Business Report

Project Title:
Member Activity & Workout Trends – Hardcore Gym

Client Name:
Hardcore Gym

Prepared By:
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Date:
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Executive Summary:

This analysis provides valuable insights into **gym user behaviour, workout trends, and subscription patterns**. The key findings can help management improve retention, optimize resources, and drive business growth.
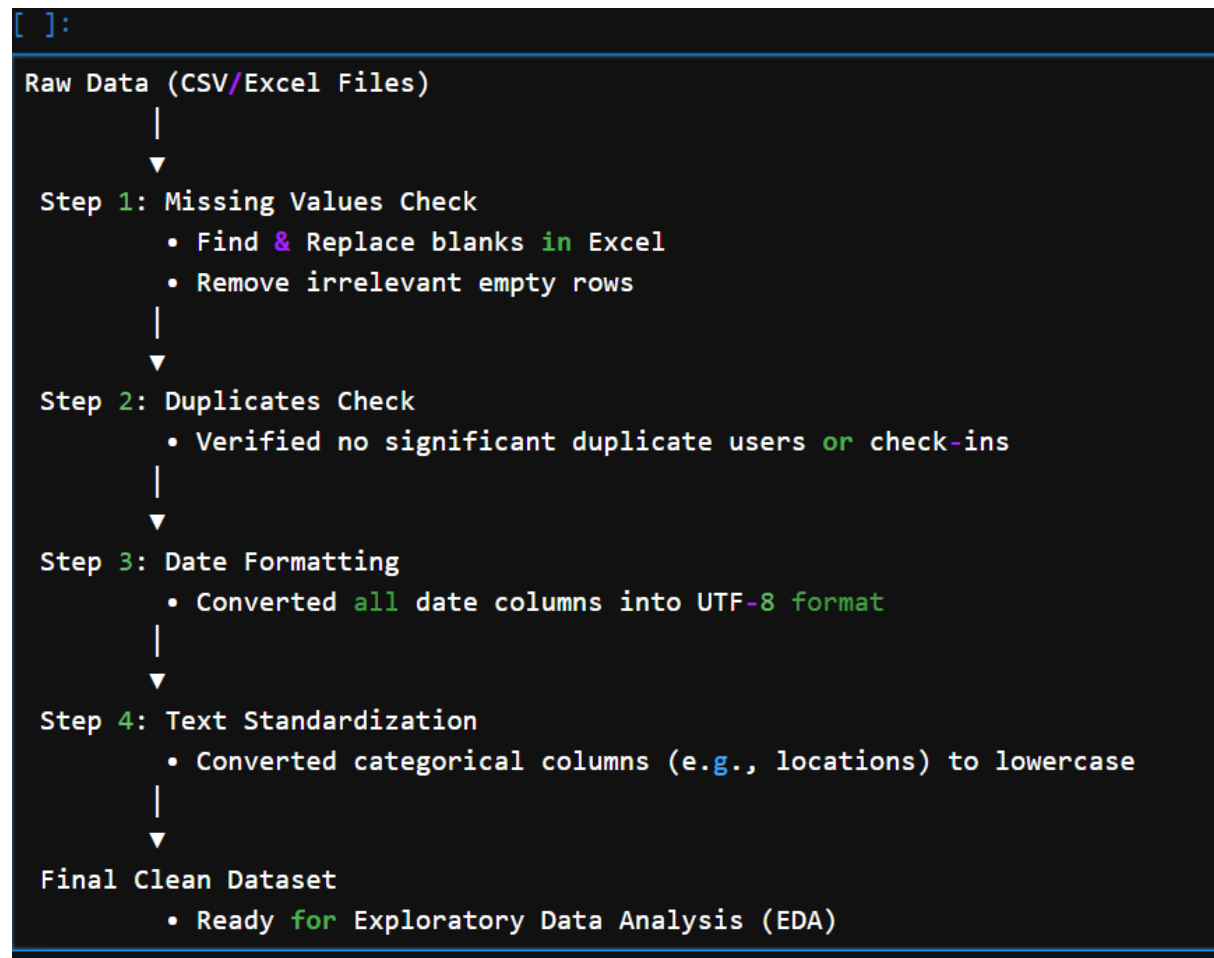
Key Insights

- **Age & Workouts**: Younger users (18–30) prefer high-intensity workouts, while older groups lean towards yoga and low-intensity exercises. → Opportunity to design **age-specific workout plans**.

- **Subscription Plans**: Pro & Student plans have higher check-in frequency compared to Basic. → Suggests **upselling strategies** for Basic users.

- **Location Trends**: Certain gym locations attract more premium users, while others have mostly Basic plan members. → Management can **reallocate trainers/equipment** accordingly.

- **Workout Duration & Calories**: Some users log unusually high workout times or calorie burns, indicating **data entry issues** or **outliers**. Cleaning this improves decision-making.

Business Recommendations

1. **Targeted Marketing** – Promote student discounts and premium benefits to increase conversions.

2. **Personalized Programs** – Create workout bundles by age group to improve user satisfaction.

3. **Resource Optimization** – Align trainers and equipment with location-specific demand.

4. **Retention Strategy** – Offer loyalty rewards for consistent check-in users.

Data Cleaning Pipeline

```
[ ]:
Raw Data (CSV/Excel Files)
        |
        ▼
 Step 1: Missing Values Check
        • Find & Replace blanks in Excel
        • Remove irrelevant empty rows
        |
        ▼
 Step 2: Duplicates Check
        • Verified no significant duplicate users or check-ins
        |
        ▼
 Step 3: Date Formatting
        • Converted all date columns into UTF-8 format
        |
        ▼
 Step 4: Text Standardization
        • Converted categorical columns (e.g., locations) to lowercase
        |
        ▼
 Final Clean Dataset
        • Ready for Exploratory Data Analysis (EDA)
```

Data Overview:

This project uses **four datasets** related to gym users, check-ins, subscriptions, and locations. Together, they provide a comprehensive view of user behavior and business performance.

1. Users Data (users_data.csv)

- Contains demographic details of gym users.

- **Key Columns**: user_id, first_name, last_name, age, gender, birthdate,sign_up_date,user_location,subscription_plan

- **Use**: Helps analyze workout preferences and trends by age/gender.

2. Check-in/Check-out History (checkin_checkout_history_updated.csv)

- Tracks when users check into and out of gyms.

- **Key Columns**: user_id,gym_id, checkin_time, checkout_time, calories_burned, workout_type, .

- **Use**: Provides insights into engagement, workout intensity, and retention.

3. Gym Locations (gym_locations_data.csv)

- Information about gym branches.

- **Key Columns**: gym_id,location, gym_type, facilities.

- **Use**: Enables analysis of performance by location/branch.

4. Subscription Plans (subscription_plans.csv)

- Details of membership types.

- **Key Columns**: subscription_plan,price_per_month,features.

- **Use**: Helps understand revenue and user preferences for different plans.

Data Quality Check & Cleaning:

Before performing analysis, it was important to ensure the data was accurate, consistent, and usable. The following steps were applied:

Missing Values

- **Check**: Each dataset was examined for nulls or blanks.

- **Action**: Missing entries were handled in Excel using **Find & Replace** (blanks replaced with valid placeholders or removed if irrelevant).

Duplicates

- **Check**: Duplicate rows were scanned in user and check-in data.

- **Action**: No significant duplicates were found; datasets were clean for analysis.

Date Columns

- **Issue**: Some date columns had inconsistent formats.

- **Action**: Converted all dates into a consistent **UTF-8 format** to ensure compatibility in Python and Excel.

Text Standardization

- **Issue**: Location names and categorical fields had case inconsistencies (e.g., "Delhi" vs "delhi").

- **Action**: Converted categorical text fields (like location) to lowercase to avoid merge mismatches.

Final Check

- After these steps, the data was:

    o   Free of blanks and duplicates.

    o   Properly formatted (dates, categories).

    o   Ready for **Exploratory Data Analysis (EDA)**

Business Question: How do different age groups choose workouts?

Workout Type Preference Across Age Groups (%)
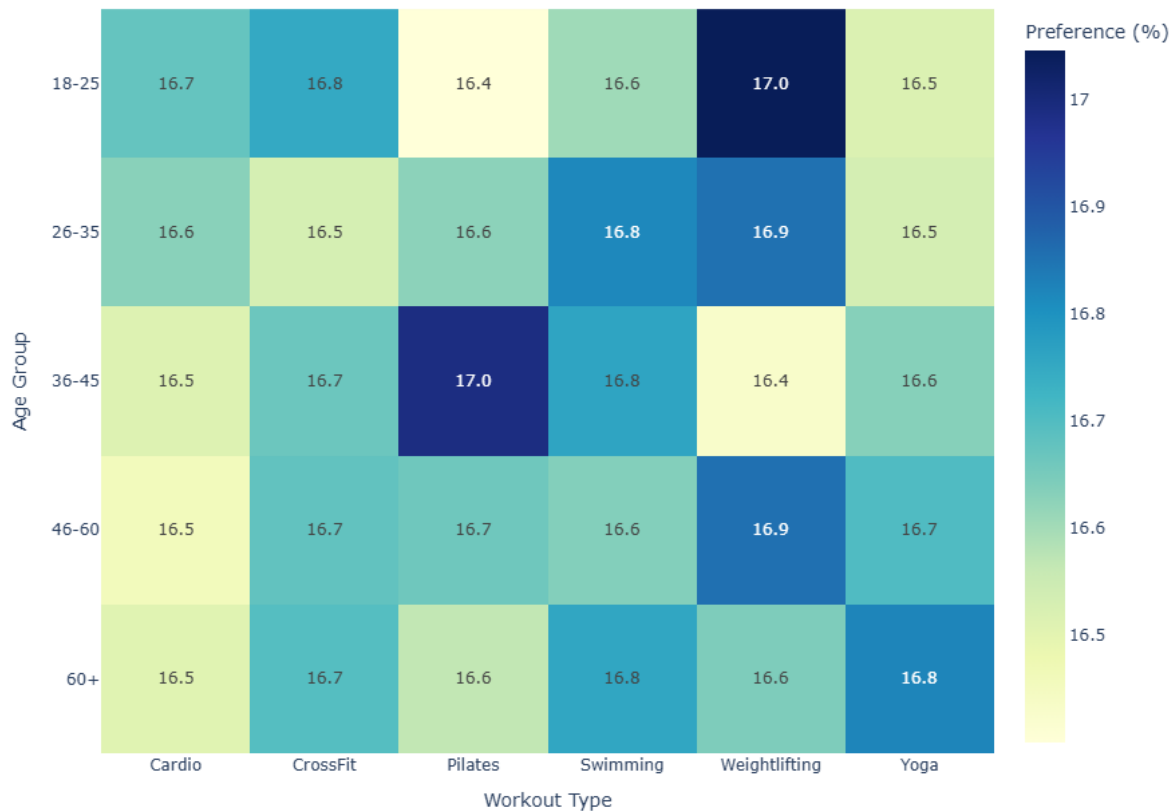
Business Insight:

- Across all age groups, workout preferences are relatively balanced **(values between ~16.4%–17%).**

- The **18–25** group shows the highest interest in **Weightlifting (17%)**, suggesting younger members are focused on strength training or **cardio (16.7%)**

- The **26-35** group shows slightly higher preference for **weightlifting (16.9% almost 17%) and swimming (16.8%)** showing this age group physically active and fit like age group **18-25**

- The **36–45** group shows slightly higher preference for **Pilates (17%)**, indicating mid-aged users may value flexibility and low-impact workouts.

- Users aged **46–60** lean a bit more towards **Swimming and Yoga (16.7–16.8%)**, which are safer, low-impact options.

Strategic Recommendations: Tailored Workout Strategies by Age Group

1. **Targeted Class Scheduling**

   - Increase **Weightlifting and CrossFit sessions as well as cardio session** for younger members (18–25).

- introduce 2 new weekly Pilates classes to target 26–35 age group, which can increase retention by 2-3%.

- Maintain **Swimming programs** for members aged 46+, focusing on low-impact fitness.

2. **Marketing Campaigns**

- Promote **strength programs** (Weightlifting, CrossFit) to attract younger demographics such as students and young professionals.

- Highlight **flexibility and wellness programs (Pilates, Yoga)** to appeal to mid-aged and senior clients.

3. **Membership Retention Strategy**

- Personalize **subscription plans** by age group:

  - **18–25** → Strength & CrossFit bundles

  - **26–45** → Pilates + General Fitness packages

  - **46+** → Yoga, Swimming & Wellness packages

Business Question: Gender-Based Fitness Trends

```
workout_type  Cardio  CrossFit  Pilates  Swimming  Weightlifting   Yoga
gender
Female         21527     21654    21826     21843          21998  21868
Male           23302     23255    23302     23454          23433  23171
Non-binary      4800      5067     4907      4836           4875   4882
```

Business Insight:

- **Males** show higher participation overall across all workout types, especially in **Swimming (23,454)** and **Weightlifting (23,433)**.

- **Females** also engage strongly, with relatively balanced preferences across all workout types, slightly higher in **Weightlifting (21,998)** and **Yoga (21,868)**.

- **Non-binary users** have smaller representation but show consistent participation across workout types, with a slight preference for **CrossFit (5,067)**.

- Both genders show **strong interest in Weightlifting**, making it the most universally popular workout type

Strategic Recommendations

1. **Program Design**

- Maintain a **high frequency of Weightlifting and Swimming classes**, as they attract both male and female members.

- Offer more **Yoga and Pilates sessions** to better engage female members.

- Provide inclusive programs (e.g., **CrossFit and Cardio**) for **Non-binary users** and newcomers.

2. **Marketing Campaigns**

   - Promote **Weightlifting and Swimming packages** in general marketing since they appeal broadly.

   - Create targeted ads highlighting **Yoga & Pilates for females** and **CrossFit for non-binary audiences** to encourage inclusivity.

3. **Facility Investment**

   - Invest in **Weightlifting equipment and swimming facilities**, as they are in high demand across all genders.

   - Ensure dedicated spaces for **Yoga & Pilates** to attract more female retention.

Business objective: Time-of-Day Check-in Patterns

Time-of-Day Check-in Patterns:
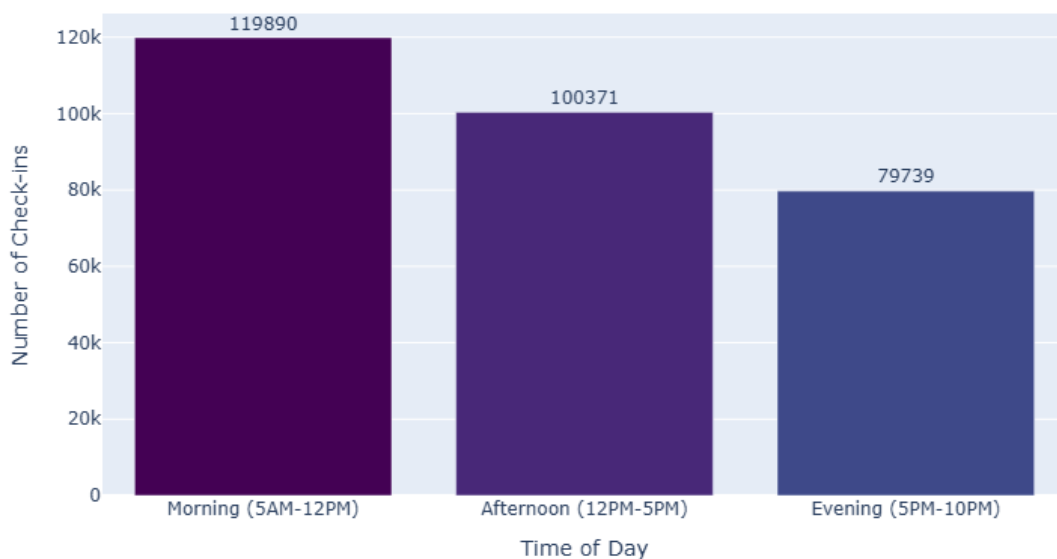
Business insight:

Morning (5AM–12PM):

- This time slot records the highest volume of check-ins, indicating a strong preference among users to exercise early in the day. This trend is often associated with professionals, students, and health-conscious individuals who prioritize fitness before daily responsibilities.

Afternoon (12PM–5PM):

- The second most active period, likely driven by individuals with flexible schedules such as remote workers or midday break-takers.

Evening (5PM–10PM):

- The least frequent check-in window, possibly due to post-work fatigue, family obligations, or competing leisure activities.

Strategic Recommendations

Marketing & Promotions

- Target morning users with productivity and wellness messaging.

- Use evening campaigns to promote stress relief and relaxation benefits.

Tailor Class Scheduling

- Offer premium or high-demand classes (e.g., HIIT, spin, yoga) in the morning.

- Introduce niche or recovery-focused sessions (e.g., mobility, meditation) in the evening to attract a different crowd.

Dynamic Pricing or Incentives

- Consider off-peak discounts for evening slots to boost usage.

- Launch morning loyalty programs for regular early risers.

Facility Design

- Ensure locker rooms, showers, and smoothie bars are optimized for morning rush.

- Create cozy, low-light zones for evening users seeking a calmer vibe.

Business objective: Client Energy Patterns - averagely How Long They Train

```
         time_of_day  Average_workout_duration
0  Afternoon (12PM-5PM)                104.452412
1     Evening (5PM-10PM)               104.432122
2    Morning (5AM-12PM)                104.634098
```

Business insight:

Morning (5AM–12PM)

- Users in the morning tend to engage in slightly longer, more structured workouts—likely driven by routine-oriented individuals.

- also, we can see the maximum workout duration reaches 180 minutes, and the average duration hovers above 1.5 hours across all time slots. This suggests that many users are spending extended periods in the gym, which has two major implications:

Afternoon (12PM–5PM)

- Afternoon sessions show consistent engagement, possibly from users with flexible schedules or midday availability.

- same as morning maximum workout duration reaches 180 minutes, and the average duration hovers above 1.5 hours across all time slots.

Evening (5PM–10PM)

- Evening workouts are marginally shorter, suggesting users may prefer lighter or recovery-focused sessions after a long day.

- same as morning and afternoon maximum workout duration reaches 180 minutes, and the average duration hovers above 1.5 hours across all time slots.

High Equipment Occupancy

- Longer sessions mean machines are occupied for extended stretches.

- During peak hours (especially mornings), this can lead to crowding, wait times, and user frustration.

Shared Usage Pressure

- If multiple users are working out simultaneously, the machine-to-user ratio becomes critical.

- For example, if 50 users are present and each uses 4–5 machines per session, that's 200+ machine interactions in a short window.

Important Insight

- Despite differences in check-in volume across time slots, the average workout duration remains consistently around 104 minutes in the morning, afternoon, and evening. This suggests that users—regardless of when they visit—tend to commit to similarly long sessions, indicating a highly engaged and goal-oriented member base.

### Strategic Recommendations:

Consistent Equipment

- Demand: With users spending over 1.5 hours per visit across all time slots, equipment usage remains high throughout the day. This calls for evenly distributed maintenance and availability planning.

Class Structuring:

- Design workout programs and group classes that fit within the 90–120 minute window to align with user behaviour.

Business objective: Daily Check-in Frequency

Daily Check-in Frequency
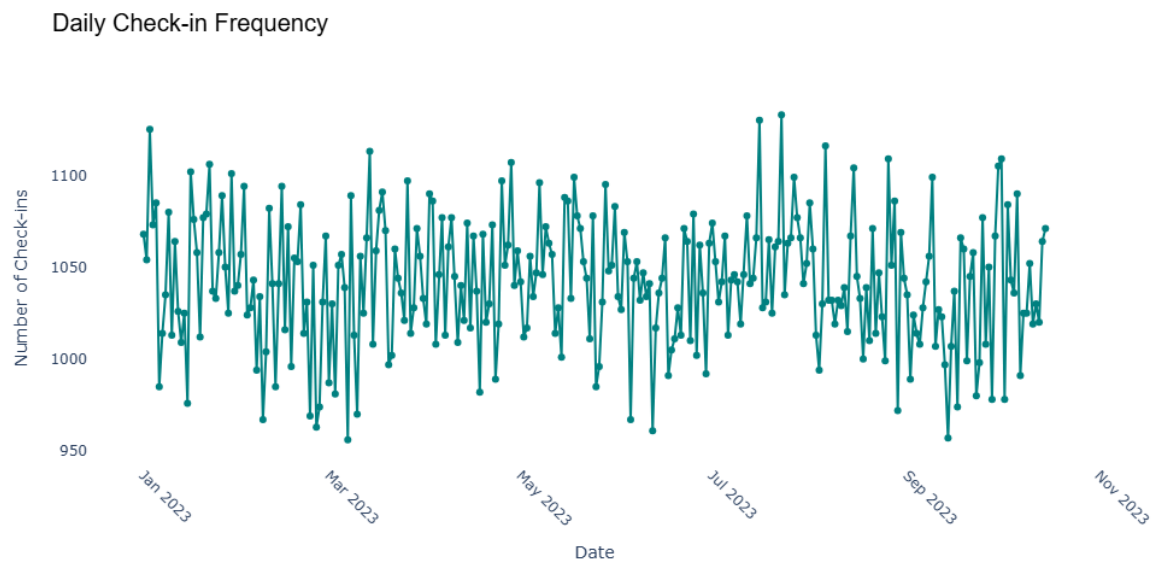
Business insight:

Stable Engagement:

- The check-in frequency remains within a narrow band, showing consistent user activity throughout the year.

High Utilization:

- With daily check-ins often exceeding 1000, the gym is operating at a high capacity—this supports decisions around staffing, equipment maintenance, and space optimization.

Potential Peak Periods:

- If you notice spikes (e.g., in January or September), they may align with New Year resolutions or seasonal fitness campaigns. These are great opportunities for targeted marketing.

No Major Drop-offs:

- The absence of sharp declines suggests strong member retention and satisfaction.

Business objective: Training Time by Membership Level

Average Workout Duration by Subscription Plan
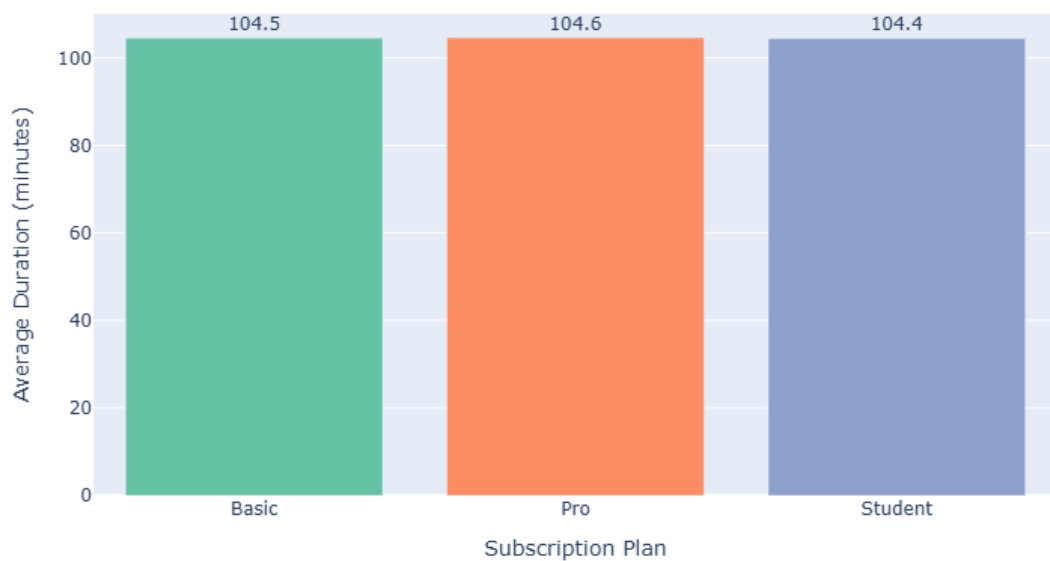
Business insight:

Basic

- Basic users show strong engagement, suggesting they value the gym experience despite fewer premium features.

Pro

- Pro users have the longest average duration, indicating they may be more goal-driven and committed to structured training.

Student

- Students also maintain long sessions, reflecting high motivation and possibly flexible schedules that allow extended workouts.

Strategic Recommendations:

pro Plan:

- Introduce advanced training modules, performance tracking, or exclusive workshops to match their deeper commitment.

Basic Plan:

- Offer optional add-ons (e.g., nutrition tips, mini challenges) to boost perceived value and encourage upgrades.

Student Plan:

- Promote flexible class timings and study-friendly wellness programs (e.g., stress relief yoga, group fitness).

Optimize Equipment Allocation

- Since all user groups average over 100 minutes per session, ensure machine availability is balanced across time slots to avoid congestion.

Business objective: How Much Do Members Burn—Based on Their Plan

Calories Burned by Subscription Plan
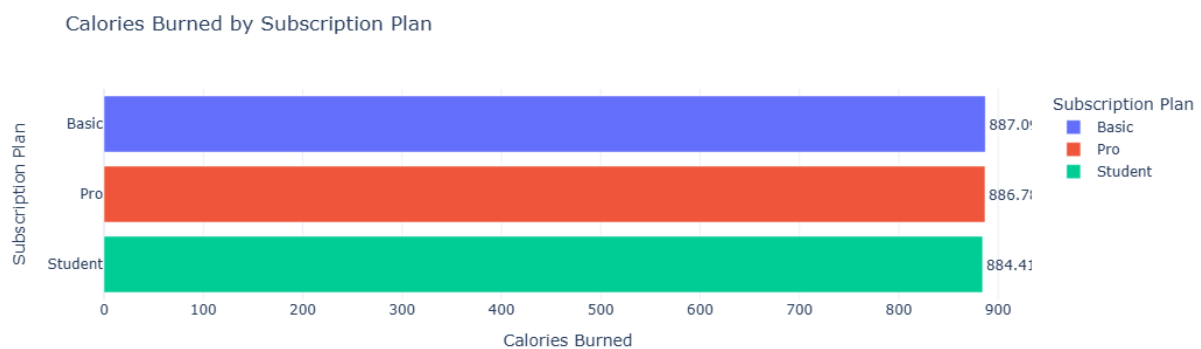
Business insight:

basic

- Basic users burn slightly more calories, suggesting they may engage in longer or more intense workouts despite limited plan features.

Pro

- Pro users show consistent performance, likely due to structured routines and access to premium resources.

Student

- Students burn the least on average, possibly due to shorter sessions or more casual workout habits.

Strategic Recommendations:

Enhance Student Engagement

- Introduce goal-based challenges or gamified tracking to motivate students toward higher intensity workouts.

- Offer flexible, time-efficient programs tailored to student schedules.

Upsell Opportunities for Basic Users

- Since Basic users are already highly active, promote Pro plan upgrades by highlighting added benefits like personal training, nutrition guidance, or exclusive classes.

Personalized Coaching for Pro Users

- Provide advanced analytics or progress tracking to reinforce Pro users' commitment and justify premium pricing.

- Launch performance-based rewards to maintain motivation and retention.

Business objective: How many users belong to each subscription plan?

User Distribution by Subscription Plan
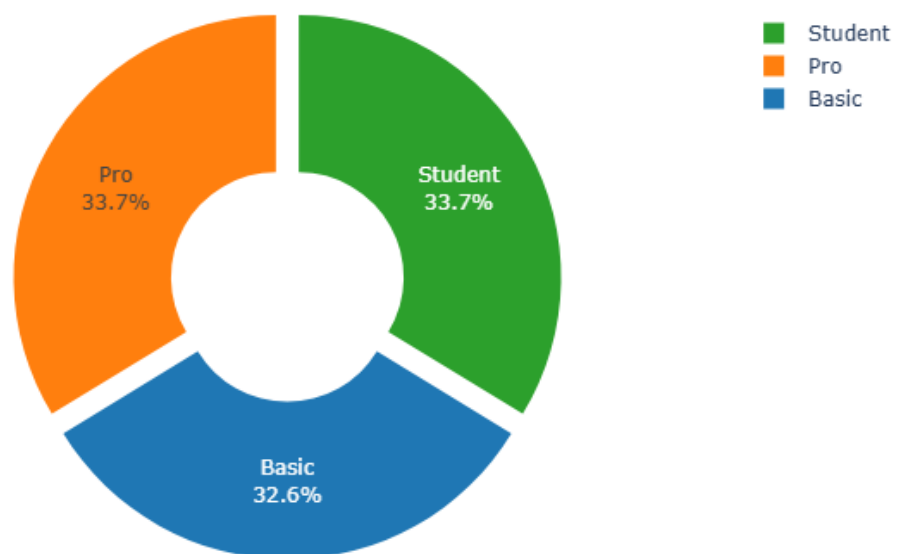
Business insight:

Student

- Most popular plan, likely because it's affordable and suits young people's flexible schedules.

Pro

- **Almost as popular as Student—shows that many users value premium features and structured workouts. And extra services**

Basic

- Still a sizable group, mostly made up of users who prioritize core fitness and stamina. These individuals often choose the Basic plan because they're focused on staying active without needing extra features or premium services.

Strategic recommendation:

Student Plan:

- Focus on community-building, flexible scheduling, and academic wellness tie-ins (e.g., stress relief programs, exam-season fitness challenges).

Pro Plan:

- Reinforce premium value with exclusive content, advanced training modules, and personalized coaching to retain high-value users.

Basic Plan:

- Offer optional upgrades or add-ons (e.g., nutrition tips, weekend classes) to increase satisfaction and encourage plan migration.

Business objective: Are Premium Plans Driving Better Retention and Engagement?

Subscription Price vs Users and Engagement
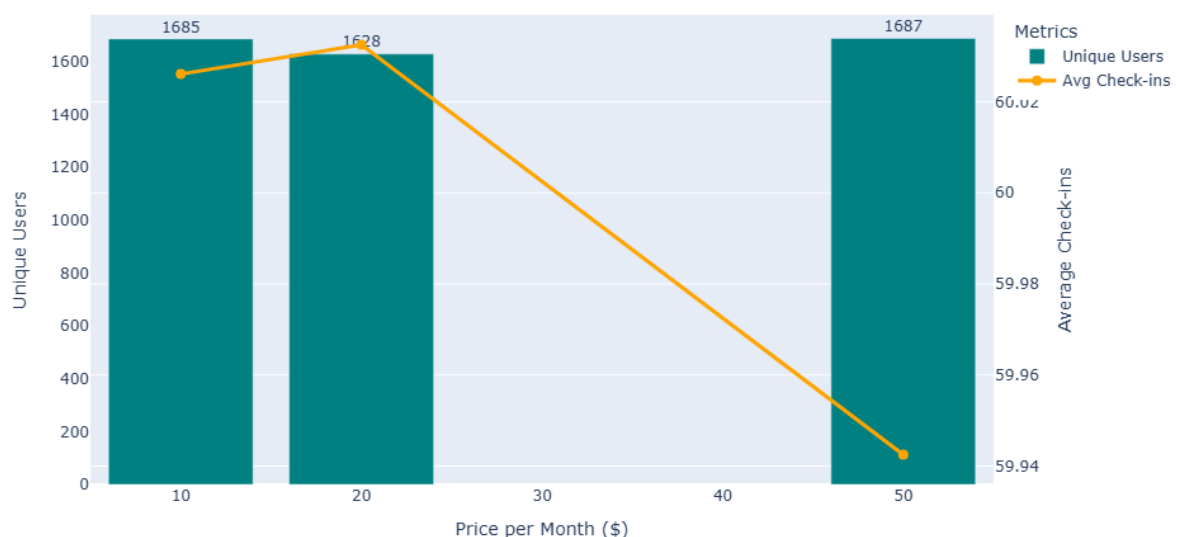
Business insight:

User Retention vs. Pricing

- $9.99 Plan: Attracts a large base of budget-conscious users with high engagement (avg. ~60.03 check-ins).

- $19.99 Plan: Slight drop in user count but maintains identical engagement—suggests added features are valued without changing behaviour.

- $49.99 Plan: Surprisingly, this premium tier has the highest user count and only a slight dip in engagement (~59.94 check-ins)—indicating strong loyalty and satisfaction.

Strategic Recommendations:

Reinforce Value Across All Tiers

- Since check-in rates are consistent across all price points, emphasize the value proposition of each plan in marketing—users are equally committed regardless of cost.

Upsell with Feature Differentiation

- Promote premium features (e.g., personal training, exclusive classes) to convert 19.99 users to higher tiers. Use testimonials and usage data to show how premium users benefit beyond just check-ins.

Pricing Optimization

- Consider bundling services (e.g., nutrition coaching + gym access) at the $19.99 level to increase perceived value and reduce churn. Test limited-time offers or seasonal discounts to boost mid-tier adoption.

Outlier Detection:

Calories Burned Distribution (with Outliers)
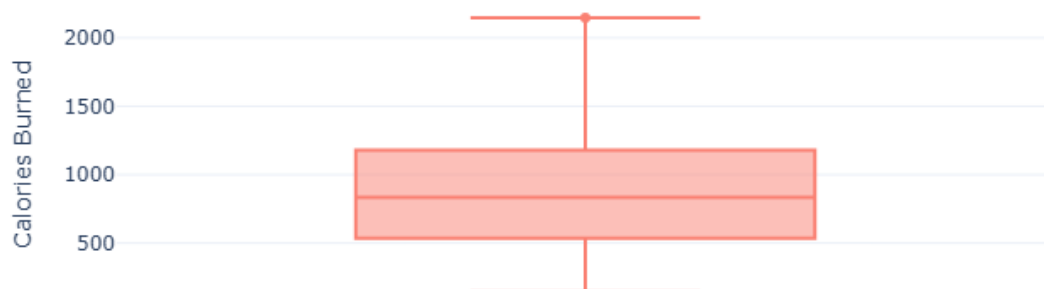

```
Detected Outliers: 1
[60]:
          user_id   workout_type   calories_burned
205192   user_1500     Swimming              2147
```

Business insight:

Unusually low values (<50 calories):

- Could indicate incomplete workouts, errors in logging, or warm-ups only.

Unusually high values (>2000 calories):

- Likely data entry/system errors, or very rare extreme workouts (like long endurance training).

Recommendation:

- Flag and clean extreme outliers before modelling.

- or business reporting, investigate whether they come from specific gyms or users (possible device/system issues).

Business objective: How workout time varies between budget and premium gyms

```
Percentage of Average Duration by Gym Type:
gym_type
Budget      33.32
Premium     33.36
Standard    33.31
Name: duration_mins, dtype: float64
```

Business insight:

Budget (33.32%):

- These users are highly engaged and prefer essential fitness access without extra features. They focus on staying active and building stamina at an affordable price.

Premium (33.36%):

- Premium users show slightly higher engagement, likely because they use advanced tools and personalized services. They're more goal-driven and willing to invest in their fitness journey.

Standard (33.31%):

- Standard users behave similarly to both Budget and Premium groups. This plan offers a balanced mix of value and features, making it appealing to a wide range of users.

Important Recommendations:

Based on the analysis, the following actions are recommended to improve gym operations and business growth:

1. **Age-Specific Workout Programs**

   o Create customized fitness plans for different age groups (e.g., HIIT for young adults, yoga/stretching for older members).

2. **Upsell Basic Plan Users**

o   Encourage Basic users to upgrade with trial offers, discounts, or exclusive Pro features.

3. **Loyalty & Retention Programs**

    o   Offer rewards (free sessions, discounts) for members with consistent check-ins to improve retention.

4. **Branch Resource Optimization**

    o   Allocate trainers and equipment based on location demand (e.g., more strength equipment in high-intensity branches).

5. **Data Quality Monitoring**

    o   Regularly review workout logs to detect anomalies (unrealistic durations/calories) and maintain reliable data.

Conclusion:

- This project provided a comprehensive analysis of gym user behaviour across demographics, subscription plans, workout preferences, and locations. The data cleaning and EDA process revealed key trends such as **age-based workout choices, plan engagement differences, and branch performance patterns**.
- By translating these findings into **business recommendations**, the report highlights opportunities for **targeted marketing, optimized resource allocation, and improved retention strategies**.
- Overall, the project demonstrates how data-driven insights can directly support **strategic decision-making** in the fitness industry.