

Hands-on Assignment 1: Construct Your First Flutter App using Dart

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GitHub Repository:

https://github.com/Oishani/MSCS533_Assignment1

Introduction

The Measures Converter is a modern Flutter application designed for converting between metric and imperial units of distance and weight. It emphasizes clarity, reliability, and extensibility, making it suitable for both educational and professional use. The app provides a clean and intuitive interface, ensuring accurate conversions and a smooth user experience on mobile platforms.

Key Features

- **Bidirectional Conversion:** Supports conversions between metric and imperial systems, while preventing conversions within the same system.
- **Type Safety:** Enforces strict compatibility by allowing only same-type conversions (e.g., distance-to-distance, weight-to-weight).
- **User-Friendly Interface:** Offers a modern design with clear input fields and dropdowns for unit selection.
- **Error Handling:** Provides validation to ensure only valid, non-negative numbers are accepted, with clear messages for invalid inputs.
- **Dynamic Dropdowns:** Automatically updates available target units based on the selected source unit and type.
- **Extensible Architecture:** Organized and modular codebase, supporting scalability and maintainability.
- **Test Coverage:** Includes both unit and widget tests for conversion logic and interface reliability.

Project Structure

The application follows a modular architecture with clear separation of concerns:

- **Models:** Represent units of measurement.
- **Services:** Contain conversion logic and business rules.
- **Screens:** Define the user interface.

- **Tests:** Provide coverage for both functionality and UI behavior.

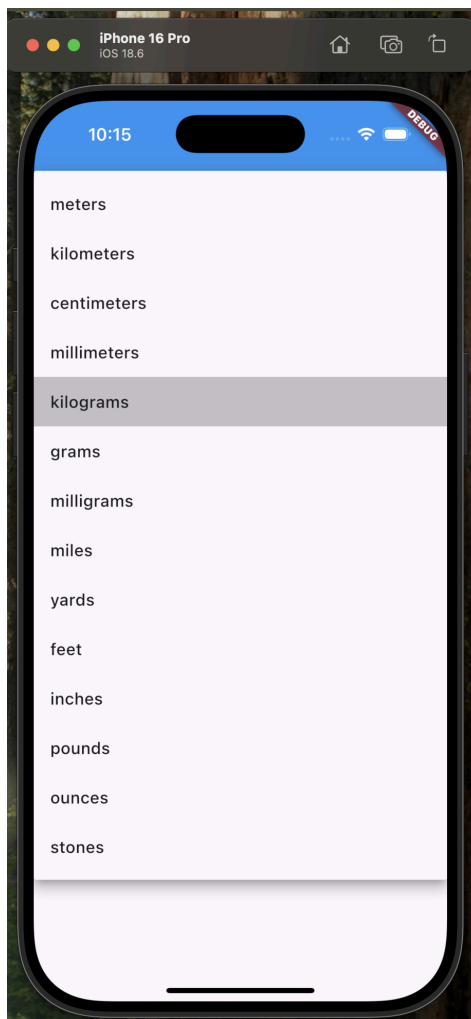
This structure enhances clarity, scalability, and long-term maintainability.

iOS Compatibility

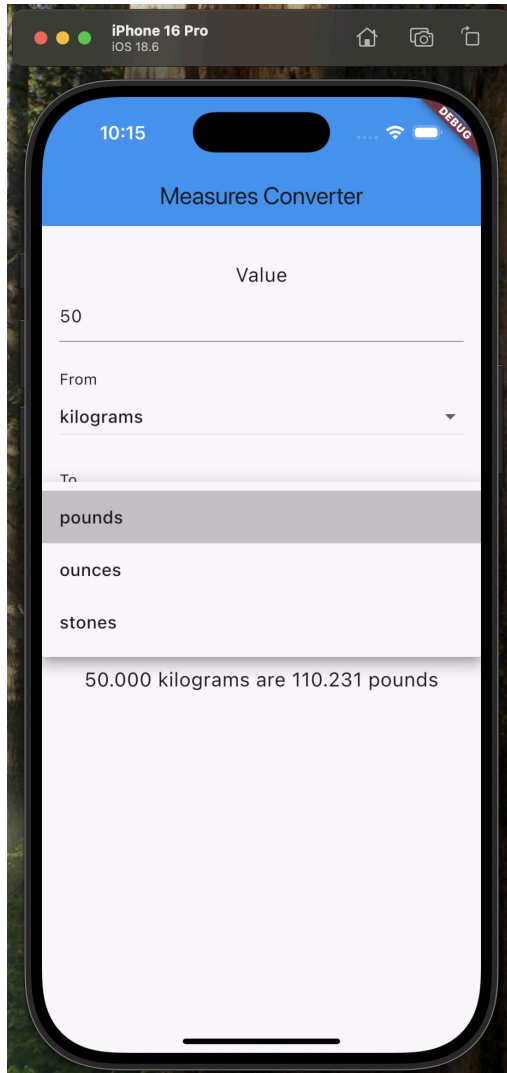
The project is configured to run on the iOS simulator, ensuring smooth integration with iOS development workflows. Dependencies and platform setup are fully supported, allowing developers to quickly build and test the app in Apple environments.

Demonstration

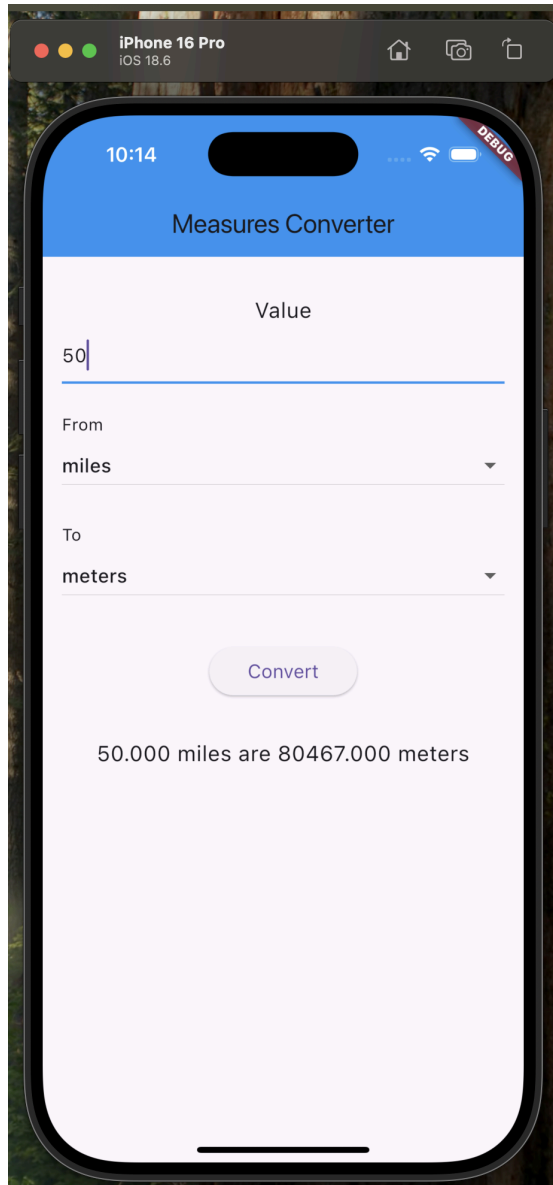
The application has been validated through both screenshots and a [demo video](#).



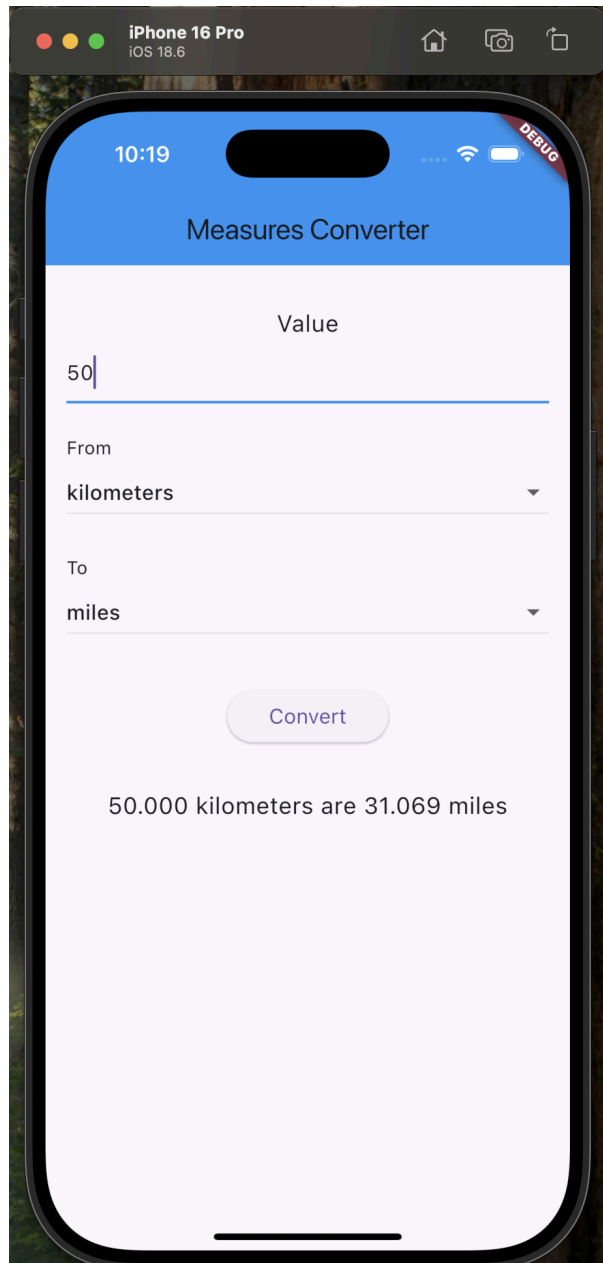
From field dropdown showing both imperial and metric units



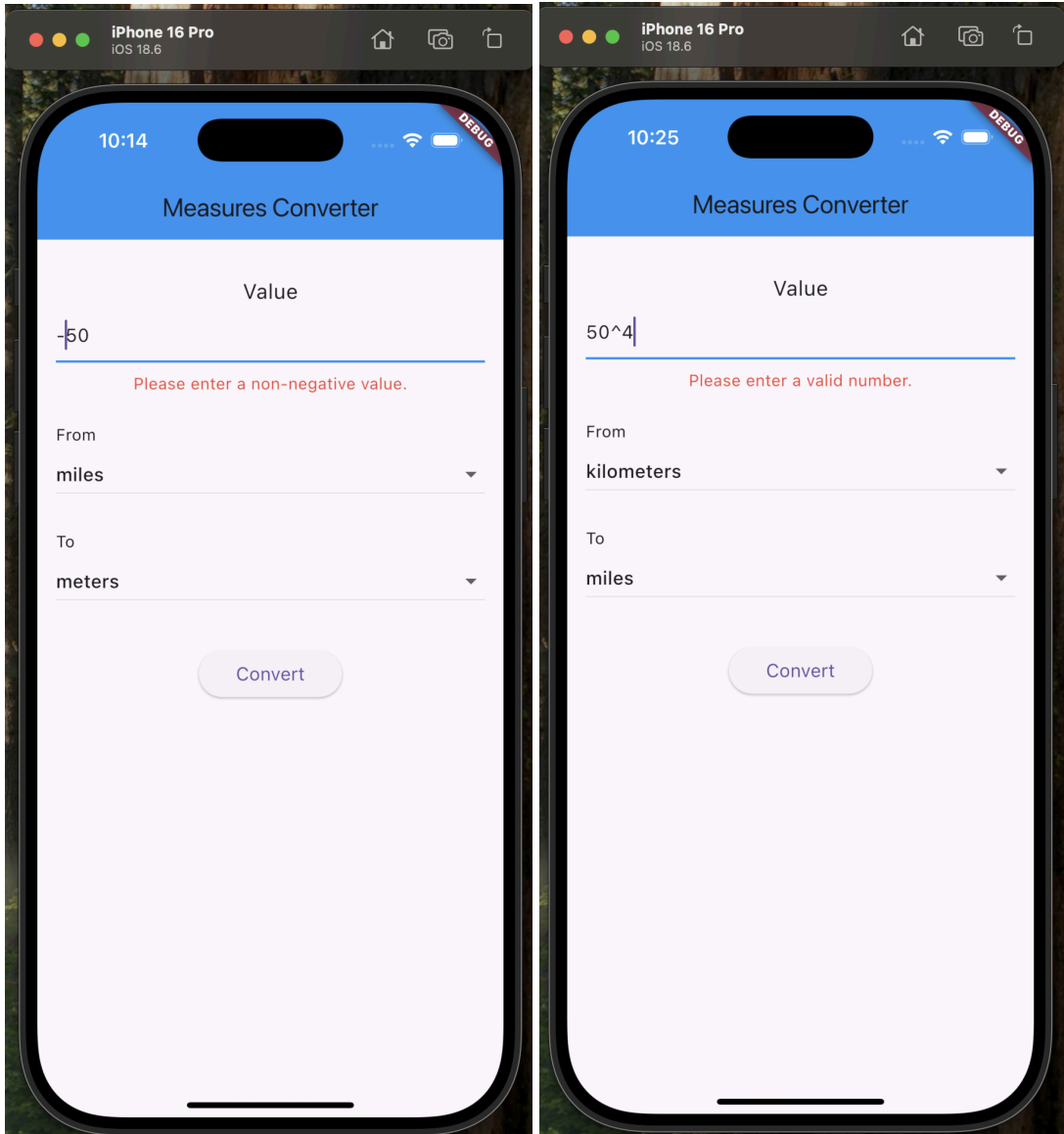
To field showing automatic type matching based on from field unit



Imperial to metric conversion



Metric to imperial conversion



Number validation