

Data Science Challenge: Media Mix Modelling

Congratulations on making it to the Data Science Challenge! As a candidate for the Data Scientist position in our User Acquisition Analytics team, your task is to demonstrate your skills in media mix modelling and profit optimisation using a provided dataset. You have 1 week to get through this task. However, if you need more time please let us know.

Task Overview:

You are provided with a simulated media mix marketing dataset spanning from 1st January 2014 to 31st December 2017. The dataset contains historical data related to user acquisition, marketing investments, and revenue for a gaming company. Your challenge is to perform media mix modelling, analyse the impact of different marketing channels on user acquisition and revenue, and optimise the marketing budget allocation to maximise profit. There are many ways you could go about this task and there are no right or wrong answers.

About the Data:

Game : The name of the Game

Date: The specific date of the data entry.

Media_Channel: The marketing channel through which user acquisition efforts were made (Facebook, Google_Ads, Unity, IronSource).

Cost: The actual amount spent on marketing efforts for a specific day.

Daily_Total_Installs: The total number of game installs for a specific day. (please note channel level installs are unknown)

Daily_Total_Revenue: The total number of revenue generated by a game for a specific day. (please note channel level revenue is unknown)

Task Description:

Part 1: Media Mix Modelling

1. Develop statistical models to understand the relationship between marketing investments (Spend) and key performance metrics (Impressions, Clicks, Daily_Total_Installs, Daily_Total_Revenue).

2. Identify which media channels have the most significant impact on user acquisition and revenue generation.
3. Assess the effectiveness of marketing investments by calculating Return on Advertising Spend (ROAS) for each media channel.

Part 2: Exploratory Data Analysis (EDA)

Perform exploratory data analysis to gain insights into the dataset. Visualise and summarise key metrics such as installs, revenue, CPI's over time and across media channels. Is there a trend or seasonality element etc.?

Part 3: Budget Allocation

1. Propose strategies for profit optimisation by adjusting marketing budgets and identifying potential opportunities for increasing profits.
2. Develop and present actionable insights and recommendations to the company's stakeholders for decision-making.

Evaluation Criteria:

- Quality and depth of exploratory data analysis, insights, and visualisations.
- Accuracy and effectiveness of media mix modelling and ROAS analysis.
- Soundness of the profit optimization strategies proposed.
- Clarity and effectiveness of insights and recommendations presented.

Deliverables:

- An executive summary presenting the key findings, insights, and recommendations from the analysis.
- A well-documented and organised R script or Jupyter Notebook showcasing your data analysis, modelling, and optimisation techniques.
- Relevant visualisations to support your analysis and recommendations.

Additional Information:

- You are encouraged to leverage the `tidyverse`/pandas package and other relevant libraries for data manipulation, visualisation, and modelling.
- Feel free to use appropriate statistical techniques, machine learning algorithms, and visualisation methods to enhance the analysis.

- The dataset is a simulation and does not represent actual data from any specific company. Focus on the quality of your analysis and modelling techniques rather than the specific values in the dataset.

Good luck! We look forward to seeing your innovative approach to media mix modelling and profit optimisation. Show us your data science prowess, and let's take our user acquisition strategies to the next level!