Case Study: Crafty Brews Brewing Company Optimization

Crafty Brews Brewing Company is a renowned craft beer producer offering a variety of craft beer types. The company supplies its products to three main client types: Bars, Restaurants, and Retail Stores. Crafty Brews aims to optimize its production and distribution strategy to maximize profit while adhering to various constraints and client preferences. Crafty Brews produces the following craft beer types: IPA (India Pale Ale), Stout, Lager, Pilsner, Wheat Beer, and Saison

Pricing:
The company offers different prices for each unit of beer type based on the client type:

Beer Type	Price for Bars	Price for Restaurants	Price for Retail Stores
IPA	$4.10	$3.60	$3.10
Stout	$4.30	$3.80	$3.30
Lager	$3.90	$3.40	$2.90
Pilsner	$4.00	$3.50	$3.00
Wheat Beer	$4.20	$3.70	$3.20
Saison	$4.40	$3.90	$3.40

Production Costs:
Crafty Brews incurs a brewing cost per unit for each beer type:

Beer Type	Brewing Cost
IPA	$1.55
Stout	$1.75
Lager	$1.45
Pilsner	$1.50
Wheat Beer	$1.60
Saison	$1.70

Production Capacity:
The company has a maximum brewing capacity per week for each beer type:

Beer Type	Max Capacity
IPA	12500
Stout	12000
Lager	10000
Pilsner	12000
Wheat Beer	11500
Saison	9500

Budget:

Crafty Brews has a weekly budget of $105,000 for brewing and delivery(transportation).

Transportation cost and capacities:

Transportation to these clients is done by 3 types of trucks. Costs and capacities are given below:

Transportation cost	cost	cap per truck (no of bottles)	max no of trucks
small truck	$0.20	1000	20
medium truck	$0.15	2000	12
large truck	$0.10	3000	7

Delivery and Client receiving Capacity:

All Bars and restaurants can accept at most four types of beer and at least two types per that week.

Retail Stores require a diverse selection, demanding at least four different types of beer in their order in every week.

Crafty Brews has maximum delivery capacities per week for each client type:

Client Type	Max Delivery Capacity
Bars	20000
Restaurants	17000
Retail Stores	28000

Build an optimization model for this to maximize the profit of Crafty Brewing company.