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# Problem Description

- ! Low awareness of the details of menstrual cycle
- ! Existing methods for raising awareness and/or providing assistance (e.g. tracking apps) have exhibited negligence toward data privacy
- ! Urgent need for such a tool that is accessible to everyone

# Solution Overview

💡 Develop a web-based cyler tracker to raise awareness and provide users with reliable cycle predictions.

Our solution achieves:

- Secure local data storage
- Period and fertility prediction
- Prediction visualisation
- User personalisation

# Objectives

1. Cycle prediction based on user input
2. Prediction visualization on a calendar
3. Syncing with local calendar - future work
4. Local data storage
5. User customization of the webpage and calendar in terms of appearance, notes, etc

# Benefits

## **Health Education and Awareness Benefits:**

- ✓ Users gain a better insight into understanding their menstrual cycles.
- ✓ Tracking your information helps recognise symptoms and how they change with the different phases of your cycle.
- ✓ Offers educational resources that may not be accessible to all.
- ✓ Can be used as a teaching tool in schools to educate about menstrual health.

## **Data Security and Data Driven Health Insights Benefits**

- ✓ Users have control over their data where their information is only accessed by them.
- ✓ Data is accumulated over a long time increasing the accuracy of pattern recognition
- ✓ Long term data collection is valuable when tracking overall reproductive health trends.

# Benefits

## Customisation Benefits

- ✓ Users can adjust the settings to their preference.
- ✓ Trailered recommendations can be given from the user data if the user wants.
- ✓ There can be a customisation of tracking features to suit individual needs.

## Personal Benefits

- ✓ The website can provide a sense of community which can minimise the feeling of isolation with menstrual health awareness.
- ✓ Understanding your cycle can reduce stress when managing life around your period.
- ✓ Tracking your period can help reduce anxiety about unexpected periods.
- ✓ Having a safe space to track your information can also reduce stress and anxiety when thinking about your menstrual cycle.

# Solution Details - Cycle Tracker Web App

- Framework
- Data Processing and Storage
- User and Prediction
- User Personalisation
- Information

# Framework

- Platform - Flutter
- Accessible web-based app
- 5 subpages under the main framework



Visualise the cycle data stored on the device and previous predictions

Allows user to keep diaries

Displays a calendar to show predictions of cycle start date and fertile window

Provides user with useful information on period cycle

Contains settings for the page such as appearance and language



Data



Diary



Home



Info



Setting



# Data Processing and Storage

- Local data storage: IndexedDB
- Hive Flutter package
- Key-Value Format like Python dictionary
- Data persistent across sessions
- Only accessible by the tracker app



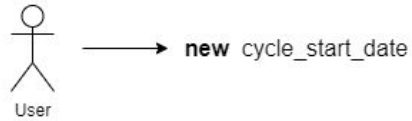
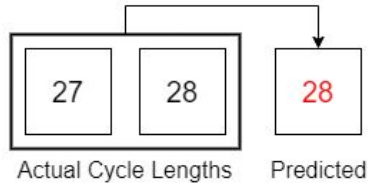
Start from key		
#	Key	Value
0	"2024-06-02"	▶ "28 2024-06-02"

## Storage

- ▶ Local storage
- ▶ Session storage
- ▼ IndexedDB
  - ▼ cycledata
    - box
  - ▼ diarybox
    - box
- ▶ Cookies
- Private state tokens
- Interest groups
- ▶ Shared storage
- Cache storage

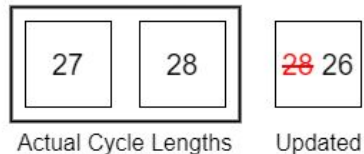
# User and Prediction

iteration N:

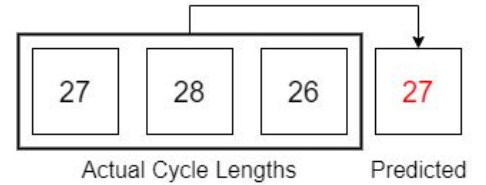


**actual** cycle\_length = **new** cycle\_start\_date - **old** cycle\_start\_date

save data: {entry\_date: 'cycle\_length cycle\_start\_date'}



iteration N+1:



...

# User and Prediction

2 types of errors during user input:

- Repetition error: more than 1 records are made on the same day →
- Preceding error: the recorded cycle\_start\_date precedes the previous cycle\_start\_date →

**Repetition Error**

Two dates are recorded today, please select which entry to keep.

Previous Entry is: 2024-05-22

Current Entry is: 2024-05-13

Cancel

**Preceding Error**

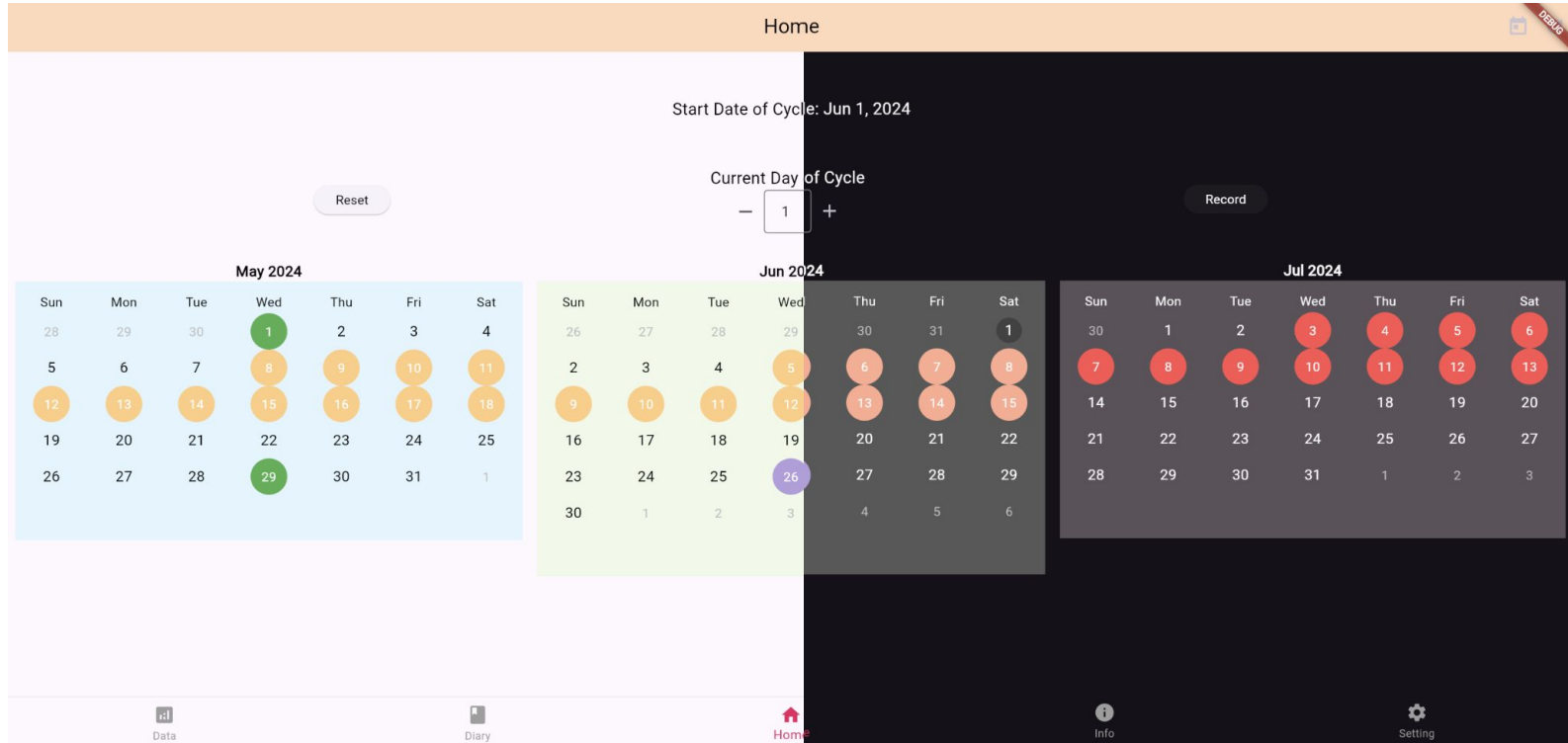
The date entered is invalid because it is earlier than the last recorded date, please retry.

Last Cycle Started on: 2024-05-22

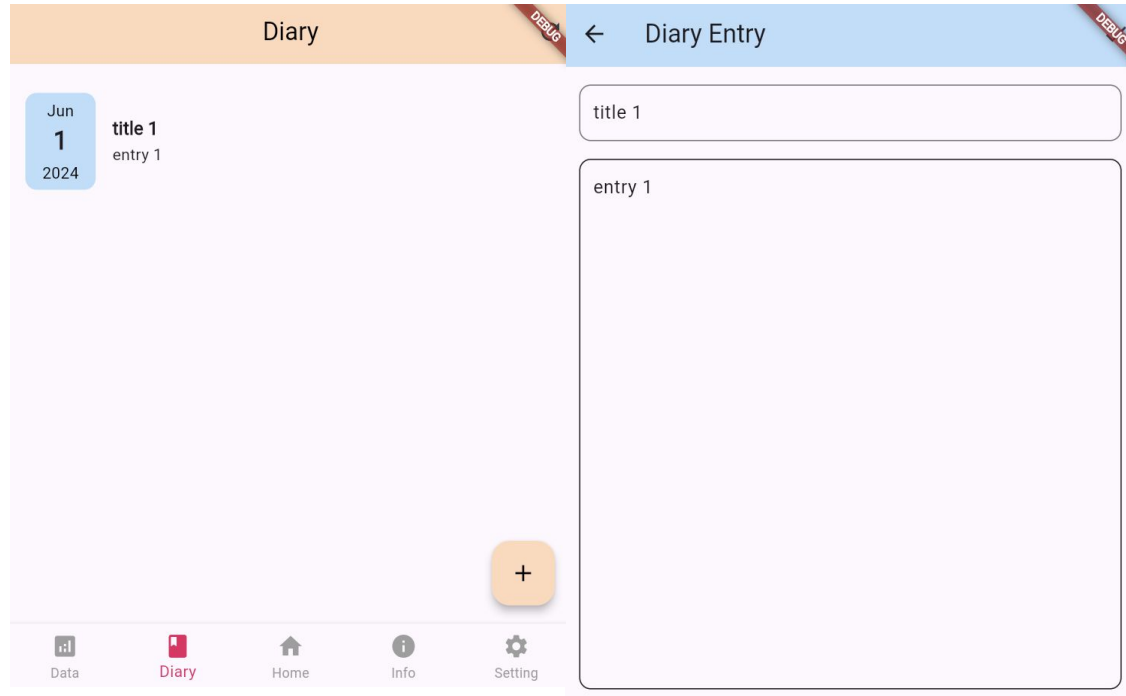
Enter new start date of cycle: YYYY-MM-DD

Cancel Submit

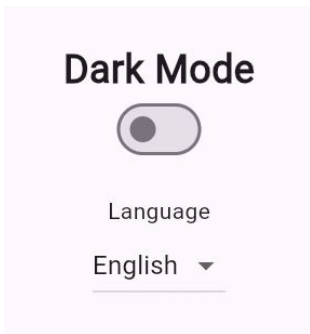
# User Personalisation - Light/Dark Mode



# User Personalisation - Personal Diary



# User Personalisation - Language (English/Spanish)



Información

Comprender las Etapas del Ciclo Menstrual

Tu ciclo menstrual es todos los días de tu vida (hasta la menopausia!), por lo que es importante realizar un seguimiento. Cada día sucede algo diferente, por eso te sentirás diferente durante las diferentes fases de tu ciclo. Podemos dividir tu ciclo en 4 partes, es fácil entenderlas si lo piensas como las Estaciones.

### Invierno

*Etapas 1: Fase menstrual (días 1-6)*

Biológicamente - su útero se está deshaciendo del revestimiento que habría contenido el óvulo si hubiera sido fertilizado. Este revestimiento se ha ido acumulando a lo largo del mes y su cuerpo ahora está trabajando duro para liberar la sangre en el revestimiento de su útero. ¡Así que te envía todas las señales para que reduzcas la velocidad y te detengas mientras está ocupado!

Emocionalmente - puedes sentirte sensible y cansada. Es como una liberación física y emocional cuando llega tu periodo, ¡todas las emociones también pueden desaparecer y la tensión puede liberarse! Puedes tomarte este tiempo para nutrirte realmente, conseguir dormir mucho e incluso llevar bonitos jerseys grandes y abrigados.

Físicamente - espere algo de dolor y fatiga. Tomarse este tiempo de inactividad ahora lo preparará para el resto de su ciclo. Si no disminuye la velocidad, puede terminar quedándose sin combustible más tarde, lo que puede hacer que su síndrome premenstrual sea realmente intenso. intenso.

Ejercicio - ejercicio suave, como caminar o estirarse. Después de unos días de sangrado, es posible que te sientas lleno de energía, así que no dejes de correr suavemente si tu cuerpo así lo desea.

Dieta - aumente la ingesta de hierro con alimentos como granola, pollo y verduras de hojas verdes. Los refrigerios como pasas y orejones también son buenos, y un poco de jugo de naranja.

### Primavera

*Etapas 2: Fase folicular (días 7-13)*

Biológicamente - su óvulo se está preparando para ser liberado. El óvulo sale del ovario y viaja por las trompas de Falopio hacia el útero. Durante este viaje, el óvulo se encontrará con el espermatozoide (si hay espermatozoides presentes) y será fertilizado para producir embarazo.

Emocionalmente - ¡Siéntete más enérgico y optimista. Nuestros niveles de estrógeno comienzan a aumentar y comenzamos a sentir más energía, más motivación y llenos de esperanza, optimismo e ideas.

Físicamente - ¡listo para hacer ejercicio y emprender nuevos proyectos. Tu creatividad está comenzando a fluir, así que aprovéchalo al máximo. ¡Reúnete con amigos, socializa y siente la energía!

Ejercicio - antes de la ovulación, la temperatura corporal se mantiene constante, la tolerancia al dolor aumenta y la capacidad de digerir y utilizar carbohidratos es más eficiente. En otras palabras, ¡sal y cambia algo de acero y alcanza tus marcas personales! Pero ten cuidado, ya que tus ligamentos y tendones están un poco más relajados gracias al estrógeno, así que no estires demasiado ni trabajes demasiado la flexibilidad durante esta fase, ya que podrías tirar un músculo o torcerte un tobillo o algo así.

Dieta - Dieta - Ensaladas con brócoli, salmón y alimentos fermentados para ayudar al intestino. Las nueces también son un excelente refrigerio; ¡puedes considerarlas durante tu jornada laboral para mantenerte con energía y concentrado!

Data

Diary

Home

Info

Setting

# Information

- Educational page consisting of:
  - The 4 stages of the menstrual cycle breaking down the biological, emotional, physical effects and how you should adapt your exercise and diet to help you.
  - The common symptoms and tips to help with these symptoms throughout your cycle
  - An About IMMI section to learn about the reason behind the project
  - Frequently Asked Questions to learn more about your period



# GPT Log

- The new prompting
  - CoT prompting
  - More specific prompting - saves time
- The old prompting
  - Hard to understand
  - Generates repetitive answers - reaches the limit of tokens

## User

I am developing software using Flutter and dart. Currently, I have a framework that is working well. I would like to add a function to store the data in .txt. I found out that indexeddb can be used as a database, or can you suggest what I can use for data storage? I will give you a brief introduction and some code. Would you please let me know how to add this to my software so I can store and update the data as I want? Please think and explain step by step. brief introduction: My software has 5 subpages and one main.dart. I will give you the code for my main.dart. Please only output the code that needs to be modified and with explanation. Do not output the whole code. main.dart code: import 'package:flutter/material.dart';

## ChatGPT

### Step-by-Step Implementation:

#### Step 1: Adding Dependencies

First, you need to add `path\_provider` to your `pubspec.yaml` to find the correct local path for storing your file.

## User

I am designing a female period tracker web-based app using flutter. On the main homepage, I would like there to be a 3-month up-to-date calendar. Also, for everyday on the calendar, I want a function of taking notes. Would you please give me the flutter code for it? For any specific requirements, I will let you know later.

## ChatGPT

Sure! Below is a simplified version of a Flutter app that includes a 3-month up-to-date calendar on the homepage and allows users to take notes for each day. We'll use the `table\_calendar` package for the calendar functionality and `shared\_preferences` for storing the notes.



# Future Work



Local calendar syncing



Different themes



More powerful prediction algorithms



AI empowered diary (context understanding)

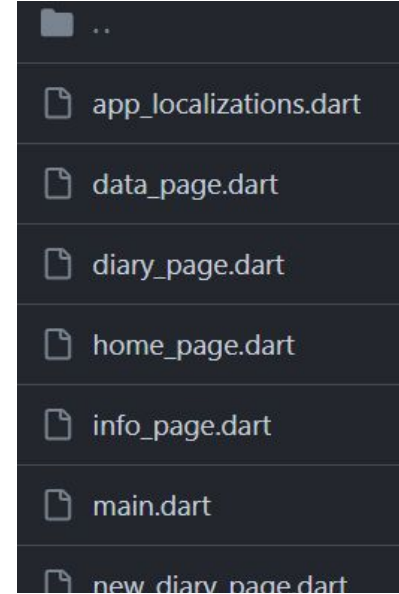


Compiling for IOS and Android systems for wider user group

# Our Documentation


- Good coding practices  
(e.g. class, function,  
variable naming, OOP)
- Clear readme.md file
- Detailed GPT log
- Handover meeting

```
class Note {  
  String title, description;  
  DateTime notedate;  
  
  Note({  
    required this.title,  
    required this.description,  
    required this.notedate  
  });  
  
  Map<String, dynamic> toMap() {  
    return {  
      'title': title,  
      'description': description,  
      'notedate': notedate.toString()  
    };  
  }  
}
```



```
static Future<Map<String, String>> readAllCycleData() async {  
  Map<String, String> allData = {};  
  // Ensure _box is awaited if it's a future or requires async  
  var boxMap = await _box.toMap(); // Make sure to await if ne  
  boxMap.forEach((key, value) {  
    allData[key.toString()] = value.toString(); // Ensuring t  
  });  
  return allData;  
}
```

# Directory Hierarchy



## How to Navigate

```
/web_app # flutter files for the web app
|___ /lib
|   |___ /app_localizations.dart # translates
|   |___ /data_page.dart # visualizes all saved cycle data and predictions
|   |___ /diary_page.dart # diary page for user to make a note
|   |___ /home_page.dart # home page of the app (contains calendar)
|   |___ /info_page.dart # information page about the menstrual cycle and IMMI
|   |___ /main.dart
|   |___ /new_diary_page.dart # updated version of diary page (currently used version)
|   |___ /prediction.dart # where the prediction algorithm lives
|   |___ /setting_page.dart # settings page of the app
|   |___ /theme_provider.dart # dark mode
|   |___ /utils.dart # utility functions for cycle data and diary
|___ /prediction_algorithm # Python implementation of the prediction algorithm
|   |___ /args.py # parsing the configs
|   |___ /configs.yaml # prediction algorithm setting
|   |___ /cycle_data.txt # where predictions are saved
|   |___ /main.py
|   |___ /utils.py # utility functions (e.g.save, read, update)
|___ /pubspec.yaml # configs and dependencies needed for flutter
```

Demo