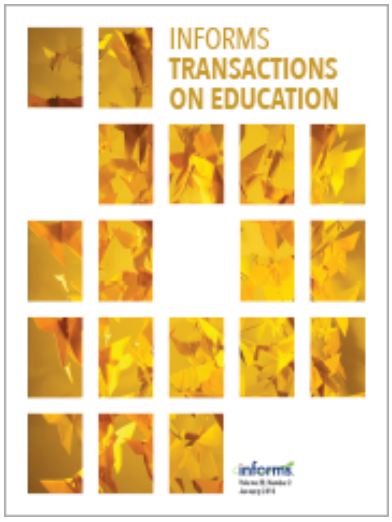
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Case

Creating a Brick Empire Through Data Visualization and Analytics (B)

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Greg McCullough has conducted a thorough analysis of the more than 600 LEGO sets released in 2018 and 2019 to gain a better understanding of the characteristics of the different themes and subthemes. His overall goal is to identify the sets in which he should invest. After the sets retire, he expects to use the proceeds from selling the sets to supplement his family's collecting passion.

Although the future value of a retired LEGO set is partially dependent on the desirability of the set itself and the theme (such as Harry Potter, Minecraft, Star Wars, etc.), another major determinant of the desirability of a set as an investment is the value potential, which is defined as the difference between the price that LEGO "should" be charging for the set based on its characteristics and the actual retail price. Sets with large value potential represent outsized investment opportunities in much the same way that a value mutual fund invests in securities that are potentially undervalued based on their fundamentals.

In his prior analysis, Greg developed a model that determines the price that LEGO should be charging for sets and has used it to determine the value potential for all of the sets that were released in 2019. Some sets ending up having positive value potentials, whereas others had negative value potentials. He eliminated all the sets with negative value potential from further investment consideration. He also researched the resale prices for retired LEGO sets on the secondary market and narrowed his potential investment options to sets in the following themes: City, Creator, DC Super Heroes, Friends, Harry Potter, Hidden Side, Ideas, Marvel Super Heroes, Minecraft, Ninjago, Overwatch, Speed Champions, and Star Wars. This left him with the 109 sets listed in the data file provided.

Greg's task now is to determine which specific sets he should purchase as an investment. He has initially allocated $4,000 to his investment budget, although he is open to adjusting that amount up or down within the range from $2,000 to $6,000 based on the relationship between value potential and total investment.

Like any well-constructed investment portfolio, Greg also wants to ensure that he is properly diversified to limit his exposure to adverse market conditions affecting one particular set or theme in the future. As a result, he had decided not to purchase more than 10 copies of any one set, and he seeks to avoid any one theme representing more than 20% of the total number of LEGO sets that he has purchased.

Based on his analysis of sets selling on the secondary market, however, Greg thinks that sets from three themes—Hidden Side, Ideas, and Star Wars—have the potential to increase in value significantly upon retirement, and he wants to be in position to take advantage of such an opportunity in the future. Therefore, he requires that at least 5% of the total sets purchased are from each of those three themes.

Perhaps most importantly, Greg wants to avoid the wrath of his wife, who is not interested in turning their entire house into a warehouse for his new investments to sit while they appreciate. He has negotiated the use of one metal shelving unit with dimensions 60 inches × 36 inches × 24 inches that is set up in the basement to store these LEGO sets. He has assured his wife that the sets he purchases for investment will fit entirely on those shelves.