SE Lab Assignment 5

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1. There are four philosophers sitting around a round table. There are forks on the table, one between each pair of philosophers. The philosophers want to eat spaghetti from a large bowl in the center of the table. Unfortunately the spaghetti is of a particularly slippery type, and a philosopher needs both forks in order to eat it. The philosophers have agreed on the following protocol to obtain the forks:

Initially philosophers think about philosophy, when they get hungry they do the following:

- Take the left fork

- Take the right fork and start eating

- Return both forks simultaneously, and repeat from the beginning.

Build a SPIN model for this scenario.

Source Code:

#define N 4

byte fork[N];

byte nr\_eat;

proctype Philosopher(byte id)

{

    Think:

        printf("Plilosopher with id %d is thinking\n",id);

        if

        :: atomic { fork[id] == 0 -> fork[id] = id + 1; };

        :: atomic { fork[(id + 1)%N] == 0 -> fork[(id + 1)%N] = id + 1; };

        fi;

    One:

        if

        :: atomic

        {

            fork[id] == id + 1 -> fork[(id + 1)%N] == 0 -> fork[(id + 1)%N] = id + 1;

            nr\_eat++;

        }

        :: atomic

        {

            fork[id] == 0 -> fork[(id + 1)%N] == id + 1 -> fork[id] = id + 1;

            nr\_eat++;

        }

        fi;

    Eat:

        printf("Plilosopher with id %d is eating\n",id);

        d\_step { nr\_eat--; fork[(id + 1)%N] = 0; fork[id] = 0;}

    goto Think;

}

init {

    atomic

    {

        byte i = 0;

        do

        :: i < N -> run Philosopher(i); i++;

        :: else -> break;

        od;

    }

}

Output:

