(ASSIGNMENT-1)

LINEAR PROGRAMMING FORMULATION MODEL

Data given

- Two models produced by back savers are Collegiate and Mini.
- Material required to produce each Collegiate is 3 square feet and each Mini is 2 square feet.
- Shipment of material per week is 5000 square feet.
- 1000 Collegiate and 1200 Mini sold per week.
- Time required to produce each Collegiate and Mini is 45 **minutes** and 40 **minutes** each respectively.
- Profit produced by each Collegiate and Mini is $32 and $24 each.
- Total **laborers** available for the company is **35** and each provided with **40 hours** per week.

Model	Material required for each model	Sold per week	Time required for each labor to produce	profit
Collegiate	3 sq. Ft	1000	45 minutes	$32
Mini	2 sq. Ft	1200	40 minutes	$24

Decision Variables

X- Number of Collegiate model quantity required to produce per week.

Y-Number of Mini model required quantity to produce per week.

Z_{max} -Maximize Profit per week.

Objective Function

Z_{max} = 32X+24Y

Constraints

1.Sales forecast mentioned is X model is 1000 and Y model is 1200 per week so it's a restriction.

$X \leq 1000$

$Y \leq 1200$

2.Total shipment they can receive per week is 5000 square feet.

$3X+2Y \leq 5000$

3.Labor time required to produce each model in minutes.

$45X+40Y \leq 84000$

(Explanation for 84000 minutes

According to given data 40 hours per week which should be converted into minutes is 40*60=2400 minutes.

Number of laborers mentioned is 35 so 35*2400=84000 total minutes available.)

4.Non-negativity restrictions.

$X \geq 0$

$Y \geq 0.$

Mathematical Linear Programming Formulation

Standard form:

Maximize $Z = 32X+24Y$

Subject to the restrictions:

$3X+2Y \leq 5000$

$45X+40Y \leq 84000$

$X \leq 1000$

$Y \leq 1200$

and

$X \geq 0$

$Y \geq 0$.