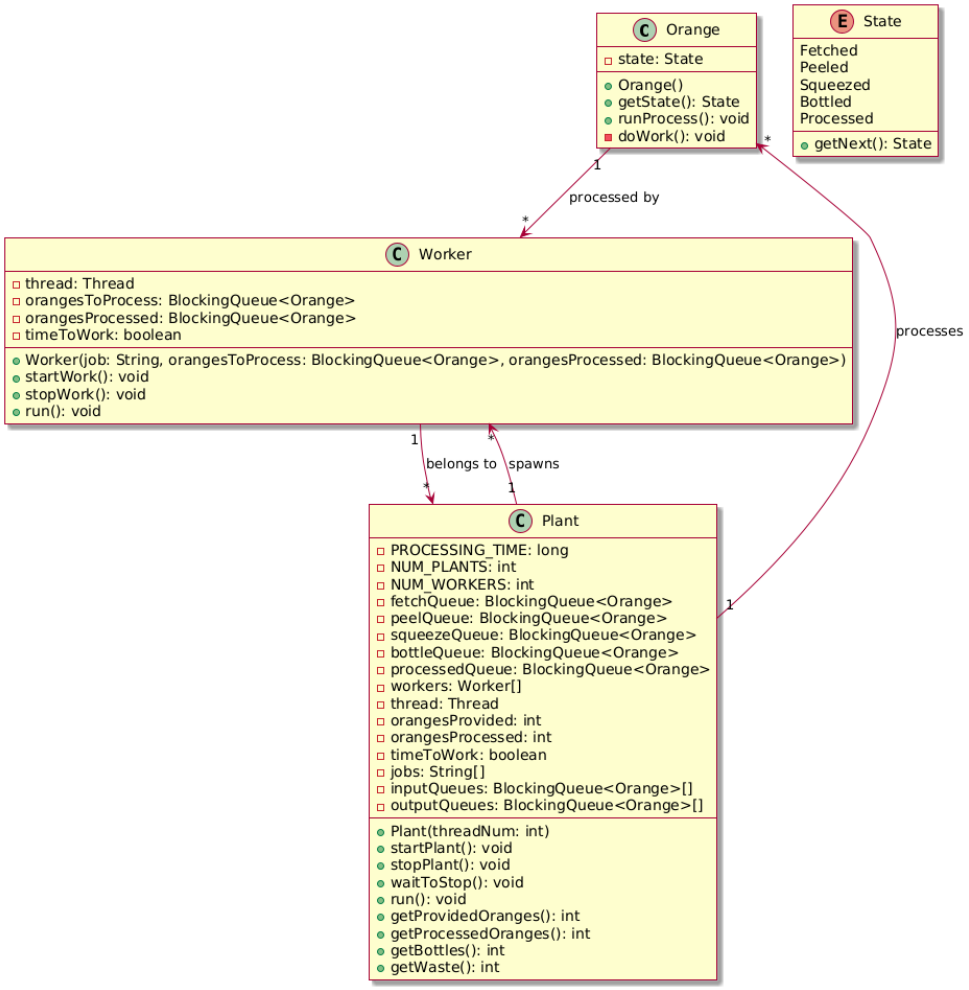
UML Diagram



Requirements

- 6 plants are created (data parallelization)
- 6 workers are instantiated in an array of workers within each plant (task parallelization)
    - Each worker completes a different task (i.e. there is a “fetcher”, “squeezer”, etc.)
- The main plant thread spawns 6 plants which each spawn 6 workers for a total of 36 threads
- Multiple workers can access each of the orange queues so they are implemented using blocking queues. Only one worker will go for a single orange at a time

Challenges Faced

- Choosing how to implement the blocking queues
    - Originally, I was going to try blocking mailbox but you can only put one orange at a time in a mailbox. I discovered blocking queue which allows for multiple oranges to be put in a queue at once.
- Delegating tasks to the workers
    - The workers must work on different tasks but it was difficult to get them to work on the same orange consecutively. My original juice bottlers had one worker take an orange or two and then never give it back.
- Thread-safe implementation
    - Since multiple oranges can be in the same stage of processing at one time, we have to make sure threads only access one orange at a time