**Game of life**

**Concurrency Problems and Solutions**

1. **When two or more cells(threads) try to eat the same food resource at the same time.**

We will use ReentrantLock() and tryLock() methods to lock the respective resource. So, while it is locked by a cell (thread), it cannot be accessed by another cell (thread). After the cell finished eating, unlock the resource.

A picture containing chart

Description automatically generated

1. **When two or more sexuate cells(threads) try to reproduce with the same cell.**

When a sexuate sell finds another cell to multiply with, the first will lock the other until the reproduction is done, using methods listed below. So, the second cell chosen for multiplication won’t be available for the other cells.

Chart, scatter chart

Description automatically generated

1. **When two or more cells die at the same time and create new food resources**

When a cell dies and creates resources it will lock the resources, until it finishes, using methods listed below.

Diagram

Description automatically generated

1. **When a number of cells die at the same time, producing resources and the other cells are already eating another food resources.**

For each operation mentioned above, the resources will be locked.