

## Purchasing Components

American Electronics Corporation (AEC) is a leading manufacturer of networked computer systems and associated peripherals. Their product line consists of two families: The desktop (DK) family and the laptop (LP) family. Within each family there are different models for sale as shown in the following table of marketing data. In the table we find marketing estimates of the maximum demand potential in the coming quarter for the individual models as well as for the families. In addition, information is given on minimum demand levels, which represents sales contracts already signed with major distributors. The DK-1 model can also act as a server on a local area network (LAN).

Model	Minimum Demand	Maximum Demand	Selling Price (\$)
DK-1	–	1800	3500
DK-2	600	–	2000
DK-3	–	300	1500
DK family	–	3600	–
LP-1	500	–	1500
LP-2	400	–	800
LP family	–	2500	–

AEC is a vertically integrated firm, manufacturing many of its own key components. Recently, AEC headquarters has learned from its semiconductor division that the supply of their new CPU chips is limited for the foreseeable future. In addition, the memory division has capacity to produce a limited number of disc drives, and there are limits to the number of memory chips their supplier will make available to them for purchase. This information, in the form of quarterly supply quantities, along with usage information on the composition of various products, is summarized in the following table.

component	DK-1	DK-2	DK-3	LP-1	LP-2	supply limit
CPU chip	2	1	1	1	1	6,000
Disk Drives	2	2	1	2	1	9,000
Memory Chips	4	2	2	2	1	12,000

To help understand the problem they are facing, planners at AEC have asked you to build a linear programming model for revenue maximization (as a surrogate for market share) subject to the above specified limits on demands and supplies.