|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Messages | | | | | | | | | | | | | | | | | | | | | | |
|  | **(m)** | | | | - | | base algorithm message | | | | | | | | | | | | | | |  |
|  | **(marker)** | | | | - | | snapshot algorithm message | | | | | | | | | | | | | | |  |
|  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Variables | | | | | | | | | | | | | | | | | | | | | | |
|  | recordedP | | | | - | | true if P takes local snapshot | | | | | | | | | | | | | | |  |
|  | makerp[c] | | | | - | | true if the marker message arrived to P through channel c | | | | | | | | | | | | | | |  |
|  | stateP[c] | | | | - | | a stack holding the messages to P arrived from channel c after the local snapshot in P | | | | | | | | | | | | | | |  |
|  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Initialize | | | | | | | | | | | | | | | | | | | | | | |
|  | recordedP | | | | ← | false | | | | | | | | | | | | | | | |  |
|  | makerp[c] | | | | ← | false for all channel c | | | | | | | | | | | | | | | |  |
|  | stateP[c] | | | | ← | ∅ for all channel c | | | | | | | | | | | | | | | |  |
|  | **if** P wants to initiate snapshot | | | | | | | | | | | | | | | | | | | | |  |
|  |  | perform procedure TakeSnapshot | | | | | | | | | | | | | | | | | | | |  |
|  | **end if** | | | | | | | | | | | | | | | | | | | | |  |
|  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Algorithm | | | | | | | | | | | | | | | | | | | | | |  |
|  | **if P receives a basic message (m) through incoming channel c0** | | | | | | | | | | | | | | | | | | | | |  |
|  | **if** **recordedP** = true and **makerp[c]**= false | | | | | | | | | | | | | | | | | | | | |  |
|  |  | **stateP[c]** ← append(**stateP[c]**, **(m)**) | | | | | | | | | | | | | | | | | | | |  |
|  | **end if** | | | | | | | | | | | | | | | | | | | | |  |
|  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **if P receives (marker) through incoming channel c0** | | | | | | | | | | | | | | | | | | | | |  |
|  | perform procedure TakeSnapshot | | | | | | | | | | | | | | | | | | | | |  |
|  | **makerp[c]**← true | | | | | | | | | | | | | | | | | | | | |  |
|  | **if** **makerp[c]** = true for all incoming channels | | | | | | | | | | | | | | | | | | | | |  |
|  |  | terminate | | | | | | | | | | | | | | | | | | | |  |
|  | **end if** | | | | | | | | | | | | | | | | | | | | |  |
|  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **Procedure TakeSnapshot** | | | | | | | | | | | | | | | | | | | | |  |
|  | **if** **recordedP** = false | | | | | | | | | | | | | | | | | | | | |  |
|  |  | **recordedP** ← true | | | | | | | | | | | | | | | | | | | |  |
|  |  | send **(marker)** into each outgoing channel of **P** | | | | | | | | | | | | | | | | | | | |  |
|  |  | take local snapshot of the state of **P** | | | | | | | | | | | | | | | | | | | |  |
|  | **end if** | | | | | | | | | | | | | | | | | | | | |  |
|  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |