MATH 381 Project Proposal

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Profit optimization for marketing agency

Phenomenon: We have a company that offers various advertising services to clients. Each service has different resource requirement and generates different profit. The company has a limited amount of resources and they would like to know the optimal number of projects they should take to maximize profit.

Goal: Find optimal number of projects of each type that the company should take on each month to maximize profit while making sure employee work hours are being used to their fullest degree.

Impact: Help the company generate more profit.

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Plan: Make Linear model with fixed and non-fixed constraints

Sample Problem:

Company offers 3 services: Plans A, B and C. Plan A generates $100, B generates $50, C generates $75 per month. A requires 5 hours of work, B requires 2 hours of work and C requires 3.5 hours of work per month. A costs $60 to complete, B costs $30 to complete and C costs $40 to complete. Assuming each project takes a month to complete and total number of hours that the company operates is 50 hours per month and total budget is $5,000. By law, the company cannot take on more than 60 projects per month. How many projects of each kind should the company take on per month to maximize profit.

Mathematical Model:

Decision variables: A, B, C where A is number of plan A, B is number of plan B and C is number of plan C.

Objective Function: Max 40A + 20B + 35C

Constraints: 60A + 30B + 40C <= 5000

5A + 2B + 3.5C <= 50

A + B + C <= 60

Solution: A = 0, B = 25, C = 0

Max Value for objective function = 500.

Interpretation: The company should only offer service of type B to maximize profit. They should take on 25 clients each month and this will result in 500$ in profit.

References: Operations Research by Winston