daily_activities_merged Analysis

- Created a pivot table with average steps taken by day of the week and overall
    # Average steps of all data is 8,329
    # In descending order Sat(8,979), Tue(8,927), Mon(8,488), AVERAGE(8,329) Wed(8,191), Thurs(8,185), Fri(7,821), Sun(7,669)

- Edited pivot table to show COUNTA of Unique_Id. Since the data begins on a Tuesday and ends on a Thursday, I filtered out the last three days of data to have an equal number of every day of the week. Shows which days of the week had the largest number of FitBit uses.
    # Friday had most uses and Sunday and Monday tied for the least uses

- Edited pivot table to show Average of TotalMinutesAsleep by the day of the week.
    # Sunday had most sleep. Tuesday, Thursday, and Friday are all close at the bottom ~50 minutes less than Sunday.
    # Average sleep for days with sleep data was 419 minutes, indicating the average user does not get the recommended amount of sleep.

- Edited pivot table to check DayOfWeek vs average of TotalMinutesWorn. Nothing stands out as useful.

- Edited pivot table to look compare Id vs TotalSleepRecords and average of TotalMinutesAsleep on days with 1 sleep record.
    # 24 of 33 users recorded sleep data at least once
    # 13 of 33 users recorded sleep data 22 or more times, 11 of 33 had between 1 and 15 sleep records, and 9 of 33 with 0 sleep records
    # Minor positive correlation between tracking sleep and average TotalMinutesAsleep

- Created a chart comparing VeryActiveMinutes and TotalMinutesAsleep for users on days with 1 sleep record recorded
    #The users with the most and fewest minutes of sleep tended to have the least amount of minutes asleep
    #The users who recorded the most VeryActiveMinutes tended to average around 400 minutes asleep

- Created a chart comparing FairlyActiveMinutes and TotalMinutesAsleep for users on days with 1 sleep record recorded
    # Again users with the most and least sleep had among the least amount of FairlyActiveMinutes

- Created 4 columns to measure PercentMoreActive (VeryActiveMinutes + FairlyActiveMinutes divided by TotalMinutesWorn) , PercentLessActive (LightlyActiveMinutes + SedentaryMinutes divided by TotalMinutesWorn), PercentVeryActive (VeryActiveMinutes divided by TotalMinutesWorn), and PercentSedentary (SedentaryMinutes divided by TotalMinutesWorn)
- Copy and Special Pasted values only for the four columns and then formatted them as percents
- Created pivot table to compare TotalMinutesWorn to levels of activity while wearing FitBit
    # Users who wore their FitBit between half and three quarters of the day had the highest percent of MoreActive time. Over 30% more time than the next closest quartile.
    # When compared to which users had sleep records, users in the half to three quarters quartile for TotalMinutesWorn recorded 81% of all sleep records in the study
    # Users who wore their device between 1/4 and 1/2 a day recorded the lowest PercentMoreActive percentage. Less than half the average for the whole dataset.
    # Users wearing their device for less than 1/4 of the day recorded the lowest percentage for PercentSedentary, while being average for PercentMoreActive.

hourly_data_merged Analysis

- Instances of activity by hour of day top 5
    1. 12pm-1pm
    2. 7pm-8pm
    3. 5pm-6pm
    4. 6pm-7pm
    5. 1pm-2pm
- 1am-6am has by far the least activity recorded

- Highest average intensity sorted by hour and day
    Sunday- 10am, 5pm, 2pm, 7pm, 6pm
    Monday- 5-8pm
    Tuesday- 5am, 5-7pm, 12pm
    Wednesday- 5-8pm
    Thursday- 5am, 4-8pm
    Friday- 6-8pm, 5-7am
    Saturday- 11am-3pm, 1-2pm highest

- Hours of week with highest intensity
    1. Saturday 1-2pm
    2. Tuesday 5-6am
    3. Monday 6-7pm
    4. Wednesday 5-6pm
    5. Saturday 2-3pm

- Most Average Steps sorted by hour and day
    1. Saturday 1-2pm
    2. Saturday 2-3pm
    3. Wednesday 6-7pm
    4. Wednesday 5-6pm
    5. Monday 6-7pm
    6. Saturday 11am-12pm
    7. Sunday 10-11am
    8. Saturday 12-1pm

SQL Queries: Hourly Data

/* This query joins the hourly_intensities and hourly_steps tables by concatenating the Id and ActivityHour to make a UniqueId column used for the join */

```
SELECT
   hourly_intensities.Id,
   hourly_intensities.ActivityHour,
   TotalIntensity,
   AverageIntensity,
   StepTotal
FROM
   fitness_tracker_data.hourly_intensities AS hourly_intensities
FULL OUTER JOIN
   fitness_tracker_data.hourly_steps AS hourly_steps ON
   hourly_intensities.Id = hourly_steps.Id AND
```

```
    hourly_intensities.ActivityHour = hourly_steps.ActivityHour
ORDER BY
    hourly_intensities.Id, hourly_intensities.ActivityHour


--Checking that all AverageIntensity values fall in expected range

SELECT
    MAX(AverageIntensity) AS max_instensity,
    MIN(AverageIntensity) AS min_intensity
FROM
    fitness_tracker_data.hourly_intensities


--  Looking at highest AverageIntensity values in the hourly_intensities data

SELECT
    AverageIntensity
FROM
    fitness_tracker_data.hourly_intensities
ORDER BY
   AverageIntensity DESC
LIMIT
    10


-- Looking at the highest StepTotal's in the data

SELECT
    StepTotal
FROM
    fitness_tracker_data.hourly_steps
ORDER BY
   StepTotal DESC
LIMIT
    25


/* This query joins the hourly_intensities and hourly_steps tables by concatenating the Id and
ActivityHour to make a UniqueId column used for the join */

SELECT
    hourly_intensities.Id,
    hourly_intensities.ActivityHour,
    TotalIntensity,
    AverageIntensity,
    StepTotal
FROM
    fitness_tracker_data.hourly_intensities AS hourly_intensities
FULL OUTER JOIN
    fitness_tracker_data.hourly_steps AS hourly_steps ON
    hourly_intensities.Id = hourly_steps.Id AND
    hourly_intensities.ActivityHour = hourly_steps.ActivityHour
ORDER BY
```

```
    hourly_intensities.Id, hourly_intensities.ActivityHour



-- Compares AverageIntensity and StepTotal by the hour of day across all participants
-- Also calls highest and lowest AverageIntensity and StepTotal

SELECT
    EXTRACT(TIME FROM ActivityHour) AS HourOfDay,
    MAX(AverageIntensity) AS HighestIntensity,
    MIN(AverageIntensity) AS LowestIntensity,
    MAX(StepTotal) AS HighestSteps,
    MIN(StepTotal) AS LowestSteps,
    AVG(AverageIntensity) AS AverageIntensityByHour,
    AVG(StepTotal) AS AverageStepsByHour
FROM
    fitness_tracker_data.hourly_data_merged
GROUP BY
    HourOfDay



-- Finds all instances where a subject had no recorded activity for an entire day

SELECT
    Id,
    EXTRACT(DAYOFYEAR FROM ActivityHour) AS Day,
    AVG(TotalIntensity) AS TotalIntensityPerDay,
    AVG(AverageIntensity) AS AverageIntensityPerDay,
    AVG(StepTotal) AS StepTotalPerDay,

FROM
        fitness_tracker_data.hourly_data_merged
WHERE
    TotalIntensity = 0 AND AverageIntensity = 0 AND StepTotal = 0
GROUP BY
    Day, Id



-- Queries the hours of the day that had the most instances of any activity across all days and
users

SELECT
    EXTRACT(HOUR FROM ActivityHour) AS HourOfDay,
    COUNT(TotalIntensity) AS IntensityCount
FROM
    fitness_tracker_data.hourly_data_merged
WHERE
    TotalIntensity > 0
GROUP BY
    HourOfDay
ORDER BY
    IntensityCount DESC
```

```
-- Queries the hours of the day that had the most instances of any activity
-- Further seperates by day of week


SELECT
   EXTRACT(DAYOFWEEK FROM ActivityHOur) AS DayOfWeek,
   EXTRACT(HOUR FROM ActivityHour) AS HourOfDay,
   COUNT(TotalIntensity) AS IntensityCount
FROM
   fitness_tracker_data.hourly_data_merged
WHERE
   TotalIntensity > 0
GROUP BY
   HourOfDay, DayOfWeek
ORDER BY
   IntensityCount DESC


/* Queries the hours of week for each week day and returns in order the hours throughout
with highest average intensity, where any level of intensity was recorded.  This sorts by
day of week then by hour to show which hours are most active, for each individual day */

SELECT
   EXTRACT(DAYOFWEEK FROM ActivityHOur) AS DayOfWeek,
   EXTRACT(HOUR FROM ActivityHour) AS HourOfDay,
   AVG(AverageIntensity) AS IntensityCount
FROM
   fitness_tracker_data.hourly_data_merged
WHERE
   AverageIntensity > 0
GROUP BY
   HourOfDay, DayOfWeek
ORDER BY
   DayOfWeek, IntensityCount DESC


/* Queries the hours of week where the most steps were taken on average. Only hours when
any steps are taken are accounted for */

SELECT
   EXTRACT(DAYOFWEEK FROM ActivityHOur) AS DayOfWeek,
   EXTRACT(HOUR FROM ActivityHour) AS HourOfDay,
   AVG(StepTotal) AS StepCount
FROM
   fitness_tracker_data.hourly_data_merged
WHERE
   StepTotal > 0
GROUP BY
   HourOfDay, DayOfWeek
ORDER BY
   StepCount DESC
```

```
/* Checking to see if there are any hours in the week with high intensity and low steps,
signaling common times for activities other than walking or running */

SELECT
   EXTRACT(DAYOFWEEK FROM ActivityHOur) AS DayOfWeek,
   EXTRACT(HOUR FROM ActivityHour) AS HourOfDay,
   AVG(StepTotal) AS StepCount,
   AVG(AverageIntensity) AS IntensityAverage
FROM
   fitness_tracker_data.hourly_data_merged
WHERE
   StepTotal > 0
GROUP BY
   HourOfDay, DayOfWeek
ORDER BY
   StepCount, IntensityAverage DESC
```