PYTHON REINFORCEMENT PROJECT

GYM TRACKING

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Introduction

The purpose of this analysis is to explore how various lifestyle factors influence Body Mass Index (BMI). Using the Gym Tracking dataset, this study examines the relationship between BMI and key variables such as workout frequency, water intake, height, and weight. Understanding these patterns can provide insights into how physical activity and hydration contribute to maintaining a healthy body composition. By analyzing this data, we aim to identify trends that can guide effective fitness and wellness planning.

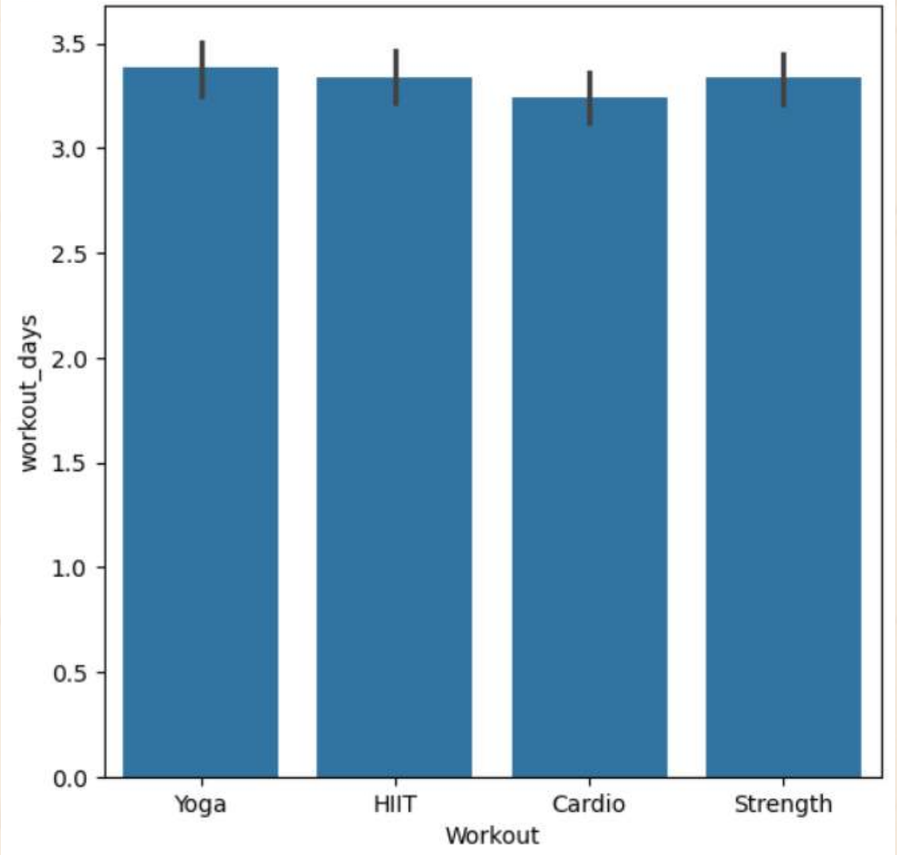
Age	Gender	Weight (kg	Height (m)	Max_BPM	Avg_BPM	Resting_BI	Session_D	Calories_B	Workout_Type	Fat_Percentage	Water_Intake (liters)	Workout_Frequ	Experience_Level	BMI
56	Male	88.3	1.71	180	157	60	1.69	1313	Yoga	12.6	3.5	4	3	30.2
46	Female	74.9	1.53	179	151	66	1.3	883	HIIT	33.9	2.1	4	2	32
32	Female	68.1	1.66	167	122	54	1.11	677	Cardio	33.4	2.3	4	2	24.71
25	Male	53.2	1.7	190	164	56	0.59	532	Strength	28.8	2.1	3	1	18.41
38	Male	46.1	1.79	188	158	68	0.64	556	Strength	29.2	2.8	3	1	14.39
56	Female	58	1.68	168	156	74	1.59	1116	HIIT	15.5	2.7	5	3	20.55
36	Male	70.3	1.72	174	169	73	1.49	1385	Cardio	21.3	2.3	3	2	23.76
40	Female	69.7	1.51	189	141	64	1.27	895	Cardio	30.6	1.9	3	2	30.57
28	Male	121.7	1.94	185	127	52	1.03	719	Strength	28.9	2.6	4	2	32.34
28	Male	101.8	1.84	169	136	64	1.08	808	Cardio	29.7	2.7	3	1	30.07
41	Male	120.8	1.67	188	146	54	0.82	593	HIIT	20.5	3	2	1	43.31
53	Male	51.7	1.7	175	152	72	1.15	865	HIIT	23.6	3.5	3	2	17.89
57	Male	112.5	1.61	195	165	61	1.24	1013	Cardio	22.1	2.7	3	2	43.4
41	Male	94.5	2	179	136	69	1.18	794	HIIT	27.6	3.7	3	1	23.62
20	Male	117.7	1.81	196	161	54	1.35	1195	Yoga	26.4	3.3	3	2	35.93
39	Female	42.5	1.75	181	131	52	1.13	740	Strength	26.2	2.1	2	1	13.88
19	Female	64	1.53	166	167	58	1.33	1111	HIIT	29.8	2.3	3	2	27.34
41	Female	43.8	1.77	182	165	58	1.19	884	Cardio	31.9	1.6	3	1	13.98
47	Female	66.8	1.75	199	146	56	1.13	742	Strength	32.8	2.5	3	2	21.81
55	Female	75.2	1.67	188	167	51	1.37	1030	HIIT	25.2	2.2	2	1	26.96
19	Male	89	1.77	175	127	72	1.5	1048	Strength	28.9	3.7	4	2	28.41
38	Male	71.9	1.77	197	142	72	1.12	875	Cardio	25.7	3.1	2	1	22.95
50	Female	71	1.68	187	161	70	1.17	848	Yoga	33.1	2.5	2	1	25.16

DATASET OVERVIEW

The Gym Tracking dataset contains 973 records and 15 variables, capturing detailed information about individuals' physical and fitness characteristics. The dataset includes demographic, physiological, and lifestyle factors related to workout behavior and body composition.

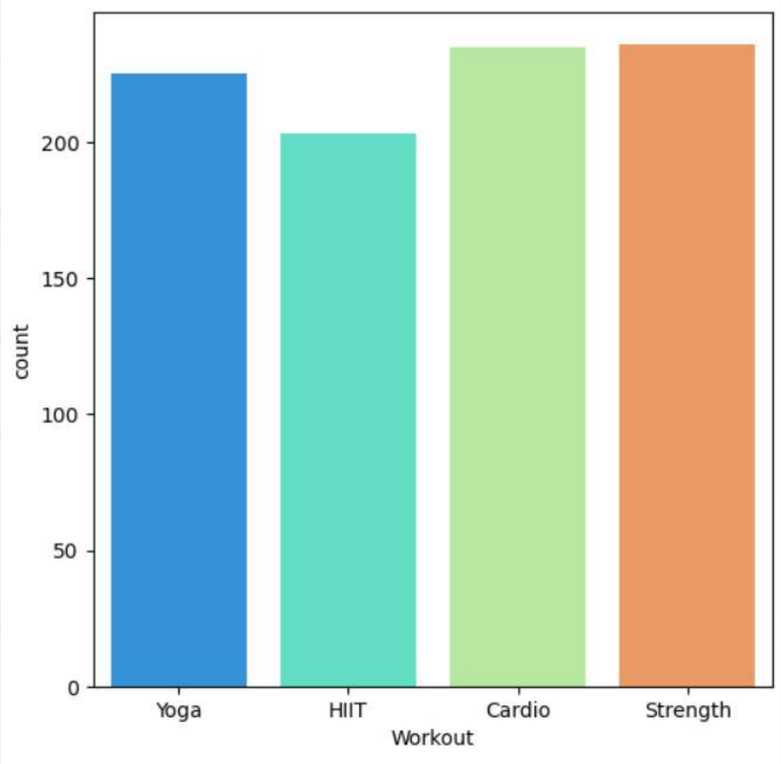
INSIGHT

This indicates that regardless of workout type — whether it's Yoga, HIIT, Cardio, or Strength — people maintain a steady workout routine of about 3 sessions per week. No specific workout type is linked with a significantly higher training frequency.



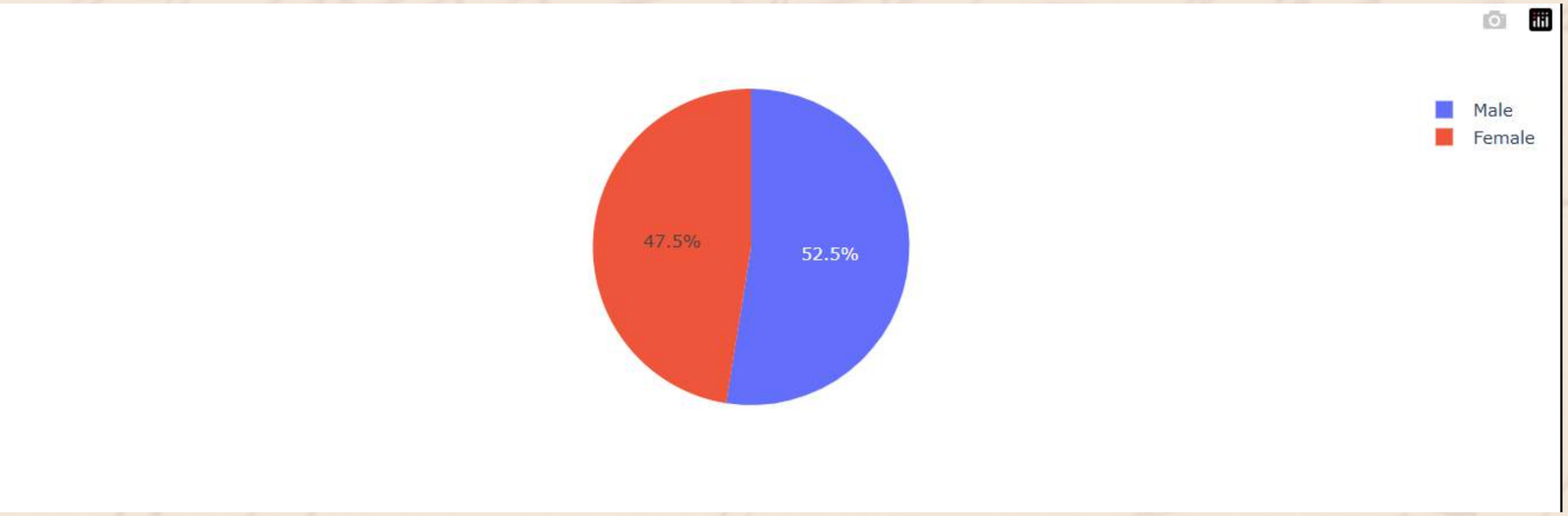
INSIGHT

The dataset reveals that Cardio and Strength workouts are the most popular among participants, while HIIT is the least chosen. However, the differences between all workout categories are relatively small, suggesting a well-balanced distribution of workout preferences across the sample.



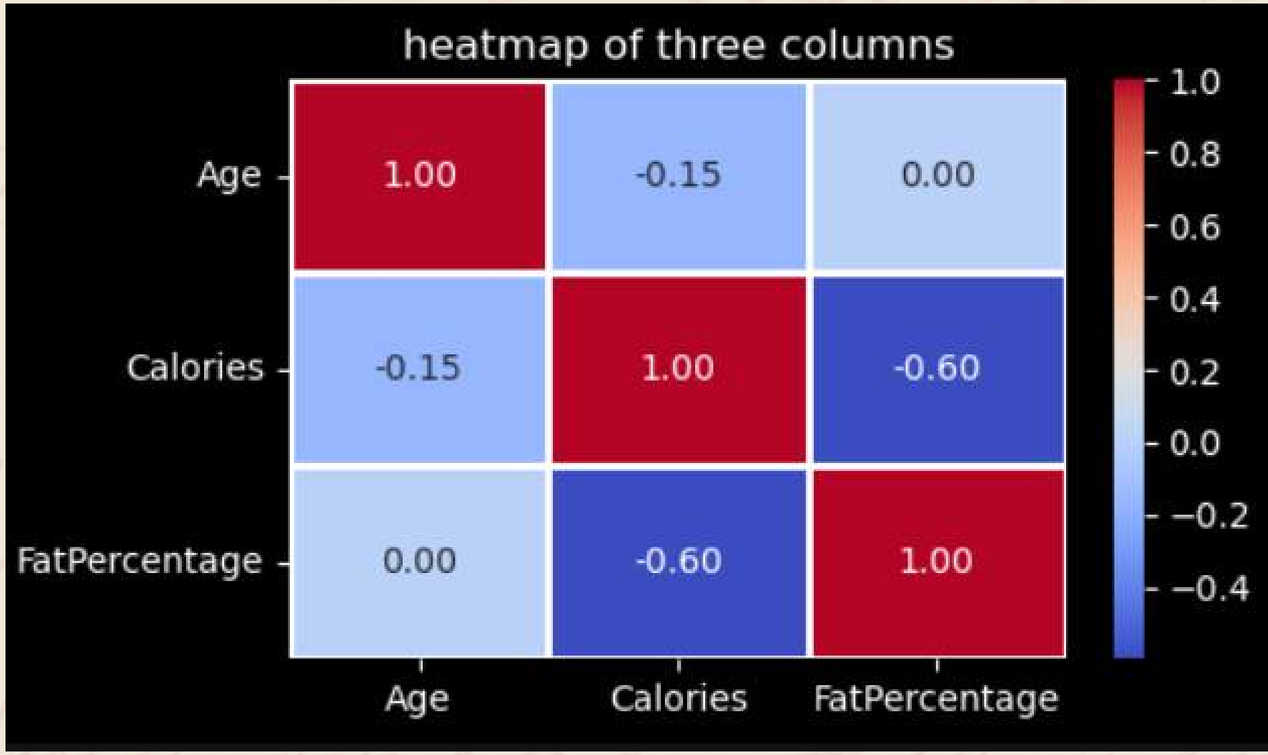
INSIGHT

The dataset has a nearly balanced gender distribution, with a slightly higher proportion of males (about 5% more than females).
This balanced representation ensures that analyses based on BMI, workouts, and other health metrics can be interpreted without significant gender bias.



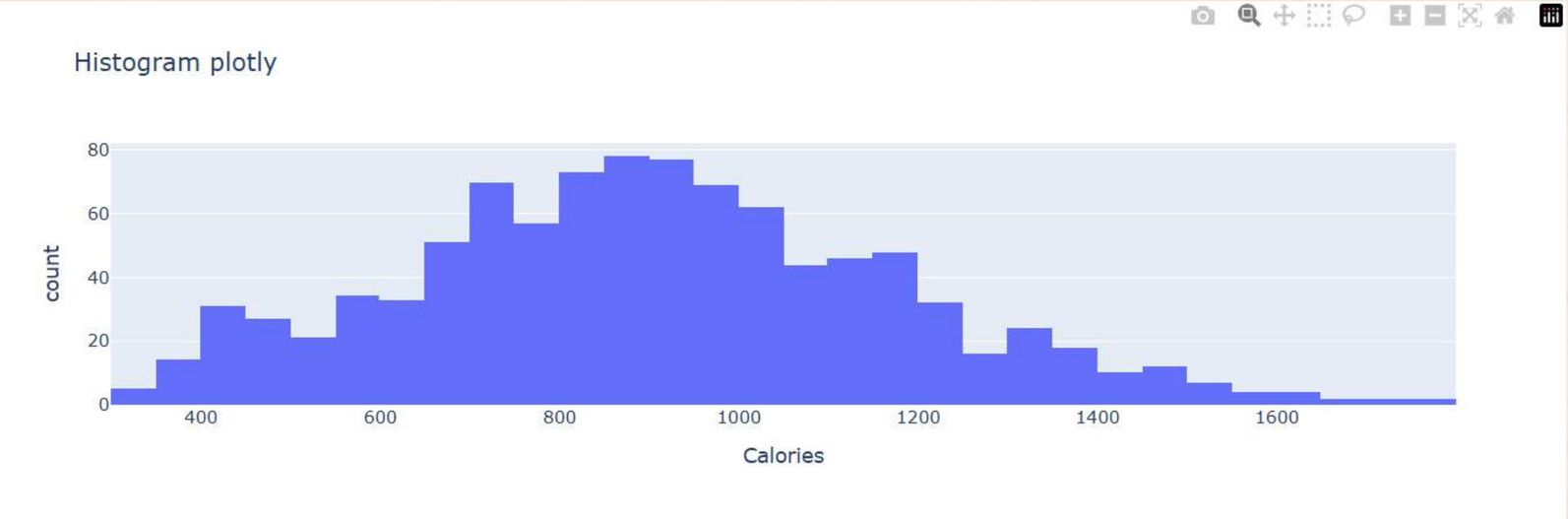
INSIGHT

Overall, the strongest relationship observed is between Calories Burned and Fat Percentage. This reinforces the idea that consistent calorie-burning activities contribute to reduced body fat, while age has minimal direct impact on either variable in this dataset.



INSIGHT

Most gym members tend to have moderate to high-intensity workouts, typically burning 800–1000 calories per session. This suggests a generally active population with few extreme outliers in training intensity.



INSIGHT

The data implies that while a portion of participants maintain a healthy BMI, a significant number have higher-than-recommended BMI levels, highlighting the importance of balanced workouts and nutritional management in maintaining healthy body weight.

```
20.11
28.56
7.4350000000000005
41.235
```

INSIGHT

Overall, the majority of gym members maintain a consistent calorie expenditure pattern, suggesting regular workout habits. A few individuals, however, push their limits with significantly higher energy output, showing diverse training intensity levels across the group.

```
720.0
1076.0
186.0
1610.0
```

INSIGHT

Gender plays a significant role in calorie expenditure during workouts — one gender (likely males) tends to burn more calories on average than the other, possibly due to differences in body composition, muscle mass, or workout intensity.

```
=== Hypothesis Test 1: Calories Burned by Gender ===
T-statistic: 4.6280
P-value: 0.0000
 Reject Null Hypothesis: There is a significant difference in calories burned between genders.
```

INSIGHT

Workout type selection appears to be independent of gender. Both men and women engage in a balanced mix of workout types, indicating that fitness preferences are likely influenced more by individual goals and interests rather than gender differences.

```
=== Hypothesis Chi Square test: Relationship between Gender and Workout Type ===
Chi-square Statistic: 2.1413
Degrees of Freedom: 3
P-value: 0.5436
 Fail to reject H0: No significant relationship between gender and workout type.
```

Thank you!