Summary

It is requested to create a software application that simulates the functioning of an adjustable number of parallel oriented locks, with use of the programming software Delphi and the additional library 'Tomas'. The user should be able to give certain parameters as input, like the number of locks, water levels and lock strategy. The output of this application should be at least the mean ship waiting time, the mean ship in system time, the occupation rate of the lock(s) and the activity rate of the lock(s). The simulation should also be 2-D animated.

A conceptual model is created with the lockkeeper, the lock(s) and the waiting queues as non moving elements. The ships are the moving elements and sail through the system boundary on the left side into the left waiting queue and leave the system at the right side after sailing out of the lock, and vice versa. The lockkeeper assigns a ship to a specific lock, depending on the lock strategy.

The model consists of the element classes *Lockkeeper*, *Lock*, *Ship*, and *ShipGenerator*, each having its own process. The *Delay* and the *Progress* class are used to support the simulation. The simulation is initialized with an initialization procedure.

When the application is executed, a window appears with on the left side a form, where the user is able to adjust the simulation parameters. During the simulation, an animation is shown in a new window, if desired by the user. The speed of this animation can be controlled. Also graphs visualizing important simulation data can be shown in the main window. A progress bar indicates the progress of the simulation. When the simulation is finished, a report is shown containing the most important results.

The current simulation model has some limitations, for example ships can only be positioned behind each other, not next to each other. If this model is further developed, these limitations should be taken into account. The animation should also be revised, because it is currently not able to cope with all water levels and lock lengths.