Monte Carlo Simulation for Library Acquisitions

JinKyung Lee and Shyui Liu
School of Information Sciences, University of Illinois at Urbana-Champaign

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Introduction

Library Acquisitions refer to a library response for the selection and purchase of materials or resources. While collection development focuses primarily on selection, acquisitions makes that selected, paid-for content available to authorized uses. Thus, acquisitions cannot be simply explained as “buying books.” Acquisitions should be considered all the process of the purchase, ordering, receiving, establishing access, and paying. Also, acquisitions should be considered a library’s physical space, budget, and their collections they house.

We create A Monte Carlo Simulation for Library Acquisition focusing on printed books and e-book. Each library has different patrons preference between two different formats. Based on patron’s needs and preference in a certain format of resources, each library consider to purchase a certain format more than the other format. Also, depending on preference of the two formats, variables a library should consider might change. For example, in terms of printed books, a library considers budget, available space for new materials, labor costs for cataloging and circulation, and preservation. Unlike printed book, a library should consider budget, aggregators, access contract, cataloging cost, etc.

Our primary goal of the simulation is to suggest better acquisitions to purchase new materials based on these variables.

Hypothesis

Annual budget and a library space is stable, although budget might be changed year by year. Also, a total library space is fixed, available space is gradually decreased because of new physical materials.

We simulate probability of that a library purchases only physical books as a preliminary simulations. Next, we simulate probability of that a library purchases both physical books and e-books.

In terms of the preliminary simulation, available space and budget may not remarkably impact on a library’s annual plan to purchase of books. However, e-book may crucially impact possible purchased number of titles, because to purchase e-book has more variables such as prices depending on access condition and contract with aggregators. According to Jesse Holden, “options for the acquisition of eBook bundles tend to be more numerous and varied” than printed books.[1)]

1) Holden, Jesse. Acquisitions: Core Concepts and Practices. Chicago: Neal-Schuman, 2017: 61.

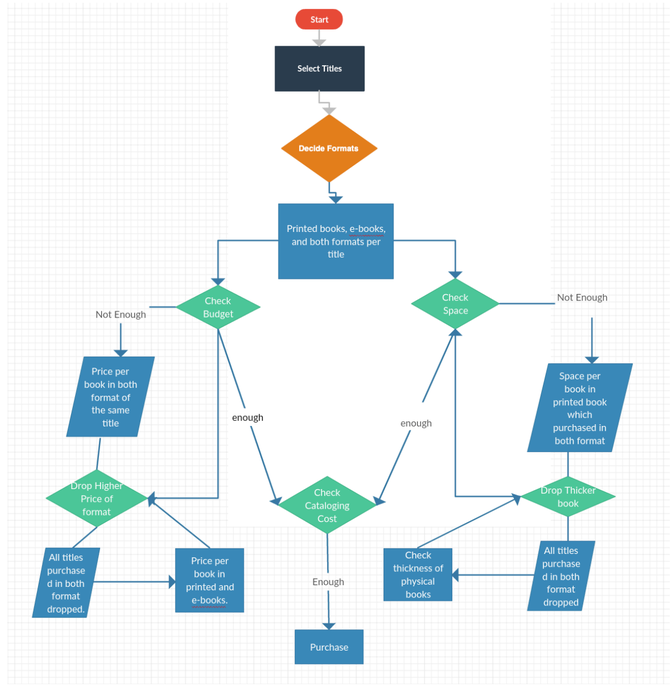
Method

Parameters
There are six parameters: budget, total storage space, current collection volumes, available space, a number of titles to be purchase, and ratio of purchasing book format (printed books, e-books, and both printed and e-books.)

Variables

- Price Decision
  if printed books:
    random total page number * random price per page
  elif e-books:
    printed book cost = random total page number * random price per page
    if one person access:
      printed book cost * 1.3
    elif three person access:
      printed book cost * 1.3. * 1.5.
    elif unlimited access:
      printed book cost * 1.3. * 2.0
  elif both purchase:
    printed book cost + e-book
- Thickness Decision
  random total page number * random thickness per page
- Cataloging Labor Cost
  total working days = total number of purchased books / 12 (a system wide standard labor speed)
  total cost = total working days * 8 (working hour per day) * labor cost
- Maintaining Cost
  maintaining cost = total volume of collections * random maintaining cost
- Repairing Cost
  number of books needed to repair = total volume of collections * random circulation rate
  repairing cost = the number of books (random repairing costs)

Simulation Process



Expected Result

Calculate Mean from the Simulation

To Simulate the Monte Carlo Simulation for 5 times.

	total_books	final_price	final_space
0	25	3461.06	641.707844
1	25	3349.77	862.157228
2	25	3440.53	934.228341
3	25	3543.14	883.044384
4	25	3342.90	729.064267

To calculate each mean values in order to bring more precise results. To get 30 different mean values from the simulation.

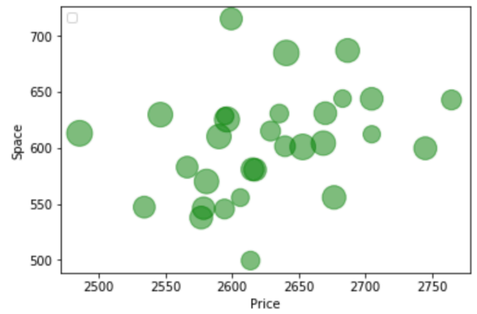


Figure. Scatter graph between total price and space.

Reference

American Library Association. “Acquisitions Procedures.” http://www.ala.org/tools/challengesupport/selectionpolicytoolkit/acquisitions. Accessed on April 11. 2019.

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Burger, Robert H. Financial Management of Libraries and Information Centers. California: Libraries Unlimited, 2017.

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Introduction

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Method

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Results

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Conclusions

We have created this template with scientific researchers in mind and with the help of feedback we have received. We encourage any comments or suggestions so that we can continue to update and improve this template. Visit this page to make a suggestion.

Acknowledgments

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