Eniac - insides

Discount products

is it beneficial or not?

E-Commerce Sales & Discount
Analysis Report

Overview of current data situation

With regard to the given data set, all results should be treated with **caution**!

Dataset name	Orders	Orderlines	Products	Brands
Nr. items given	226909	293983	19326	187
Nr. items remain	40985	53231	9992	187
remaining in %	**~18,1**	**~18,1**	~51,7	0

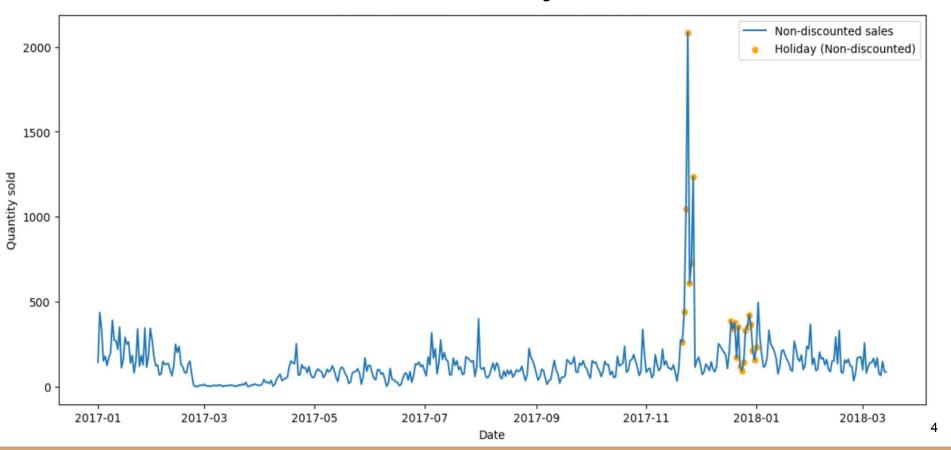# 1. Strategic Recommendation on Discounts

- **No, discounts should not be the primary sales lever.**
  - Holidays and seasonality already generate strong demand.
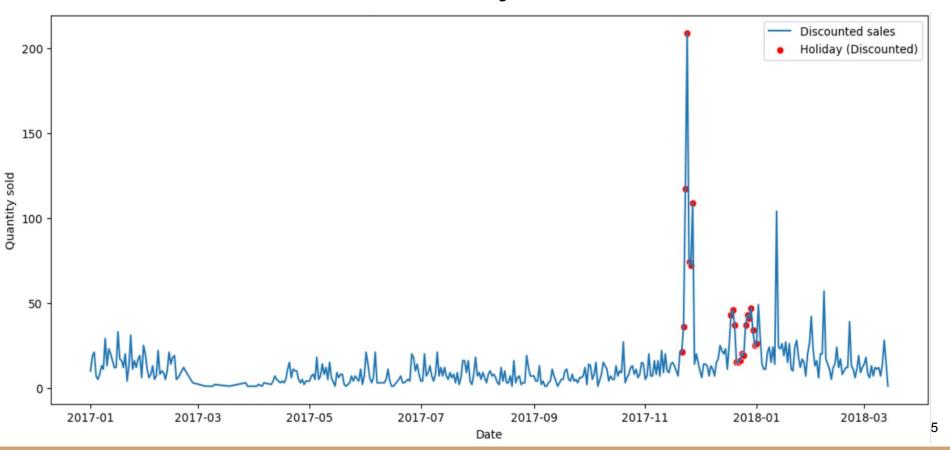 - Heavy discounts cut margins but don't significantly increase total revenue.

- **Yes, discounts should still be used strategically.**
  - For refurbished, old stock and niche categories, discounts are necessary to move inventory.
  - But avoid blanket discounting of popular products that customers are willing to buy at full price during holidays.
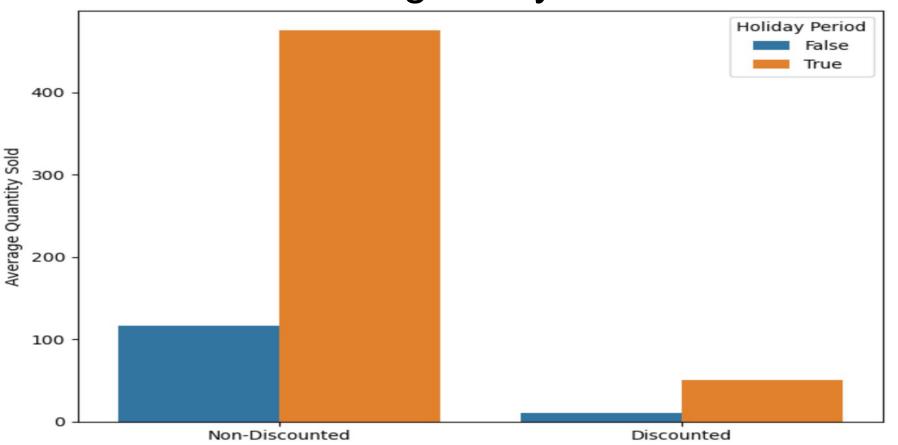
Non-Discounted - Daily Product Sales

Discounted - Daily Product Sales

Average daily sales

Interpretation

- **Holiday effect is stronger than discount effect.**
  → The big sales spike is mainly because of seasonal demand (Black Friday, Christmas), not because of heavy discounting.

- **Discounts do increase sales somewhat, but they represent only a small fraction of total sales.**
  → That means if discounts are cutting into margin, their overall impact might not justify the cost.

Conclusion - Recommendation

- **Keep some discounts for specific categories** (clearance, low-demand items, refurbished goods).
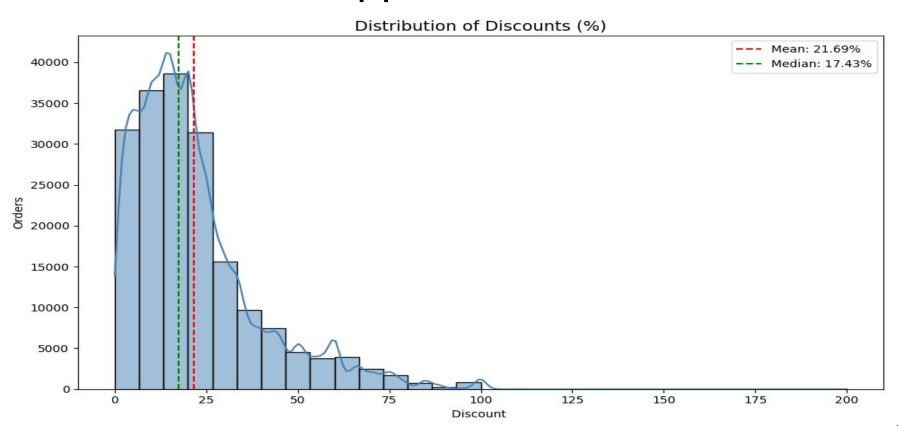
- **Don't rely on discounts to drive holiday sales** → your chart proves that customers are already buying a lot of full-priced items during holidays.

- **Better strategy:** combine limited discounts + strong seasonal marketing campaigns (ads, bundles, urgency) instead of blanket discounts.
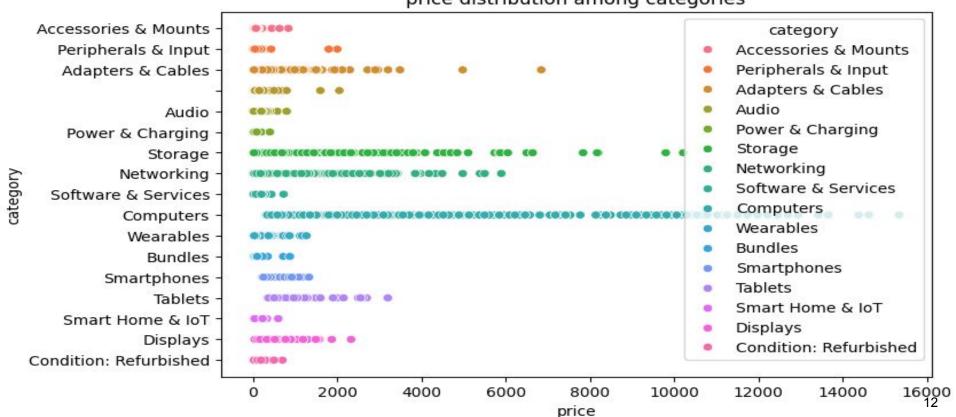
Questions?

Appendix - 1

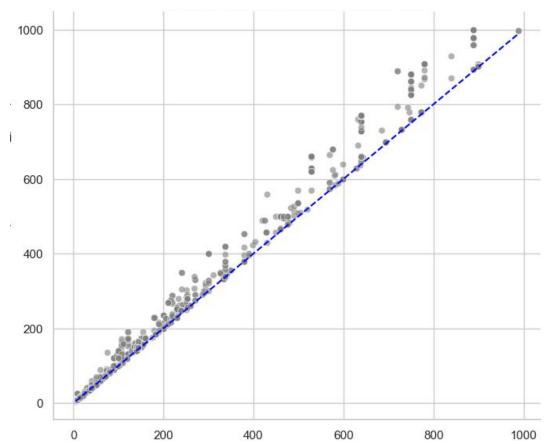**Data Quality Issues**

- Prices stored as text (9.999.99) → errors in parsing.

- Missing COGS(cost of good sold), promo IDs.

- Some extreme prices (e.g., €7M adapters).

📌 Recommendation: Improve data pipeline with validation + promotion metadata.
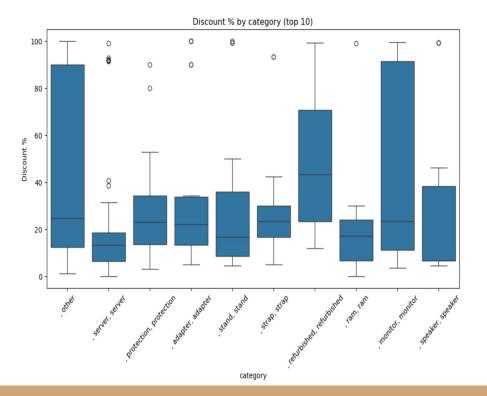
Appendix - 2

Distribution of Discounts (%)

Appendix - 3

price distribution among categories

Appendix - 4 Distribution of overpriced products

Appendix - 5

👉 In short: **Yes, sales go up during holidays, but mostly without discounts. The proof in your Seaborn chart suggests you should reduce reliance on discounts and focus on seasonal demand drivers.**

Discount % by category (top 10)

Insights from the Discount % by Category chart

- **Huge variability across categories**
    - Some categories (like *refurbished* and *monitor*) often get very deep discounts (close to 100%).
    - Others (*servers, protection, adapters*) stay in the 10–30% range.
- **Refurbished products**
    - Median discount is high (~40–50%).
    - This makes sense: refurbished items need deeper discounts to move, but they're also lower-margin.
- **Other & Monitor categories**
    - Both show extreme values (up to 100%).
    - Suggests inconsistent discounting strategies → possibly unstructured markdowns rather than targeted pricing.
- **Core accessories (ram, adapter, strap, stand, protection)**
    - Discounts are smaller and more stable.
    - These are probably more "commodity-like" products that don't need huge promotions to sell.

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1. Purpose of the Analysis

This analysis was conducted to evaluate:

- How products can be classified for simpler reporting and analysis.
- The distribution of product prices across categories.
- The role and size of discounts across categories.
- The impact of seasonality (Black Friday, Christmas) on sales.
- Whether discounts should be continued or reduced.

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2. Product Classification

- Since the original product type column was not meaningful, categories were created from product descriptions (e.g., mouse, stand, strap, smartwatch, adapter, RAM, protection, server, monitor, speaker, refurbished).
- This improves reporting by grouping similar items into understandable buckets rather than raw SKUs.

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3. Price Distribution Across Categories

- High variation between categories: core accessories (RAM, adapters, straps) tend to be lower-priced, while categories like monitors or servers can be very expensive.
- Median prices differ strongly → this justifies category-based reporting for clearer financial insights.

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4. Discount Usage

- **899 products** are actively discounted.
- **Average discount size:** ~34% off.
- **Distribution:**
  - Accessories (RAM, adapters, straps) → smaller discounts (10–30%).
  - Refurbished products, monitors, "other" → deep discounts (often 50–100%).
- **Boxplot evidence:** Discounts are highly inconsistent, with some categories showing extreme markdowns.

- 📊 **Insight:** Large discounts are used mostly to move slow-moving or low-demand stock, not best-sellers.

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5. Seasonality & Holiday Effects

- **Black Friday & Christmas** cause clear sales spikes.
- **Non-discounted products dominate these spikes.**
  - Average daily sales of non-discounted items during holidays are 4–5x higher than regular periods.
- **Discounted products show an uplift too, but much smaller in absolute numbers.**

📊 **Insight:** Holidays themselves, not discounts, are the primary sales driver.

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6. Combined Findings

- **Discount % by Category:**
  - Highest markdowns occur in low-demand categories (*refurbished, monitors, "other"*).
  - Core products don't need deep discounts → they sell during holidays anyway.
- **Holiday Sales Chart:**
  - Proves demand peaks naturally in holiday seasons.
  - Even full-price items see massive uplift.
- **Discount vs Non-discount Chart:**
  - Discounts add some uplift, but the majority of holiday sales volume comes from non-discounted products.

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7. Recommendations

✅ **Keep discounts targeted**

- Apply to clearance, refurbished, and low-demand products.
- Avoid unnecessary margin cuts on popular categories.

✅ **Leverage seasonality instead of discounts**

- Strong seasonal campaigns (ads, bundles, limited editions) can drive sales without heavy markdowns.

✅ **Standardize discount strategy**

- Current discount levels are inconsistent.
- Introduce clear rules: e.g., 10–20% for accessories, up to 50% for refurbished, avoid 90–100% markdowns unless stock liquidation.

✅ **Improve data collection**

- Track **revenue per category** alongside discount % → ensures visibility into whether discounts actually increase profit, not just units sold.
- Record **marketing spend vs. discount spend** to evaluate ROI.

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8. Final Answer: Should We Use Discounts?

Based on the data:

- **No, discounts should not be the primary sales lever.**
  - Holidays and seasonality already generate strong demand.
  - Heavy discounts cut margins but don't significantly increase total revenue.
- **Yes, discounts should still be used strategically.**
  - For **refurbished, old stock, and niche categories**, discounts are necessary to move inventory.
  - But **avoid blanket discounting** of popular products that customers are willing to buy at full price during holidays.

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📌 **Executive Summary for SEO:**

Proof from Seaborn charts shows:

- **Holiday effect > Discount effect**.
- **Non-discounted products drive most holiday revenue.**
- **Deep discounts are concentrated in categories that don't contribute much to total revenue.**

👉 Conclusion: **Focus on seasonality, keep discounts only where strategically needed, and standardize the discount strategy.**

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List of sources

- Given 4 CSV's
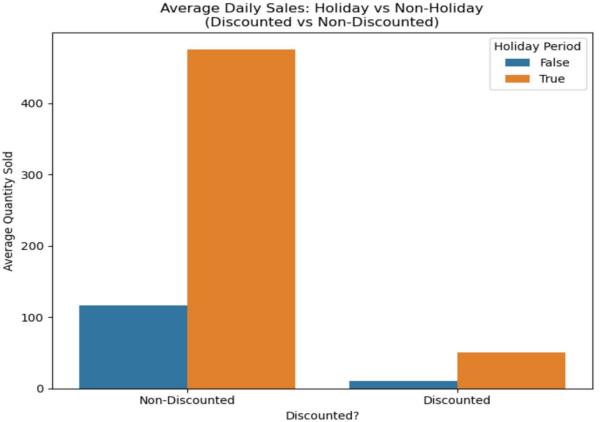- Google Colab

AI support by using

- ChatGPT
- Gemini

Appendix - End
Beginn Reminders/memory aid

Overview of current data situation

With regard to the given data set, all results should be treated with caution, as we had to remove double, invalid, suspicious data and worked with "Completed" state orders as follows in order to ensure a reliable data basis

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Nr. items given	226909	293983	19326	187
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Comparisons

Average Daily Sales: Holiday vs Non-Holiday
(Discounted vs Non-Discounted)

Non-discounted products:

- Holiday sales (orange) are *much higher* than non-holiday sales (blue).
- This means holidays alone drive a massive increase in sales, even without discounts.

Discounted products:

- Sales also go up during holidays, but the absolute numbers are much smaller compared to non-discounted products.
- The uplift is visible, but not the main driver of total holiday sales.