

# Lab Session 3:

## *Conduits Extensions II*

### **1. Source Feedback**

An overflow in a conduit can eventually cause the entire system to overflow. To prevent such an event from happening, sources must monitor the condition of the conduits downstream and be able to adapt their flow when the amount of fluid in the conduits downstream reaches critical levels. For example, whenever a pipe downstream is filled more than 95%, a source will reduce its flow until the pipe is filled less than 95%. After that, the source maintains its production to ensure a maximal throughput of the conduits system. This means that if the same pipe becomes filled less than 80%, the source increases its production again.

Implement a source that adapts its production whenever a pipe in its downstream is filled more than a certain percentage (with 100% being an overflow) **or** less than a certain percentage (with 0% being completely empty). The goal of the source is to maximize throughput in the conduits system without overflowing it. Such a source does not use a profile to produce its flow but rather starts by producing a steady amount of liquid. After some time, it either augments or decreases its production such that at least one conduit in its downstream reaches the critical level, after which the source decreases its production. Afterwards, the source continues to monitor the conduits downstream to guarantee maximum throughput.

A conduit is located in the downstream of a source if the fluid that is produced by that source can flow through the conduit. Mind that a single conduit can be located in the downstream of multiple sources.

Use an aspect to implement the monitoring of conduits.