

Machine Learning for Smart Services EBC4255
Özge Tuncel

Final Exam

Question 03

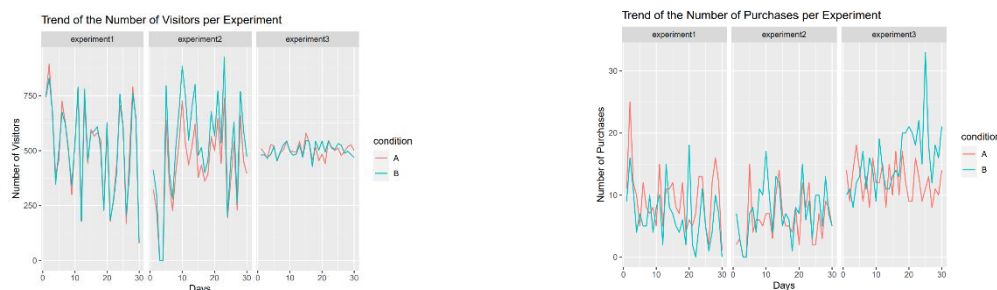
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Question 3: Effectiveness Analysis of Advertising Campaign

Dataset Analysis

In this final analysis, the dataset from an advertisement campaign's three experiments conducted over two conditions for a month each is scrutinized. The objective is to determine the superior condition and draw conclusions about the experimental procedure.

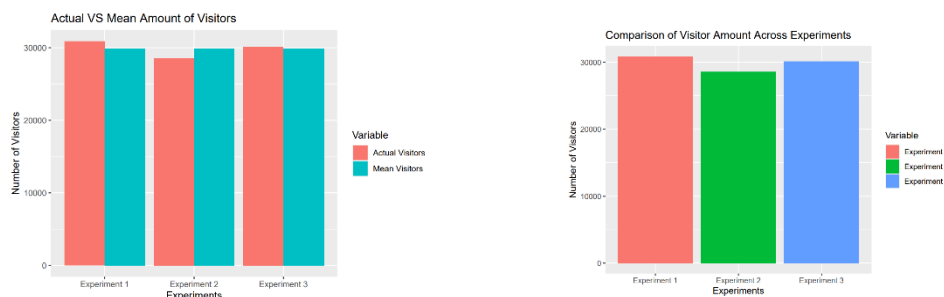
First, the trends of the number of visitors and purchases are presented:



These graphs show some discrepancies in the data which helps create 2 hypotheses for further analysis:

1. Variations exist in visitor counts across experiments.
2. Significant differences arise from high purchase variations.

Confirmation of these hypotheses through chi-square tests highlights a significant difference in visitors and purchases across experiments. Notably, the second experiment observes a lower visitor turnout, emphasizing caution in analyzing purchase data:



Similar tests reveal significant differences in purchases compared to the mean and across experiments, indicating inconsistencies in experimental outcomes (Appendix).

Condition Analysis

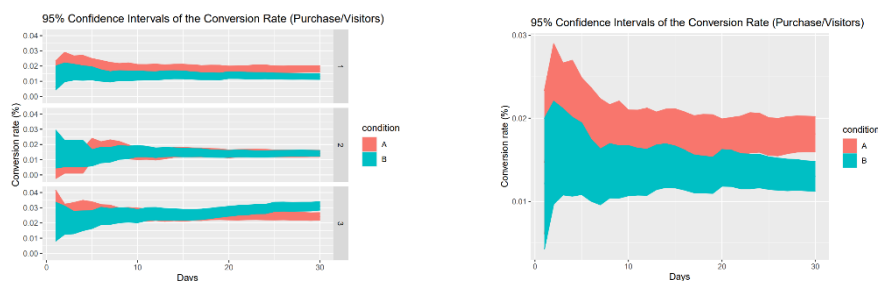
Conditions A and B are examined within each experiment, demonstrating significant differences only in experiment 2, with a higher number of visitors in condition A. This emphasizes the importance of considering conditions when interpreting results.

Due to visitor imbalances, purchase analysis is confined to each experiment. Results show conflicting outcomes in experiments 1 and 3, prompting a need for a different analytical approach. (Appendix)



Rate of Purchase

Introduction of the purchase/visitor rate addresses biases (Appendix). Confidence intervals reveal no clear significance on an experimental level, with slight global significance by the study's end. This suggests that the overall impact of conditions becomes evident over the 30-day period.



Conclusion

In summary, statistically, there is no evidence supporting the superiority of condition A or B within or across all experiments. Indeed, from the data and the studies performed no signs of overall significance are present. Additionally, it can be seen that there is inconsistency in the slight local significance found as it moves through experiments and thus time. Therefore, one potential reasoning would be threefold: chance, customers get used to the new format, or the new format fits better a special time (e.g., A Christmas themed interface). Further studies would thus be needed to understand which other variable might be influencing the results.

Appendix

