

Pseudo Codes for the Replication of the Demographic Prisoner's Dilemma

The pseudo code of our replication is given in Table 1 and Table 2 for asynchronous and synchronous updating, respectively. The presented cases assume option “Remove dead agents immediately” to be false. For the case of this option being true, the removal of agents occurs as soon as an agent dies, whether of age or from the result of playing the prisoner's dilemma.

```
Initialize model
DO t times
  FOR EACH agent DO
    Move
    Play against all Von Neumann-neighbors in random order
    IF resources < 0 THEN
      Die
    END IF
    FOR EACH neighbor of agent DO
      IF resources < 0 THEN
        Die
      END IF
    END FOR EACH
    Give birth to offspring if possible
    IF age >= maximum age THEN
      Die
    END IF
  END FOR EACH
  Remove dead agents from the space
  FOR EACH agent DO
    Age increases by 1
  END FOR EACH
  Shuffle activation order of agents
END DO
```

Table 1: Pseudo code in the case of asynchronous updating

```

Initialize model
DO t times
  FOR EACH agent DO
    Move
  END FOR EACH
  FOR EACH agent DO
    Play against all Von Neumann-neighbors in random order
    IF resources < 0 THEN
      Die
    END IF
    FOR EACH neighbor of agent DO
      IF resources < 0 THEN
        Die
      END IF
    END FOR EACH
  END FOR EACH
  FOR EACH agent DO
    Give birth to offspring if possible
  END FOR EACH
  FOR EACH agent DO
    IF age >= maximum age THEN
      Die
    END IF
  END FOR EACH
  Remove dead agents from the space
  FOR EACH agent DO
    Age increases by 1
  END FOR EACH
  Shuffle activation order of agents
END DO

```

Table 2: Pseudo code in the case of synchronous updating