Strava Fitness Data Analysis

GitHub Link:

Strava Fitness Data Analysis (SQL)

Introduction:

This SQL code includes queries to analyze user activity based on the Strava Fitness dataset. The dataset records day-level fitness information in the form of steps, calories, heart rate, sleep, METs, and body composition. The objective is to derive actionable insights with SQL queries to enable strategic decisions for maximum user activity, well-being outcome, and product efficiency.

The questions are categorized under main business areas to keep the analysis relevant and meaningful.

1. User Activity Analysis :

This category is focusing on the way in which users interact with physical activity — i.e., steps, distance, and calories burned. This is used to determine top performers, typical activity levels, and behavior trends among users.

Q1. Who are the top 5 most active users by total steps?

Answer:

```sql
SELECT Id, SUM(TotalSteps) AS TotalSteps
FROM fitness_data
GROUP BY Id
ORDER BY TotalSteps DESC
LIMIT 5;
```

Id	TotalSteps
8877689391	497241
8053475328	457662
1503960366	375619
2022484408	352490
4388161847	335232

Insights:

These are the five users who use their fitness equipment and activities the most frequently and have the highest total number of steps. They may be targeted for premium features, rewards, or enabling community challenges.

Q2. What is the average number of steps per user per day?

Answer:

```
SELECT Id, ROUND(AVG(TotalSteps), 2) AS Avg_Steps_PerDay
FROM fitness_data
GROUP BY Id;
```

Id	Avg_Steps_PerDay
1503960366	12116.74
1624580081	5743.90
1644430081	7282.97
1844505072	2580.06
1927972279	916.13
2022484408	11370.65
2026352035	5566.87
2320127002	4716.87
2347167796	9519.67
2873212765	7555.77
3372868164	6861.65
3977333714	10984.57
4020332650	2267.23
4057192912	3838.00
4319703577	7268.84
4388161847	10813.94
4445114986	4796.55
4558609924	7685.13
4702921684	8572.06
5553957443	8612.58
5577150313	8304.43
6117666160	7046.71
6290855005	5649.55
6775888955	2519.69
6962181067	9794.81
7007744171	11323.42
7086361926	9371.77
8053475328	14763.29
8253242879	6482.16
8378563200	8717.71
8583815059	7198.52
8792009665	1853.72
8877689391	16040.03

Insights:

These are all the users with average steps per day, which helps to understand the baseline activity level of users. The analysis indicates that some users walk fewer than

7,000 steps per day on average, so it might be necessary to add more motivating elements or step challenges.

Q3. On what dates did the average user burn the most calories?

Answer:

```
SELECT ActivityDate, ROUND(AVG(Calories), 2) AS Avg_Calories
FROM fitness_data
GROUP BY ActivityDate
ORDER BY Avg_Calories DESC
LIMIT 5;
```

ActivityDate	Avg_Calories
2016-05-03	2453.90
2016-04-21	2421.88
2016-05-05	2415.07
2016-04-23	2397.16
2016-04-20	2395.22

Insights:

According to the analysis, there may be peaks because of weekends, fitness events, or seasonality. These types of data can be used in defining user behavior patterns or the influence of advertising campaigns.

Q4. How consistent are users with their activity?

Answer:

```
SELECT Id, COUNT(DISTINCT ActivityDate) AS ActiveDays
FROM fitness_data
GROUP BY Id;
```

Id	ActiveDays
1503960366	31
1624580081	31
1644430081	30
1844505072	31
1927972279	31
2022484408	31
2026352035	31
2320127002	31
2347167796	18
2873212765	31
3372868164	20
3977333714	30
4020332650	31
4057192912	4
4319703577	31
4388161847	31
4445114986	31
4558609924	31
4702921684	31
5553957443	31
5577150313	30
6117666160	28
6290855005	29
6775888955	26
6962181067	31
7007744171	26
7086361926	31
8053475328	31
8253242879	19
8378563200	31
8583815059	31
8792009665	29
8877689391	31

Insights:

This analyzes user engagement by measuring the number of active days one user had. More active users have more regular fitness activity, which is a strong predictor for habit creation. Active users are then targeted with loyalty incentives, adoption promotions, or peer challenges.

Q5. How many users consistently track their weight or sleep?

Answer:

```
SELECT Id, COUNT(*) AS Days_With_Weight
FROM fitness_data
WHERE WeightKg IS NOT NULL
GROUP BY Id
HAVING Days_With_Weight >= 5;
```

Id	Days_With_Weight
1503960366	31
1624580081	31
1644430081	30
1844505072	31
1927972279	31
2022484408	31
2026352035	31
2320127002	31
2347167796	18
2873212765	31
3372868164	20
3977333714	30
4020332650	31
4319703577	31
4388161847	31
4445114986	31
4558609924	31
4702921684	31
5553957443	31
5577150313	30
6117666160	28
6290855005	29
6775888955	26
6962181067	31
7007744171	26
7086361926	31
8053475328	31
8253242879	19
8378563200	31
8583815059	31
8792009665	29
8877689391	31

Insights:

From this analysis, we can see that regular sleeping or weight tracking reflects higher levels of user engagement and health consciousness. Regular users are ideal candidates for paid analysis features, personalized recommendations, or habit-forming programs. Low-engagement users, on the other hand, can be encouraged or reminded to log in.

2. Sleep and Wellness Analysis :

Sleep has a critical role in recovery and performance. This category analyzes sleep time, bedtime, and sleep efficiency to help measure user health and identify possibilities for personalized health recommendations.

Q1. What is the average sleep duration per user?

Answer:

```
SELECT Id, ROUND(AVG(TotalMinutesAsleep), 2) AS Avg_Sleep_Minutes
FROM fitness_data
GROUP BY Id
HAVING Avg_Sleep_Minutes > 0.00;
```

Id	Avg_Sleep_Minutes
1503960366	290.55
1644430081	39.20
1844505072	63.10
1927972279	67.26
2026352035	457.19
2320127002	1.97
2347167796	372.33
3977333714	274.07
4020332650	90.16
4319703577	399.77
4388161847	296.90
4445114986	347.90
4558609924	20.58
4702921684	363.61
5553957443	463.48
5577150313	374.40
6117666160	307.79
6775888955	40.35
6962181067	448.00
7007744171	5.27
7086361926	350.81
8053475328	28.74
8378563200	445.13
8792009665	225.34

Insights:

From the analysis we can see that there are many users whose average sleep is less than 7 hours, which means they have poor sleep patterns. Therefore, Strava might suggest bedtimes, recovery measurements, or tips to improve sleep.

Q2. What is the average time in bed vs. time asleep?

Answer:

```
SELECT
  ROUND(AVG(TotalTimeInBed), 2) AS Avg_Time_InBed,
  ROUND(AVG(TotalMinutesAsleep), 2) AS Avg_Minutes_Asleep,
  ROUND((AVG(TotalMinutesAsleep) / AVG(TotalTimeInBed)) * 100, 2) AS Sleep_Efficiency_Percent
FROM fitness_data;
```

Avg_Time_InBed	Avg_Minutes_Asleep	Sleep_Efficiency_Percent
199.98	182.83	91.43

Insights:

From the analysis, we see that the average time spent by the users in the bed is 200 minutes, out of which they sleep for 183 minutes, and hence the sleeping efficiency comes to 91.43%. Therefore, this is considered a good sign of sleep health because an efficiency percentage of more than 85% is generally regarded as healthy. All users are sleeping very quickly and remaining asleep, which reflects well for their rest and recovery phases. Strava can utilize this data to highlight good user habits and promote regular sleep monitoring.

Q3. Do users burn more calories on days with longer sleep?

Answer:

```
SELECT
  ROUND(AVG(Calories)) AS Avg_Calories_ShortSleep,
  ROUND(AVG(CASE WHEN TotalMinutesAsleep >= 420 THEN Calories ELSE NULL END)) AS Avg_Calories_LongSleep
FROM fitness_data;
```

	Avg_Calories_ShortSleep	Avg_Calories_LongSleep
▶	2304	2370

Insights:

From the output we can see that those who sleep the most (>7 hours) burn slightly more calories than those who sleep less. This implies that normal sleep would positively affect body performance or activity level. Therefore, promoting users to acquire healthier sleeping habits would result in improved energy creation and overall fitness results.

Q4. What is the average sleep duration by day of the week?

Answer:

```
SELECT
  DAYNAME(ActivityDate) AS Day_Name,
  ROUND(AVG(TotalMinutesAsleep), 2) AS Avg_Sleep_Minutes
FROM fitness_data
GROUP BY Day_Name
ORDER BY FIELD(Day_Name, 'Monday', 'Tuesday', 'Wednesday', 'Thursday', 'Friday', 'Saturday', 'Sunday');
```

	Day_Name	Avg_Sleep_Minutes
▶	Monday	160.81
	Tuesday	172.99
	Wednesday	191.26
	Thursday	174.71
	Friday	183.40
	Saturday	192.64
	Sunday	205.79

Insights:

This analysis shows which days people sleep more or less. From the analysis, we can say that weekend sleep averages are higher, as users are recovering from sleep deficits

on weekdays. This helps change in-app reminders or suggestions to sleep more regularly.

Q5. How many days per user did they log sleep?

Answer:

```
SELECT Id, COUNT(*) AS Sleep_Log_Days
FROM fitness_data
WHERE TotalMinutesAsleep > 0
GROUP BY Id
ORDER BY Sleep_Log_Days DESC;
```

Id	Sleep_Log_Days
5553957443	31
6962181067	31
8378563200	31
2026352035	28
3977333714	28
4445114986	28
4702921684	27
4319703577	26
5577150313	26
1503960366	25
7086361926	24
4388161847	23
6117666160	18
2347167796	15
8792009665	15
4020332650	8
1927972279	5
4558609924	5
1644430081	4
1844505072	3
6775888955	3
8053475328	3
7007744171	2
2320127002	1

Insights:

This helps to analyze consistency in sleep monitoring. From the analysis, there are some users who log sleep regularly, so they must get rewarded with deeper sleep insights, whereas infrequent users need to be reminded or educated on the benefits of sleep monitoring.

Q6. What is the sleep efficiency distribution across users?

Answer:

```sql
SELECT
  Id,
  ROUND(AVG(TotalMinutesAsleep / TotalTimeInBed) * 100, 2) AS Avg_Sleep_Efficiency
FROM fitness_data
WHERE TotalTimeInBed > 0
GROUP BY Id
ORDER BY Avg_Sleep_Efficiency DESC;
```

Id	Avg_Sleep_Efficiency
8053475328	98.49
7086361926	97.13
6962181067	96.15
8792009665	96.04
7007744171	95.71
4702921684	95.25
4319703577	94.75
4388161847	94.72
1927972279	94.70
6775888955	94.20
2026352035	94.13
6117666160	94.02
5577150313	93.92
1503960366	93.64
4020332650	93.04
4445114986	92.54
8378563200	91.75
5553957443	91.52
2347167796	91.04
4558609924	90.71
2320127002	88.41
1644430081	88.20
1844505072	67.84
3977333714	63.37

Insights:

It shows how well users spend time in bed. From the analysis, we can see that most users have a higher efficiency rate (> 85%), which indicates good rest quality. Strava can use this result to highlight top sleepers, whereas for users who have lower efficiency, it can provide suggestions for rest routines.

3. Heart Health & Activity Intensity:

This category considers cardiovascular activity through average heart rate and active zone time. It focuses on high-intensity exercise users and provides information on overall effort to fitness and endurance.

Q1. What is the average heart rate per user?

Answer:

```sql
SELECT Id, ROUND(AVG(AvgHeartRate), 2) AS Avg_Heart_Rate
FROM fitness_data
WHERE AvgHeartRate IS NOT NULL
GROUP BY Id;
```

Id	Avg_Heart_Rate
1503960366	77.44
1624580081	77.44
1644430081	77.44
1844505072	77.44
1927972279	77.44
2022484408	80.06
2026352035	78.76
2320127002	77.44
2347167796	76.35
2873212765	77.44
3372868164	77.44
3977333714	77.44
4020332650	82.36
4057192912	77.44
4319703577	77.44
4388161847	66.42
4445114986	77.44
4558609924	81.6
4702921684	77.44
5553957443	67.77
5577150313	69.53
6117666160	82.95
6290855005	77.44
6775888955	90.53
6962181067	77.55
7007744171	90.01
7086361926	77.44
8053475328	77.44
8253242879	77.44
8378563200	77.44
8583815059	77.44
8792009665	74.55
8877689391	82.14

Insights:

From the analysis, we can see that there are some users having higher average heart rates, which indicates stress or overtraining. Therefore, this measure can be used to advise users on recovery needs or recommend heart rate-based training zones.

Q2. Which users are burning the most calories through very active minutes?

Answer:

```sql
SELECT Id, SUM(VeryActiveMinutes) AS Total_Active_Mins, SUM(Calories) AS Total_Calories
FROM fitness_data
GROUP BY Id
ORDER BY Total_Active_Mins DESC
LIMIT 5;
```

	Id	Total_Active_Mins	Total_Calories
▶	8053475328	2640	91320
	5577150313	2620	100789
	8877689391	2048	106028
	8378563200	1819	106534
	7086361926	1320	79557

Insights:

From the analysis, we can see that these are the top 5 users who are most engaged with intense physical activity. Therefore, these users can be considered as a target audience for premium coaching features or performance-based incentives.

Q3. What is the average duration of very active minutes per week?

Answer:

```
SELECT WEEK(ActivityDate) AS Week_Number, ROUND(AVG(VeryActiveMinutes), 2) AS Avg_Active_Mins
FROM fitness_data
GROUP BY WEEK(ActivityDate);
```

	Week_Number	Avg_Active_Mins
▶	15	22.09
	16	23.08
	17	21.06
	18	20.11
	19	18.44

Insights:

These analyze the intensity and frequency of workouts at a weekly level. The average duration of very active minutes decreased slowly from 22.09 minutes during Week 15 to 18.44 minutes in Week 19. This downward trend shows decreasing workout intensity or exhaustion in the long term. Strava can address this through weekly challenges, reminders, or motivational push notifications reminding users to do more intense workouts.

Q4. What is the average heart rate during different activity intensity levels?

Answer:

```sql
SELECT
  ROUND(AVG(AvgHeartRate), 2) AS Avg_Heart_Rate,
  ROUND(AVG(VeryActiveMinutes), 2) AS Avg_VeryActive_Minutes,
  ROUND(AVG(FairlyActiveMinutes), 2) AS Avg_FairlyActive_Minutes,
  ROUND(AVG(LightlyActiveMinutes), 2) AS Avg_LightlyActive_Minutes
FROM fitness_data
WHERE AvgHeartRate IS NOT NULL;
```

Avg_Heart_Rate	Avg_VeryActive_Minutes	Avg_FairlyActive_Minutes	Avg_LightlyActive_Minutes
77.86	21.16	13.56	192.81

Insights:

From the analysis, we can see that the average heart rate is 77.86 bpm, and users spend a lot more time on light activity compared to very active or fairly active time. This concludes that even though users are fairly active during the daytime, there is limited high-intensity activity, which suggests potential to assist with more formalized exercise or cardio-based objectives.

Q5. How often do users engage in high-intensity activity?

Answer:

```sql
SELECT Id, COUNT(*) AS High_Intensity_Days
FROM fitness_data
WHERE VeryActiveMinutes >= 30
GROUP BY Id
ORDER BY High_Intensity_Days DESC;
```

Id	High_Intensity_Days
8053475328	27
5577150313	25
1503960366	23
8877689391	23
7086361926	22
8378563200	20
2022484408	19
7007744171	15
6962181067	13
5553957443	11
3977333714	10
4388161847	7
8253242879	7
2873212765	6
6775888955	5
1644430081	4
8583815059	4
4020332650	3
4445114986	3
2347167796	2
6290855005	2
1624580081	1
4558609924	1

Insights:

From the analysis, we can say that there are some users who perform intense workouts (> 20 days). These users are very active and might benefit most from performance stats, leaderboards, or challenge invitations.

4. Metrics Comparison :

This category compares METs (Metabolic Equivalent Tasks) to other measures such as calories burned, which serves to validate intensity data and the way energy output is distributed among users.

Q1. What is the correlation between METs and calories burned?

Answer:

```
SELECT
  ROUND(AVG(TotalMETs), 2) AS Avg_METs,
  ROUND(AVG(Calories), 2) AS Avg_Calories
FROM fitness_data;
```

	Avg_METs	Avg_Calories
▶	20850.35	2303.61

Insights:

The analysis shows that there is a correlation between MET and calories burned. This indicates that METs is a reliable predictor of overall physical activity and can be used effectively to monitor and regulate calorie-focused fitness goals or exercise intensity recommendations.

Q2. How consistent is a user's MET output across the week?

Answer:

```sql
SELECT
  Id,
  DAYNAME(ActivityDate) AS Day_Name,
  ROUND(AVG(TotalMETs), 2) AS Avg_METs
FROM fitness_data
WHERE TotalMETs IS NOT NULL
GROUP BY Id, Day_Name
ORDER BY Id, FIELD(Day_Name, 'Monday', 'Tuesday', 'Wednesday', 'Thursday', 'Friday', 'Saturday', 'Sunday')
LIMIT 14;
```

Id	Day_Name	Avg_METs
1503960366	Monday	24743.25
1503960366	Tuesday	25091
1503960366	Wednesday	23673.2
1503960366	Thursday	23095.8
1503960366	Friday	23267.25
1503960366	Saturday	24138.5
1503960366	Sunday	22568.75
1624580081	Monday	17818
1624580081	Tuesday	16840.8
1624580081	Wednesday	17463.2
1624580081	Thursday	16292.4
1624580081	Friday	16728.5
1624580081	Saturday	18520.5
1624580081	Sunday	21930.5

Insights:

These analyze users who regularly spend energy (METs) throughout the week. Here, we have analyzed two users' average MET spending throughout the week. From the analysis, we can see that users only exert high effort on specific days (e.g., weekends or weekdays). Therefore, users with uneven METs can benefit from routine-building features or weekday activity reminders, whereas regular users may be encouraged by progressive difficulty.

5. Weight & BMI Monitoring :

This category understands users' body composition and progress while tracking. Average BMI, weight change, and improving users over time are evaluated here, which can guide customized coaching and goal tracking.

Q1. What is the average BMI and weight across all users?

Answer:

```
SELECT
  ROUND(AVG(WeightKg), 2) AS Avg_WeightKg,
  ROUND(AVG(BMI), 2) AS Avg_BMI
FROM fitness_data
WHERE WeightKg IS NOT NULL AND BMI IS NOT NULL;
```

Avg_WeightKg	Avg_BMI
63.18	24.45

Insights:

The average BMI and average weight are both within the healthy normal category. This means the overall user base has a fairly healthy body composition, implying that Strava Fitness is reaching out to an audience familiar with well-being. Such users are perhaps likely to react well to goal-driven features like body monitoring or fitness challenges.

Q2. Which users have the highest recorded BMI?

Answer:

```
SELECT Id, MAX(BMI) AS Max_BMI
FROM fitness_data
GROUP BY Id
ORDER BY Max_BMI DESC
LIMIT 5;
```

Id	Max_BMI
1927972279	47.54
5577150313	28
4558609924	27.46
4319703577	27.45
8877689391	25.68

Insights:

From the analysis, we can identify these are the top five users who are at health risk with the highest BMI, and Strava can recommend proper fitness programs, dietary advice, or even prompt them towards goal-centric tracking.

Q3. What is the distribution of users across BMI categories?

Answer:

```
SELECT
  CASE
    WHEN BMI < 18.5 THEN 'Underweight'
    WHEN BMI BETWEEN 18.5 AND 24.9 THEN 'Normal'
    WHEN BMI BETWEEN 25 AND 29.9 THEN 'Overweight'
    WHEN BMI >= 30 THEN 'Obese'
    ELSE 'Unknown'
  END AS BMI_Category,
  COUNT(*) AS User_Count
FROM fitness_data
WHERE BMI IS NOT NULL
GROUP BY BMI_Category;
```

	BMI_Category	User_Count
▶	Normal	907
	Obese	1
	Overweight	32

Insights:

This analysis helps to categorize users according to health risk types. From the analysis, we can see that the maximum number of users fall under the normal BMI category, so they are out of health risk, whereas users who fall under obese and overweight may require certain health advice, weight reduction steps, or specific activity targets in order to enhance user wellness.

Q4. How often do users log their weight or BMI?

Answer:

```
SELECT Id, COUNT(*) AS Weight_Log_Frequency
FROM fitness_data
WHERE WeightKg IS NOT NULL
GROUP BY Id
ORDER BY Weight_Log_Frequency DESC;
```

Id	Weight_Log_Frequency
1503960366	31
1624580081	31
7086361926	31
1844505072	31
1927972279	31
2022484408	31
2026352035	31
2320127002	31
8053475328	31
2873212765	31
8378563200	31
8583815059	31
4020332650	31
8877689391	31
4319703577	31
4388161847	31
4445114986	31
4558609924	31
4702921684	31
5553957443	31
6962181067	31
1644430081	30
3977333714	30
5577150313	30
6290855005	29
8792009665	29
6117666160	28
6775888955	26
7007744171	26
3372868164	20
8253242879	19
2347167796	18
4057192912	4

Insights:

This analyzes user consistency in tracking weight/BMI. From the analysis, we can say that the maximum number of users track their weight/BMI regularly, which interprets that they are health-conscious and can benefit from progress-tracking features, whereas users who do not track regularly may require reminders for logging or encouragement to track.

Q5. What is the correlation between BMI and activity level?

Answer:

```
SELECT BMI, ROUND(AVG(TotalSteps),0) AS Avg_Steps
FROM fitness_data
WHERE BMI IS NOT NULL
GROUP BY BMI
ORDER BY BMI;
```

BMI	Avg_Steps
21.45	8859
21.69	7566
22.65	14915
23.82	11095
23.85	10147
23.89	9071
23.93	10524
23.96	10842
24	9889
24.1	8543
24.17	5155
24.21	13217
24.24	10550
24.35	12342
24.39	7299
25.14	8064
25.26	18193
25.29	19377
25.31	21129
25.41	13959
25.44	21727
25.49	12996
25.53	14858
25.56	17180
25.59	21236
25.61	20226
25.68	17305
27	11451
27.04	7891
27.25	8940
27.32	3428
27.38	10429
27.45	29
27.46	8095
28	12231
47.54	356

Insights:

From the analysis, we can see that users in the upper-normal to mildly overweight BMI category are more physically active, perhaps due to awareness and effort in maintaining or losing weight. However, there are some users with extremely high BMI scores (e.g., 47.54) who show drastically low activity, suggesting mobility issues or nonparticipation. Therefore, this insight can be utilized to provide motivational and fitness plans to users with higher BMI so activity levels can be improved progressively.

6. Time-Based Trends :

This final category shows how user behavior evolves over time — between weeks of the day, weeks, or activity dates. It identifies trends in engagement, spikes in activity, and behavior seasonality.

Q1. What is the weekly average calorie burn?

Answer:

```sql
SELECT
  WEEK(ActivityDate) AS Week_Number,
  ROUND(AVG(Calories), 2) AS Avg_Calories
FROM fitness_data
GROUP BY WEEK(ActivityDate)
ORDER BY Week_Number;
```

Week_Number	Avg_Calories
15	2356.15
16	2352.19
17	2323.13
18	2325.15
19	2077.65

Insights:

This analysis shows the weekly trend, which helps to understand the consistency level of users. We can see a week-to-week drop, which may indicate a lack of motivation, whereas consistent growth shows habit formation.

Q2. What are the average steps on weekdays vs. weekends?

Answer:

```sql
SELECT
  CASE
    WHEN DAYOFWEEK(ActivityDate) IN (1, 7) THEN 'Weekend'
    ELSE 'Weekday'
  END AS Day_Type,
  ROUND(AVG(TotalSteps), 2) AS Avg_Steps
FROM fitness_data
GROUP BY Day_Type;
```

Day_Type	Avg_Steps
Weekday	7668.70
Weekend	7550.57

Insights:

From the analysis, we see that there is minimal variation in average steps on weekdays and weekends. This indicates the users maintain a routine each week, which implies

good fitness habits. Strava can also encourage such a routine by designing streak challenges or a weekly step challenge to engage the users on each and every day.

Q3. Which users are improving (weight decreasing over time)?

Answer:

```
SELECT Id, MIN(ActivityDate) AS Star_Date, MAX(ActivityDate) AS End_Date,
       MIN(WeightKg) AS Start_Weight, MAX(WeightKg) AS End_Weight
FROM fitness_data
WHERE WeightKg IS NOT NULL
GROUP BY Id;
```

Id	Star_Date	End_Date	Start_Weight	End_Weight
1503960366	2016-04-12	2016-05-12	52.6	62.5
1624580081	2016-04-12	2016-05-12	62.5	62.5
1644430081	2016-04-12	2016-05-11	62.5	62.5
1844505072	2016-04-12	2016-05-12	62.5	62.5
1927972279	2016-04-12	2016-05-12	62.5	133.5
2022484408	2016-04-12	2016-05-12	62.5	62.5
2026352035	2016-04-12	2016-05-12	62.5	62.5
2320127002	2016-04-12	2016-05-12	62.5	62.5
2347167796	2016-04-12	2016-04-29	62.5	62.5
2873212765	2016-04-12	2016-05-12	56.7	62.5
3372868164	2016-04-12	2016-05-01	62.5	62.5
3977333714	2016-04-12	2016-05-11	62.5	62.5
4020332650	2016-04-12	2016-05-12	62.5	62.5
4057192912	2016-04-12	2016-04-15	62.5	62.5
4319703577	2016-04-12	2016-05-12	62.5	72.4
4388161847	2016-04-12	2016-05-12	62.5	62.5
4445114986	2016-04-12	2016-05-12	62.5	62.5
4558609924	2016-04-12	2016-05-12	62.5	70.3
4702921684	2016-04-12	2016-05-12	62.5	62.5
5553957443	2016-04-12	2016-05-12	62.5	62.5
5577150313	2016-04-12	2016-05-11	62.5	90.7
6117666160	2016-04-12	2016-05-09	62.5	62.5
6290855005	2016-04-12	2016-05-10	62.5	62.5
6775888955	2016-04-12	2016-05-07	62.5	62.5
6962181067	2016-04-12	2016-05-12	61	62.5
7007744171	2016-04-12	2016-05-07	62.5	62.5
7086361926	2016-04-12	2016-05-12	62.5	62.5
8053475328	2016-04-12	2016-05-12	62.5	62.5
8253242879	2016-04-12	2016-04-30	62.5	62.5
8378563200	2016-04-12	2016-05-12	62.5	62.5
8583815059	2016-04-12	2016-05-12	62.5	62.5
8792009665	2016-04-12	2016-05-10	62.5	62.5
8877689391	2016-04-12	2016-05-12	62.5	85.8

Insights:

This analysis monitors the weight change or BMI over time that enables one to identify the users with apparent health improvement. From the analysis, we see that most users are consistent with no change in weight, always beginning and ending at 62.5 kg. There are a few users with increased weight (e.g., from 62.5 kg to above 70–90 kg), while only one user indicates a positive change with weight reduction (from 52.6 kg to 62.5 kg). This indicates that few users track or optimize weight over time, and more weight-tracking feature and customized feedback are needed to encourage weight

management targets. Strava can incorporate reminders of progress or monthly check-ins to encourage long-term health monitoring.

Q4. How does average daily step count vary across days of the week?

Answer:

```
SELECT
  DAYNAME(ActivityDate) AS Day_Name,
  ROUND(AVG(TotalSteps), 2) AS Avg_Steps
FROM fitness_data
GROUP BY Day_Name
ORDER BY FIELD(Day_Name, 'Monday', 'Tuesday', 'Wednesday', 'Thursday', 'Friday', 'Saturday', 'Sunday');
```

Day_Name	Avg_Steps
Monday	7780.87
Tuesday	8125.01
Wednesday	7559.37
Thursday	7405.84
Friday	7448.23
Saturday	8152.98
Sunday	6933.23

Insights:

From the analysis, we can see that the highest steps are on Tuesday and Saturday, whereas Sunday has the lowest. This indicates that users are more engaged during the beginning of the week and Saturdays, perhaps when they have been newly motivated or have free time. Strava could leverage this and introduce weekday motivational solutions or Sunday recovery tips to keep users active and in balance.

Q5. How has user participation changed week over week?

Answer:

```
SELECT
  WEEK(ActivityDate) AS Week_Number,
  COUNT(DISTINCT Id) AS Active_Users
FROM fitness_data
GROUP BY Week_Number
ORDER BY Week_Number;
```

	Week_Number	Active_Users
▶	15	33
	16	32
	17	32
	18	30
	19	27

Insights:

User activity reduced from 33 users in Week 15 to 27 in Week 19, falling steadily every week. This means lower user interest or loss of motivation over time. Such a trend can be reversed by Strava through re-engagement strategies, e.g., streak rewards, weekly challenges, or personalized reminders to sustain user engagement.

Conclusion

SQL analysis of the Strava Fitness dataset gave us detailed insights into user activity regarding different aspects of wellness, such as physical exercise, sleep, heart, and weight monitoring. Based on accurate queries, we could analyze user consistency, workout intensity, activity trends, and health metrics.

It also helped to uncover strengths in addition to areas that lacked user participation. All these findings lay the foundation for building smarter, data-driven features, enhancing retention, and building a healthier, more consistent fitness experience via the Strava Fitness platform.