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Document 1: The Mini-Project Student Handout

Mini-Project: The Quick Commerce Conundrum
Foundations of Statistics and Probability (FSP) | Week 10

Project Title:
"The Quick Commerce Conundrum: A Data-Driven Delivery Revival"

✅ Objective:

You have been hired a**s a Data Analyst at QuickBazaar**, a promising quick-commerce startup based in **Pune**. After a strong start, the company is facing major operational challenges, leading to customer dissatisfaction and stagnating growth. Your job is to:

1. **Diagnose the underlying problems** using data-driven insights from the company's operations.
2. **Apply statistical concepts** (mean, median, variance, correlation, probability) to analyze patterns in delivery performance and customer behavior.
3. **Use the specified toolset** (Google Sheets, Flourish, Binder, Orange, GeoGebra) to analyze data, generate insights, and create visualizations.
4. **Prepare and present a recovery strategy** to the Head of Operations based on your data analysis.

🎯 Scenario Background:

QuickBazaar launched in 2023, promising 15-minute grocery deliveries in Pune. While initial adoption was high, the last two quarters have been challenging:

- A **30% decline in Average Order Value (AOV)**.
- A sharp **increase in customer churn** and app uninstalls.
- Poor feedback regarding **late deliveries** and **item unavailability**.
- Growing **operational costs** from inefficient delivery routes.

The Head of Operations, **Rohan Mehra**, suspects the issues stem from a mix of poor **inventory management, inefficient delivery fleet allocation, and service quality issues in specific city zones. Yo**ur task is to use the provided data to find the root cause and propose a solution.

🛠️ Tools to Be Used:

Tool	Purpose	Use Case in Project
Google Sheets	Data management and basic analysis	Organize datasets, perform data cleaning, calculate basic stats (mean, median), create pivot tables.
Flourish	Interactive data visualization	Create dynamic charts, geo-maps of delivery hotspots, and a final dashboard for presentation.
Binder (Jupyter Notebook)	Statistical computation & analysis	Calculate correlation between delivery time and customer rating; perform basic regression analysis.
Orange	Visual data mining & EDA	Explore data visually, create heatmaps, identify customer segments, and find important variables.
GeoGebra	Visualizing statistical concepts	Plot probability distributions of delivery times; visualize the regression line to explain correlation.
ChatGPT / Gemini	Natural language analysis & ideation	Summarize customer complaints from text feedback; brainstorm and refine hypotheses.
Napkin.ai	Flowchart and relationship mapping	Visualize the customer order journey and map out friction points (e.g., order placed -> payment -> dispatch -> delivery).

Perplexity AI	External research	Compare QuickBazaar's performance metrics (e.g., average delivery time) to industry benchmarks (e.g., Zepto, Blinkit).

📊 Dataset Provided:

The following (simulated) datasets will be provided for analysis in a Google Sheet:

- ✅ **Order & Customer Data (1,000 records):** Includes Customer ID, Order Timestamp, Average Order Value (AOV), Customer Rating (1-5), and text feedback.
- ✅ **Delivery & Operations Data (Monthly: 1 month):** Includes Order ID, Delivery Rider ID, Time to Dispatch, Time in Transit, Delivery Location Pincode, and Late/On-Time status.
- ✅ **Inventory Data:** Includes Product Category and Weekly Stockout Incidents.

🏆 End Goal:

➡️ Identify root causes for high churn and low customer satisfaction.
➡️ Propose a data-driven solution to improve delivery efficiency and customer retention.
➡️ Present a strategic turnaround plan to management with data-backed insights.

🚀 Project Timeline:

- **Total Duration:** 1 week
- **Team Size:** 3–4 students per group

📅 Phase 1: Project Setup and Planning (20 minutes)

- **Objective:** Set up a project workspace and brainstorm initial ideas.
- **Tasks:**

1. **Set Up Project Plan in Google Sheets (10 mins):**
    - Open the shared Google Sheet. Create a new tab named "Project Plan."
    - List the main phases: Data Analysis, Insight Generation, Strategy Design.
    - Assign tasks and set deadlines for each phase.
2. **Create an Order Journey Map in Napkin.ai (10 mins):**
    - Brainstorm the potential steps and friction points in a customer's order journey.
    - **Prompt:** "Generate a flowchart for a typical quick-commerce customer journey, highlighting potential failure points like payment issues, slow dispatch, and delivery delays."

📊 Phase 2: Data Exploration and Analysis (40 minutes)

- **Objective:** Load data and explore patterns using visualization and statistical tools.
- **Tasks:**
    1. **Load and Analyze Data in Orange (20 mins):**
        - Import the datasets into **Orange**.
        - Use widgets like "Distributions" to see the spread of delivery times and customer ratings.
        - Create a **Heatmap** to find initial correlations between variables (e.g., Pincode vs. Late Deliveries).
    2. **Summarize Feedback with ChatGPT (10 mins):**
        - Copy a sample of the text feedback from Google Sheets.
        - **Prompt:** "Analyze this customer feedback from a quick-commerce app and generate a summary of the top 3 complaints, including common keywords."
    3. **Benchmark with Perplexity AI (10 mins):**
        - Research industry standards for quick commerce in India.
        - **Prompt:** "What is the benchmark average delivery time and customer retention rate for quick-commerce companies like Zepto and Blinkit in Indian metro cities?"

🧠 Phase 3: Hypothesis Building (20 minutes)

- **Objective:** Develop and refine hypotheses based on statistical patterns.
- **Tasks:**
    1. **Test Hypotheses in Binder (Jupyter Notebook) (10 mins):**
        - Use the provided Binder link to open a Jupyter Notebook.
        - Write simple Python code (using pandas and scipy) to calculate the **correlation coefficient** between Time in Transit and Customer Rating.
    2. **Visualize Concepts in GeoGebra (10 mins):**
        - Based on the mean and standard deviation of delivery times from your analysis, use **GeoGebra** to plot a normal distribution curve.
        - Use this to explain the probability of a delivery being significantly late.

💡 Phase 4: Insight Generation (30 minutes)

- **Objective:** Generate AI-powered insights to support your strategy.
- **Tasks:**
    1. **Generate Reports in Flourish (20 mins):**
        - Import your cleaned data from Google Sheets into **Flourish**.
        - Create a dashboard with:
            - A **line chart** showing Average Order Value (AOV) over the last 12 months.
            - A **geo map** of Pune, color-coding pincodes by the frequency of late deliveries.
            - A **bar chart** showing stockout incidents by product category.
    2. **Summarize Report with Gemini (10 mins):**
        - Describe your key findings from Flourish and Binder to Gemini.
        - **Prompt:** "I found that delivery times are highest in the Hadapsar and Hinjewadi areas of Pune, which strongly correlates with negative customer ratings. AOV has dropped by 30%. Summarize these key insights into a professional summary for a business presentation."

🎯 Phase 5: Strategic Action Plan (20 minutes)

- **Objective:** Create a recovery strategy using your insights.
- **Tasks:**
    1. **Build Strategy Roadmap in Google Docs (10 mins):**
        - Create a new Google Doc. Outline a recovery plan with 3 key initiatives:
            - Optimize delivery routes for high-traffic zones.
            - Improve inventory forecasting for popular product categories.
            - Introduce a customer loyalty program to win back churned users.
    2. **Create a Strategy Presentation in Google Slides (10 mins):**
        - Build a presentation outline with AI-generated suggestions.
        - Embed your charts from **Flourish** and key insights.

🎤 Phase 6: Group Presentation

- **Objective:** Present findings and recommendations to the Head of Operations.
- **Tasks:**
    - Each group gets **5 minutes** to present.
    - Focus on: Data Analysis, Hypotheses, Recommended Strategy, and how the tools helped derive insights.

🗣️ Phase 7: Q&A and Feedback

- Discuss effective strategies and reflect on the key learning points.

📦 Deliverables(In form of project report and PPT):

1. **Google Sheet** with project plan and basic analysis.
2. **Flourish Dashboard** .
3. **Binder/Jupyter Notebook** with correlation analysis .
4. **Google Slides Presentation**.

🏅 **Evaluation Criteria & Process:**

- **Judged by Industry Experts:** Your strategy will be evaluated on its real-world viability.
- **Evaluation Focus:**
    - **Clarity of Insights (30%):** How well did you diagnose the root cause?
    - **Data Visualization Quality (30%):** How effectively does your data tell a story?
    - **Practicality of Solution (20%):** Is your turnaround plan actionable?
    - **Creative Use of AI Tools (20%):** Did you leverage the AI tools effectively?
- **Innovation Rewarded:** Unique insights and aesthetically pleasing, clear presentations will score higher. Copied or template-based submissions will not be awarded.
- **Bonus Points:** Awarded for consistent on-time assignment submission throughout the course.
- **Negative points** : Awarded for every late submission from the start of submission time.
- **Award Qualification:** Submission of both mini-project (FSP and BDA) is **mandatory** to be eligible for any course awards.