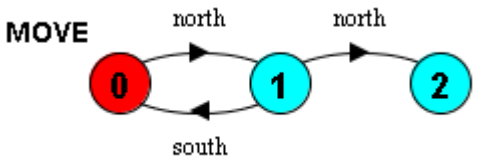
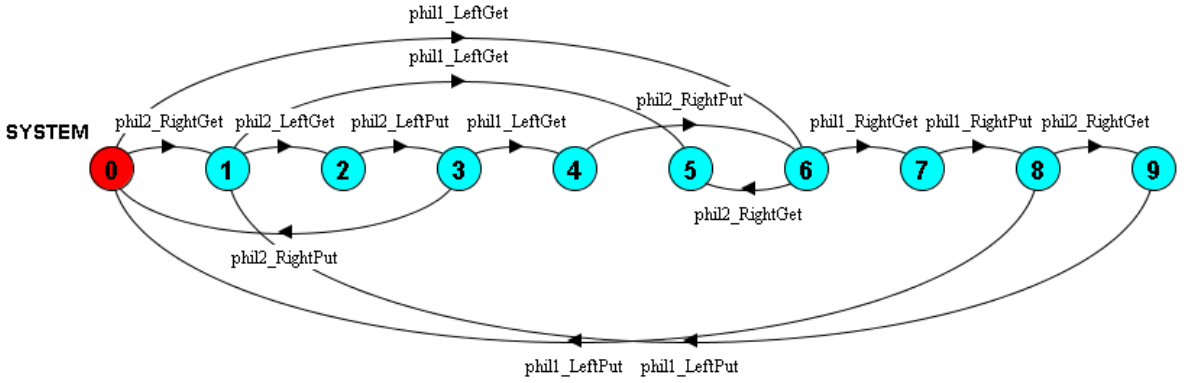
Safety/Deadlock Assignment

```
MOVE = (north->(south->MOVE|north->STOP)).
```

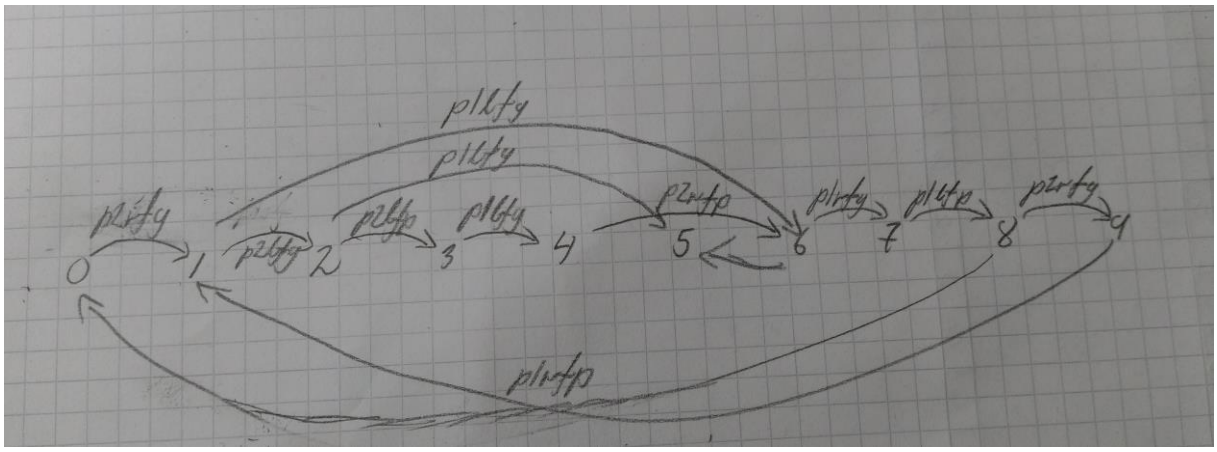


Dining philosophers

```
PHIL1 = (phil1_LeftGet -> phil1_RightGet ->  phil1_RightPut -> phil1_LeftPut  -> PHIL1).
PHIL2 = (phil2_RightGet-> phil2_LeftGet -> phil2_LeftPut -> phil2_RightPut -> PHIL2).

FORK1 = (phil1_LeftGet -> phil1_LeftPut -> FORK1
        |phil2_LeftGet -> phil2_LeftPut -> FORK1).

FORK2 = (phil2_RightGet -> phil2_RightPut -> FORK2
        |phil1_RightGet ->  phil1_RightPut -> FORK2).

||SYSTEM = (PHIL1 || PHIL2 || FORK1 || FORK2).
```



Assignment



Assignment

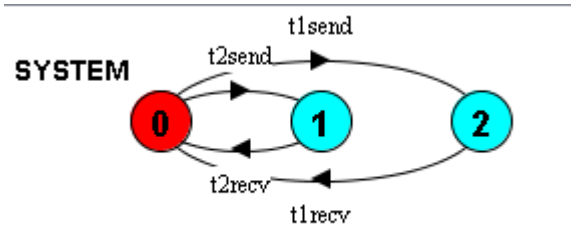
```
PHIL1 = (phil1_Fork1Get -> phil1_Fork3Get -> phil1_Fork3Put -> phil1_Fork1Put -> PHIL1).
PHIL2 = (phil2_Fork1Get -> phil2_Fork2Get -> phil2_Fork2Put -> phil2_Fork1Put -> PHIL2).
PHIL3 = (phil3_Fork2Get -> phil3_Fork3Get -> phil3_Fork3Put -> phil3_Fork2Put -> PHIL3).

FORK1 = (phil2_Fork1Get -> phil2_Fork1Put -> FORK1
        |phil3_Fork1Get -> phil3_Fork1Put -> FORK1).

FORK2 = (phil2_Fork2Get -> phil2_Fork2Put -> FORK2
        |phil3_Fork2Get -> phil3_Fork2Put -> FORK2).

FORK3 = (phil3_Fork3Get -> phil3_Fork3Put -> FORK3
        |phil1_Fork3Get -> phil1_Fork3Put -> FORK3).

||SYSTEM = (PHIL1 || PHIL2 || PHIL3 || FORK1 || FORK2 || FORK3).
```

```
Composition:
SYSTEM = PHIL1 || PHIL2 || PHIL3 || FORK1 || FORK2 || FORK3
State Space:
 4 * 4 * 4 * 3 * 3 * 3 = 2 ** 12
Composing...
-- States: 64 Transitions: 184 Memory used: 21207K
Composed in 2ms
```

Communication

Assignment

```
T1 = (t1send -> t1recv -> T1).
T2 = (t2send -> t2recv ->  T2).

SA = (t1send -> t1recv ->  SA
     | t2send -> t2recv -> SA).
SB = (t1send -> t1recv ->  SB
     | t2send -> t2recv -> SB).

||SYSTEM = (T1 || T2 || SA || SB).
```



Assignment

```
const N = 5
BUFFER = COUNT[ 0 ] ,
COUNT[ i : 0 .. N] = (when ( i < N) put -> COUNT[ i +1]
| when ( i >0) get -> COUNT[ i -1]
)/{ se n d / put , recv / get } .
PRODUCER = ( c.send -> PRODUCER ) .
CONSUMER = ( c.recv -> CONSUMER ) .
| | BOUNDEDCHAN = (PRODUCER | | CONSUMER | | c : : BUFFER ) .
```