

# BloodInsight Final Documentation

## Project Description

BloodInsight is a Flutter-based mobile application that helps users track and analyze their bloodwork results. Based on bloodwork data and user profiles, the app provides personalized health insights, trends analysis, and recommendations.

### Key Features

- Secure authentication system
- Dashboard with recent results overview
- Comprehensive bloodwork history
- AI-powered health insights using Gemini API
- Test reminder system
- Laboratory location mapping

## Integrations

### Firebase Services

- **Authentication:** Email/password, Google Sign-In
- **Firestore:** Main database

### External APIs

- **Firebase/Firestore API** Authentication and storage
- **Google Maps API:** Healthcare locations and maps
- **Gemini API:** Health insights generation

## Database Schema

### Firestore Collections

```
users/  
└─ {userId}/  
  │  
  └─ name: string  
  └─ dateOfBirth: timestamp  
  └─ gender: string  
  └─ height: number  
  └─ weight: number  
  └─ bloodType: string  
  │  
  └─ bloodwork/  
    └─ {bloodworkId}/  
      └─ labName: string  
      └─ dateCollected: timestamp  
      └─ markers/  
        └─ {markerId}/  
          └─ name: string  
          └─ value: number  
          └─ unit: string  
          └─ minRange: number  
          └─ maxRange: number  
          └─ category: string  
  │  
  └─ reminders/  
    └─ {reminderId}/  
      └─ labName: string  
      └─ notes: string  
      └─ scheduledDate: timestamp  
      └─ isFasting: boolean
```

## Optional requirements

## Multi-Platform Support

- Mobile (Android)

## Animations

- Animations using Lottie:
  - Animation controller with segment looping support
  - Implementation in welcome screens
  - Loading state animations

## Authentication System

- Firebase Authentication:
  - Email/password authentication
  - Google Sign-in integration

## Multi-step Registration Form

- User input validation:
  - Personal information collection
  - Health data initialization

## Data Persistence

- Offline Storage Implementation via:
  - Firestore offline persistence
  - SharedPreferences

## Platform Integration

- Platform Feature Packages:
  - Local notifications
  - Geolocation services
  - Native splash screen

## Continuous Integration

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### GitHub Actions Workflows

#### CI Workflow

```

name: CI
on:
  pull_request:
    branches:
      - master
      - dev

jobs:
  flutter_test:
    name: Run flutter test and analyze
    runs-on: ubuntu-latest
    steps:
      - name: Checkout code
        uses: actions/checkout@v4

      - name: Setup environment
        uses: ./github/actions/env_setup

      - name: Verify formatting
        run: dart format --output=none --set-exit-if-changed .

      - name: Analyze project source
        run: flutter analyze --fatal-warnings

      - name: Run tests
        run: flutter test

  flutter_build_android:
    name: Build Android
    needs: flutter_test
    runs-on: ubuntu-latest

    steps:
      - name: Checkout code
        uses: actions/checkout@v4

      - name: Setup environment
        uses: ./github/actions/env_setup

      - name: Build Android APK
        run: flutter build apk

      - name: Upload APK Artifact
        uses: actions/upload-artifact@v4
        with:
          name: BloodInsight-Apk
          path: build/app/outputs/flutter-apk/app-release.apk
          if-no-files-found: error

      - name: Build Android App Bundle
        run: flutter build appbundle

      - name: Upload Bundle Artifact
        uses: actions/upload-artifact@v4
        with:
          name: BloodInsight-AppBundle
          path: build/app/outputs/bundle/release/app-release.aab
          if-no-files-found: error

```

## Setup environment composite action

```
name: Setup Environment
description: Setup environment for Flutter project

runs:
  using: composite
  steps:
    - name: Set up Java
      uses: actions/setup-java@v4
      with:
        distribution: "zulu"
        java-version: "21.x"

    - name: Set up Flutter
      uses: subosito/flutter-action@v2
      with:
        channel: "stable"
        flutter-version: 3.27.4

    - name: Install dependencies
      run: flutter pub get
      shell: bash
```

## CI Pipeline Features

- Automated testing on pull requests
- Static code analysis with Flutter Analyze
- APK build generation
- Artifact upload

← Back to pull request #1

✓

Dev merge #6

Re-run all jobs

...

Summary

Jobs

✓ Run flutter test and analyze

✓ Build Android

Run details

Usage

Workflow file

Run flutter test and analyze

succeeded 25 minutes ago in 2m 3s

Search logs

↺ ⚙

> ✓ Set up job1s

> ✓ Checkout code1s

> ✓ Setup environment1m 5s

> ✓ Verify formatting1s

> ✓ Analyze project source34s

> ✓ Run tests17s

> ✓ Post Setup environment0s

> ✓ Post Checkout code0s

> ✓ Complete job0s

← Back to pull request #1

✓

Dev merge #6

Re-run all jobs

...

Summary

Jobs

✓ Run flutter test and analyze

✓ Build Android

Run details

Usage

Workflow file

Build Android

succeeded 10 minutes ago in 15m 26s

Search logs

↺ ⚙

> ✓ Set up job0s

> ✓ Checkout code2s

> ✓ Setup environment1m 5s

> ✓ Build Android APK13m 38s

> ✓ Upload APK Artifact4s

> ✓ Build Android App Bundle30s

> ✓ Upload Bundle Artifact3s

> ✓ Post Setup environment0s

> ✓ Post Checkout code0s

> ✓ Complete job0s

## Permission Requirements

- Internet access
- Location access
- Notification access

## Test Account

Email: test@bloodinsight.dev

Password: Test@123