Text of exercise #3

Matteo Corain S256654

Laboratory #11 – System and device programming – A.Y. 2018-19

A one-way bridge is approached by cars in both directions, but being one-way it must follow three rules:

- Only cars from one direction can traverse the bridge in each moment, either the ones moving from left-to-right or the one running from right-to-left.
- There can be multiple cars going in the same direction.
- If cars from the opposite direction arrive while there are cars on the bridge, those cars in the opposite direction must wait till the bridge is cleared.

Write a Windows program to synchronize all cars traversing the bridge.

More specifically, the program must run two threads. The first thread is in charge of all cars moving from left-to-right. The second one is in charge of all cars moving from right-to-left. Each one of the previous two threads run one extra thread to represent each car.

Notice that:

- Cars running from left-to-right arrive at random time intervals, varying from 0 to `time_A_L2R` (integer value) seconds.
- Cars running from right-to-left arrive at random time intervals, varying from 0 to `time_A_R2L` (integer value) seconds.
- All cars traversing the bridge from left-to-right need `time_T_L2R` (integer value) seconds
- All cars traversing the bridge from right-to-left need `time_T_R2L` (integer value) seconds
- The program has to terminate only once exactly:
    - `number_L2R` (integer value) cars have traversed the bridge from left-to-right
    - `number_R2L` (integer value) cars have traversed the bridge from right-to-left.

The program must accept 6 parameters on the command line, namely 6 integers: `time_A_L2R`, `time_A_R2L`, `time_T_L2R`, `time_T_R2L`, `number_L2R`, `number_R2L`.

Suggestion: referring to the classical reader and writer logical scheme modify it to manipulate two sets of readers.