AI-Powered Bundling & Pricing Strategist

Background

In today's e-commerce landscape, merchants manage thousands of SKUs**. Identifying and pricing optimal product bundles** - whether complementary (e.g., lipstick + foundation + makeup brush, shoes + belt + handbag) or based on other logical criteria (e.g., skincare set, seasonal fashion trends) - can help overcome common fundamental retailer challenges such as boosting average order value, reducing excess inventory, selling out unpopular sizes, and enhancing customer engagement and satisfaction overall. Additionally, effective bundling strategies can maximize revenue by leveraging cross-selling opportunities and promoting high-margin items. By analyzing customer behavior and preferences, retailers can create personalized bundles that cater to specific segments, further driving sales and loyalty. Furthermore, incorporating real-time data on stock levels and replenishment schedules ensures that bundles are timely and relevant, ultimately leading to better inventory management and increased profitability.

Glossary – Useful Terms

- **SKU (Stock Keeping Unit)**: A unique code used to identify individual products in inventory, including variations like size or color.
- **Cross-Selling**: Recommending or selling additional related products to increase overall purchase value (e.g., a belt with trousers).
- **Customer Segment**: A group of customers with shared traits (e.g., shopping behavior, demographics, or preferences).
- **High-Margin Items**: Products that generate a large profit relative to their cost.
- **Average Order Value (AOV)**: The average total spends per transaction, used to measure revenue efficiency per order.

Challenge

Build a tool that:

- Suggests product bundles using any meaningful grouping logic:

- **Complementary Bundles**: Products that are often used together (e.g., t-shirt + sorts).
- **Thematic Bundles**: Based on a theme or occasion (e.g., “summertime beach toolkit”).
- **Volume Bundles**: Multiple units of the same product at a discount (e.g., 3 lipsticks for the price of 2).
- **Cross-Sell Bundles**: Combine high-margin accessories with popular items.
- Any other you might think of 😄 (Remember: be creative and well-thought-out)

- Optimizes bundle pricing to maximize forecasted revenue.
- Determines recommended availability period (“bundle duration”) based on real-time stock levels

Example Scenarios & Questions

Participants should consider how their tool would answer real-world questions such as:

- "Which three products, when bundled, can increase average order value by at least 15% over the next two weeks?"
- "What price should we set for a summer-themed bundle of sunglasses, beach towel, and sunscreen to maximize margin without sacrificing demand?"
- "Given current stock, when and for how long should a back-to-school bundle of backpack + stationery + laptop sleeve be offered to clear inventory before the new shipment arrives?"
- "How can we bundle and promote leftover items from a previous collection—such as older models soon to be replaced, or low-demand sizes and colors of a product—to accelerate sell-through and free up inventory?"
- "How can we tailor bundles for premium vs. budget-conscious customer segments to optimize revenue per cohort?"

Objectives

Participants’ solutions should:

1. **Discover bundles**
   - Apply data-driven methods to identify high-potential groupings, regardless of whether products are inherently complementary
2. **Price optimization**
   - Model price sensitivity and recommend optimal bundle prices
3. **Revenue forecasting**
   - Project incremental revenue uplift per bundle over its proposed duration
4. **Stock-driven timing**
   - Define start/end dates for each bundle based on inventory

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Constraints & Helpful Notes

- **Timebox**: Aim for a solution achievable within Makeathon timeframes of work.
- **Data Quality**: Account for missing or noisy data (e.g., incomplete transactions, stock discrepancies).
- **Interpretability**: Provide explanations or visualizations for how bundles and prices were chosen.
- **Customer Segmentation Hint**: Explore grouping customers by shared behaviours - such as demographics, spending habits, or decision-making patterns - to create targeted bundle strategies (be creative: see if you can find more data on the web 🤦).

Data & Tools

Data:

You get a file with 2 sets of data (one set per sheet)

Orders

	Data Item	Description
1	**OrderNumber**	A number that uniquely identifies an order.
2	**CreatedDate**	The date and time that the order was placed.
3	**SKU**	The Stock Keeping Unit is a unique identifier for one product/item
4	**Item title**	The name or title of the product/item
5	**Category**	The category name that the product/item belongs to.
6	**Brand**	The brand name of the product/item.
7	**Quantity**	Quantity (the number of) of this item in the order.
8	**OriginalUnitPrice**	The original price of this product/item.
9	**OriginalLineTotal**	The line total is the multiplication of the original price times the quantity.
10	**FinalUnitPrice**	Final price of the product/item (after any discounts or coupons or other offers). If this is equal to the original price then, no discount, coupon or offer was applied.
11	**FinalLineTotal**	The final line total is the multiplication of the Final Unit Price times the quantity. If this is equal to the OriginalLineTotal then, no discount, coupon or offer was applied.
12	**FinalOrderItemsTotal**	the total amount of all products in the order excluding the shipping costs.
13	**ShippingTotal**	The cost to ship the entire order.
14	**TotalOrderAmount**	The sum of FinalOrderItemsTotal and ShippingTotal. The total amount htat the customer paid.
15	**UserID**	A unique identifier of customers. If this value is null, then this customer performed a guest checkout.

Inventory

	Data Item	Description
1	**SKU**	The Stock Keeping Unit is a unique identifier for one product/item. ** Note that SKUs not found in the list should be considered as currently out of stock.*
2	**Quantity**	number of items in warehouses

Expected Deliverables

1. **Codebase**
   - GitHub or any other repo or ZIP with scripts (documented code is considered a plus)
2. **Report or Presentation**
   - PPT/PDF or Notion doc summarizing approach, logic, key assumptions, results, and insights

3. **Prototype/Demo** (optional)
    - Lightweight web app or notebook showcasing bundle suggestions and pricing outputs

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Evaluation Criteria

	Criterion	Description
1	Functionality	The solution correctly identifies product bundles and assigns pricing and timing logic that works end-to-end.
2	Data Handling & Modelling	Effective use of data (cleaning, merging, feature extraction) and application of relevant models for forecasting and optimization.
3	Innovation & Creativity	The solution applies original thinking to bundle logic, pricing strategy, or segmentation approach.
4	Business Relevance & Value	The solution aligns with real-world retail challenges and demonstrates potential for measurable impact.
5	Completeness	All core objectives are addressed: bundle discovery, pricing, forecasting, stock alignment.
6	Documentation & Clarity	The code and accompanying explanations are well-organized, readable, and clearly present assumptions and results.

Bonus / Stretch Goals

- **Customer Segmentation**
    - Personalize bundles and pricing by user segment (e.g., High-Spenders/VIPs vs. Price-Conscious/Deal Seekers)
- **Visualization Dashboard**
    - Interactive dashboard to explore forecasts and bundle performance

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Good luck, teams!

Poke us on Discord if you have any questions!

We look forward to your creative bundling solutions.