

# STRAVA FITNESS — SQL Analysis Report

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**Tool Used:** DB Browser for SQLite

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## Section 1: Activity Trends

### Query 1: Average Steps per Day

**SQL Query:**

```
SELECT
    ActivityDate,
    ROUND(AVG(TotalSteps),2) AS avg_steps
FROM daily_activity
GROUP BY ActivityDate
ORDER BY ActivityDate;
```

**Result Table:**

ActivityDate	avg_steps
2016-04-12	8756.59
2016-04-13	7663.16
2016-04-14	8243.16
2016-04-15	7533.85
2016-04-16	9080.47
2016-04-17	7217.43
2016-04-18	8151.71
2016-04-19	9198.46
2016-04-20	8707.17
2016-04-21	9421.25
2016-04-22	7686.58
2016-04-23	8904.13
2016-04-24	7887.37
2016-04-25	9066.04
2016-04-26	8644.41
2016-04-27	8914.34
2016-04-28	7838.58
2016-04-29	8367.46
2016-04-30	9240.21
2016-05-01	7388.21

2016-05-02	7537.12
2016-05-03	8747.7
2016-05-04	7406.19
2016-05-05	9738.46
2016-05-06	7760.25
2016-05-07	7976.38
2016-05-08	8275.39
2016-05-09	9279.92
2016-05-10	8988.57
2016-05-11	8203.09
2016-05-12	3848.89

### Insight:

- Average daily steps vary widely by day — from under 4,000 to nearly 10,000.
- Sedentary minutes often exceed 700–1,200 per day.

### Business Impact:

- Promote personalized daily step goals.
- Use push notifications and gamified step challenges to increase movement.
- Create inactivity alerts for prolonged sedentary time.

### Query 2: Total Calories Burned per Day

#### SQL Query:

```
SELECT
    ActivityDay,
    SUM(Calories) AS total_calories
FROM daily_calories
GROUP BY ActivityDay
ORDER BY ActivityDay;
```

#### Result Table:

ActivityDay	total_calories
2016-04-12	78893
2016-04-13	75459
2016-04-14	77761
2016-04-15	77721
2016-04-16	76574
2016-04-17	71391
2016-04-18	74668

2016-04-19	75491
2016-04-20	76647
2016-04-21	77500
2016-04-22	74485
2016-04-23	76709
2016-04-24	73326
2016-04-25	75186
2016-04-26	74604
2016-04-27	74514
2016-04-28	74114
2016-04-29	72722
2016-04-30	73592
2016-05-01	66913
2016-05-02	65988
2016-05-03	71163
2016-05-04	66211
2016-05-05	70037
2016-05-06	68877
2016-05-07	65141
2016-05-08	62193
2016-05-09	63063
2016-05-10	57963
2016-05-11	52562
2016-05-12	23925

#### **Insight:**

- Users burned between 52,000 and 78,000 calories per day collectively.
- The highest calorie burn occurred on April 12 (78,893) and remained consistently high through the second half of April.
- There is a clear decline in calories burned in May, dropping significantly by May 10–12, where it reached as low as 23,925 on May 12.

#### **Business Impact:**

- Alert and re-engage users when calorie burn trends drop, particularly after long streaks of high activity.
- Align seasonal promotions or challenge resets at the start of new months when user activity wanes.

### Query 3: Active vs. Sedentary Minutes

#### SQL Query:

```
SELECT
    ActivityDate,
    SUM(VeryActiveMinutes + FairlyActiveMinutes +
    LightlyActiveMinutes) AS active_minutes,
    SedentaryMinutes
FROM daily_activity
GROUP BY ActivityDate
ORDER BY ActivityDate;
```

#### Result Table:

ActivityDate	active_minutes	SedentaryMinutes
2016-04-12	7562	728
2016-04-13	7018	776
2016-04-14	7733	1218
2016-04-15	8016	726
2016-04-16	7577	773
2016-04-17	6275	539
2016-04-18	7322	1149
2016-04-19	7669	775
2016-04-20	7889	818
2016-04-21	7182	838
2016-04-22	7463	1217
2016-04-23	8535	732
2016-04-24	7074	709
2016-04-25	7445	814
2016-04-26	7606	833
2016-04-27	7424	1108
2016-04-28	7647	782
2016-04-29	7527	815
2016-04-30	7916	712
2016-05-01	5958	730
2016-05-02	6266	798
2016-05-03	7050	816
2016-05-04	5942	1179
2016-05-05	7098	857
2016-05-06	6776	754
2016-05-07	6261	833

2016-05-08	5920	574
2016-05-09	6467	835
2016-05-10	5777	746
2016-05-11	5287	669
2016-05-12	2208	890

### Insight:

- Users maintain 7,000 to 8,500 active minutes daily across the group, showing generally consistent engagement.
- Sedentary minutes hover around 700–1,200 per day, which is about 12–20 hours daily.
- Some days (e.g., April 14, April 22, May 4) show very high sedentary minutes (1200+), which may indicate low movement or incomplete device usage.

### Business Impact:

- Introduce "Stand Up" reminders or hourly movement alerts when sedentary time exceeds 10 hours/day.
- Use trends to develop habit coaching models: e.g “You were most active around April 23 – let’s match that this week!”

## Section 2: Sleep Patterns

### Query 4: Average Sleep Duration per User

#### SQL Query:

```
SELECT
    Id,
    ROUND(AVG(TotalMinutesAsleep),2) AS avg_sleep_minutes
FROM sleep_day
GROUP BY Id
ORDER BY avg_sleep_minutes DESC;
```

#### Result Table:

Id	avg_sleep_minutes
1844505072	652.0
2026352035	506.18
6117666160	478.78
4319703577	476.65
5553957443	463.48
7086361926	453.13

6962181067	448.0
2347167796	446.8
8378563200	445.13
8792009665	435.67
5577150313	432.0
4702921684	417.48
1927972279	417.0
4388161847	400.17
4445114986	385.18
1503960366	360.28
6775888955	349.67
4020332650	349.38
8053475328	297.0
1644430081	294.0
3977333714	293.64
4558609924	127.6
7007744171	68.5
2320127002	61.0

#### Insight:

- Users average 400–450 minutes of sleep on weekdays.
- Some users sleep less than 2 hours (outliers), while top sleepers average over 10 hours.

#### Business Impact:

- Offer weekday sleep reminders.
- Integrate sleep hygiene education and rest streaks in the app.
- Identify and assist users with very low sleep averages.

#### Query 5: Average Sleep Duration by Weekday

##### SQL Query:

```
SELECT
    strftime('%w', SleepDate) AS weekday,
    ROUND(AVG(TotalMinutesAsleep),2) AS avg_sleep_minutes
FROM sleep_day
GROUP BY weekday
ORDER BY weekday;
```

##### Result Table:

weekday	avg_sleep_minutes
0	452.75
1	419.5
2	404.54
3	434.68
4	401.3
5	405.42
6	419.07

### Insight:

- Users sleep the most on Sunday (452.75 minutes -> 7.5 hrs).
- Weekdays average less than 7 hours, with Thursday (401.3 mins) being the lowest.
- There's a consistent dip in sleep on workdays, especially midweek.

### Business Impact:

- Promote weekday bedtime reminders or relaxation content to boost weekday rest.
- Add sleep consistency goals or streaks to drive long-term improvement.
- Use this data to introduce personalized coaching for users sleeping <6.5 hours.

## Section 3: Steps vs Calories

### Query 6: Steps vs Calories

#### SQL Query:

```
SELECT
    TotalSteps,
    Calories
FROM daily_activity
ORDER BY ActivityDate;
```

**Note:** Full result contains 861 rows. Only top 10 shown below for illustration .

#### Result Table:

TotalSteps	Calories
13162	1985
8163	1432
10694	3199
6697	2030

678	2220
11875	2390
4414	1459
10725	2124
10113	2344
8796	1982

#### Insight:

- There's a clear positive correlation between steps and calories burned.
- Example: Users with 10,000+ steps often burn 2,000–3,200+ calories.

#### Business Impact:

- Reinforce steps as a key contributor to energy burn.
- Educate users that every step counts — motivate even low-active users.
- Suggest non-step based activities for users unable to walk due to lifestyle or health.

#### Query 7: Top 5 Active Users (Steps & Calories)

#### SQL Query:

```
SELECT
    Id,
    ROUND(AVG(TotalSteps),2) AS avg_steps,
    ROUND(AVG(Calories),2) AS avg_calories
FROM daily_activity
GROUP BY Id
ORDER BY avg_steps DESC
LIMIT 5;
```

#### Result Table:

Id	avg_steps	Avg_calories
8877689391	16040.03	3420.26
8053475328	14763.29	2945.81
1503960366	12520.63	1876.97
7007744171	11776.36	2583.48
2022484408	11370.65	2509.97

#### Insight:

- There is a strong correlation between steps taken and calories burned.
- Top 5 active users average over 11,000–16,000 steps and 2,500–3,400 calories per day.



### Business Impact:

- Highlight walking as a primary calorie-burning strategy.
- Encourage smartwatch tracking accuracy validation.
- Reward top active users to motivate others.

## Section 4: Weight Trends

### Query 8: Weight Trend Over Time

#### SQL Query:

```
SELECT
    Id,
    WeightDate,
    ROUND(WeightKg,2) As WeightKg
FROM weight_log
ORDER BY Id, WeightDate;
```

**Note:** Only first 10 rows displayed here. Full query returned 67 rows.

#### Result Table:

Id	WeightDate	WeightKg
1503960366	2016-05-02 23:59:59	52.6
1503960366	2016-05-03 23:59:59	52.6
1927972279	2016-04-13 01:08:52	133.5
2873212765	2016-04-21 23:59:59	56.7
2873212765	2016-05-12 23:59:59	57.3
4319703577	2016-04-17 23:59:59	72.4
4319703577	2016-05-04 23:59:59	72.3
4558609924	2016-04-18 23:59:59	69.7
4558609924	2016-04-25 23:59:59	70.3
4558609924	2016-05-01 23:59:59	69.9

#### Insight:

- Weight is mostly stable across entries, with minor fluctuations per user.
- Some users maintain logs over multiple dates, showing consistent tracking.

### Business Impact:

- Reinforce long-term tracking with weight milestone alerts.
- Encourage users to log weight regularly for progress visualization.

## Section 5: Hourly Activity

### Query 9: Most Active Hour of the Day

#### SQL Query:

```
SELECT
    strftime('%H', ActivityDateTime) AS hour_of_day,
    SUM(StepTotal) AS total_steps
FROM hourly_steps
GROUP BY hour_of_day
ORDER BY total_steps DESC;
```

#### Result Table:

hour_of_day	total_steps
18	542848
19	528552
12	505848
17	498511
14	497813
13	495220
16	450639
10	447467
11	423534
09	403404
08	398044
15	371782
20	320638
07	284932
21	278865
22	215141
06	166191
23	110286
05	40886
00	39404
01	21555
02	15964
04	11836
03	5996

**Insight:**

- Peak activity occurs between 12 PM and 7 PM, with 6 PM being the highest (542,848 steps).
- Activity drastically drops post 9 PM and is lowest between 12 AM–5 AM.

**Business Impact:**

- Schedule push notifications or challenges in the 12–7 PM window.
- Encourage users to build habits during these naturally active hours.
- Offer evening cooldown/stretch programs to balance activity cycles.

**Query 10: Avg Calories Burned per Hour****SQL Query:**

```
SELECT
    strftime('%H', ActivityDateTime) AS hour_of_day,
    ROUND(AVG(Calories),2) AS avg_calories
FROM hourly_calories
GROUP BY hour_of_day
ORDER BY hour_of_day;
```

**Result Table:**

hour_of_day	avg_calories
00	71.81
01	70.17
02	69.19
03	67.54
04	68.26
05	81.71
06	87.0
07	94.48
08	103.34
09	106.14
10	110.46
11	109.81
12	117.2
13	115.31
14	115.73
15	106.64
16	113.33
17	122.75

18	123.49
19	121.48
20	102.36
21	96.06
22	88.27
23	77.59

#### Insight:

- Most active hours: 12 PM – 7 PM (peaking at 6 PM)
- Calories burned also peak during the same time block.

#### Business Impact:

- Schedule midday workout reminders.
- Tailor in-app challenges and rewards during high engagement hours.

## Section 6: Summary Insights

### Query 11: Top 5 Most Active Users

#### SQL Query:

```
SELECT
    Id,
    ROUND(AVG(TotalSteps),2) AS avg_steps
FROM daily_activity
GROUP BY Id
ORDER BY avg_steps DESC
LIMIT 5;
```

#### Result Table:

Id	avg_steps
8877689391	16040.03
8053475328	14763.29
1503960366	12520.63
7007744171	11776.36
2022484408	11370.65

#### Insight:

- The top user (Id: 8877689391) averages over 16,000 steps/day, followed by others exceeding 11,000+.

- These users likely represent high engagement and optimal tracker usage.

#### **Business Impact:**

- Identify these users as power users or community influencers.
- Feature them in leaderboards or testimonial programs.
- Tailor in-app rewards or early feature testing to their behaviour.

#### **Query 12: Top 5 Best Sleepers**

##### **SQL Query:**

```
SELECT
    Id,
    ROUND(AVG(TotalMinutesAsleep),2) AS avg_sleep_minutes
FROM sleep_day
GROUP BY Id
ORDER BY avg_sleep_minutes DESC
LIMIT 5;
```

##### **Result Table:**

<b>Id</b>	<b>Avg_sleep_minutes</b>
1844505072	652.0
2026352035	506.18
6117666160	478.78
4319703577	476.65
5553957443	463.48

##### **Insight:**

- Top sleeper (Id: 1844505072) averages 10.8 hours/day (652 minutes).
- Other top users sleep consistently over 7.5 hours/day.
- Suggests high recovery awareness or lifestyle alignment with wellness.

#### **Business Impact:**

- Leverage these users for sleep success case studies.
- Promote healthy sleep habits modeled after their behaviour.
- Encourage others to reach 7–8 hours/day with gamified sleep streaks.

## **Section 7: Business Impact and Conclusion**

### **Business Impact:**

#### **Optimize Engagement Windows Based on Activity Trends**

- Analysis shows users are most active between 12 PM and 7 PM, especially around 6 PM.
- Strava can send motivational nudges, workout reminders, or step goals during these high-activity hours to maximize engagement.

### **Promote Consistent Sleep Patterns and Recovery**

- Weekday sleep durations are lower than weekends (especially Thursday), and some users average under 6 hours.
- Implement weekday bedtime reminders, sleep streak tracking, and recovery scores to boost consistency and wellness.

### **Reinforce Step-Based Calorie Burn Strategies**

- There's a clear correlation between steps and calories burned.
- Educate users that increasing daily steps can effectively manage calorie expenditure. Use this for goal-based coaching and habit formation features.

### **Recognize and Leverage High-Performing Users**

- Top users consistently average 11K–16K steps/day and maintain 7.5–10 hrs of sleep.
- Use these users for community-based motivation, feature them in leaderboards, and design persona-driven campaigns for others to emulate.

## **Conclusion:**

The SQL analysis provided essential visibility into user activity, calorie burn, sleep behaviour, and engagement trends using raw smart device data. These insights form a foundational layer for Strava's:

- Marketing Strategy → personalized campaigns, nudges, challenges
- Product Innovation → smart recommendations, habit building tools
- User Retention → progress tracking, engagement triggers

With data-backed evidence, Strava can now enhance the app experience, boost user wellness, and drive deeper engagement across its platform.