Airport Management: Synchronization Lab

Master M1 MOSIG, Grenoble University

2015

1 Guidelines

You are required to turn in, for **the 2nd of December 12pm**, an archive file

- in **tar.gz** format
- the file should be named using the family names of the students who have worked together
- it should contain a subdirectory for each question, containing the pseudo-code solution, as well as the C (pthread) source code
- if a code does not compile (your reference is the mandelbrot server and you should provide the compilation command), the respective mark will be 0
- your code should be clean from temporary, object and executable files
- it should contain a report in **.pdf** format, briefly (max 2 pages) explaining your progress, problems and tests

Have fun!

2 Airport Synchronization

In this problem we are interested in the landing of planes in an airport. The obvious goal being to prevent crashes. We suppose that planes are modeled as threads executing the `land` function. In the following questions we will consider different airport configurations and different ways of making the planes land.

Question .1: *Imagine a small airport having only one runway. Give the code of the* `land` *function with the appropriate synchronization solution.*

Question .2: *Suppose now that the airport has multiple runways i.e there may be several planes landing in parallel as long as they use different runways. Give the code of the* `land` *function with the appropriate synchronization solution.*

Question .3: *It is Christmas and the airport is completely full! There are so many airplanes that there are a number of them waiting in the air. The goal in this question is to make them land in the order of their arrival. Give the code of the* `land` *function with the appropriate synchronization solution.*

Question .4: *Look! There is the plane of Mr. President! Soon will arrive the planes of the ministers... The air-traffic controller has work to do: he/she needs to give priority to the government planes and still continue respecting the FIFO order for "normal" planes (the government planes also respect the FIFO order among them)! Help him/her by writing the* `land` *function with the appropriate synchronization solution.*