

Supply Chain Process (EVS PAR EX) Improvements



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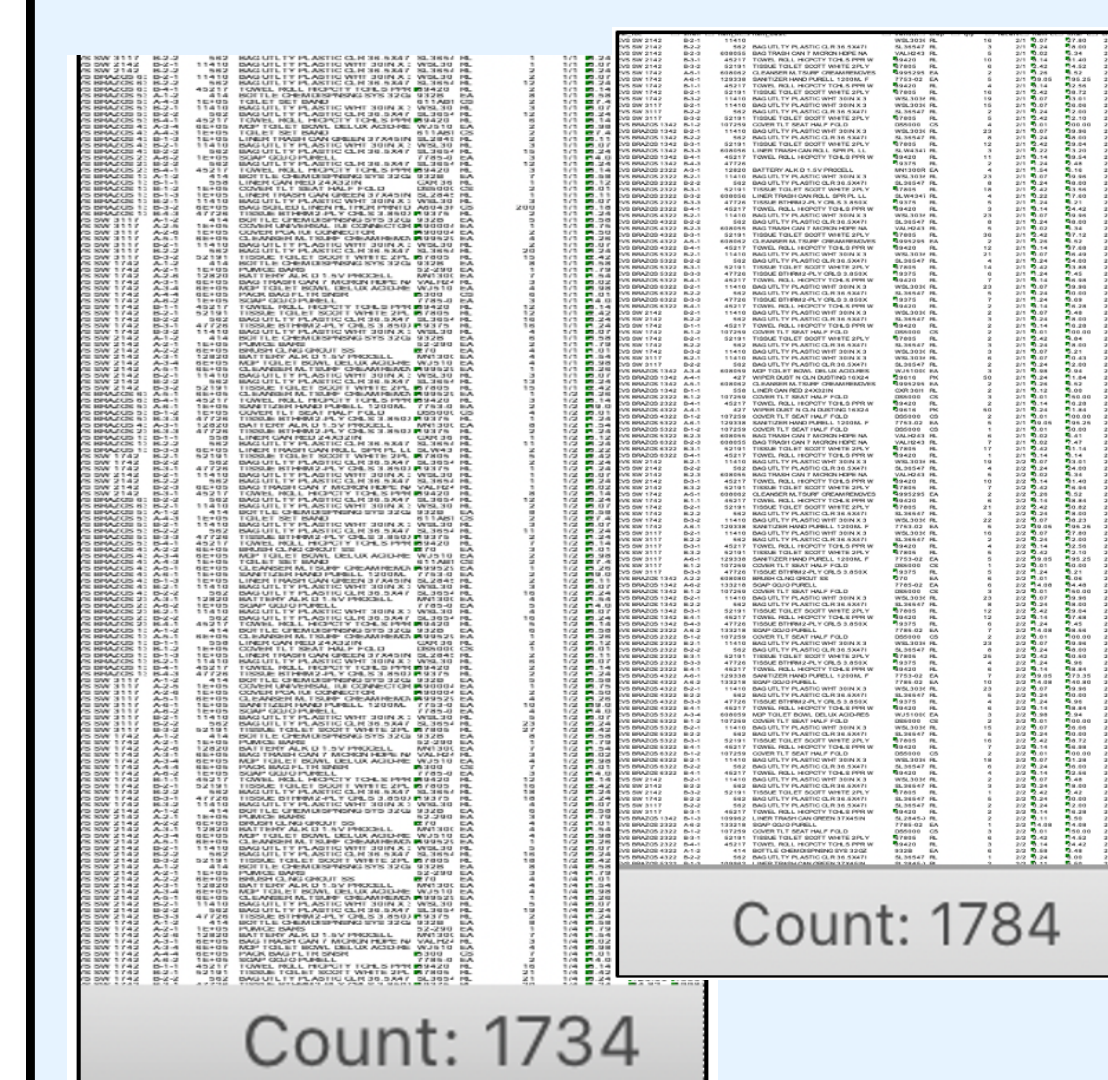
Introduction

The Houston Methodist Sugar Land Supply Chain Department has started implementing a program called PAR EXCELLENCE (PAR EX). The system is weight-based replenishment automation. The PAR level is the set amount of each item to stock. Once an item's bin reaches a certain weight called the reorder point (ROP), it will trigger an automated replenishment. In 2023, PAR EX was extended to the EVS department, so each room receives two orders a day. The Supply Chain Employees must manually close the orders to ensure PAR EX identifies what has been received. The two focuses of this original research endeavor are determining which item PAR Levels need to be changed and analyzing trends in EVS orders from the data to daily order frequency.

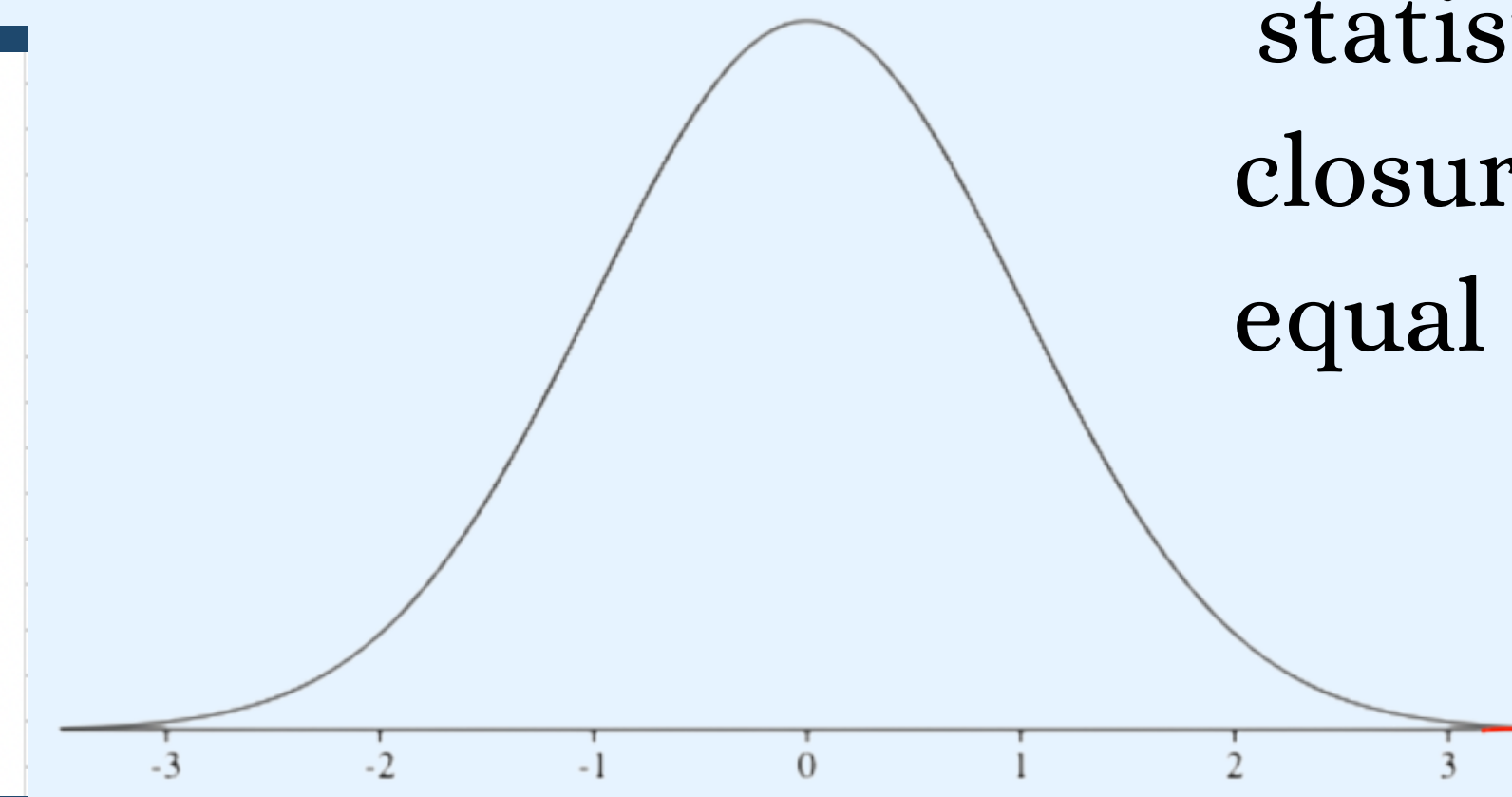
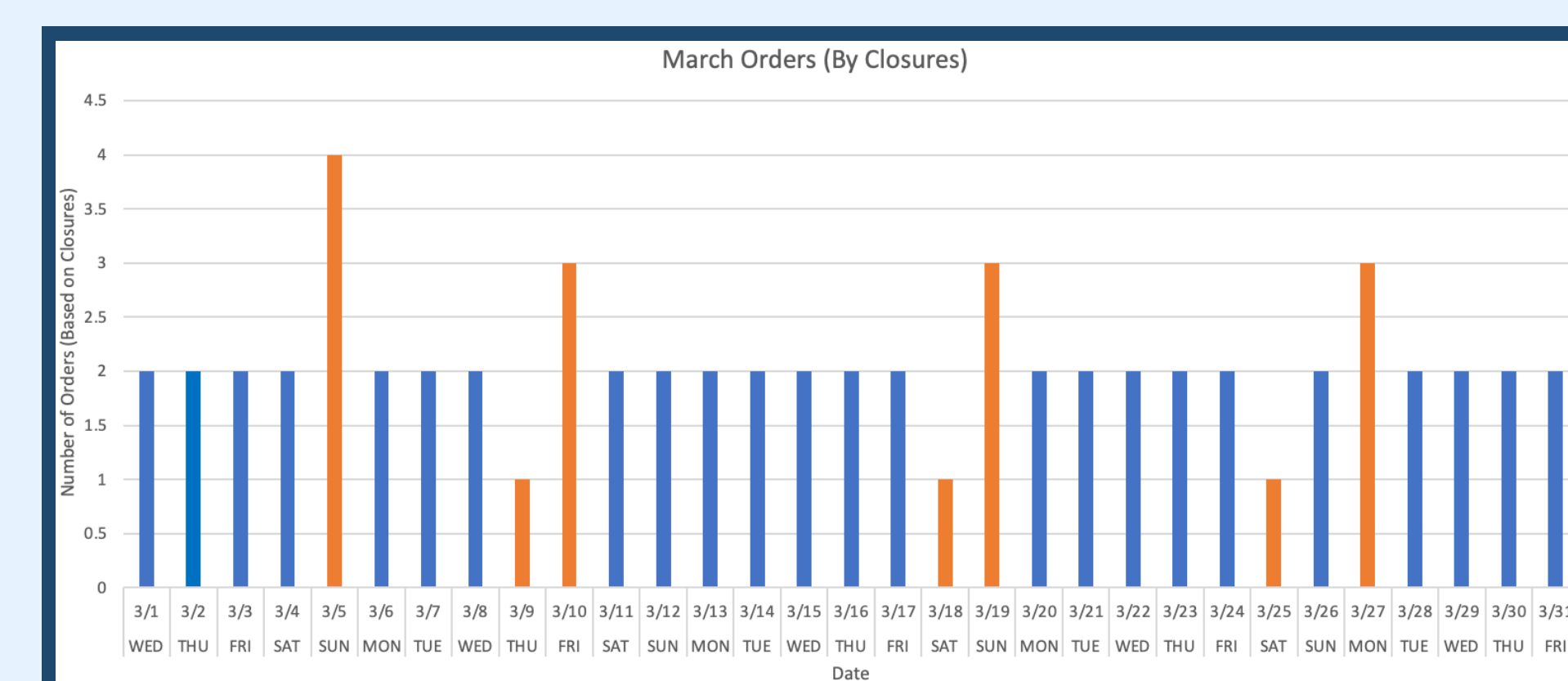
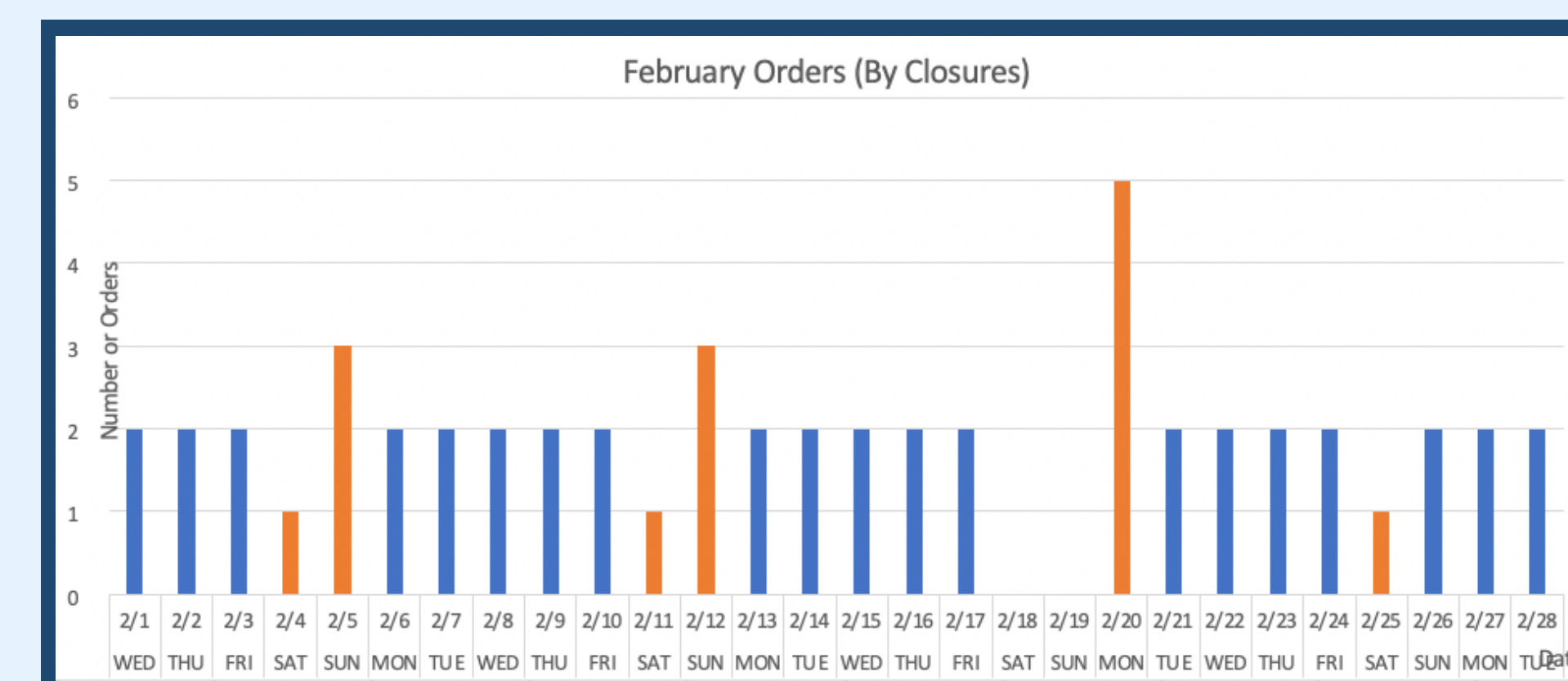
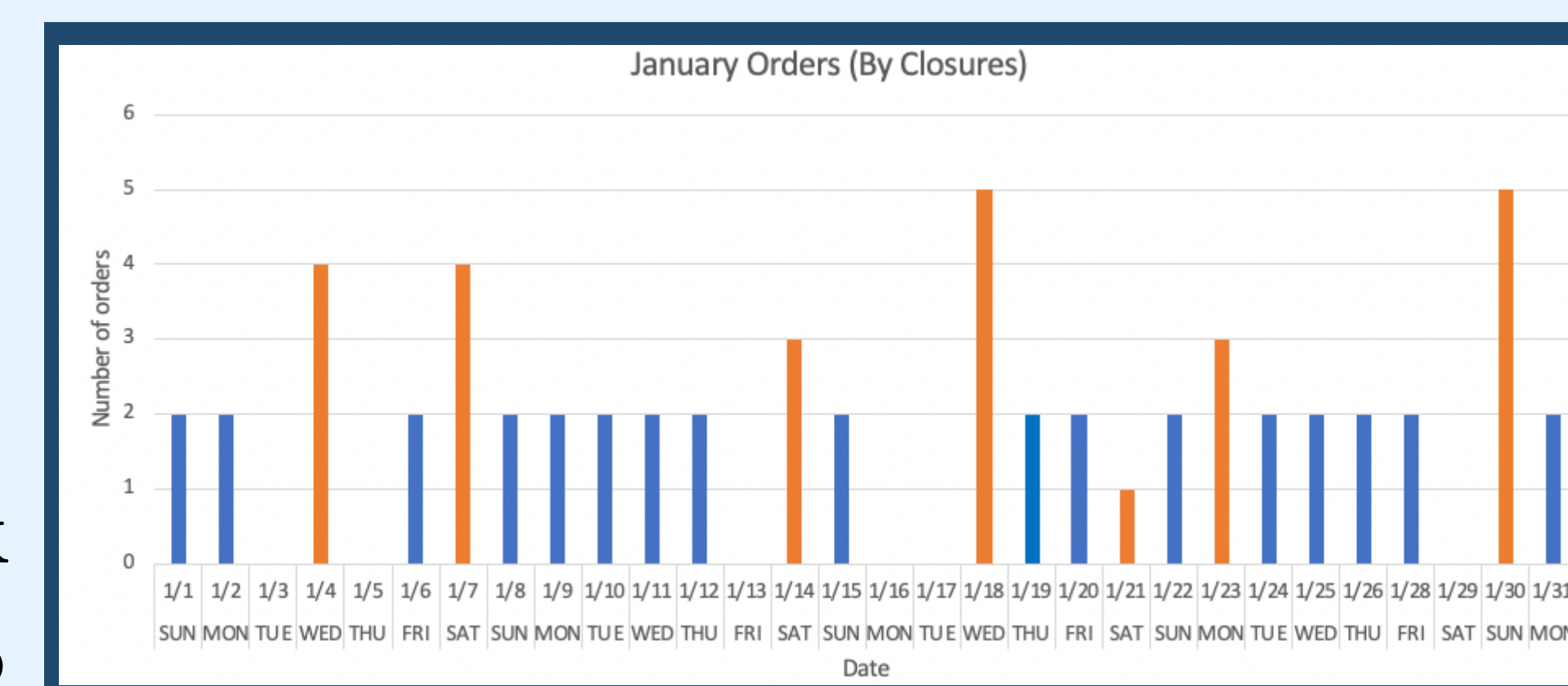
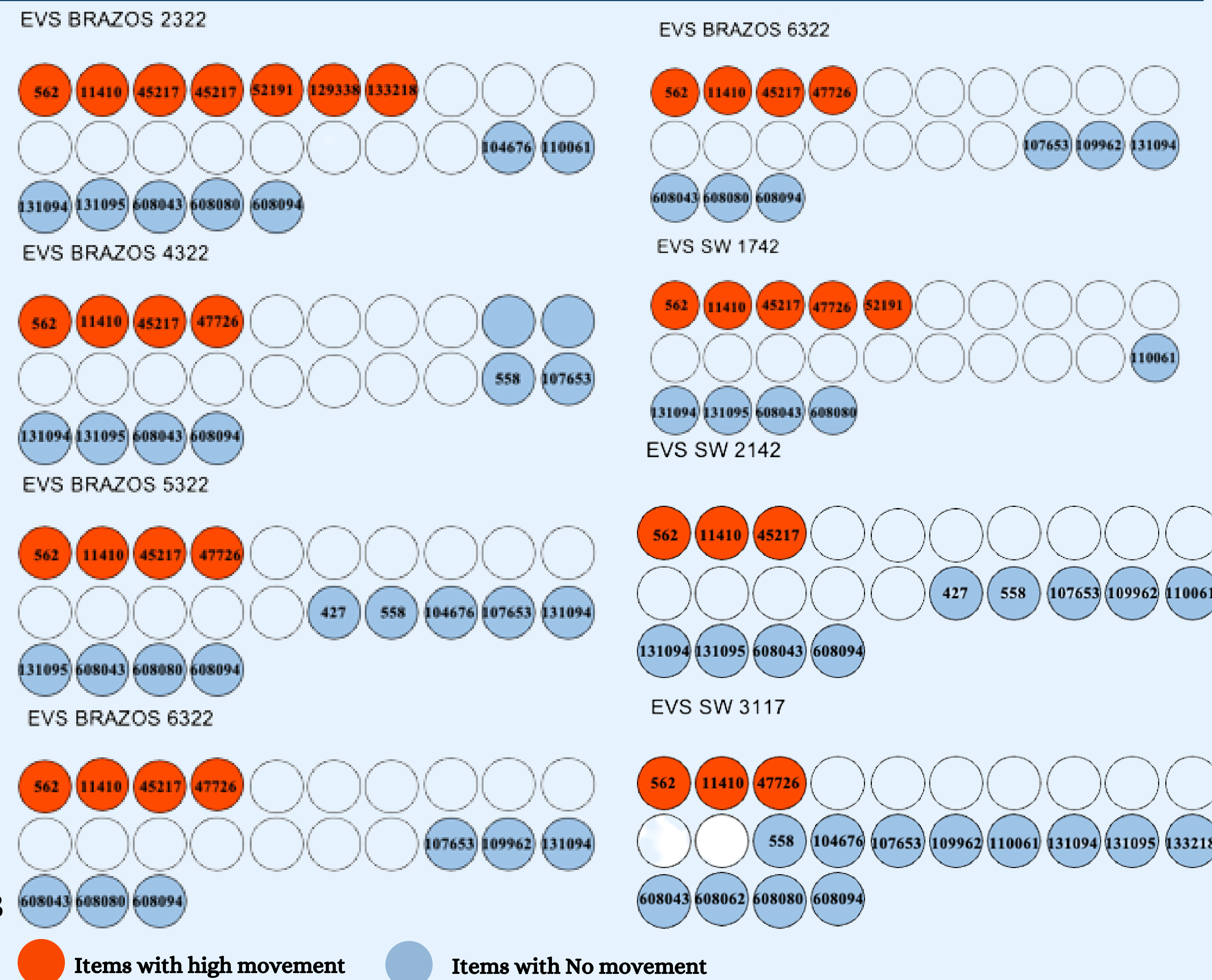
Methodology

This endeavor comprised data from January to March 2023 usage reports. For our first focus, we made a pivot table that identifies items ordered for each room. Next, we determined the average quantity per order (AQ) and frequency for each item. Then, we used the "On Hands" report, which shows all supply rooms and their products, to determine each item's PAR Level and ROP. Lastly, check all items that were ordered against the On Hands report to identify which items were not ordered in the month.

For the second focus of our research endeavor, the researcher made another pivot table, this time focusing on order closures for each room.



Results



Discussion

For our first focus, we determined items 562, 11410 and 45217 have the highest frequency in the most amount of rooms. Item 562 has a PAR Level of 8 and a ROP of 6. The small difference between Par level and ROP could indicate why so many 562's are being used, but the AQ is 8.1. Item 11410 has a PAR level of 23, ROP of 18 and a AQ of 12.9. Item 45217 has a PAR level of 12, ROP of 10 and an AQ of 7.8. Items 608094, 131094, and 131095 were not replenished in the majority of the rooms. Item 131094 and 131095 are reusable (single item). Whereas item 608094 come in boxes of 20 and can also be reused.

For our second focus, bars that are highlighted in orange are days with orders higher or lower than two which is classified as an unusual. There were 13(65%) instances of unusual occurrences on the weekend and 7 (35%) instances order closures on the weekday. We will perform a z test to determine if order closures on the weekends are statistically higher than expected. Our expected order closures on weekends to be 2/7 or .285, or each day having an equal amount of order closures.

$$z - score = \frac{.65 - .285}{\sqrt{\frac{.285(1 - .285)}{20}}} = 3.616$$

$$P \text{ value} = \text{normcdf}(3.616, \infty, 0, 1) = .00015$$

Since .00015 < .05, our results are statistically significant and there is a higher than expected unusual order closures on weekends.

Takeaways and Next Steps

Based on the data for item 562 indicates the PAR Level needs to be increased because despite the reorder point being so high, PAR EX is still replenishing the whole PAR level each order. Based on the data for item 45217, we can determine that neither the PAR Level nor ROP need to be changed for this item. Additionally for item 45217, since the ROP is so high, and the average quantity per order is not greater than the par level, this indicates we need to decrease the ROP. There is no reason to remove items 608094, 131094 and 131095 from the inventory, as they may be needed in the future. The current operational errors are due to orders being closed after midnight or absences. To reduce the operational errors, employees need to close the orders on time.