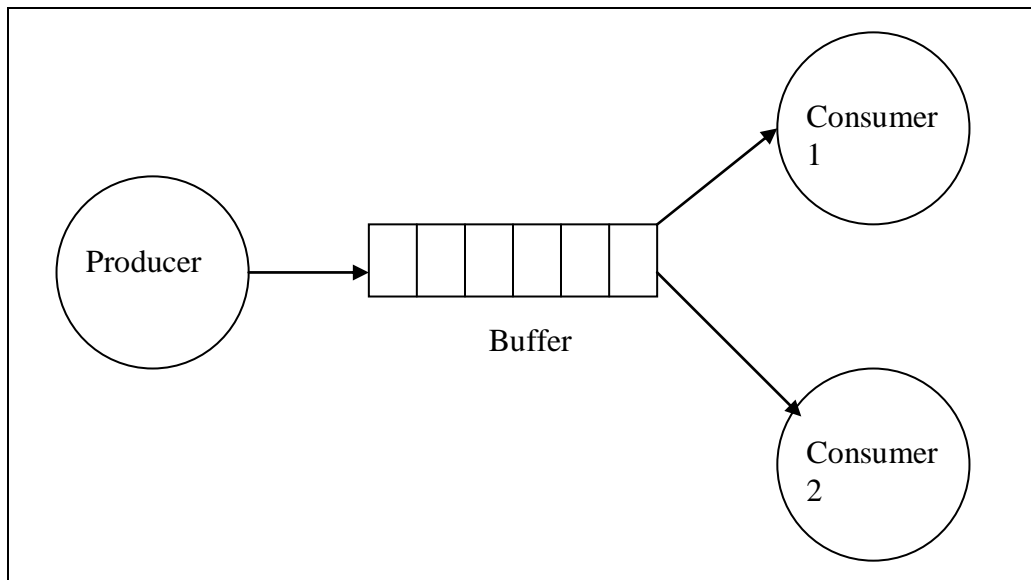




COP 6614 Operating Systems Techniques  
Assignment #1  
Due Date: 26 September, 2004 midnight

1. To write a concurrent program using BACI for the following scenarios:

- **Producer Consumer Problem:** Implement a 1 Producer and 2 Consumer problem with a shared buffer using Semaphores.



You have to implement according to the following specifications:

- The Producer code should be able to run at a speed as defined by a parameter passed to it and also must be able to produce the items as specified by a parameter; i.e., the function prototype of the producer will look something as follows:  
<return type> Producer(int seconds, int NumberOfItems)  
And say if 10 seconds is passed, then the Producer should produce 1 item every 10 seconds and put it in the Buffer (until the number of items to be produced has been reached).  
NumberOfItems denotes the number of items that the producer should produce.

- The Buffer is a fixed size buffer of size 20. i.e. it can hold up to 20 items.
- The two Consumers will run at different speeds as defined by a parameter passed to it; i.e., the function prototype of the consumer will look something as follows:  
 <return type> Consumer(int seconds, int ConsumerID)  
 Once one of the consumers detects that the buffer has been emptied, it will send a signal to the other consumer to indicate that the buffer is empty. The two consumers should then terminate normally.  
 ConsumerID is either 1 or 2 (from the above figure). This provides a way to differentiate between the two consumer processes.
- **Readers Writers Problem:** Implement a Readers Writers problem using Monitors giving preference to Writers over Readers. Note that writing is exclusive, but several readers can read at the same time. In your program's "cobegin" construct, just invoke several instances of readers and writers. Both the readers and writers shall take an ID value as parameter (used to differentiate them from one another); i.e., the function prototype will look something as follows:  
 <return type> Writer(int ID)  
 <return type> Reader(int ID)

**Deliverables:**

- Two separate documents explaining your implementation of the above two problems.
- The Source Codes for the above two problems.

Please email them by the midnight of 09/26 to [ekambara@cs.ucf.edu](mailto:ekambara@cs.ucf.edu) with the subject line as "COP 6614 – Assignment 1 Submission".