Concurrency: Theory, Languages and Programming

– Proofs in π-Calculus –

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(Exam) Questions?

CCS / Pi

- concurrency primitives
- read & write labeled transition semantics rules
- derivation of transitions
- simulation, mutual & bi- simulation
- strong vs. weak
- modeling exercises/examples w/ and w/out mobility

Scala

- transforming calculus into “language”
- transforming “language” into calculus
- representation of “high-level” concurrency primitives

Joint Foundations for Lambda & Pi

- α-conversion & substitution
- equivalences
- contexts & congruence

Lambda

- semantics using evaluation contexts
- reduction strategies
- various equivalences
- Y recursion

Exercise: Semaphores

- recall the examples from Session 8
- now, think different !

- informal description of specification and implementation
- model in Pi
- run in Scala
- verify using the ABC