Question: 12 / 20
Designer: Christopher Sun

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Operations Research Group

Scream for Ice cream!

Description

You're planning to rebuild your ice cream truck for the upcoming summer. You have the budget to make 5 upgrades into three possible improvements: 1) Speed, 2) Capacity, 3) Durability. Your current Ice cream truck has the following characteristics for these 3 attributes: Speed: 20 km/h, Capacity: 3 ice cream buckets, Fuel tank durability: 5 stops a work shift. For every upgrade you make in Speed: your truck travels 5km/hr faster, Capacity: holds 1 ice cream bucket more, and Fuel tank durability: ability to travel one stop further. Given the following data on the demand and distance to each ice cream stop, which upgrades will you make and what stops will you go to in order to make the most profit from customers in 3 hours?
The distances from stop to stop as well as details for each stop in the data provided.

Datasets Provided

`'Demand'`: A matrix containing information on the Ice cream stop #, Demand (Buckets), Time Spent to serve (minutes), Profit ($)

`'Distances'`: A matrix in which the (*i,j*)th element is the distance between stops from stop *i* to stop *j*.

Solution Requirements

Please submit the number upgrades to each category (Speed, Capacity, Durability respectively) and the order of the stops you plan to visit to maximize profit in a .xlsx (Excel file) under a column header as shown below. Submitting a 0 in the upgrade category indicates no upgrade given. Leave columns empty if no further stops can be made (i.e. if your trip only makes 6 stops, leave cells for stop 7 to stop 10 empty).

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Submission Columns:
Speed Upgrade, Capacity Upgrade, Durability Upgrade, Stop 1, Stop 2, Stop 3, Stop 4, Stop 5, Stop 6, Stop 7, Stop 8 , Stop 9 , Stop 10