Project Milestone 1

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Topic

A Data Story about a Bike that Goes Nowhere

Introduction

VHS cassettes introduced the first at-home exercise programme in 1979, and Jane Fonda's exercise programme sparked an explosion of similar programmes in the 1980s. [4] As technology advanced, the format of exercise videos changed to DVDs, then to streaming via computers and tablets. [4] Sales of both conventional exercise equipment like weights and treadmills as well as novelty goods like the Thighmaster drove the home fitness equipment sector to new heights in the 1990s. [6] In the present, devices like the Peloton®, Tread, and Mirror have been used in conjunction with digital exercise equipment. These sophisticated exercise machines have a feature that lets an instructor direct your workout. Due to gyms being closed in 2020 to stop the spread of the coronavirus, the home workout market flourished. Fitness equipment sales increased by 55% from January to March of 2020 while the country was in lockdown. [6] Even if having the necessary equipment at home can cut down on the time needed to accommodate a workout into a schedule, a 2016 study indicated that incentives and rewards are what keep people motivated to exercise long enough for health to be a motivator. [9] Data may serve as a motivational force for certain people.

The 2012 launch of Peloton® was motivated by the company's vision to "leverage technology and design to connect the globe through exercise, allowing individuals to be their best selves wherever, anytime." [8] For those with hectic schedules, founder John Foley aimed to offer a high-end, boutique training experience right in their homes. [5] They released its treadmill in 2018, and by 2019, they had sold over 400,000 indoor spinning cycles. [5] Following Peloton's popularity, rivals

like NordicTrak, Echelon, and Flywheel produced their own cycles with streaming content at various price ranges, giving more households the opportunity to experience a studio exercise at home.

Literature Review

The linked applications provide data about the exerciser and their workout in addition to delivering the instructor-led coaching experience into your house. On students in the seventh and eighth grades, the impact of percentile-based feedback on intrinsic motivation was assessed in 1985. After receiving either positive, negative, or no biassed feedback, the respondents' perceptions of interest, enjoyment, competence, effort, and pressure were assessed. Scores from the positive feedback group were above the 80th percentile, while those from the negative feedback group were below the 20th percentile. The group that were told they were in the 80th percentile had a boost in intrinsic motivation, showing that the data point had a favourable impact on their performance. [11]

Wearable trackers that count steps taken, activity, and calories burnt have grown in popularity alongside home exercise equipment. In addition to gathering data, these gadgets also provide customers advice on how to raise the figures. Additionally, some gradually raise goals as a person advances in fitness. Data, gamification, and content were found to be the three main aspects of the user interface that had an impact on performance during a four-week study of 34 users of the fitness trackers JawBone and FitBit. The statistics on movement and sleep, objectives, and visualisations are considered to be the most influential data.

Users are motivated by tasks or competitions that they may participate in to gain badges through gamification.The tracker's and applications' content refers to their capacity to assist the wearer's objectives. [1]

Objective

Through the Peloton® Power Zone training programme, I experienced personally how statistics can serve as a motivator. To determine their baseline fitness to direct their effort in each lesson, users can perform a bike known as the FTP test. Each ride is cued to a different level, ranging from 1 to 7, with 1 being easy and 7 being maximum exertion. Rider modifies cadence and resistance such that output is within cued range. The cyclist retakes the FTP test once the effort becomes

easier and receives new, harder levels. My motivation to exercise on the bike improved as my zones grew easier and my average FTP score rose. [7]

I'm now fit and able to concentrate again on building up my strength after being diverted by health concerns over the past few years. My body has not responded the same way to my post-illness power zone exercise, despite the fact that I have restarted it. Are there any aspects that I can detect utilising the information from my Peloton® and Apple Health Apps that are under my control besides the obvious ones like age and medication? Some issues I can look at are:

- What are the primary variables influencing my ride's output?
- What are my best workouts based on the statistics for resistance, cadence, time of day, and weekday? What do I do best?
- What exercises do I perform while my weight is decreasing? Short or long rides, HIIT, Power Zone, Endurance, Strength,
- What is my typical heart rate while I am trying to lose weight? Does the rumour of the "fat burning zone" hold water? Do lower intensities cause me to burn more fat?
- Is it possible to forecast my weight based on my workouts from the past two weeks?

This project will explore the information that is generated by one of these tools to improve the workout experience and motivate me to continue doing the work.

Data

I'll utilise Pelotonunofficial ®'s API to download the data points shown below from my history of workouts [10]:

- Type of exercise
- Personal Record: Is this a time or type of exercise record for you?
- The number of users who evaluated the ride,
- The start time
- The total output
- The difficulty level
- The duration, the instructor
- The difficulty rating.

- Total Workouts - the total number of users who completed this exercise.
- Leaderboard Users, or the total number of users on the leaderboard.

The following factors must be considered:

- Intensity
- Average output
- Average cadence
- Average resistance
- Average speed
- Total output
- Total distance
- Total calories.

In addition to trying to connect to the Apple Health Kit to collect my workout data, I will also try to download my weight history. I've been use a Renpho Bluetooth scale that syncs with an app for a few years now.

Methods

Although Peloton® has not published official documentation on their API, the process for connecting to the API is extensively documented because the Peloton® world is full of data hounds. I loaded my individual workout information, general workout numbers, performance metrics, and instructor names using the procedure A. Chen had outlined. [3] I won't be importing the data into Coda Doc; instead, I'll be working with a dataset.

Additionally, many people have already downloaded their health information from the Apple Health Kit. I continue to look into various approaches to obtaining this information. My ideal strategy would be to load the health data using XML in accordance with the instructions given in Guido Casiraghi's Better Programming blog post. [2]

When comparing my weight to workout data, I'd like to create a time series graph using different workout statistics to look for any trends in the workouts that take place right before my weight declines. Most of the variables are largely numerical, therefore Pearson's coefficient can be used to investigate correlation between them. In order to forecast output based on workout

characteristics or weight depending on workouts, linear regression will be employed. A fascinating experiment would be to predict the teacher using ride statistics and a classification model.

Challenges

I haven't tried it yet, despite the fact that downloading health data from the Apple Health information is documented. I need this to function in order to learn more about how the bike affects my weight. I've owned the Peloton® for a few more years than the Bluetooth scale, so any modelling based on weight needs to remove workouts before the scale data begins. As a result, there might not be enough information to make valid forecasts.

Conclusion

For any routine to be maintained, motivation is necessary. Knowing what motivates you and leveraging those things wisely can help you achieve your goals. Community, convenience, competitiveness, and data are just a few of the options for inspiration offered by the online fitness community. Users can get even more value out of their investment by developing a reproducible strategy to pinpoint the elements that can enhance performance and outcomes.

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