The Task

A client has approached the Monks seeking our expertise in developing a robust R Shiny application to visualise their Marketing Mix Model (MMM) output. They require a user-friendly interface that allows stakeholders to interactively explore data insights, analyse trends, and share outputs with other stakeholders. The client emphasises the importance of clear visual representations to facilitate data-driven decision-making and enhance the understanding of marketing effectiveness.

You have been tasked with utilising your R Shiny skills to complete this. Below are some requirements you are tasked with following. Please use whatever packages / frameworks within R and Shiny you wish to be successful in this task.

The Data

Provided dataset is an excel spreadsheet containing 5 tabs that are explained below:

- **Decomp** - consist of 4 columns: model_name, Date, category & value. The data shows the categories that drives each of our Key Performance Indicators (KPI) for each week. E.g. a value of 25 for TV in the sales model suggests 25 sales are driven by consuming a TV advert.
- **ActualFittedResiduals** - consists of 5 columns: model_name, date, actual, fitted, residuals. Data in the actual column refers to the KPI data we are trying to estimate when building a model. Fitted values are the predicted KPI values outputted from the built model and residuals are the difference between the two (actual - fitted).
- **DateList** - consists of 2 columns: DateGroup and Date. This shows a mapping between the weekly dates and which aggregated time period (Date Group) they belong to.
- **ROI** - consists of 4 columns: model_name, SpendVariable, date_group, Profit. This data shows the Profit numbers that each media channel is driving based off a given level of spend
- **SpendData** - consists of 3 columns: SpendVariable, DateGroup, Spend. This data provides the spend data for each media channel by time period

Requirements

Your application must show at least the following three views and an additional fourth view of your own choosing:

Task 1: Build a time series chart using the Decomp Data:

    - You must be able to filter charts by: Date, Category, and Model.
    - Plot the actual column from the ActualFittedResiduals tab on the chart as well.

Task 2: Create a Waterfall Chart:

- Aggregate values in the "Decomp" column by Category and Date Group (hint: use "DateList" sheet to find mapping).
- Visualise the differences by categories across DateGroup using a Waterfall Chart

Task 3: Interactive ROI Display

- Include columns: SpendVariable, date_group, Profit from “ROI” Tab
- Create a Spend column by joining data from the "SpendData" tab.
- Calculate ROI metric (Profit / Spend)
- Visualise these all numbers (Spend, Profit, ROI) in an interactive way

Task 4: Freestyle

- This is your opportunity to show off your skills
- Think about what would be useful to show a potential stakeholder within this dataset & how best to display it

Submission Instructions

- Provide the complete R Shiny app code and any additional scripts or files.
- Include a README file summarising the functionality and how to run the application
- Submit your project as a ZIP file