Optional Assignment on Flow Logic

If you want to earn full credits for the summerschool by doing the assignment on Flow Logic you should solve the following exercise:

1. Find and read a suitable reference on the process algebra CSP;
   • make sure to select a version where values are passed as part of communication.

2. Define the syntax and operational semantics of CSP;
   • explain the choices made;
   • informally argue why it captures the intention behind CSP.

3. Develop a simple control flow analysis in the Flow Logic format for determining which values reach what places;
   • explain the choices made;
   • illustrate the analysis on a well-chosen example;
   • argue in detail for the well-formedness of the specification;
   • formally prove the subject reduction result;
   • establish the Moore family result.

Try to answer one of the following questions:

4a. Estimate the complexity of the Flow Logic specification.

4b. Develop an interesting analysis (perhaps dealing with security) on top of your simple control flow analysis.

Write the report in the form of a conference style paper.

It is quite acceptable to seek inspiration in the slides and in published papers (e.g. http://www2.imm.dtu.dk/~nielson/FlowLogic.html or papers providing partial answers to question 2).