

Assignment 1

- 1) Decision Variable: In this scenario there are 2 decision variables

Which is number of collegiates to produce in a week and number of minis produced in a week

B1 = Number of collegiate to produce / week

B2 = Number of mini to produce / week

- 2) What is objective function:

The objective of the problem is to maximize profit by identifying how many units to be produced for each backpack.

Collegiate (B1) = 32 \$ profit

Mini (B2) = 24 \$ profit.

Max combined profit for both backpack (P) = 32(B1) + 24(B2)

- 3) Constraints:

- 1) Nylon and Labour Hours

According to the problem statement 3 sq ft of nylon is required for Collegiate
= 3(B1)

According to the problem statement 2 sq ft of nylon required for mini= 2(B2)

3(B1) + 2(B2) <= 5000

According to the problem statement time required to make 1 B1 = 45 min

According to the problem statement time required to make 1 B2 = 40 min

35 labour working 40 hrs per week = 1400 hrs

Converting into min = 1400 * 60 = 84000

45(B1) + 40(B2) <=84000

4) Mathematical formulation for this LP problem:

Max combined profit for both backpack (P) = $32(B1) + 24(B2)$

Raw material required: **$3(B1) + 2(B2) \leq 5000$**

Labour hour required: **$45(B1) + 40(B2) \leq 84000$**

$B1, B2 \geq 0$