**Overview:** The product team has released a new feature encouraging participants to log a weight and would like to judge its effectiveness on improving weight loss over a 10-week period.

**Step 1 (SQL):** Sample data highlighting some of the key columns in the main dataset (weights.xlsx). Here, two sample tables are joined, grouping on the column mobile, and averaging weight loss to compare across mobile vs. nonmobile users. Each table is shown below.

|  |  |  |
| --- | --- | --- |
| table\_1 | | |
| id | mobile | first\_weight |
| 1 | Yes | 180 |
| 2 | Yes | 290 |
| 3 | No | 220 |
| 4 | No | 235 |
| 5 | Yes | 195 |
|  |  |  |
| table\_2 | | |
| id | new\_feature | weight\_loss |
| 1 | 0 | 10 |
| 3 | 0 | 8 |
| 2 | 1 | 7.5 |
| 5 | 1 | 9.3 |
| 4 | 0 | 6.9 |

**SQL Syntax:**

SELECT

    t1.mobile,

    AVG(t2.weight\_loss) as avg\_wl

FROM table\_1 as t1

JOIN table\_2 as t2 ON t1.id = t2.id

GROUP BY t1.mobile

**Output of Query:**

|  |  |
| --- | --- |
| **mobile** | **avg\_wl** |
| Yes | 8.3 |
| No | 8.4 |

**Step 2 (Analysis):** Making recommendations on implementing the new feature, using exploratory data analysis, summary statistics, and other statistical analyses.

**Step 2 Notes:**

1. Data Cleaning / Transformation:
   1. Checked for duplicates (0 found)
   2. Checked for N/A or blanks (removed one row on blank id)
   3. Cleaned Mobile column (Y -> Yes, N -> No)
      1. One row had “1”
      2. I removed this row; however, in a real world setting I would reach out and ask about this. Its likely that a “1” means affirmative and therefore a Yes
   4. Cleaned first\_weight and min\_weight columns (removed one row with negative values)
   5. Renamed columns to be in snake\_case
   6. XLOOKUP to bring in start\_date column from dim\_project\_dates
2. Exploratory Data Analysis:
   1. Two pivot tables in spreadsheet:
      1. One exploring how grouping by Mobile and New Feature impact the average weight loss
         1. **For mobile users, there is a 40% increase in weight loss with the new feature**
         2. **For non-mobile users, there is a slight (1%) decrease in weight loss with the new feature**
         3. **For, non-mobile users there is a 15% increase in weight loss compared to mobile users**
      2. Second exploring these groupings over time based on project start date
         1. **For mobile users, the total amount of average weight loss at each start date is relatively consistent over time and the new feature group consistently losses more weight on average**
         2. **For non-mobile users there is variance from week to week within the same feature group, as well as between the two feature groups each week (i.e., some weeks the new feature has greater average weight loss and other weeks it has less)**
   2. Summary chart below:
3. Statistical Analysis:
   1. Brought data into R Studio to perform statistical analysis with R
   2. Tested assumptions for t-test (normal distribution and equality in variance)
   3. For mobile users, the difference in average weight loss between the new feature and no new feature group was found to be statistically significant.
4. **Recommendations:**
   1. Based on the statistically significant increase in average weight loss between mobile users with the new feature vs. those without the new feature, **I would recommend that the new feature be implemented only for mobile users.**
   2. For future analysis, I would explore why
      1. non-mobile users:
         1. Have higher average weight loss than mobile users
         2. Experience greater variance in average weight loss from week to week compared to mobile users
      2. the improvement in average weight loss varies so much from project to project

**Step 3 (Effectiveness):** Business objective is to create a report or dashboard that a clinical or product manager might use on a recurring basis to monitor effectiveness of feature or accounts or projects or users.

**Step 3 Notes:**

Created a Power BI dashboard that focused on highlighting the difference between the new feature vs. not having the new feature as an A/B test dashboard. With clinical or product managers in mind, there is the ability to filter on a number of categories, including start date, mobile, project, and user. Please see screenshot below and the .pbix file for the full dashboard.

