



Espresso Overflow E9

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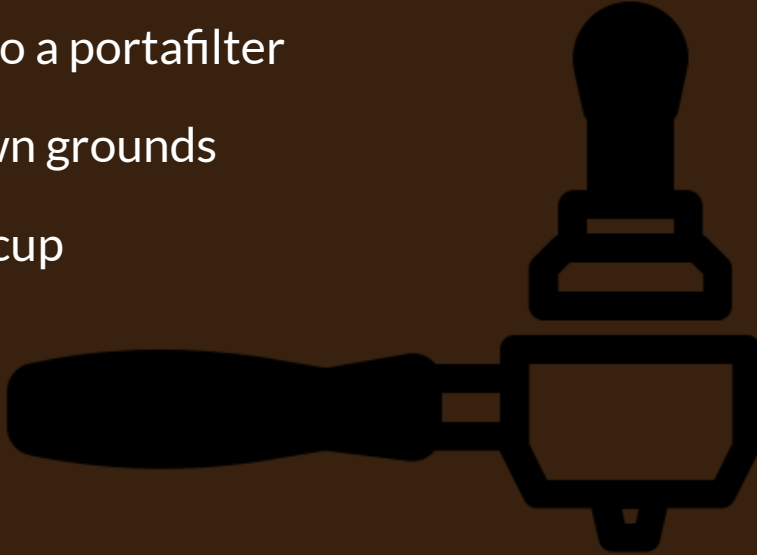
Espresso Walkthrough

Grind coffee beans into a portafilter

Smooth and press down grounds

Extract espresso into cup

Update log





Use Case

Espresso extractions i.e. “pulls” are measured and tweaked

Different Rates and time durations yield dramatically different espresso

Any level of espresso drinker can use our product

Use Case

Provide data collection

Easily see statistics and recommendations

Use smartphone to store and view

COFFEE ORIGIN/NAME *Ethiopia/Pero*
Black Cat Espresso

ROASTER *Intelligentsia* PRODUCER *'11*

ROAST DATE *6/02* BREW DATE *6/05*

BEVERAGE *Espresso* PRICE *\$17.12.02.*

NOTES
Melon, Strawberry
Grind Set 12
25-second pull, slight
channeling on outside

RATING
★★★★☆

BREW METHOD
 CUPPING
 DRIP
 ESPRESSO
 POUR-OVER
 PRESS
 SIPHON
 OTHER:

FLAVOR WHEEL

Category	Intensity (0-10)
LINGER/FINISH	2
SWEET	8
SOUR/TART	6
FLORAL	1
SPICY	4
SALTY	3
BERRY FRUIT	7
CITRUS FRUIT	5
STONE FRUIT	2
CHOCOLATE	1
CARAMEL	1
SMOKY	1
BITTER	1
SAVORY	1
BODY	1
CLEAN	1



Requirements

Metrics:

Weight scale that is able to display and record statistics throughout an espresso pull

Weight and time is tracked through load cells and microprocessor



Requirements

Ease of use:

BLE connectivity to smartphone application

Software -> Smartphone applications and microprocessor firmware

Hardware-> Scale circuit + internal PCB

Visual aids:

Real time graph creation and tracking visible through application

Accuracy:

Load sensor sensitivity and amplifier



Technical Challenges

Software

Multiplatform application capable of connecting to scale through BLE

- Android + iPhone

Big data storage through AWS or similar

- User Specific Recommendations

UI design + interaction

- App UI + Flow
- Scale UI + Flow



Technical Challenges

Hardware

Component selection and placement

- Low Power & Compact

PCB/Schematic design

- BLE Trace
- JTAG MCU Connectivity

Physical Housing

- 3D Printable Model
- Functional + PCB Enclosing



Solution Approach

Custom PCB

- Load cell + Amplifier
- STM32 Microcontroller
- LCD Display + Driver
- User interaction Buttons
- BLE Antenna + IC Driver
- 1.8V Voltage Regulator
- Eagle for PCB design

Communication done with I2C

Solution Approach

Application

Flutter

- Multi-Platform Framework

Flutter_blue

- BLE Flutter package

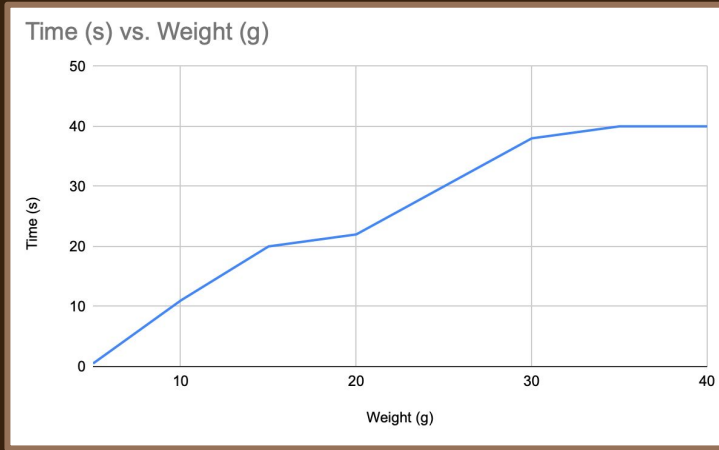
SQL Database

- Stored with AWS



Testing and Verification

Pulls are able to be viewed and stored.
Metadata can be added to each for further information



PCB bringup insures the design and placement of the components

Firmware testing composed of full walkthrough of all features

- Display with accurate timing and weight tracking
- Data traveling through BLE to phone wirelessly
- Buttons fulfill required function (tare, timer start, power on)

Tasks and Schedule: Gantt Chart

Legend: Stefan (Red), Archana (Teal), Harper (Yellow)

