# Dataset: Fitbit Fitness Tracker Data

# Group Number 5

# Use Case: Activity tracking on Fitbit Mobile Application

## 1.1 Introduction

Fitbit's wearable activity trackers track a variety of data related to the daily physical activity of the wearer. This data varies depending on the device, but almost all of them track the wearer's daily steps, distance, calories burned, and sleeping activity. Some of the more advanced devices can also monitor heart rate and track position with GPS, which allows users to view their route, distance, and pace in the mobile app after a run.

## 1.2 Description

Fitbit devices allow users to view a good amount of their tracked activity on their built-in screens. Users can also view a more detailed account of their activity, including all past activity, through the Fitbit app. In addition to storing the sleep and steps stats, the app will be extended with a new feature which would allow users to log other physical activities like yoga, cycling, running etc. along with intensity levels which would help accurate calculations of the calories burned during the activities.

## 1.3 Use Case Details

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| **Name** | Fitbit Activity Tracking |
| **Intent** | Sleep, steps, calories, weight and activity data tracking from the Fitbit device |
| **Scope** | Fitbit mobile application |
| **Level** | User |

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| **Status** | Conceptualization |
| **Primary Actor** | (Fitbit Device) User |
| **Secondary Actors** | None |
| **Preconditions** | The User must<br>• have a wearable Fitbit device paired to the mobile application.<br>• be logged onto the mobile application with their user id.<br>• have an active internet connection, logged onto the [company.com/shop] site open in the browser. |
| **<Dynamic Preconditions>** | • User successfully logs on the application.<br>• A device is successfully paired with the mobile application. |
| **Assumptions** | The User has a Fitbit wearable device and an internet connection. |
| **Trigger** | User input |
| **Basic Flow** | • User logs in and pairs his Fitbit device to the mobile application.<br>• The sleep, steps and calorie data are collected from the device worn through the day. This data is collected through the sensors in the device and requires no user input.<br>• User can log any activity besides walking in the app manually:<br>1. User searches for the activity he wants to track in the app.<br>1.1 The user finds the activity: User finds the activity and selects the intensity level.<br>1.2 The user doesn't find the activity.<br>✓ User creates a new activity if the activity doesn't exist.<br>✓ User defines the possible intensity levels and expected calories burned during the activity based on intensity.<br>2. User logs the duration he spent doing the activity. |
| **Business Rules** | 1. A user cannot log data without pairing a device to the application.<br>2. The user cannot log an activity if it does not exist. |

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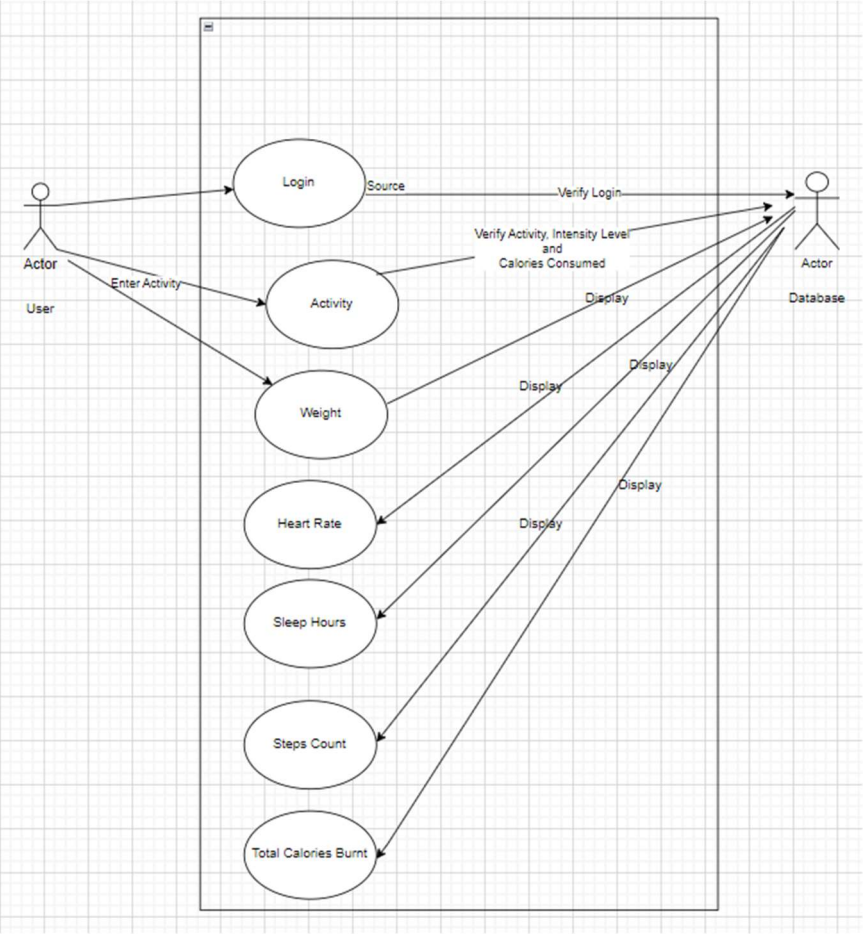
| | 3. One user account is associated with only one device.<br>4. One device will have many sleep, steps, and calories records with timestamps in minutes.<br>5. One device will have many heart rate records with timestamps in seconds.<br>6. One device will have zero to many activity records per day.<br>7. Weight must be entered in either Kilograms or Pounds.<br>8. The user cannot log an activity without defining the intensity level and calories burned for that activity.<br>9. There must be at least 1 intensity level defined for each activity. One activity can have one or many intensity levels. |
| **Success Post Condition** | User's activity entry is successfully created, and the total calories burned during the day is updated. |
| **Failed Post Condition** | **Exception**: Submitted data is incomplete:<br>1. The activity or intensity creation, or the entry of activity duration fails.<br>2. Actor re-enters the data.<br>3. The System responds. |
| **Failure End Condition** | The user does not enter any activity, and all the information remains unchanged. |

## 1.4 Use Case Diagram

The below use case diagram provides a high-level overview of the interactions between the actors (Fitbit User) and the Database System. The diagram can serve as a starting point for more detailed analysis and documentation of the system's behavior.



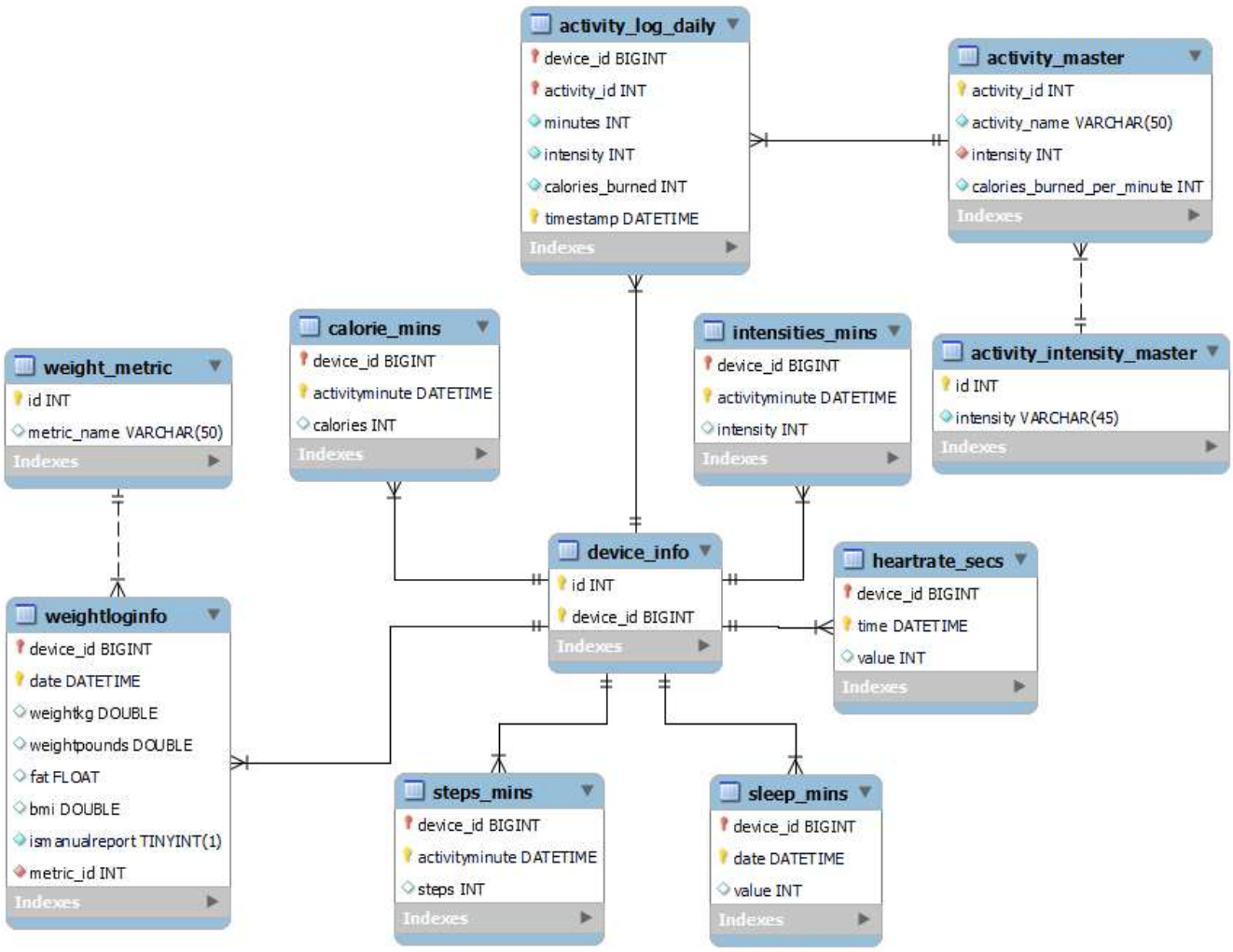

**Actors:**

1. **User:** Represents the person who wears the Fitbit device and interacts with the online Fitbit mobile application.
2. **Database:** Represents the backend relational data storage and management system for the data collected by the Fitbit device and through user input.

**Use Cases:**

1. **Login:** Allows the customer to log on to the mobile application.
2. **Verify Login:** Enables the database to validate the user log in request.
3. **Enter Activity:** Allows the customer to view heartrate, sleep, steps, intensities and calories burnt information and enables them to enter weight and activity information in the mobile application.
4. **Verify Activity and Intensity Level:** Allows the database to verify the activity, intensity level and calories burnt information entered by the user.
5. **Display:** Allows the database to return data for displaying on the mobile application.

## 1.5 Entity Relationship Diagram




## 1.6 Data Dictionary

### 1. device_ info

| Column Name | Data Type | Is Nullable | Primary Key | Foreign Key | Description |
|---|---|---|---|---|---|
| id | INT | N | Y | | Unique identifier for each record |

| | | | | | |
|---|---|---|---|---|---|
| device_id | BIGINT | N | Y | | Unique identifier for each Fitbit device |

### 2. heartrate_secs

| Column Name | Data Type | Is Nullable | Primary Key | Foreign Key | Description |
|---|---|---|---|---|---|
| device_id | BIGINT | N | Y | Y | Fitbit device id |
| time | DATETIME | N | Y | | Date and time of the recorded measurement. |
| value | INT | Y | | | Numeric value of heartrate measurement. |

### 3. intensities_mins

| Column Name | Data Type | Is Nullable | Primary Key | Foreign Key | Description |
|---|---|---|---|---|---|
| device_id | BIGINT | N | Y | Y | Fitbit device id |
| activityminute | DATETIME | N | Y | | Date and time of the recorded activity. |
| intensity | INT | Y | | | Numeric value representing the intensity of the activity. |

### 4. calorie_mins

| Column Name | Data Type | Is Nullable | Primary Key | Foreign Key | Description |
|---|---|---|---|---|---|

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|---|---|---|---|---|---|
| device_id | BIGINT | N | Y | Y | Fitbit device id |
| activityminute | DATETIME | N | Y | | Date and time of the recorded activity. |
| calories | INT | Y | | | The number of calories burned during the corresponding activity minute. |

### 5. sleep_mins

| Column Name | Data Type | Is Nullable | Primary Key | Foreign Key | Description |
|---|---|---|---|---|---|
| device_id | BIGINT | N | Y | Y | Fitbit device id |
| date | DATETIME | N | Y | | Date and time of the recorded measurement. |
| value | INT | Y | | | Numeric value associated with the measurement. |

### 6. steps_mins

| Column Name | Data Type | Is Nullable | Primary Key | Foreign Key | Description |
|---|---|---|---|---|---|
| device_id | BIGINT | N | Y | Y | Fitbit device id |
| activityminute | DATETIME | N | Y | | Date and time of the recorded activity. |
| steps | INT | Y | | | Numeric value representing the number of steps taken |

## 7. weightlog_info

| Column Name | Data Type | Is Nullable | Primary Key | Foreign Key | Description |
|---|---|---|---|---|---|
| device_id | BIGINT | N | Y | Y | Fitbit device id |
| date | DATETIME | N | Y | | Date and time when the measurement was recorded. |
| weightkg | DOUBLE | Y | | | Weight of the individual in kilograms. |
| weightpounds | DOUBLE | Y | | | Weight of the individual in pounds. |
| fat | FLOAT | Y | | | Fat percentage. |
| bmi | DOUBLE | Y | | | Body Mass Index. |
| ismanualreport | TINYINT(1) | Y | | | Flag indicating whether the entry was manually reported. |
| metric_id | INT | Y | | Y | Numerical Id of the metric in which the user logged the weight (kilograms or pounds) |

## 8. weight_metric

| Column Name | Data Type | Is Nullable | Primary Key | Foreign Key | Description |
|---|---|---|---|---|---|
| id | BIGINT | N | Y | | Unique row identifier |
| metric_name | VARCHAR(50) | Y | | | Name of the metric (e.g., "Kilograms," "Pounds") |

### 9. activity_log_daily (New Table 1)

| Column Name | Data Type | Is Nullable | Primary Key | Foreign Key | Description |
|---|---|---|---|---|---|
| device_id | BIGINT | N | Y | Y | Fitbit device id |
| activity_id | INT | N | Y | Y | Unique identifier for each activity type |
| minutes | INT | N | | | Duration of the activity in minutes |
| intensity | INT | N | | | Level of intensity associated with the activity |
| calories_burned | INT | N | | | Number of calories burned during the activity |
| timestamp | DATETIME | N | Y | | Timestamp when the activity was logged by the user |

### 10. activity_master (New Table 2)

| Column Name | Data Type | Is Nullable | Primary Key | Foreign Key | Description |
|---|---|---|---|---|---|
| activity_id | INT | N | Y | | Unique identifier for each activity. |
| activity_name | VARCHAR(50) | N | | | Name or description of the activity. |
| intensity | INT | N | | Y | Identifier for level of intensity associated with the activity (e.g., "low," "medium," "high"). |

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|---|---|---|---|---|---|
| calories_burned_per_minute | INT | N | | | Number of calories burned per minute for the specific activity and intensity. |

### 11. activity_intensity_master (New Table 3)

| Column Name | Data Type | Is Nullable | Primary Key | Foreign Key | Description |
|---|---|---|---|---|---|
| id | INT | N | Y | | Unique identifier for each activity intensity level |
| intensity | VARCHAR(45) | N | | | Intensity description (low, high, medium etc.) |