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Week 5 Homework

Chapter 9

Question 9

Consider the data in the Excel file Nuclear Power. Use a simple linear regression to forecast the data. What would be the forecast for the next 3 years?





Chapter 13

Question 1

Valencia Products makes automobile radar detectors and assembles two models; LaserStop and SpeedBuster. The firm can sell all it products. Both models use the same electronic components. Two if these can be obtained only from a single supplier. For the next month, the supply of these is limited to 4,000 of component A and 3,500 of component B. The number of each component required for each product and the profit per unit are given in the table.

|  |  |  |  |
| --- | --- | --- | --- |
| Component Required/ Unit | | | |
|  | A | B | Profit/unit |
| LaserStop | 18 | 6 | $24 |
| SpeedBuster | 12 | 10 | $40 |

1. Identify the decision variables, objective function and constraints in a simple verbal statements.

The decision variables

* X1- Lasertop product
* X2- Speedbuster product

Objective function

* Maximize= 24X1+40X2

Constraints

* 18X1+12X2 ≤ 4000
* 6X1+10X2 ≥ 3500

1. Mathematically formulate a linear optimization model.

Maximize z= 24X1 + 40X2

Subject to constraint 18X1 +12X2≤ 4000

6X1+10X2 ≥ 3500

X1,X2 ≥ 0

5. Implement the linear optimization model that you developed for Valencia Products in Problem 1 in Excel and use Solver to find an optimal solution. Interpret the Solver Answer report and identify the binding constraints and verify the values of the slack variables by substituting the optimal solution into the model constraints.

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