



EXPECTED VALUE OF PROFITS FROM SALES OF A PUBLISHING COMPANY

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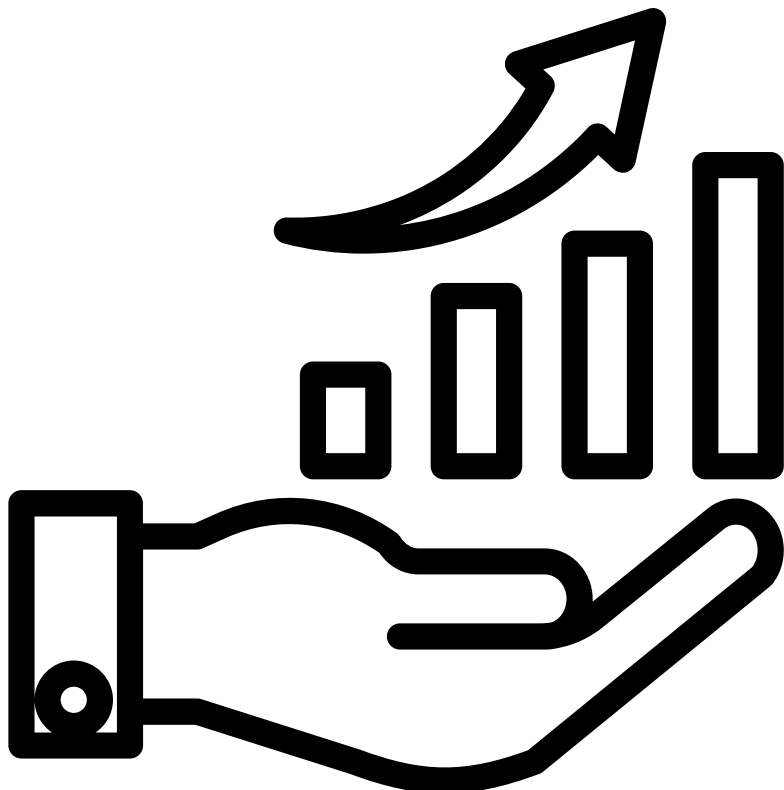
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Summary

Based on the need of an educational book distributor to optimize its sales strategy, we employed a Monte Carlo simulation due to the impossibility of customizing resources for each client. Using data collected on customer visits, we seek to maximize profits by considering variables such as customer location and sales categories. To achieve this we use the vehicle routing problem (VRP) to optimize routes and minimize costs. The simulation, implemented in Python, uses real data and shows results that improve sales and routing strategies, highlighting the relationship between sales and test costs per book. This creates valuable information for the publishing company.

Introduction

Due to the high number of students and the high demands for educational quality, it is not feasible for an educational book distributor to customize its resources for each customer. To maximize their profits, they must plan a sales strategy for their learning consultants, choosing where to offer their products most effectively. The distributor contacted us to design a market simulation to optimize its profitability by considering various scenarios. During the year, the publisher collects data on the visits of its employees and the status of each potential teacher customer, so it would be inefficient not to use this information to improve its sales plan. Trying new strategies without evidence of their effectiveness would be risky, and a simulation would help find an optimal solution.

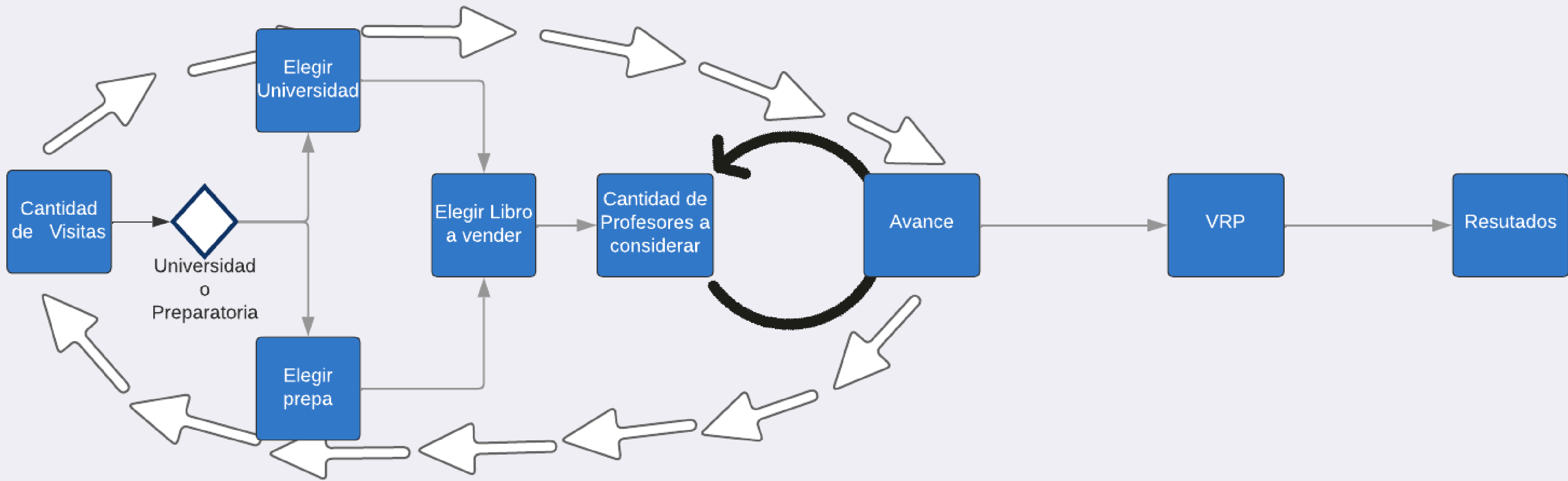


Objective

The objective of the project is to create a simulation of the distribution system that maximizes profits by identifying effective parameters such as customer location, sales values by category and average visit profit, among others

Methodology

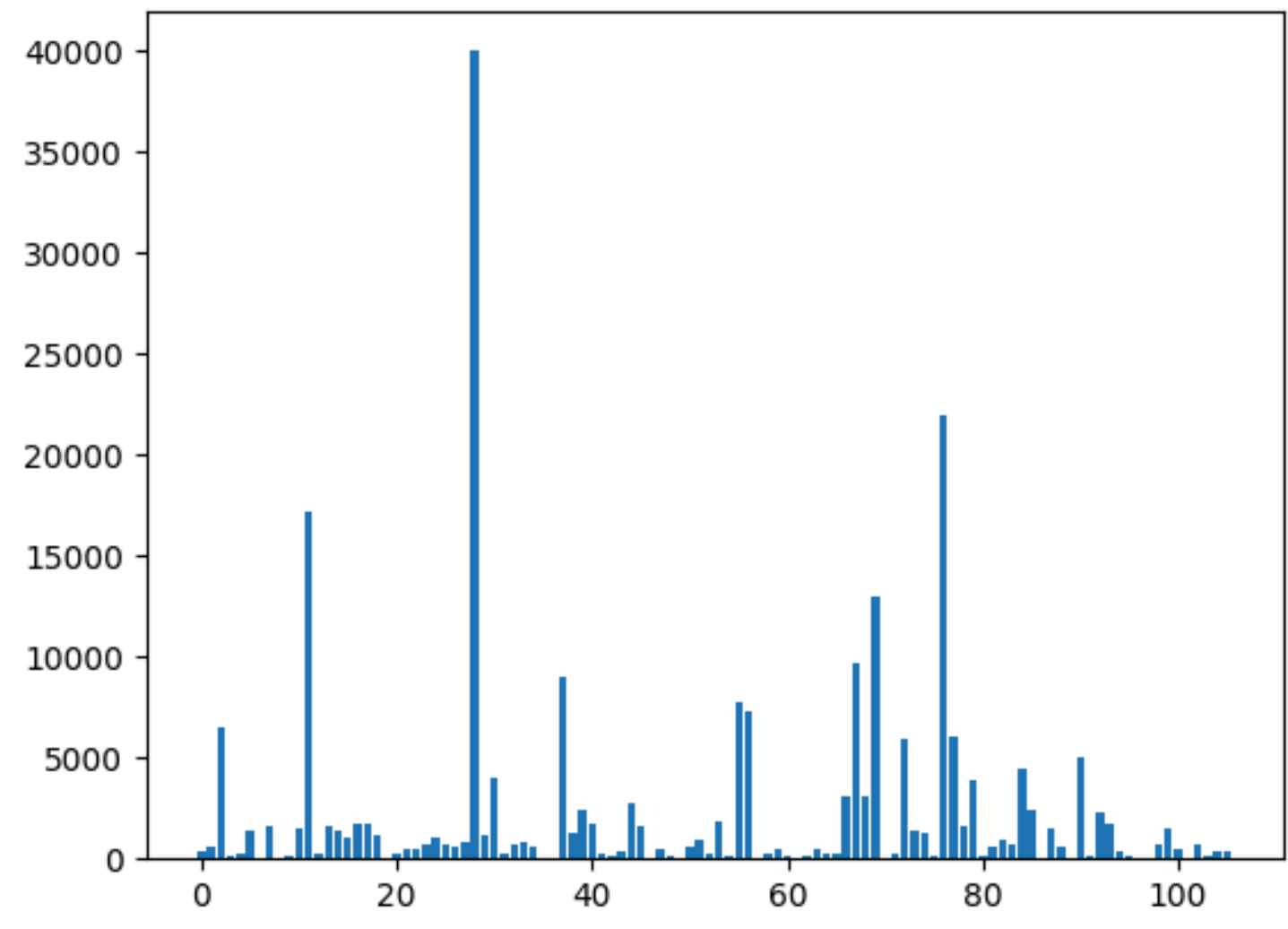
The values needed for the simulation will be taken from the historical values provided by the company. For this, apart from the book profits, the costs of the route that the salesman will take to sell the products must be taken into consideration. For this we will use a VRP that calculates the best route between the schools visited in a day and gives us its cost. In this way we create a complete simulation that models the entire sales process exemplified by the diagram shown below.



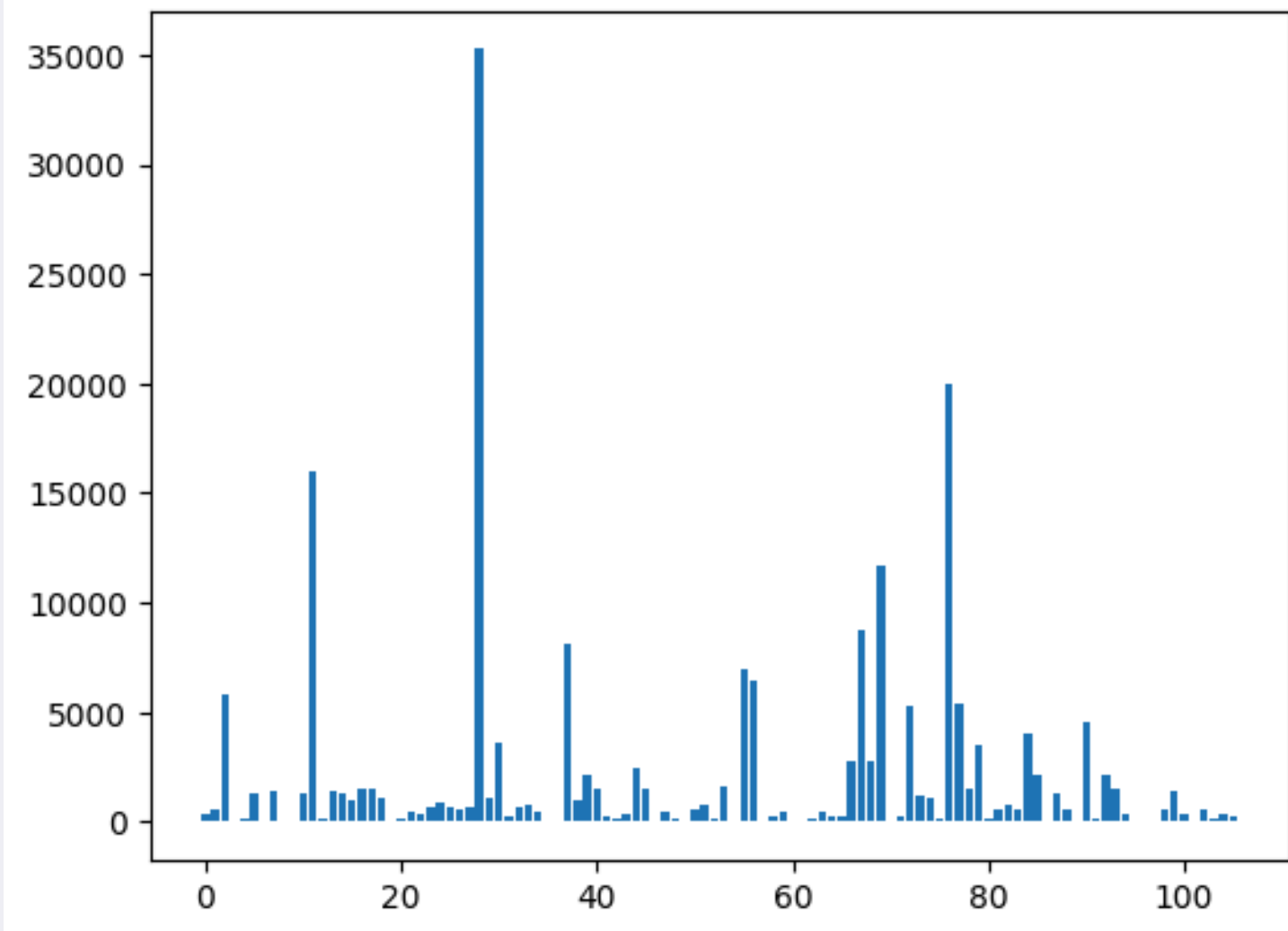
Results

We successfully determined book-dependent expected values for revenue, sales, profits, among others. We were also able to determine the relation between free samples and sales, revenue and sample costs, free samples and revenue, among others. We also calculated closure percentages given different conditions for our chosen agent.

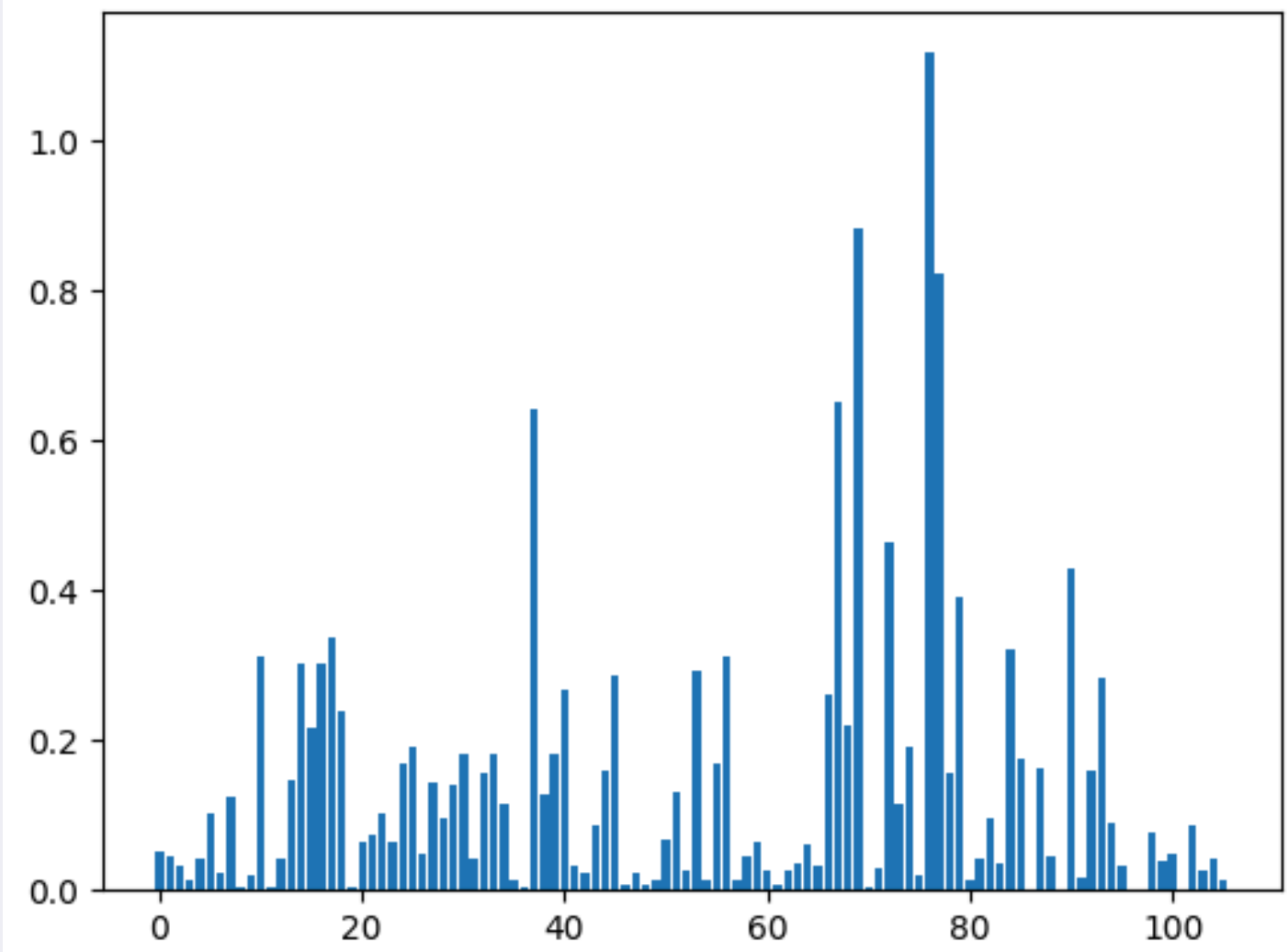
Revenue by Book



Profit by Book



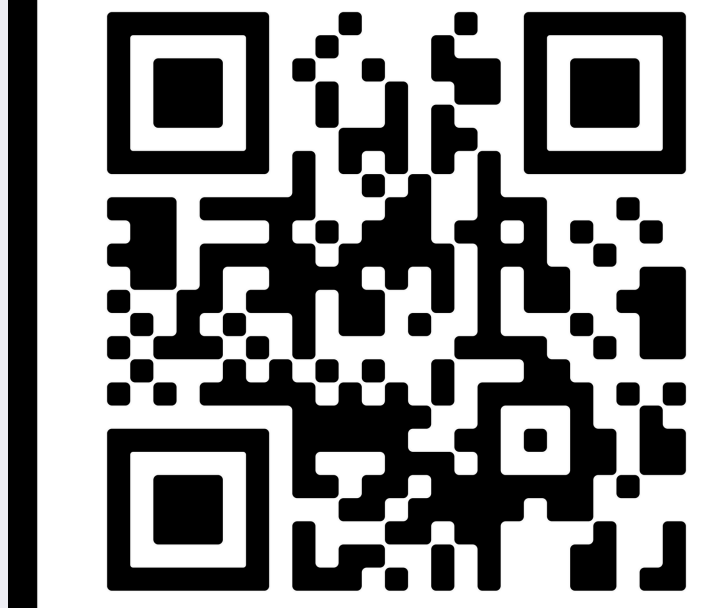
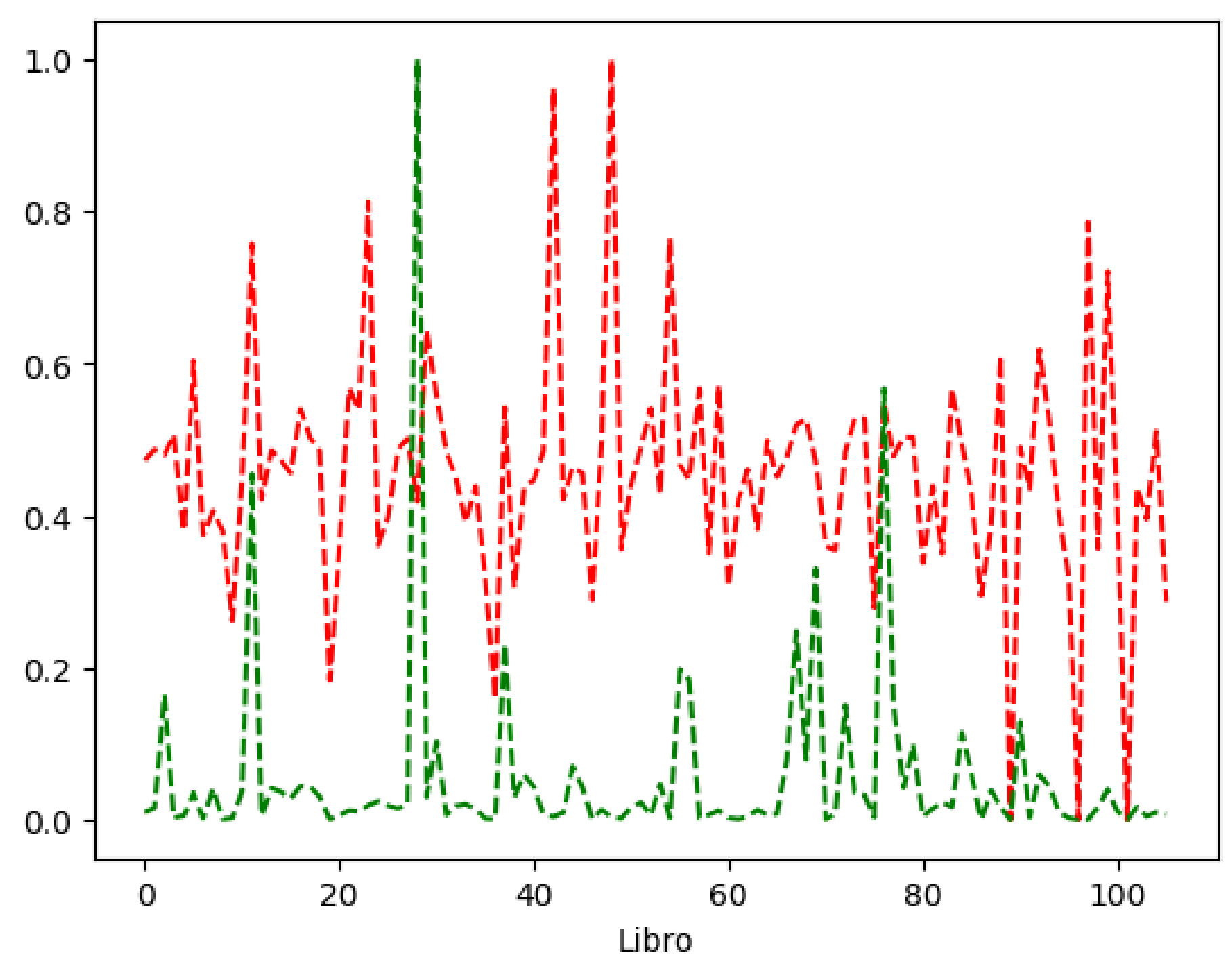
Sales by Book



	Given	Global	Theorical Agent	Experimental Agent
Total	0.25	0.2184	0.1381	0.2986
Given Free Sample	0.40	0.5016	0.5089	0.4576

Conclusion

Based on the above analysis, our recommendations are mainly focused on giving greater focus to the books that have a better relationship between the evidence given and the income obtained, in order to take advantage of this opportunity. As well as considering not to spend resources on books with a low ratio that could result in losses for the company.



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