

Tourism Company

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TOPICS COVERED

1 Natural Language

2 Problem Description

3 Implementation

4 Conclusion



WHAT IS THE PROBLEM?

We found it hard to decide how many trip packages it should sell in case to maximize profit and customer satisfaction.

The company provides two trip packages, package A and package B. To maximize the profit, the manager advises that the price of package A is 2400 SR/Star and, package B is 2500 SR/Star.

PROBLEM DESCRIPTION

	PACKAGE A	PACKAGE B	MINIMUM REQUIREMENT
PRICE /STAR	2400	2500	
No. of Days	5 DAY	3 DAY	200 Days
Activites	2 ACTIVITIES	3 ACTIVITIES	400 Activities
Hotel Board	1 BOARD	2 BOARD	100 Meal
Cities Visited	3 CITY	1 CITY	400 Cities

Problem Description

Constraints:

- Number of days ≤ 200
- Activity ≤ 400
- HotelBoard ≤ 100
- CitiesVisited ≤ 400

Objective Function:

$$2400 * \text{PackageA} + 2500 \text{ Package B}$$

BASIC LOCAL SEARCH

••• Run Sample

The Initial Solution is (4 , 1) With Objective Function = 12100

The Neighbors: [[7, 2], [7, 4], [5, 4], [6, 4], [5, 3]]

The maximum objective among these neighbors is (26800) With the value= (7 , 4)

The Neighbors: [[9, 6], [8, 7], [9, 5], [8, 5], [10, 7]]

The maximum objective among these neighbors is (41500) With the value= (10 , 7)

The Neighbors: [[13, 9], [11, 8], [11, 9], [12, 8], [12, 10]]

The maximum objective among these neighbors is (53800) With the value= (12 , 10)

Feasible solution set: [26800, 41500, 53800]

The Maximum objective function is: 53800 of the value (12 , 10)

BASIC LOCAL SEARCH

Run Sample

The Initial Solution is (3 , 3) With Objective Function = 14700



The Neighbors: [[6, 5], [5, 5], [6, 6], [5, 4], [4, 6]]

The maximum objective among these neighbors is (29400) With the value= (6 , 6)

The Neighbors: [[7, 8], [7, 9], [7, 7], [9, 8], [8, 9]]

The maximum objective among these neighbors is (41700) With the value= (8 , 9)

The Neighbors: [[9, 11], [10, 12], [11, 11], [10, 11], [11, 12]]

The maximum objective among these neighbors is (56400) With the value= (11 , 12)

Feasible solution set: [29400, 41700, 56400]

The Maximume objective function is: 56400 of the value (11 , 12)

POPULATION-BASED SEARCH 22

••• Run Sample

First Population: [86500, 37400, 41000, 58000, 19700]

Loop Number 1 :

new population: [106100, 57000, 60600, 77600, 39300]

The population before dropping lower values: [106100, 86500, 77600, 60600, 58000, 57000, 41000, 39300, 37400, 19700]

The population after selecting the maximum objective functions: [106100, 86500, 77600, 60600, 58000]

The point (14 , 29) has an objective function = 106100

The point (10 , 25) has an objective function = 86500

The point (24 , 8) has an objective function = 77600

The point (19 , 6) has an objective function = 60600

The point (20 , 4) has an objective function = 58000

POPULATION BASED SEARCH

Run Sample



Loop Number 2 :

new population: [115900, 66800, 70400, 87400, 49100]

The population before dropping lower values: [115900, 106100, 87400, 86500, 77600, 70400, 66800, 60600, 58000, 49100]

The population after selecting the maximum objective functions: [115900, 106100, 87400, 86500, 77600]

The point (16 , 31) has an objective function = 115900

The point (14 , 29) has an objective function = 106100

The point (26 , 10) has an objective function = 87400

The point (10 , 25) has an objective function = 86500

The point (24 , 8) has an objective function = 77600

POPULATION-BASED SEARCH

Run Sample

Loop Number 3 :

new population: [125700, 76600, 80200, 97200, 58900]

The population before dropping lower values: [125700, 115900, 106100, 97200, 87400, 86500, 80200, 77600, 76600, 58900]

The population after selecting the maximum objective functions: [125700, 115900, 106100, 97200, 87400]

The point (18 , 33) has an objective function = 125700

The point (16 , 31) has an objective function = 115900

The point (14 , 29) has an objective function = 106100

The point (28 , 12) has an objective function = 97200

The point (26 , 10) has an objective function = 87400

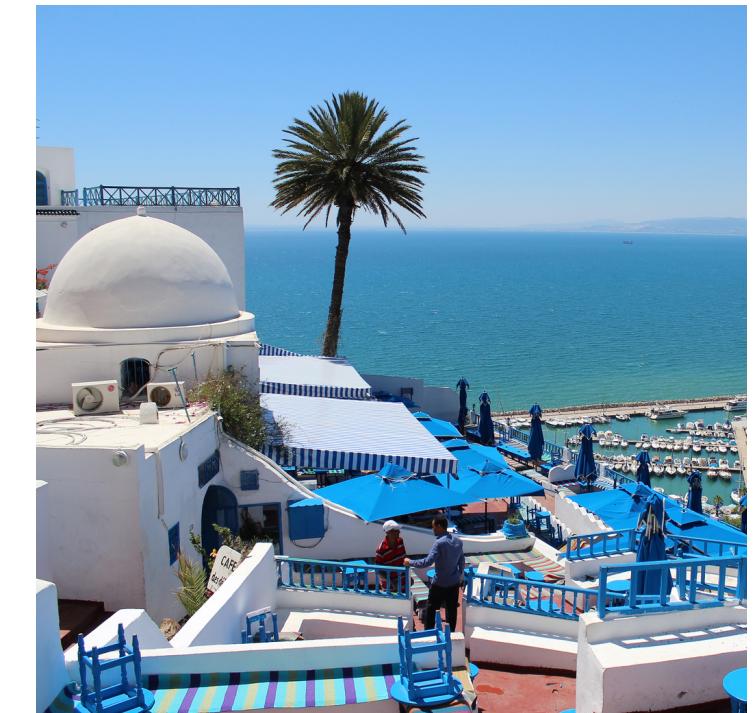
Conclusion

Based on the previous results:

We found that the population-based search has the best results:

BASIC LOCAL SEARCH

Highest objective Function:
 $P = 56400 \text{ SR/STAR}$
with the number of sales of Package, A is 11 and package B is 12



Population-Based

Highest objective Function:
 125700 SR/STAR
of 18 sales of Package A and 33 of Package B

Thank You!