

Lack-of-progress Properties

Deadlock

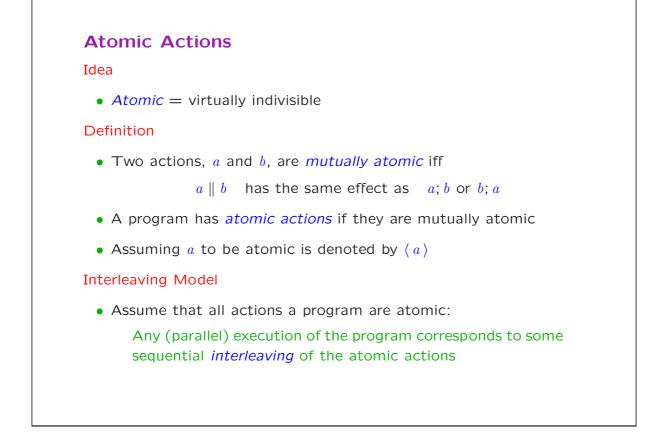
- *Deadlock* = cycle of processes waiting for each other (for ever)
- Typical cause: incremental reservation of shared resources

Starvation

- A process suffers from *starvation* if it could make progress, but never does so
- Typical causes: Unfair scheduling, priorities, bad luck

Livelock

- *Livelock* = mutual starvation (*after-you-after-you*)
- Like deadlock, but can be escaped
- Typical cause: Symmetrical strategies
- Note: Andrews sets *livelock = deadlock —* we don't



Critical References

- A simple variable is held in a machine word
- Access to simple variables is assumed atomic on standard HW
- A critical reference is either:
 - Reading a simple variable written by another process
 - Writing a simple variable accessed by another process
- Access to *non-simple variables* counts for more critical references

Rule of Critical References

• S contains at most one critical reference \Rightarrow S is atomic

