

1 Bakery algorithm

The 2-process bakery algorithm is based on the idea that when a customer enters the bakery, he gets assigned a number, greater than all previously assigned numbers. Below is a possible implementation of this algorithm in SPL.

```
P :: [ local y1, y2 : integer where y1 = 0, y2 = 0
P1 :: [ l0 : loop forever do [
      l1 : noncritical ;
      l2 : y1 := y2 + 1 ;
      l3 : await y2 = 0 ∨ y1 ≤ y2 ;
      l4 : critical ;
      l5 : y1 := 0 ]]
      ||
P2 :: [ m0 : loop forever do [
      m1 : noncritical ;
      m2 : y2 := y1 + 1 ;
      m3 : await y1 = 0 ∨ y2 < y1 ;
      m4 : critical ;
      m5 : y2 := 0 ]]]
```

1.1 Mutex

Formulate the mutex property in temporal logic and prove that the program satisfies the property by using the M&P proof system.

1.2 1-bounded overtaking

If both process 1 and 2 are waiting for access to the critical region, process 2 can only enter the critical region once before process 1 is granted access. This property is called *1-bounded overtaking*.

Formulate this property in temporal logic and prove that the program satisfies the property by using the M&P proof system.

Delivery

Your hand-ins can be mailed to me (elian@ifi.uio.no) or delivered at the administration by March 15th 2006.