

Automated Sleep and Activity Insights Generation

Allmin Susaiyah (ESR1),

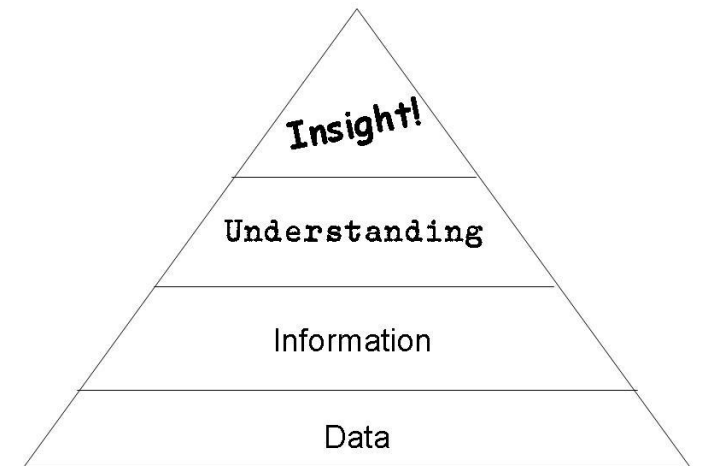
Supervised by: Prof. Ehud Reiter and Dr. Aki Härmä,

In collaboration with:

Simone Balloccu

Introduction

- What are Insights?
 - “An accurate and deep understanding”
- Insights need to be ‘mined’ from data as they are of low volume and have no fixed occurrence.
 - Apples are bigger than grapes.
 - On Mondays, you sleep less than on other days.
 - On Fridays you burn more calories than other days.



How we generate the Insights

| Activity (A) | Calories Burnt (C) | Duration (minute) |
|--------------|--------------------|-------------------|
| Running | 300 | 55 |
| Running | 310 | 59 |
| Walking | 150 | 58 |
| Walking | 140 | 60 |
| Rowing | 280 | 58 |
| Rowing | 290 | 66 |



Decide the
schematic template

{{Activity:1}}{{measurement}}{{Actiity:2}}



Step 1: Statement Generation

While running you burnt
<blank> calories than while walking.

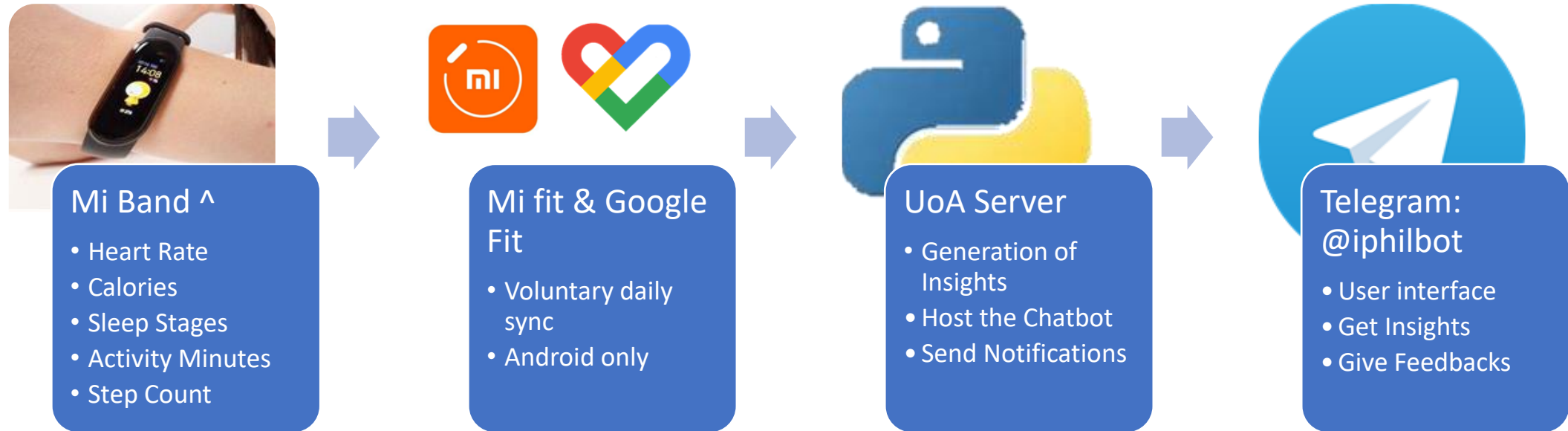
Step 2: Statement Scoring

While running you burnt **more** calories
than while walking (**score = 0.96**)

While running you burnt **more** calories
than while rowing (**score = 0.05**)

Automatically generate **significant** insights that help to optimize campaigns

Sleep and Activity IG - Overview



Hypothesis: AI based Recommendation system can help to deliver useful insights to the user

App Setup:



Google Fit

- [Google Fit: Activity Tracking – Apps on Google Play](#)
- Add google account in settings -> google -> Add another account
- Google Fit: credentials provided
- Open Google fit and choose the new user credential
- Set height/weight etc as per your wish. DOB need not be very accurate.

App Setup :



Mi Fit/
Zepp Life

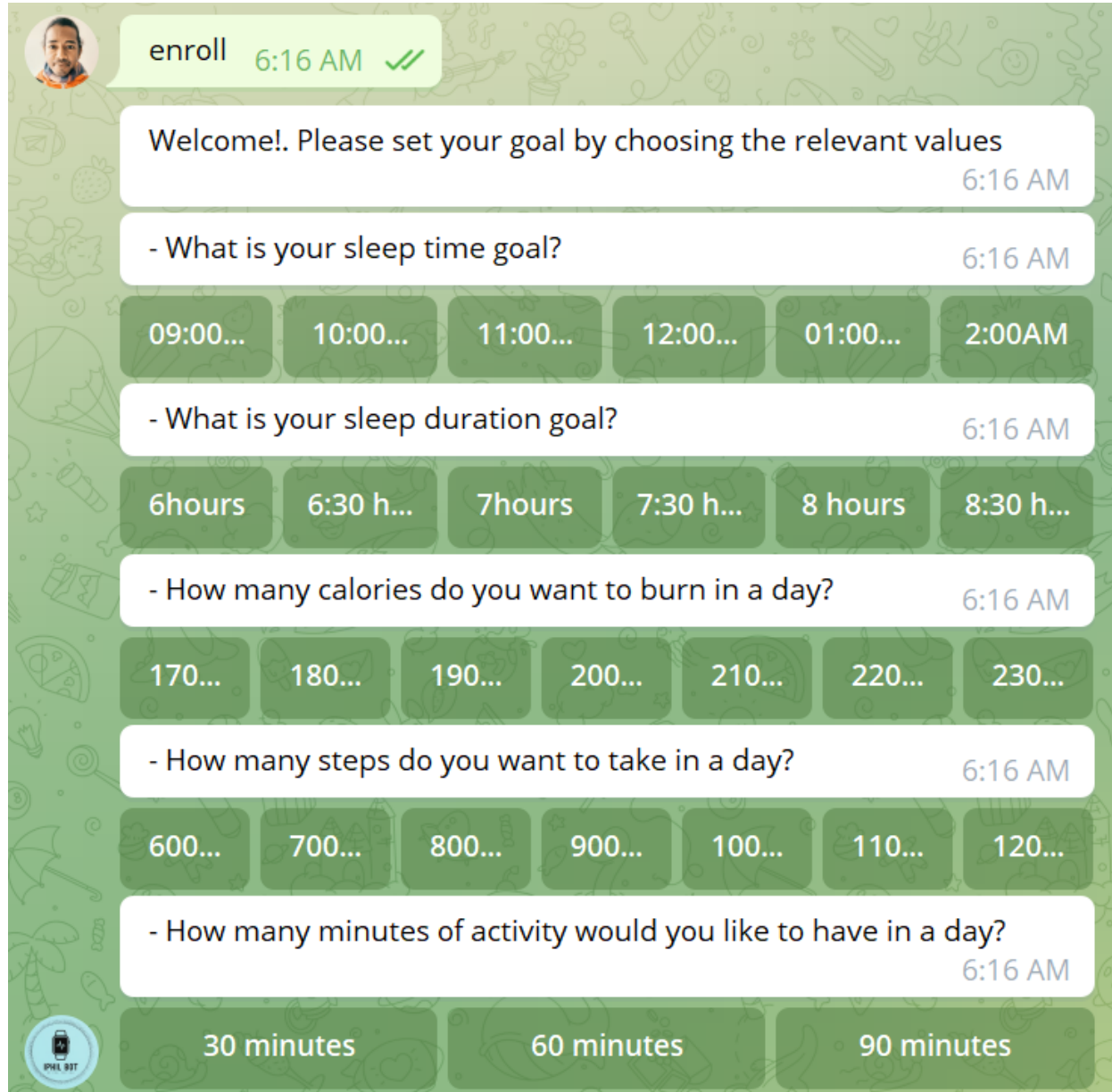
- [mi fit – Android Apps on Google Play](#)
- Credentials shared personally: create a new account using the provided google id
- Pair the device using “+ add device”, tap on the tick mark on the device
 - While-in use access
- Personal Info need not be accurate, but to some
- Important Settings:
 - Profile -> add accounts -> google fit -> login shared earlier
 - Profile -> My devices -> Mi Band ->Heart rate monitoring -> detection frequency : 1min
 - Profile -> My devices -> Mi Band ->Heart rate monitoring -> activity monitoring: on
 - Optional : background

Telegram

- [telegram – Android Apps on Google Play](#)
- Any account username to be shared
- Remember to not include contacts if you don't want to be broadcasted
- @iphilbot opens the chat bot
- Say hi to get started



Enrollment



A screenshot of a WhatsApp chat interface for an enrollment process. The chat background is green with a pattern of small white icons. At the top left is a circular profile picture of a man with a beard and orange shirt. The first message is a green bubble with the text "enroll" and a timestamp of "6:16 AM" followed by a green double-checkmark. Below this are four white bubbles, each containing a question and a timestamp of "6:16 AM". Each question is followed by a row of green buttons with white text. The first question is "Welcome!. Please set your goal by choosing the relevant values". The second question is "- What is your sleep time goal?" followed by buttons: "09:00...", "10:00...", "11:00...", "12:00...", "01:00...", and "2:00AM". The third question is "- What is your sleep duration goal?" followed by buttons: "6hours", "6:30 h...", "7hours", "7:30 h...", "8 hours", and "8:30 h...". The fourth question is "- How many calories do you want to burn in a day?" followed by buttons: "170...", "180...", "190...", "200...", "210...", "220...", and "230...". The fifth question is "- How many steps do you want to take in a day?" followed by buttons: "600...", "700...", "800...", "900...", "100...", "110...", and "120...". The sixth question is "- How many minutes of activity would you like to have in a day?" followed by buttons: "30 minutes", "60 minutes", and "90 minutes". At the bottom left is a blue circular icon with a white smartphone and the text "IPHEX 99T".

enroll 6:16 AM ✓✓

Welcome!. Please set your goal by choosing the relevant values 6:16 AM

- What is your sleep time goal? 6:16 AM

09:00... 10:00... 11:00... 12:00... 01:00... 2:00AM

- What is your sleep duration goal? 6:16 AM

6hours 6:30 h... 7hours 7:30 h... 8 hours 8:30 h...

- How many calories do you want to burn in a day? 6:16 AM

170... 180... 190... 200... 210... 220... 230...

- How many steps do you want to take in a day? 6:16 AM

600... 700... 800... 900... 100... 110... 120...

- How many minutes of activity would you like to have in a day? 6:16 AM

30 minutes 60 minutes 90 minutes

Help



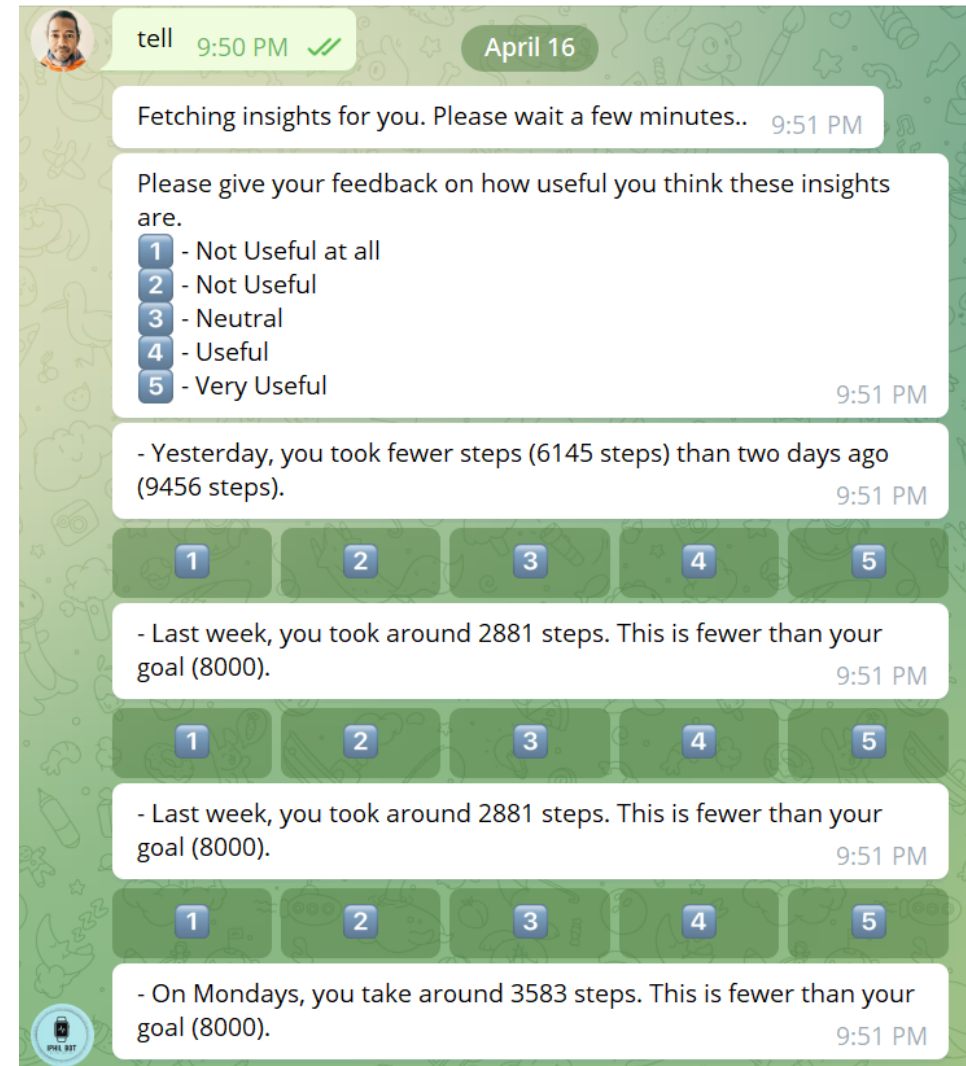
help 3:32 PM ✓✓

This bot helps you understand your sleep and fitness behavior. try asking: 3:32 PM

- Enroll - show insights from (yesterday or this week or yesterday etc) w.r.t my (activity or heart rate or calories or deep sleep or rem sleep or sleep duration)
- show insights about my (activity or heart rate or calories or deep sleep or rem sleep or sleep duration)
- show some insights about me
- talk - what do you see from my data? - Feedback: The bot doesnt reply when I say 'show me insights' 3:32 PM



On Demand Insights



The screenshot shows a chat interface with a green background and a pattern of small icons. At the top, there is a header bar with a profile picture of a man, the text "tell 9:50 PM" with a green checkmark, and a date bubble "April 16".

The chat history includes:

- A system message: "Fetching insights for you. Please wait a few minutes.." (9:51 PM)
- A text prompt: "Please give your feedback on how useful you think these insights are."
- A list of five feedback options, each in a blue box:
 - 1 - Not Useful at all
 - 2 - Not Useful
 - 3 - Neutral
 - 4 - Useful
 - 5 - Very Useful(9:51 PM)
- A text message: "- Yesterday, you took fewer steps (6145 steps) than two days ago (9456 steps)." (9:51 PM)
- A row of five blue boxes with numbers 1 through 5 for feedback.
- A text message: "- Last week, you took around 2881 steps. This is fewer than your goal (8000)." (9:51 PM)
- A row of five blue boxes with numbers 1 through 5 for feedback.
- A text message: "- Last week, you took around 2881 steps. This is fewer than your goal (8000)." (9:51 PM)
- A row of five blue boxes with numbers 1 through 5 for feedback.
- A text message: "- On Mondays, you take around 3583 steps. This is fewer than your goal (8000)." (9:51 PM)
- A row of five blue boxes with numbers 1 through 5 for feedback.

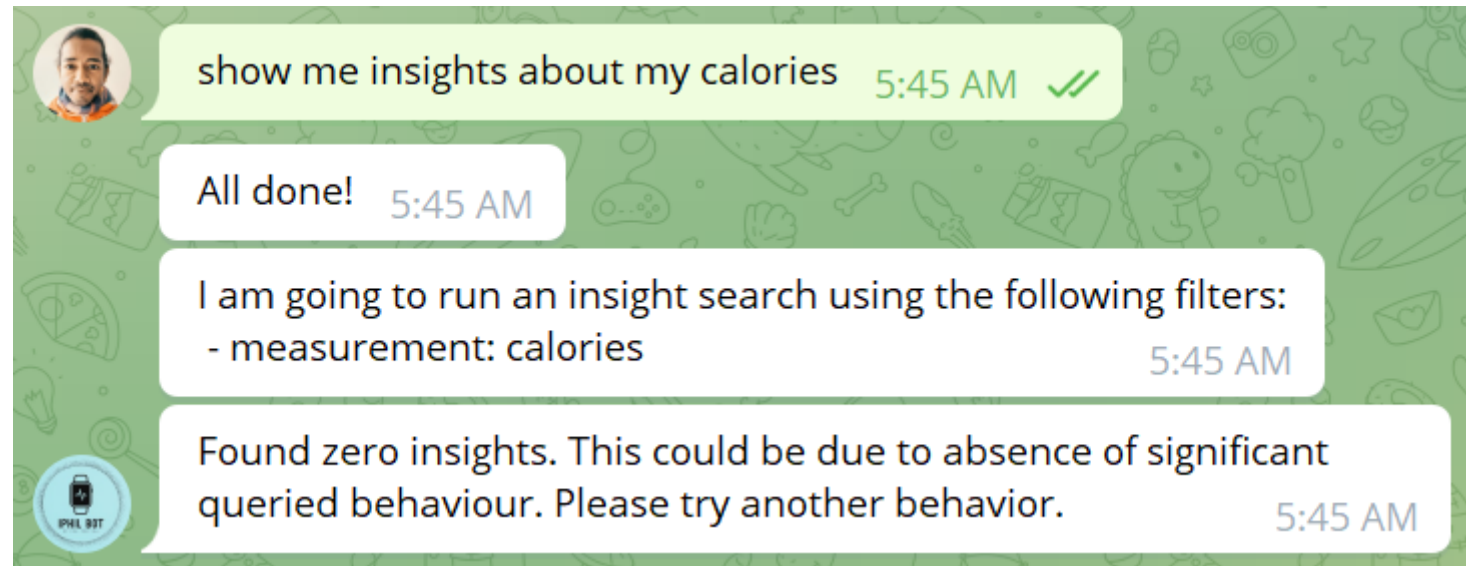
At the bottom left, there is a circular icon with a smartphone and the text "PHOTO BY".

What's a useful insight

Based on following conditions:

- Actionable (It allows you to infer what situations led to the insight)
- Measurable/Informative (It tells you measurable information about your current behaviour)
- Can use to improve your lifestyle with the insight?
- You can relate the insight to your lifestyle?

No Insights to show



Right On Time Insights

Right-on-time insights:
Please give your feedback on how useful you think these insights are.

1 - Not Useful at all
2 - Not Useful
3 - Neutral
4 - Useful
5 - Very Useful

11:51 AM

During the mornings when you were active for more than 20 minutes/hour, you were active for more minutes (50 minutes).

11:51 AM

1 2 3 4 5

During the mornings when you were active for 5 to 20 minutes/hour, you burnt more calories per hour (96 calories) than other users (81 calories).

11:51 AM

1 2 3 4 5

During the mornings following a night when you slept more than 8 hours, you burnt more calories per hour (71 calories) than other users (69 calories).

11:51 AM

1 2 3 4 5

During the mornings when you were active for 5 to 20 minutes/hour, you were active for fewer minutes (16 minutes).

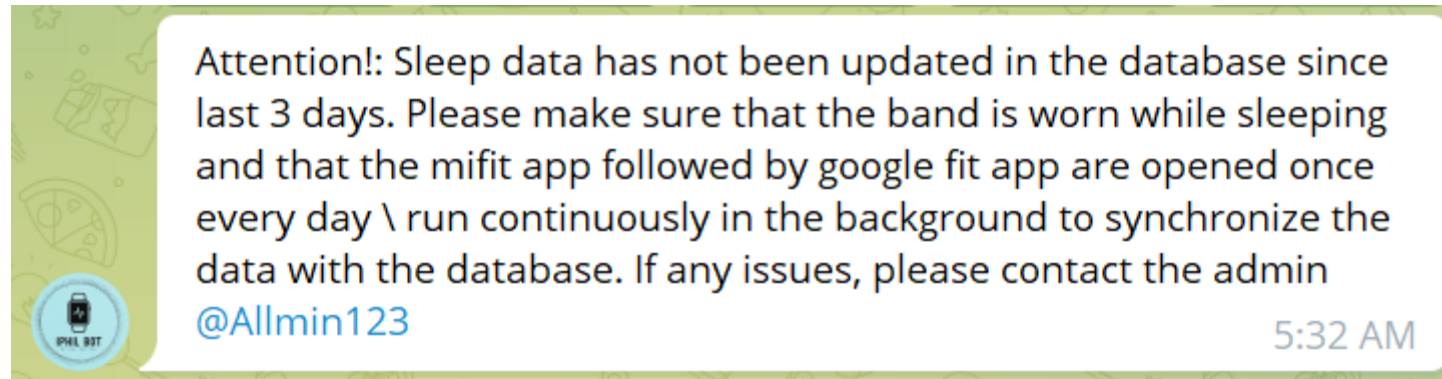
11:51 AM

1 2 3 4 5

Three times a day:

- 1) Morning
- 2) Afternoon
- 3) Evening

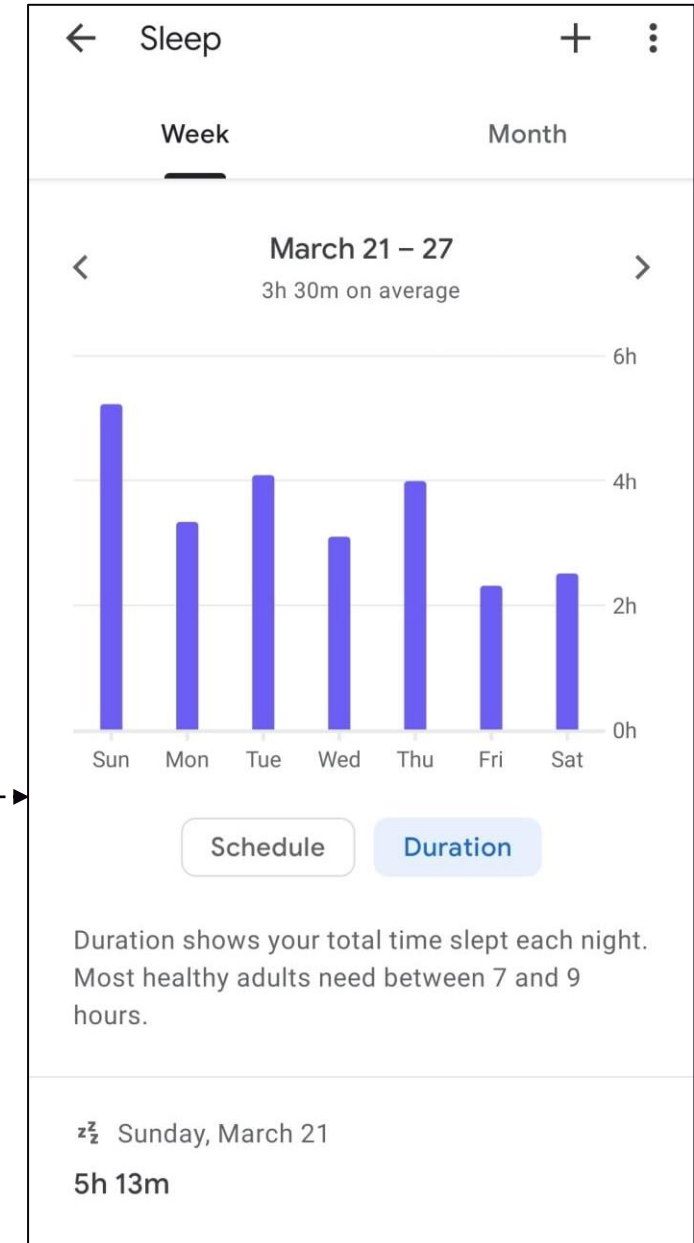
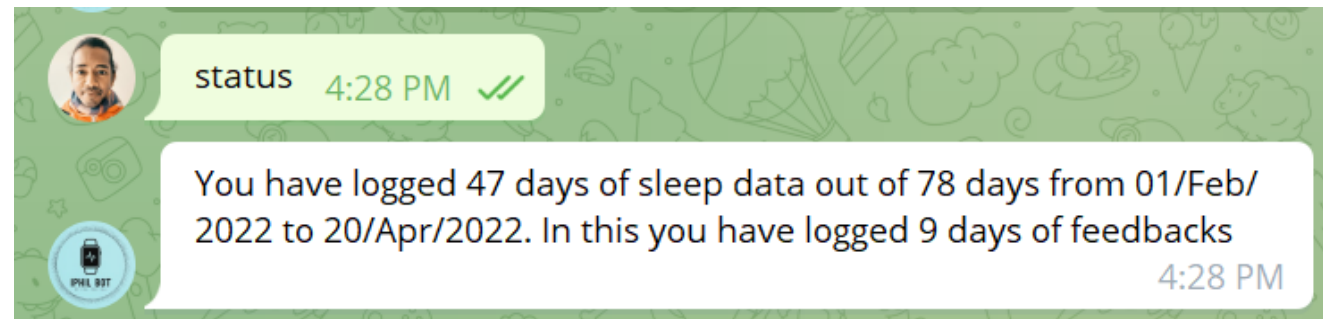
Notification: data sync



Mi Fit/
Zepp Life



Google Fit



Compliant participation instruction

- Try to wear the band as much as possible (except unavoidable reasons)
- Synch up the mobile app before sleep / 8PM every day
 - Or let the apps run in the background
- Respond to the Right-on-time insights as much as possible
- Try to give feedback at least once a day
- Any doubts. complains/bugs, please contact @Allmin123

Token of Appreciation

- 20 days of data in one month of time
 - > Wear the watch + give feedback + 15 Pounds Amazon Voucher
- Additional 20 days of data -> 15 Pounds Voucher
- You can withdraw at any time without questions. But your eligibility to keep the gift depends on when you withdraw.

Thank you