_function(self):
        self.assertEqual(geraints_function(7, 9), 2)
        self.assertEqual(geraints_function(20.4, 3.1), abs(20.4-3.1))
```

Travis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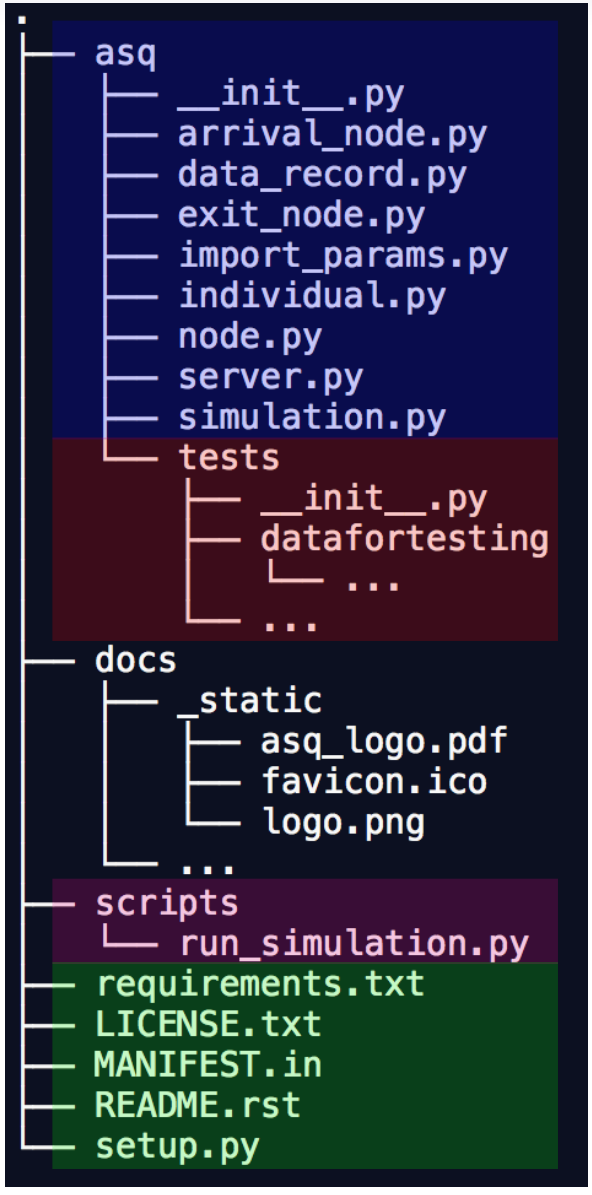
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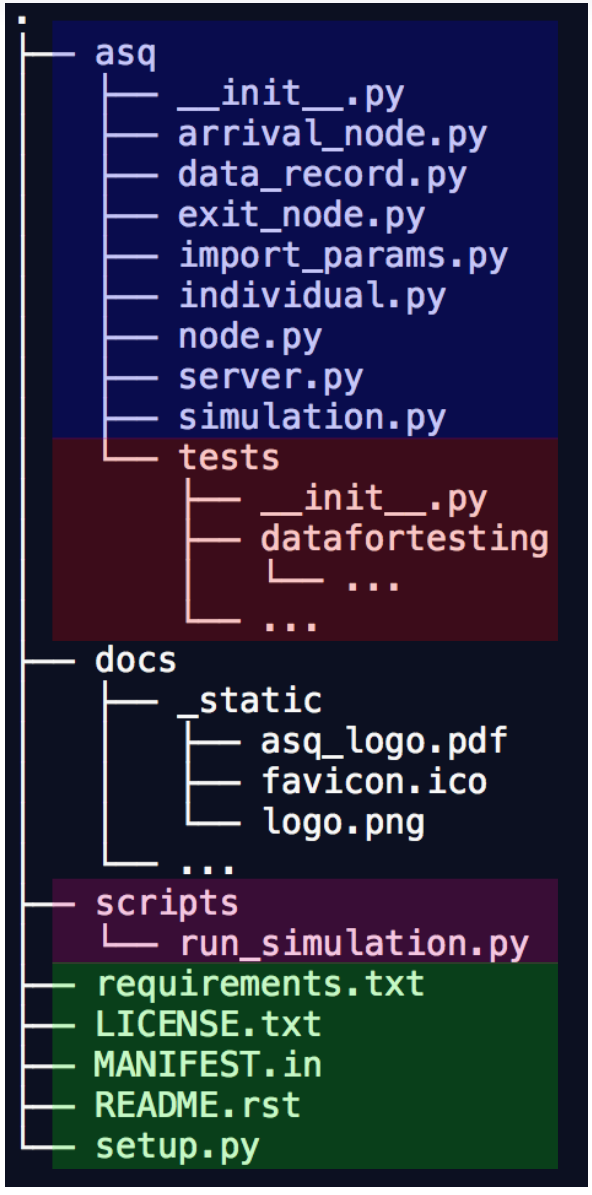
Packaging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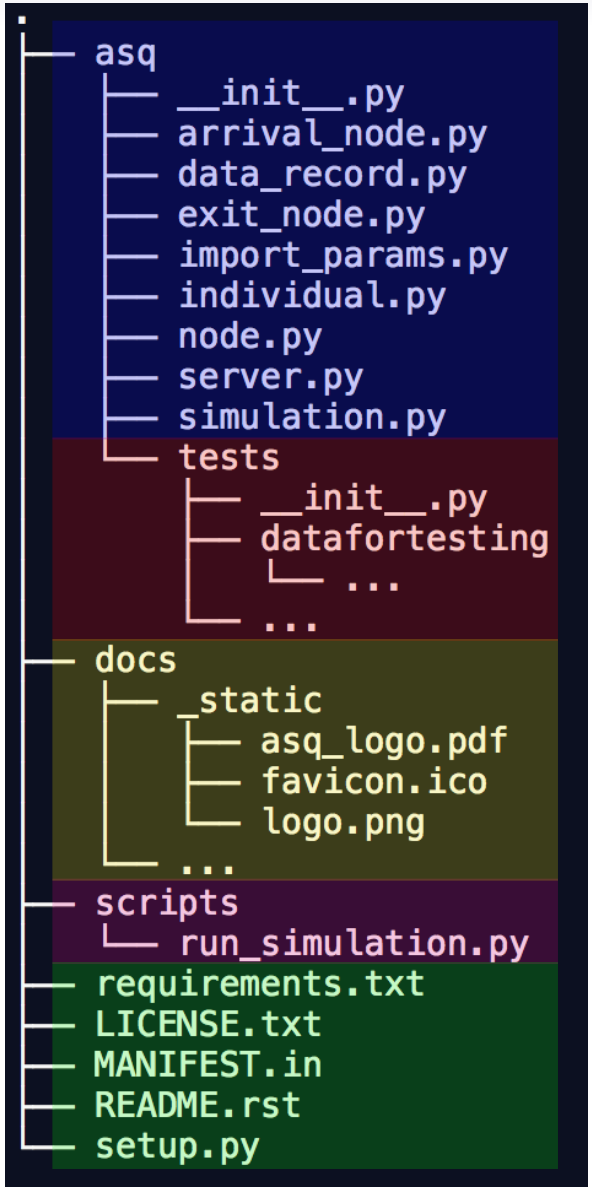
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Documentation

Academic Uses

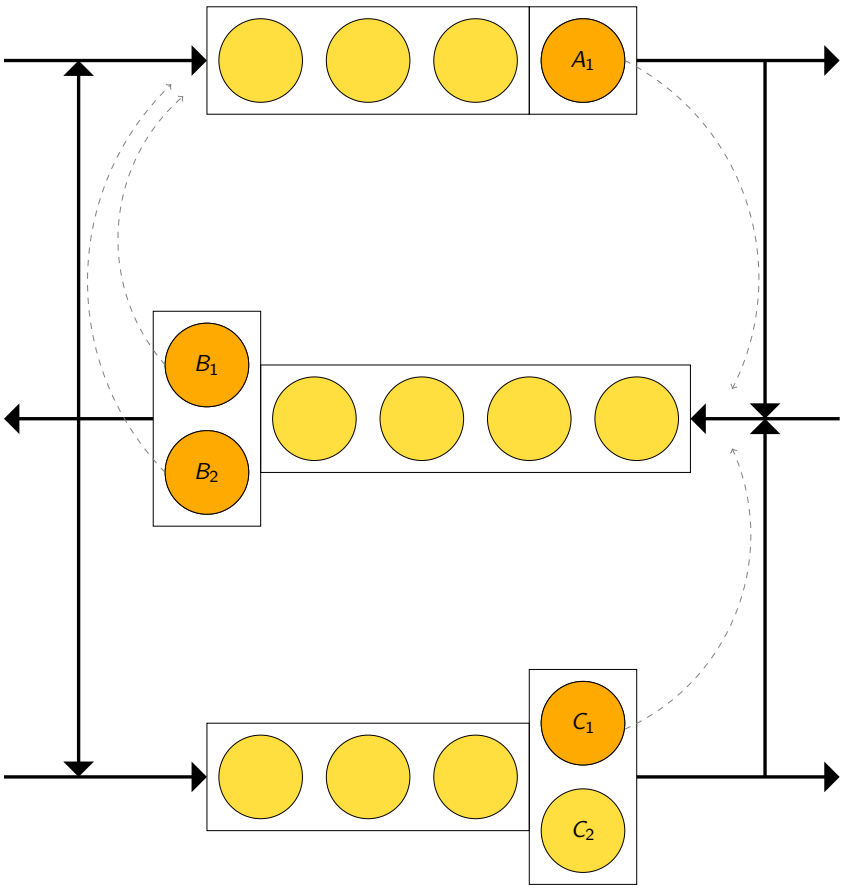
Theoretical Work

Investigating deadlock in queueing networks.
(Geraint Palmer, Prof. Paul Harper, Dr. Vincent Knight)

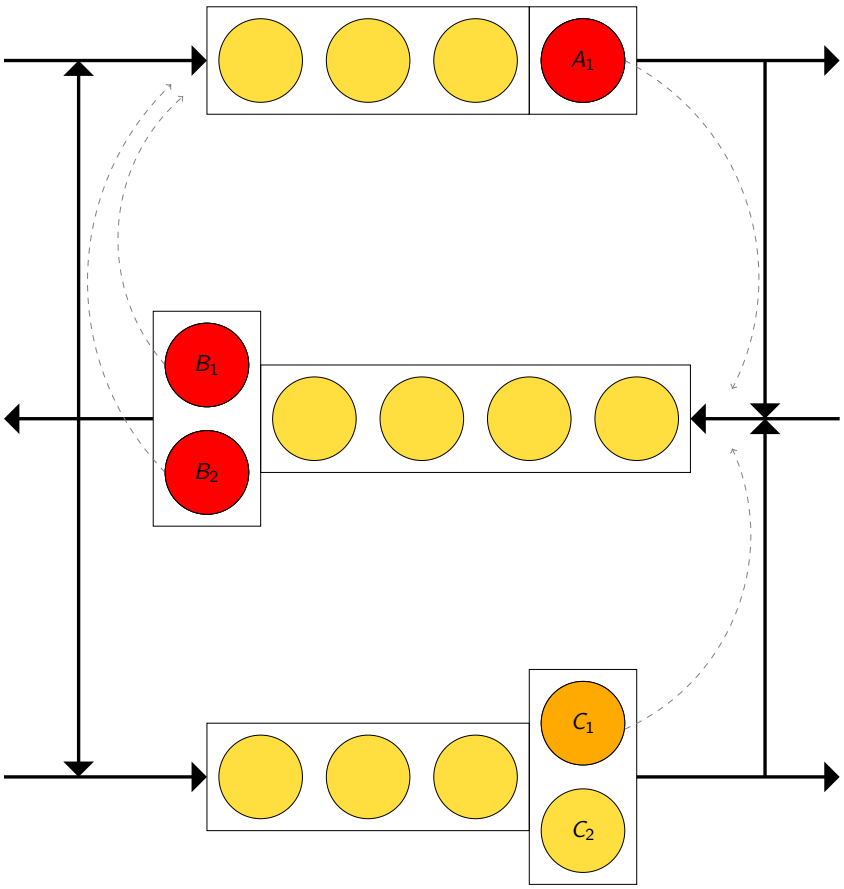
Practical Work

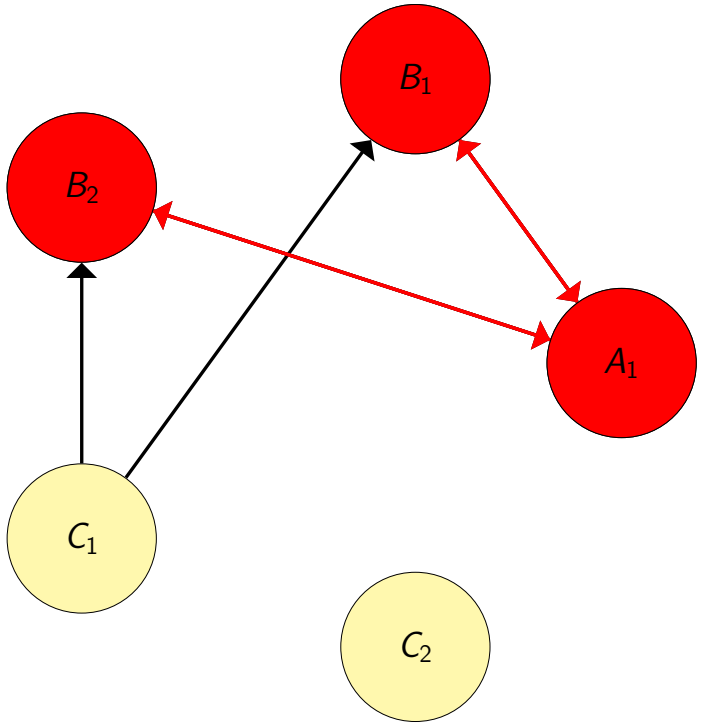
Modelling an ophthalmology clinic to strategise scheduling.
(Lieke Hölscher, Dr. Jennifer Morgan)

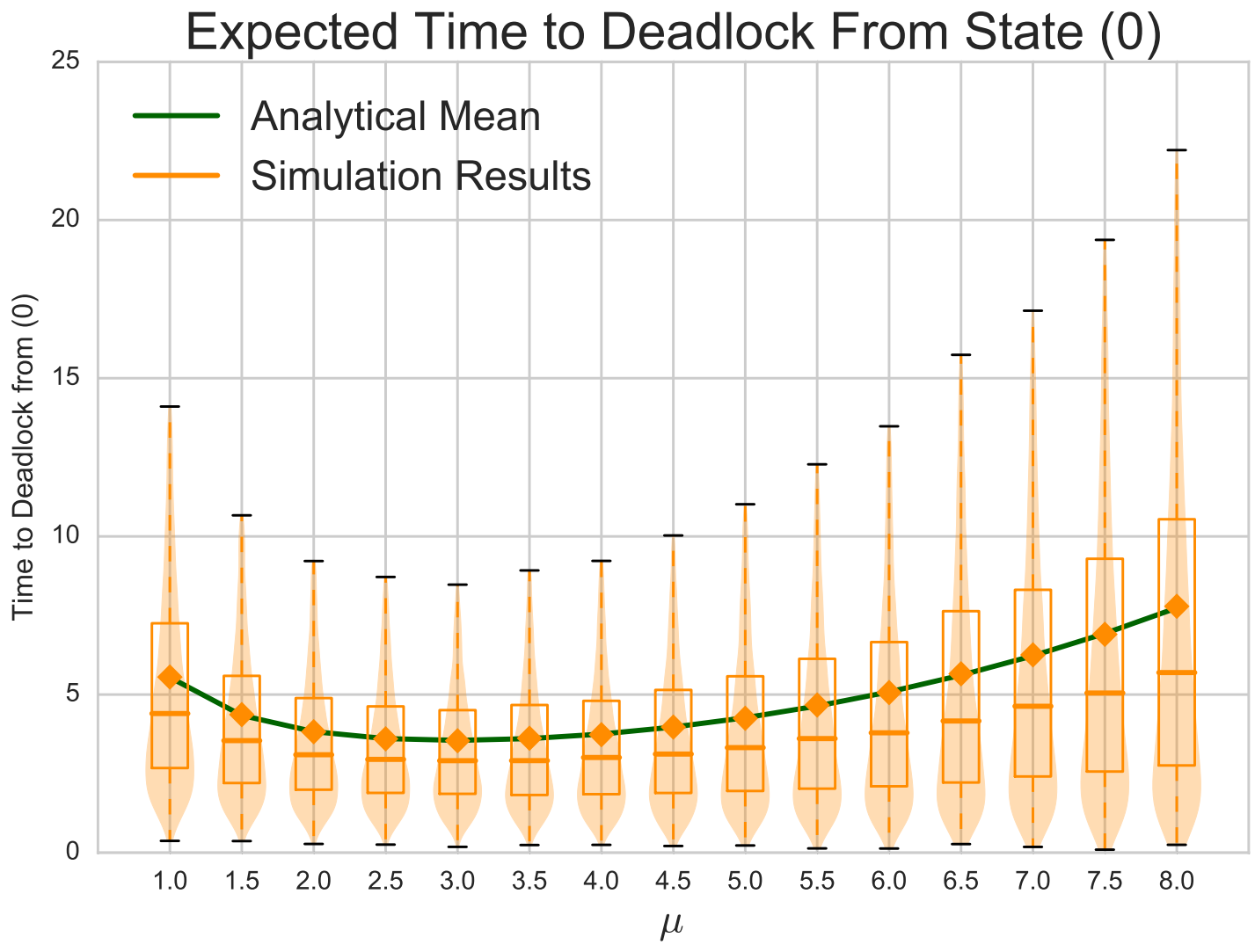
Investigating Deadlock



Investigating Deadlock






Expected Time to Deadlock From State (0)
Analytical Mean
Simulation Results
Time to Deadlock from (0)
0
5
10
15
20
25
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
μ

Modelling Ophthalmology Clinic