Ch3
• Deadlock definition
  – Difference from starvation
• Conditions for Deadlock
  – Exclusive access
  – Hold & Wait
  – Non Preemption
  – Circular Wait
• Handled by prevention, detection, avoidance
Models of Deadlock

- Single Unit Request
- And Model
- Or Model
- And/Or Model
- P out of Q model
- Resource Models
  - Reusable
  - Consumable
Graph Theoretic Models

- Set of processes, set of resources (can be partitioned into disjoint set of consumable and reusable)
- Reusable resources have a count, consumable resources have a set of producers
General Resource Graph

• Bipartite (why?) directed graph with processes and resources as nodes
• Request edge directed from process to resource
• Assignment edge from reusable resource to process
• Producer edge from consumable resource to process