**Assignment 1: Design and build a washing machine control and physics simulation**

The control has to account for:

1. Locking the door
2. Initial water and washing powder inlet stage
3. Cleaning stage, drum rotation alternates between both directions
4. Pumping stage 1: water, soap and dirt are drained
5. Rinsing water inlet, no washing powder
6. Rinsing stage: drum rotations alternates between both directions
7. Pumping stage 2: water drained
8. Centrifuge stage low speed & pumping
9. Centrifuge stage high speed & pumping
10. Unlocking the door

The physics simulation has to account for:

1. Speed of the washing drum, (washing and centrifuge stage)
2. Water inlet valve control, water drain pump, water level
3. Washing powder dosage valve
4. Door lock

**Stage 1:** First draw up a sequence diagram showing all relevant events and have that checked by the instructor. It should show at least the following:

1. Water inlet valve status
2. Washing powder valve status
3. Pump engine status
4. Water level
5. Door lock status

**Stage 2:** After approval of the sequence diagram program a simple control with a *sweep* method that merely sequences events in the right order and with the right timing without any physics simulation. Configure a sequence diagram (timing diagram) and check that it matches the one you drew up at stage 1. Have your application checked by the instructor.

**Stage 3:** Add the physics simulation as described and connect them using *input* methods for both the control and the physics simulation. Note that this differs from just offering a sequence of events with a fixed timing. Pumping off the water e.g. takes an amount of time that depends upon the amount of water in the washing drum and the capacity of the pump in l/s. Configure a sequence diagram and check that it still matches the one you drew up at stage 1. Show that defects like a broken pump provoke the right reaction of the control. It should e.g. not be possible to open the door while there's still water in the drum. Have your application checked by the instructor.

*Points: 1 for free, 2 for stage 1, 3 for stage 2, 4 for stage 3, 1 bonus for visualizing all physics items (to be explained). Max total points 10, unused bonus is valid for other assignment.*