Process synchronization

Two processes (*producer* and *consumer*) share an array of N elements. The producer adds new elements to the array, whereas the consumer removes them. The two processes produce and consume one element at a time. As illustrated in Figure 1, the array is managed as a circular array.

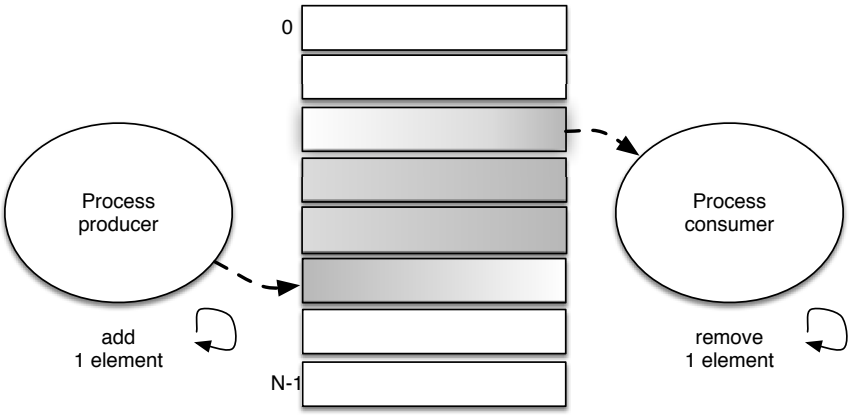

FIGURE 1 – Producer-consumer

▷ **Question 1** *Why do we need to synchronize the two processes ? What would be the consequences of a bad synchronization ?*

▷ **Question 2** *What are the three properties that must be satisfied by a program with several concurrent processes ? Illustrate these properties.*

▷ **Question 3** *What hardware mechanism can be used to set up a critical section ? Give its operation and use.*

▷ **Question 4** *Use this mechanism to solve the producer-consumer problem.*

▷ **Question 5** *What are the attributes and primitives of a semaphore ? Give examples of typical uses.*

▷ **Question 6** *Use semaphores to solve the producer-consumer problem.*