Refer to the solution to the Producer-Consumer problem (video player and streaming server problem) in the textbook that uses semaphores.

For each of the following question, show the current process, the content of the ready queue, the content of semaphore queues, and the values of semaphores – numAvailBufferSlots and numPackets. We are using the lecture note version of P() and V(). (Not the Nachos implementations of P() and V()).

**Problem 1) If Video-Player runs first before Streaming-Server produces its first packet, what happens to the Video-Player? What are the semaphore counter variable values and what do semaphore queues look like at this time (for both numAvailBufferSlots and numPackets)?**

If Video-Player runs first before Streaming-Server produces its first packet, after it calls numPacketsInBuffer.P(), Video-Player will be blocked in the numPacketsInBuffer queue. This is because numPackets will become -1. numAvailBufferSlots is 100 at this time.

**Problem 2) Streaming-Server now runs without interruption until the buffer is full. What happens to Streaming-Server and Video-Player now? What are the semaphore counter variable values and what do semaphore queues look like at this time?**

NumAvailBufferSlots.P() will run as the streaming-server fills the buffer slots, until it is equal to 0. numPacketsInBuffer.V() runs until it is equal to 100. After these things happen, streaming-server will be blocked and video-player will run again. NumPacketsInBuffer.P() will run as the video player consumes the packets, and numAvailBufferSlots.V() will run as more buffer slots become available.