

C340 Concurrency
Compulsory Coursework (2 of 3)

To be handed in to G14
Deadline: Friday December 3, 12:00am

Consider the following solution to Coursework 1:

```
const MaxIF=4
range IF=0..MaxIF

ARRIVE=ARRIVE[0],
ARRIVE[num:IF]=(enterarrq[num]->ARRIVE[(num+1)%MaxIF]).

ARRIVALQ=(enterarrq[num:IF]->ARRIVALQ[num]),
ARRIVALQ[n0:IF]=(enterarrq[num:IF]->ARRIVALQ[n0][num]
|perm_land[n0]->land[n0]->ARRIVALQ),
ARRIVALQ[n0:IF][n1:IF]=(
    enterarrq[num:IF]->ARRIVALQ[n0][n1][num]
|perm_land[n0]->land[n0]->ARRIVALQ[n1]),
ARRIVALQ[n0:IF][n1:IF][n2:IF]=(
    enterarrq[num:IF]->ARRIVALQ[n0][n1][n2][num]
|perm_land[n0]->land[n0]->ARRIVALQ[n1][n2]),
ARRIVALQ[n0:IF][n1:IF][n2:IF][n3:IF]=(
    perm_land[n0]->land[n0]->ARRIVALQ[n1][n2][n3]).

| |AIRPORT=(ARRIVE | ARRIVALQ).
```

The airport also has departing aircraft. Arriving flights are given priority over departing flights. Extend the above FSP model in such a way that the air traffic control system manages incoming and outgoing flight. Specify the liveness properties that incoming flights will eventually land and that outgoing flights will eventually depart.