

# CISC 1215 – Introduction to Programming Using Python

## PART B: Advanced Data Mining (20 points)

### 5. Recommendations (20 pts)

Prepare a **2-page summary** (PDF/WORD) with:

1. **Key Findings** (Most profitable category, sales trends).
2. **Problems Identified** (e.g., high discounts hurting profit).
3. **Business Recommendations** (e.g., "Reduce discounts in X category").

#### **Key Findings:**

Not surprisingly, the most profitable category is technology with a total profit of \$145,454.95, from the 9,994 orders. This comes as a surprise when considered the average discount offered for each category, with furniture having the highest discount of 17%, office supplies coming in second with a 16% discount and thirdly technology with a 13% discount. With the west receiving the greatest number of sales at a whopping 725,458 sales, toppling the rest of the market.

According to the monthly sales trend line graph, the top 3 most profitable months were November 2017, December 2016, and September 2017 with amounts ranging from \$118,447.83 to \$96,999.04 to \$87,866.65. While the top 3 least profitable months were February 2014, February 2015, and January 2014 with the least profitable month ranking in a total of \$4519.89, the second least profitable month with a total of \$11,951.41 and the third least profitable month with a total of \$14236.90. The top 5 most profitable customers are: Tamara Chand, Raymond Buch, Sanjit Chand, Hunter Lopez, and Adrian Barton. With the highest profitable customer ranking in \$8,981.32 in orders, the lowest contributed to \$5,444.81 in total profits made. Most of

these customers utilized “Standard Class” as their preferred shipping mode used for 5,968 out of the 9,994 orders.

When it came to detecting anomalies within the data set, there are 8,058 orders that can be classified as high margin orders while 1,871 orders can be identified as loss-making orders according to the criteria that was outlined.

### **Problems Identified:**

A problematic finding is when the minimum profit ever made on a customer is - \$6,599.98 suggesting the extent of business losses. While it may seem minimal at first, it suggests the extent to which business profits are not up to par on sales initiatives. Another issue could be the discrepancy in discounts between various categories. Despite being the most profitable category, technology receives a lower discount than both furniture and office supplies. A concerning find is how the business experiences the least profits within the first quarter of the year as noted by the top 3 least profitable months having taken place in January and February compared to the most profitable months occurring later in the year.

### **Business Recommendations:**

To increase profits, the discounts on technology can increase by 1% to encourage customers to buy more as seen in the discount vs sales correlation graph that an increase in discount prices leads to an increase in sales. And based on the correlation analysis, there exists a moderately positive correlation between profit and sales, which suggests that sales do have a strong impact on profit increases.