CHURN RATE ANALYSIS AND RETENTION PLAYBOOK FOR A B2C FITNESS APP

1. Background and Problem Statement:

A mobile fitness application offering guided workouts, progress tracking, and premium coaching features was experiencing a plateau in paid user growth. Despite high download volumes, over 60% of freemium users never converted to paid subscriptions, and nearly 47% of premium users canceled within the first 90 days. The client lacked a structured definition of churn, had no predictive mechanism to flag at-risk users, and had never implemented targeted retention interventions. The business needed a data-driven churn analysis model and a tailored retention strategy.

2. Objectives:

- Accurately calculate churn rates for both freemium and premium users

- Build a churn prediction model using behavioral and transactional data

- Identify high-risk cohorts and behavioral churn triggers

- Design and deploy engagement-based retention strategies for each risk segment

3. Methodology:

3.1 Data Collection and Preparation

- **User Base:** 165,000 total users, with ~22,400 paid subscribers

- **Data Duration:** 9 months of usage and subscription records

- **Sources:** Firebase Analytics, in-app events, Stripe billing logs

- Fields used:

    o Days since last login

    o Completed workouts/week

    o Onboarding completion

    o Subscription tier and duration

    o Support interactions

    o Device OS and region

3.2 Churn Definition

- **Freemium churn:** No login for 21 consecutive days

- **Paid churn:** Canceled or downgraded plan with no reactivation within 30 days

3.3 Churn Analysis

- Calculated churn rate monthly per segment

- Performed feature engineering to compute engagement score (0–100 scale)

- Used **logistic regression** and **random forest classifier** to model churn risk

- ROC-AUC used to assess model performance (RF model yielded AUC = 0.81)

3.4 Segmentation

Created four churn risk segments:

- **Critical (Score < 40)** → Highest churn probability

- **Vulnerable (Score 40–60)**

- **Stable (Score 60–80)**

- **Loyal (Score > 80)**

4. Results:

4.1 Churn Metrics

Segment	Churn Rate	Avg Days Active	Conversion Rate
Freemium Users	68.4%	12.3 days	6.7%
Premium Users	46.8%	63.2 days	N/A

- Most churn occurred in the **first 14 days post-download**

- Users who completed the onboarding sequence were **3.6x more likely** to convert

- Only 28% of freemium users ever completed more than two workouts

4.2 Churn Model Insights

Predictor	Importance Rank	Interpretation

Onboarding completion	1	Strong retention predictor
Avg. workouts/week	2	Higher engagement lowered churn
Last login gap	3	Gaps > 5 days linked to rapid churn
OS (iOS vs Android)	5	iOS users had lower churn, possibly due to smoother UX

5. Retention Strategy and Interventions:

5.1 Critical Segment

- **Action:** Daily push nudges + dynamic workout suggestions

- **Offer:** Free 7-day premium trial unlocked on 3rd login

- Result: 12% decrease in churn over 30 days

5.2 Vulnerable Segment

- **Action:** "Streak booster" campaign to reward 3 consecutive logins

- **Messaging:** Progress milestone visualization with unlockable badges

- Result: 8.7% increase in weekly active users

5.3 Onboarding Improvement

- Redesigned onboarding to include a 60-second tutorial and goal-setting step

- Added conditional email drip sequence based on onboarding progress

- Result: Onboarding completion rose from 52% to 74%

6. Recommendations:

- Define **active user metrics by intent** (not just logins but workout completion and goal follow-through)

- Implement **real-time churn scoring** using Firebase + Python API for in-app personalization

- Use micro-surveys after week 1 to collect NPS and tailor mid-funnel engagement

- Transition from one-size-fits-all emails to **risk-segmented campaign logic** in retention flows

7. Future Work:

- Expand model to include social features (e.g., friends added, leaderboard activity)

- Test price sensitivity and freemium upsell offers in a multivariate pricing experiment

- Integrate a churn dashboard within the internal admin panel for CS and product teams

8. Stakeholder Relevance:

Academic:

- Demonstrates real-world application of churn modeling, engagement analytics, and logistic regression

- Suitable for case studies in mobile UX design, behavioral analytics, and predictive modeling

Corporate:

- Provides an actionable churn mitigation framework for subscription-based B2C apps

- Enables marketing and product teams to align on shared KPIs for user health

- Supports performance tracking of segmented retention campaigns with measurable impact