

READERS-WRITERS PROBLEM

Semaphores:

Reader:	Writer:
P(ReaderCount)	
#Readers += 1	P(Mutex)
if (#Readers == 1)	
P(Mutex)	<i>Critical Section (Write)</i>
V(ReaderCount)	
<i>Critical Section (Read)</i>	V(Mutex)
P(ReaderCount)	
#Readers -= 1	
if (#Readers == 0)	
V(Mutex)	
V(ReaderCount)	

Monitors:

type ReaderWriter=Monitor;	
var	
NumReaders, TotalWriters: Integer;	
NoReaders, NoWriters: Condition;	
procedure entry StartRead;	procedure entry FinishRead;
begin	begin
if (TotalWriter>0) then	Dec(NumReaders);
NoWriters.Wait	if NumReaders=0 then
NumReaders+=1;	NoReaders.Signal;
NoWriters.Signal	
end;	end;
procedure entry StartWrite;	procedure entry FinishWrite;
begin	begin
Inc(TotalWriters);	Dec(TotalWriters);
if TotalWriters>1 then	NoWriters.Signal
NoWriters.Wait;	
if NumReaders>0 then	
NoReaders.Wait;	
end;	end;
Reader:	Writer:
var rw:ReaderWriter;	var rw:ReaderWriter;
begin	begin
.	.
.	.
rw.StartRead;	rw.StartWrite;
<READ>	<WRITE>
rw.FinishRead;	rw.FinishWrite;
.	.
.	.
end.	end.