

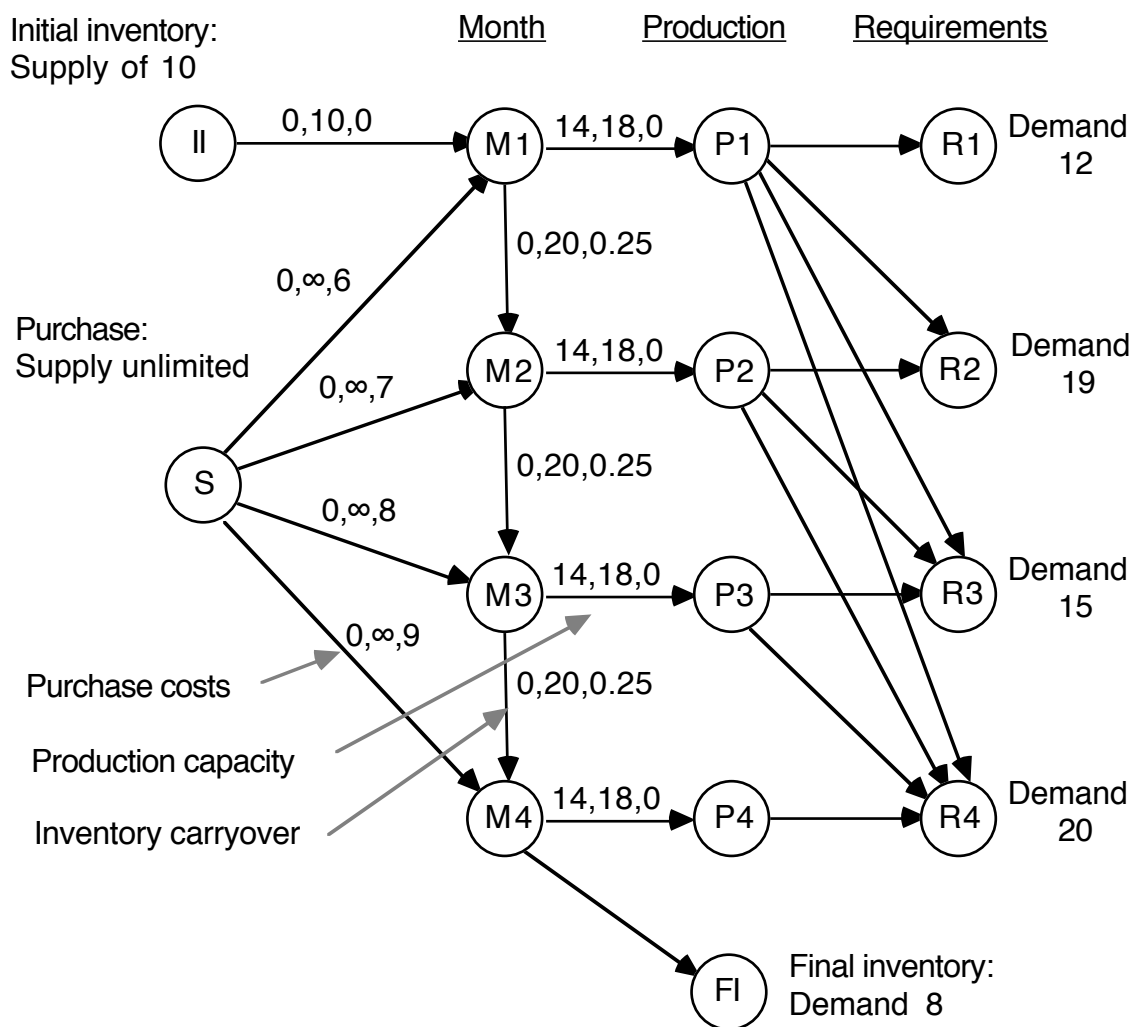
INVENTORY MANAGEMENT PROBLEM

- A particular material is used in manufacturing a product. An initial inventory of 10 units is on hand. The maximum inventory capacity is 20 units. An inventory of 8 units is required at the end of the next four month planning period.
- The current unit price of the material is 6, but it is expected to increase by 1 during each of the next several months. The unit cost of keeping the material in inventory is 0.25 per month.
- Contractual obligations require production which will consume 12, 19, 15, and 20 units of material over the next four months. Early shipment of the finished product is possible but is constrained by a maximum utilization of 18 units of material per month and a minimum utilization of 14 units per month.

HOW much raw material should be purchased in each month to minimize total cost?

NETWORK REPRESENTATION

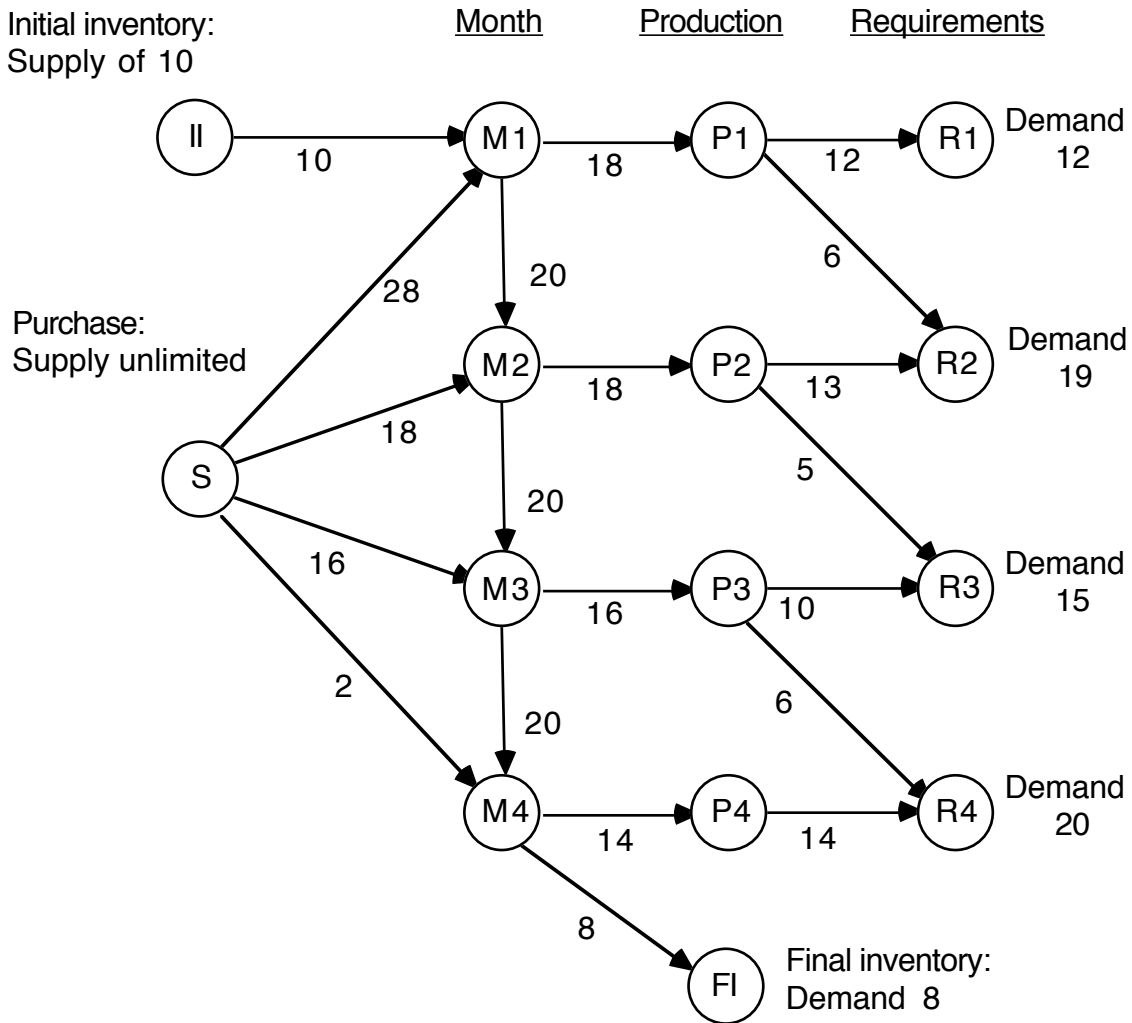
This is a **capacitated MCF problem**: some arcs have upper and/or lower bounds on the allowable flow x_{ij} .



All edges have (lower bound, upper bound, unit cost) values of $(0, \infty, 0)$ unless labeled otherwise.

OPTIMAL SOLUTION

Initial inventory:
Supply of 10



TOTAL COST = 455