Please ensure all of you are part of the round 2 teams' channel for seamless communication

Round 2 Expectation Summary:

RGM :
Optimize SKU prices for maximizing MACO (Margin of Contribution)
Teams are expected to build an optimization engine which can find the optimal prices for market's full portfolio i.e. at SKU level maximizing the national MACO adhering to the hard and soft constraints. This should be delivered along with a front-end ie a web app which can take Revenue Managers' input for Price Increase (PINC- usually between 0-6% on the entire portfolio) & Price Bounds (eg. You can only change the price of the SKU in the range PTC of SKU +/- 300) using the optimization engine in the backend to recommend the optimal price/SKU.
Use the unmasked data provided to get closer to the insights
There is additional data available for RGM

Constraints:

Your optimizer must adhere to the following **hard constraints**:

1. **Volume should change in accordance with the Industry Volume model:** The final volume must be connected to the Industry model, using elasticities as inputs to determine the new volume mix across the different products in the country. Total Industry Volume should not decline by more than 1%.
    a. New Industry Volume = (1-.56*price change) * Old Industry Volume
2. **Financial Target:** The target MACO (model output) must be higher than the base MACO (current year).
3. **Volume Target:** The target volume (model output) should not decrease by more than 1% or increase by more than 5% compared to the base volume (current year).
4. **Total Price Increase (PINC):** The overall portfolio price increase can be between 0-6%, based on a user-defined input.
5. **Market Share:** ABI's market share should not drop by more than 0.5%.
6. **Pricing Multiples:** All recommended price changes must be in multiples of 50.

You must also consider **soft constraints** to maintain brand hierarchy:

- The Net Revenue per Hectoliter (NR/HL) of different segments must follow the established hierarchy: Value < Core < Core+ < Premium < Super Premium.
- The NR/HL architecture of size groups must follow the hierarchy: Small > Regular > Large.
    - **Small:** An SKU is considered small if the pack_size is less than 300.
    - **Regular:** An SKU is considered regular if its pack_type is 'CAN' and its pack_size is between 300 and 399 (inclusive), or if its pack_type is 'RB' or 'NRB' and its pack_size is between 300 and 599 (inclusive).
    - **Large:** An SKU is considered large if its pack_type is 'CAN' and its pack_size is greater than 399, or if its pack_type is 'RB' or 'NRB' and its pack_size is greater than 599.

LTE:

Optimize Marketing Investments

Leverage the model to optimize marketing investments that can control Power. Give insights to recommend the optimal mix of investments for maximizing long-term brand equity.

- The goal for optimization is to drive power growth using the best marketing allocations
- Constraints:
    - Digital cannot be 100%
    - TV cannot be more than 50% of the total mix
- Evaluation: Power uplift w.r.t. actual power

Simulate Power based on the marketing KPIs

Develop an interactive simulator tool based on the above optimized mix where users can adjust marketing inputs and instantly see the projected impact on Brand Power.

Use the unmasked data provided to get closer to the insights

Submission Guidelines:

To ensure you qualify for AI scoring :

- The web app development should be within given Github repo that includes a single entrpoint file which can spin up the app locally across Windows/Linux/MAC Platforms
    - Examples:
        - main.py (for Streamlit/FastAPI/Flask apps) → python main.py
        - npm start (for Node.js/React apps)
        - docker-compose up (for multi-service setup)
- No manual setup should be required apart from installing dependencies (e.g., pip install -r requirements.txt, npm install, or Docker).
    - Judges should not have to configure environment variables, databases, or edit code.
    - If special setup is needed, include it in the entrypoint or **clearly document in README.md**.

Evaluation Criteria:

- Round 1 gives 40 points. Leaderboard position is prorated by fixing team 1 points as 40. (provided you qualified the code check)
- AI Scoring (15 points):
    - All submissions will be scored by an AI model, based on **code quality, structure, documentation, and testing practices**.
    - Evaluation will focus on whether the web app can be reliably executed from a single entrypoint, with clear instructions and organized code in the GitHub repository
    - Default branch (main) will be selected for the code quality evaluation

- You can clean up the code base from Round 1 further provided – your methodology, final scoring equation remains the same and we are able to reproduce the final submission file. There will be penalty for violations

- **Methodology + E2E Approach (15 points – by judges):**
  - Present the end to end steps involved in R1 & R2. No need to create ppts specifically
  - This can be done through mkdoc - md files as well (set up guide included) - Anija

  Focus on talking through the below in the methodology walk through(plus additional details as per your wish):

  General:

  1. What are the final equations? What are the packages/algorithms used?
  2. How was Gen AI leveraged?
  3. What are the key hypothesis/assumptions taken from a business POV?
  4. If you had more time/data, what enhancements would you build?

  RGM

  5. How did you ensure volume & price relationship via elasticity model? How did you ensure that the model learns from the own and cross price effects of prices for volume prediction?
  6. Explain with the example of the largest volume SKU in the market, its cannibalization rate and the sourcing matrix (ie for a 1% price increase in the SKU, which other SKus will be cannibalizing its volume – across both ABI and non-ABI SKUs) using the output from your model in R1.
  7. How did you ensure that SKUs have higher cross elasticities with other SKUs that are similar in terms of same brand, pack and size?
  8. How did you use the elasticity model in the optimization?
  9. Explain your objective function and plot it? Which optimization technique was used and why? How did you incorporate the constraints?
  10. How have you incorporated the soft constraints?
  11. What is the portfolio change? Are there any patterns in PINCS across SKUs? What are the SKUs that are driving more profitability, and why?

LTE-

12. How did you capture long term impact of marketing KPIs?
13. How long it takes to drive power through marketing investments. (eg. 1 year, 3 years, etc.)?
14. Which KPIs had short term vs long term impact on power?
15. Did you notice any interaction between KPIs?
16. How do you rationalize the optimized investments to drive power. (Eg. Any constraints that you considered)?

- **Webapp functionality (15 points – by judges) :**

Core features adherence + functionalities + live demo, Simulator/Optimizer performance – Anija

Core Features:

LTE:

- Filters to **select country, brand, and time period** (monthly, quarterly, etc.) - even if monthly, it should use the R1 model aggregation to roll up to quarterly and show quarterly results
- Dropdown or search functionality for each.
- **List all marketing KPIs (X variables)** used in the model. Users can **adjust each KPI** via:
  - Numeric input box (e.g., type exact value)
  - Slider (for incremental changes, e.g., ±20% of baseline)
- Display the **predicted power value** based on current KPI settings.
- Ability to **save multiple scenarios** for the same country-brand-period combination.
- Compare predicted power across scenarios (e.g., table or chart).
- Highlight **delta from baseline** (current predicted power vs. scenario).
- **Reset button** to restore baseline KPI values.
- **Export functionality:** CSV or Excel of scenario inputs + predicted power.
- **Responsive UI**: usable on both desktop and laptop screens.

RGM:

- **A web app** which can take Revenue Managers inputs for **Price Increase (PINC)** & **Price Bounds** [MIN and MAX eg PTC - 300, PTC + 500] and uses the optimization engine in the backend to recommend the optimal price/SKU.
- **Functionality – Take user input on PINC and Price Bound > Optimize for MACO > recommend optimal price/SKU adhering to constraints**
  Output:

- **Dynamic visualization of the** overall Portfolio Impact and Financial summary. This table should clearly show – for the given user input; the old price, new price, and the projected impact (%change) on key performance indicators (KPIs), including:
    - Volume
    - Net Revenue (NR)
    - NR per Hectoliter (NR/HL)
    - MACO
    - MACO per Hectoliter (MACO/HL)
- **Price Architecture View** - A visualization of the new and old prices across SKUs based on the recommendations from the optimizer for the user defined PINC, that can be viewed by product attributes like brand, pack, size.

Business users (15 points by Judges):

End output appeal to business users (Relevance, Hypothesis & Assumptions, Ease of use, differentiation, presentation)

Bonus Points (10 points by Judges): Judges discretion for anything outstanding, chatbot integration

Timelines:

Git Repo Submission Deadline: 9th Oct 12 AM GMT/5.30 AM IST

Round 2 for RGM: 9th Oct 6.30 PM – 9.30 PM IST/1PM-4PM GMT (You will have a total of 15 minutes to present & 10 minutes for questions per team)

Round 2 for LTE: 10th Oct 6.30 PM – 9.30 PM IST/1PM-4PM GMT(You will have a total of 15 minutes to present & 10 minutes for questions per team)