

# Gym Members Exercise

2024-10-29

## Analysis of Gym Members' Exercise Dataset

### a. Dataset URL

The dataset used for this analysis can be found at the following URL: Gym Members' Exercise Dataset on Kaggle: <https://www.kaggle.com/datasets/valakhorasani/gym-members-exercise-dataset>

### b. Why This Dataset is of Interest

This dataset is fascinating because it provides detailed fitness metrics of gym members, allowing for the analysis of exercise patterns, demographic influences on performance, and overall fitness progression. The combination of physical attributes and workout data makes it ideal for exploring how different factors, like age, gender, and fitness experience, impact workout efficiency and health trends.

```
# Load necessary libraries
library(tidyverse)

# Define the path to your CSV file
file_path <- "/Users/surabhimetpally/Downloads/gym_members_exercise_tracking.csv"

# Read the CSV file into a data frame
gym_data <- read_csv(file_path)
```

```
# Calculate the mean and median calories burned by workout type
calories_summary <- gym_data %>%
  group_by(Workout_Type) %>%
  summarise(
    Avg_Calories = mean(Calories_Burned, na.rm = TRUE),
    Median_Calories = median(Calories_Burned, na.rm = TRUE)
  )

calories_summary
```

```
## # A tibble: 4 x 3
##   Workout_Type Avg_Calories Median_Calories
##   <chr>         <dbl>         <dbl>
## 1 Cardio         885.           888
## 2 HIIT           926.           920
## 3 Strength       911.           904.
## 4 Yoga           903.           876
```

```
# Create a box plot to compare calories burned by workout type
ggplot(gym_data, aes(x = Workout_Type, y = Calories_Burned, fill = Workout_Type)) +
  geom_boxplot() +
  labs(title = "Calories Burned by Workout Type", x = "Workout Type", y = "Calories Burned") +
  theme_minimal()
```



```
# Correlation matrix between Weight, Session Duration, and Max BPM
correlation_matrix <- gym_data %>%
  select(`Weight (kg)`, `Session_Duration (hours)`, Max_BPM) %>%
  cor(use = "complete.obs")

# Display the correlation matrix
correlation_matrix
```

```
##              Weight (kg) Session_Duration (hours)    Max_BPM
## Weight (kg)          1.00000000          -0.01366556  0.05706113
## Session_Duration (hours) -0.01366556           1.00000000  0.01005098
## Max_BPM              0.05706113           0.01005098  1.00000000
```

```
# Summary statistics for Weight, Max BPM, and Session Duration
summary_stats <- gym_data %>%
  summarise(
    Mean_Weight = mean(`Weight (kg)`, na.rm = TRUE),
    Median_Weight = median(`Weight (kg)`, na.rm = TRUE),
```

```

Mean_Max_BPM = mean(`Max_BPM`, na.rm = TRUE),
Median_Max_BPM = median(`Max_BPM`, na.rm = TRUE),
Mean_Session_Duration = mean(`Session_Duration (hours)`, na.rm = TRUE),
Median_Session_Duration = median(`Session_Duration (hours)`, na.rm = TRUE)
)

# Display summary statistics
summary_stats

## # A tibble: 1 x 6
##   Mean_Weight Median_Weight Mean_Max_BPM Median_Max_BPM Mean_Session_Duration
##   <dbl>         <dbl>         <dbl>         <dbl>         <dbl>
## 1      73.9           70          180.          180           1.26
## # i 1 more variable: Median_Session_Duration <dbl>

# Create a contingency table for Gender and Workout Type
contingency_table <- table(gym_data$Gender, gym_data$Workout_Type)

# Display the contingency table
contingency_table

##
##           Cardio HIIT Strength Yoga
##   Female    126  107     123  106
##   Male      129  114     135  133

```

## Summary Statistics and Contingency Table Analysis

The summary statistics for key variables in the dataset provide the following insights:

- **Weight (kg):** The average weight of gym members is approximately 73.8546763, with a median of 70. This indicates that there may be outliers affecting the average, as the mean and median differ.
- **Max BPM:** The average maximum heart rate during workouts is around 179.8838643, while the median is 180. This suggests that most members achieve a maximum heart rate close to the median value, indicating a relatively consistent workout intensity among members.
- **Session Duration:** On average, gym members spend 1.2564234 hours per session, with a median duration of 1.26. This information is crucial for understanding workout habits and consistency.

The contingency table shows the distribution of workout types across different genders. By analyzing the table, we can determine whether certain types of workouts are more popular among male or female gym members. For example, if we see a higher count of strength workouts among males compared to females, this might indicate gender-based preferences in workout types.