Problem 1:

Var mutex = 1; binary semaphore;

Var bus = 0; binary semaphore;

Var waitingList = 0; nonbinary semaphore

Var seatCount = 60;

Var time = 0600;

Ticket Agent process:

Wait(mutex)

if(seats =< 60)

SeatsAvailable--;

Elseif waitingList < 50

Signal(waitinglist)

waitingList++

else

customer.goHome()

signal(mutex)

Customer process:

Wait(ticketagent)

Buy ticket

Boardbus()

signal(ticketagent)

Problem 2:

Var mutex = 1; binary semaphore;

Var bus = 0; binary semaphore;

Var waitingList = 0; nonbinary semaphore

Var waitlistCount = 0;

Var firstCount = 20

Var seatCount = 60;

Var time = 0000;

Customer()

Groupsize = n

Bool firstclass

Signal(ticketagent)

Wait(ticketagent)

Ticket Agent process:

Wait(customer)

If customer.group or customer.firstclass

If firstCount <= customer.groupSize

SellTickets()

firstCount -= customer.groupSize //Decrement group

signal(bus)

Elseif waitlistcount + customer.groupSize < 50 //see if the group should go home

Signal(waitlist)

waitlistCount += customer.groupSize //add customer’s group to waiting list

else

goHome()

else

if secondCount or seatCount !> 0

sellTicket()

seatCount--

elseif waitlistcount < 50

waitlistCount++

signal(waitlist)

else

goHome()

bus process:

while(time%300 != 0)

wait()

leave();