**CLUSTERING TECHNIQUES (OFM4 TASK 3)– D212**

**Performance Assessment**

**Western Governors University**

**By: Christian LeBlanc**

***Part I: Research Question***

**A-1**

**What products are purchased together most frequently?**

**A-2**

**The goal of this market basket analysis is to find which products are purchased together the most frequently. This is done to help decisions such as inventory control, marketing, and sales recommendations.**

***Part II: Market Basket Justification***

**B-1**

**Market basket analysis is a data mining technique. It is used to uncover relationships between items purchased together. This is done by collecting transactional data and applying an associate rule mining such as Apriori algorithm that will identify items that are purchased together frequently. It gives an if and then type result such as if a customer purchases cookies, then they will buy milk. In doing a market basket analysis one would expect to see results that point out products that are frequently purchased together which can lead to decisions such as cross-selling opportunities, product placement, and marketing campaigns.**

**B-2**

**Below is an example of one transaction from the data set:**

A group of black text

Description automatically generated

**B-3**

**"The approach relies on the assumption that customers who purchase a specific item are more likely to purchase another specific item or group of items" ("FAQ: What Is Market Basket Analysis?," Indeed,** <https://sg.indeed.com/career-advice/career-development/market-basket-analysis>**).**

***Part III: Data Preparation and Analysis***

**C-1**

**Please see attached csv file named d212cleant3 for cleaned data.**

**C-2**

**Please see below screenshot of the code used.**

A screenshot of a computer

Description automatically generated

**C-3**

**Please see below screenshot for values.**

A screenshot of a computer screen

Description automatically generated

**C-4**

**The top three rules according to the lift metric are in the screenshot below:**

A screenshot of a computer

Description automatically generated

**The top rule states if the VIVO Dual LCD Monitor Desk mount is purchased, then there is approximately a 22.51% chance they will also purchase the SanDisk Ultra 64GB card. The lift of the rule is 2.291162, indicating that the likelihood of purchasing SanDisk Ultra 64GB card when VIVO Dual LCD Monitor Desk mount is purchased is approximately 2.29 times higher than the likelihood of purchasing SanDisk Ultra 64GB card in general. The support of the rule is 0.039195, indicating that 3.92% of all transactions contain both VIVO Dual LCD Monitor Desk mount and SanDisk Ultra 64GB card.**

**The 2nd rule states if the SanDisk Ultra 64GB card is purchased, then there is approximately a 39.89% chance they will also purchase the VIVO Dual LCD Monitor Desk mount. The lift of the rule is 2.291162, indicating that the likelihood of purchasing** **VIVO Dual LCD Monitor Desk mount when SanDisk Ultra 64GB card is purchased is approximately 2.29 times higher than the likelihood of purchasing VIVO Dual LCD Monitor Desk mount in general. The support of the rule is 0.039195, indicating that 3.92% of all transactions contain both VIVO Dual LCD Monitor Desk mount and SanDisk Ultra 64GB card.**

**The 3rd rule states if a customer purchases the FEIYOLD Blue light Blocking Glasses, then there is approximately a 34.82% chance they will also purchase the VIVO Dual LCD Monitor Desk mount. The lift of the rule is 1.999758, indicating that the likelihood of purchasing VIVO Dual LCD Monitor Desk mount when FEIYOLD Blue light Blocking Glasses card is purchased is approximately 2 times higher than the likelihood of purchasing VIVO Dual LCD Monitor Desk mount in general. The support of the rule is 0.022930, indicating that 2.29% of all transactions contain both VIVO Dual LCD Monitor Desk mount and FEIYOLD Blue light Blocking Glasses.**

***Part IV: Data Summary and Implications***

**D-1**

**I did the top 3 rules for support, lift, and confidence in my analysis. I went in depth on the results of the top 3 for lift in section C-4. Lift gives a ratio of how likelihood that the antecedent and consequent would be purchased together vs just the consequence alone. Support gives the frequency of both the antecedent and consequent are purchased together vs the whole dataset of purchases. Dust-Off Compressed Gas 2 pack was in all the top three rules from support, which is not surprising given that it was the most popular product. Confidence measures the probability of the consequent given the antecedent. Once again Dust-Off Compressed Gas 2 pack was in all the top 3 rules. It was the consequence for all 3, which is not surprising since it was the most popular product.**

**D-2**

**I see two products that are being purchased with other products often. Dust-Off Compressed Gas 2 pack and VIVO Dual LCD Monitor Desk mount appear in the top three rules in the three metrics viewed. This is good news considering that they are top and third most popular products respectively.**

**D-3**

**My recommendation is under the assumption that these purchases is from a retail store. Dust-Off Compressed Gas 2 pack needs to have multiple places in the store that they are stocked. It is the most popular product, and it has strong relations with multiple other products. The VIVO Dual LCD Monitor Desk mount should have SanDisk Ultra 64GB card and FEIYOLD Blue light Blocking Glasses next to the display. I would also advise management to look into the margins for these three products and possibly make a bundle sale if all three are purchased on the same ticket.**

***Part V: Attachments***

**E**

Please see my Panopto video Christian LeBlanc D212 Task 3. Link: <https://wgu.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=897ee274-1e52-4bd0-a973-b165013c4fb2>

**F**

No web sources were used to acquire data or segments of third-party code.

**G**

Indeed. (03-20-24). FAQ: What Is Market Basket Analysis?. Retrieved from <https://sg.indeed.com/career-advice/career-development/market-basket-analysis>

**H**

The content in this Performance Assessment is set up and presented with the highest professional standards.