Cabinet Problem

Linear Programming

Problem Source: https://www.purplemath.com/modules/linprog3.htm

The Problem

You need to buy some filing cabinets. You know that Cabinet X costs $10 per unit, requires six square feet of floor space, and holds eight cubic feet of files. Cabinet Y costs $20 per unit, requires eight square feet of floor space, and holds twelve cubic feet of files. You have been given $140 for this purchase, though you don't have to spend that much. The office has room for no more than 72 square feet of cabinets. How many of which model should you buy, in order to maximize storage volume?

Approach

	Cabinet X	Cabinet Y	Total
Cost	10	20	140
Floor Space	6	8	72
Hold	8	12	

Requirement - Maximise Storage Volume

LP Solution

Max 8X + 12Y

St

10X + 20Y <= 140 # Cost Constraint

6X + 8Y <= 72 # Space Constraint

X >= 0

Y >= 0

To Find X and Y & Max Holding Space

X = Number of Cabinet X
Y = Number of Cabinet Y