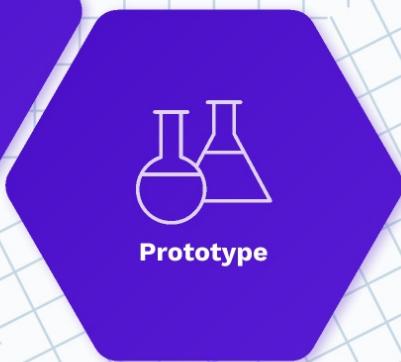
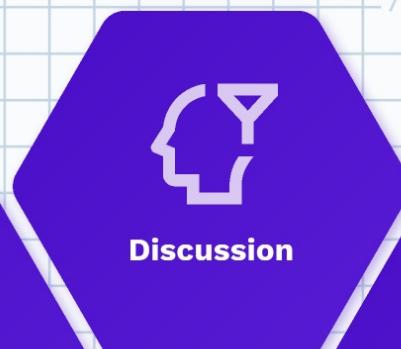


# Quiz M&M Dispenser

Martin Radinger  
Nikolai Strässle  
Pascal Steiner



## **Project Introduction**

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How can the motivation to learn something improved?

Idea



## Idea

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Link the learning process with  
a direct reward

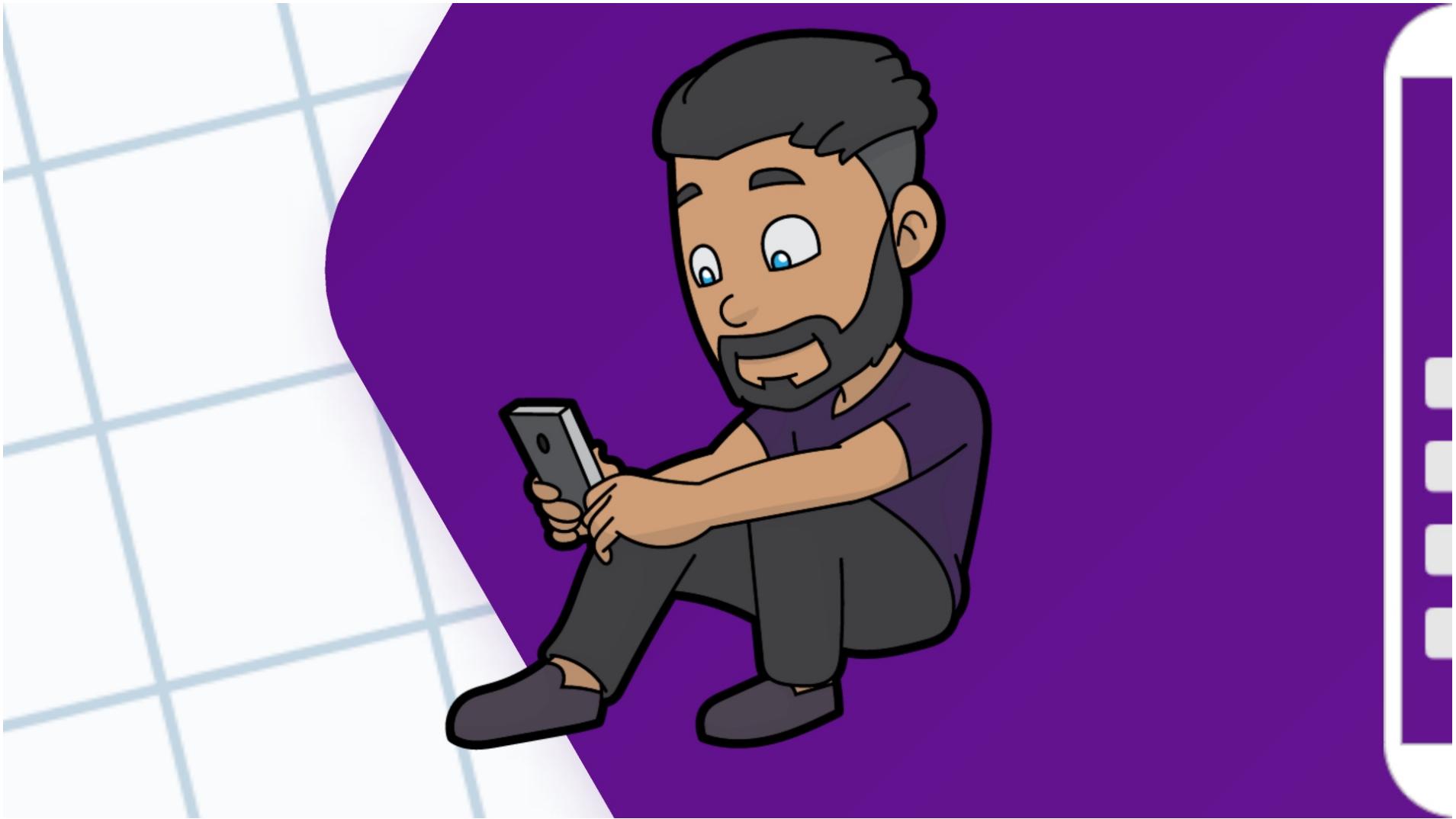
## Idea

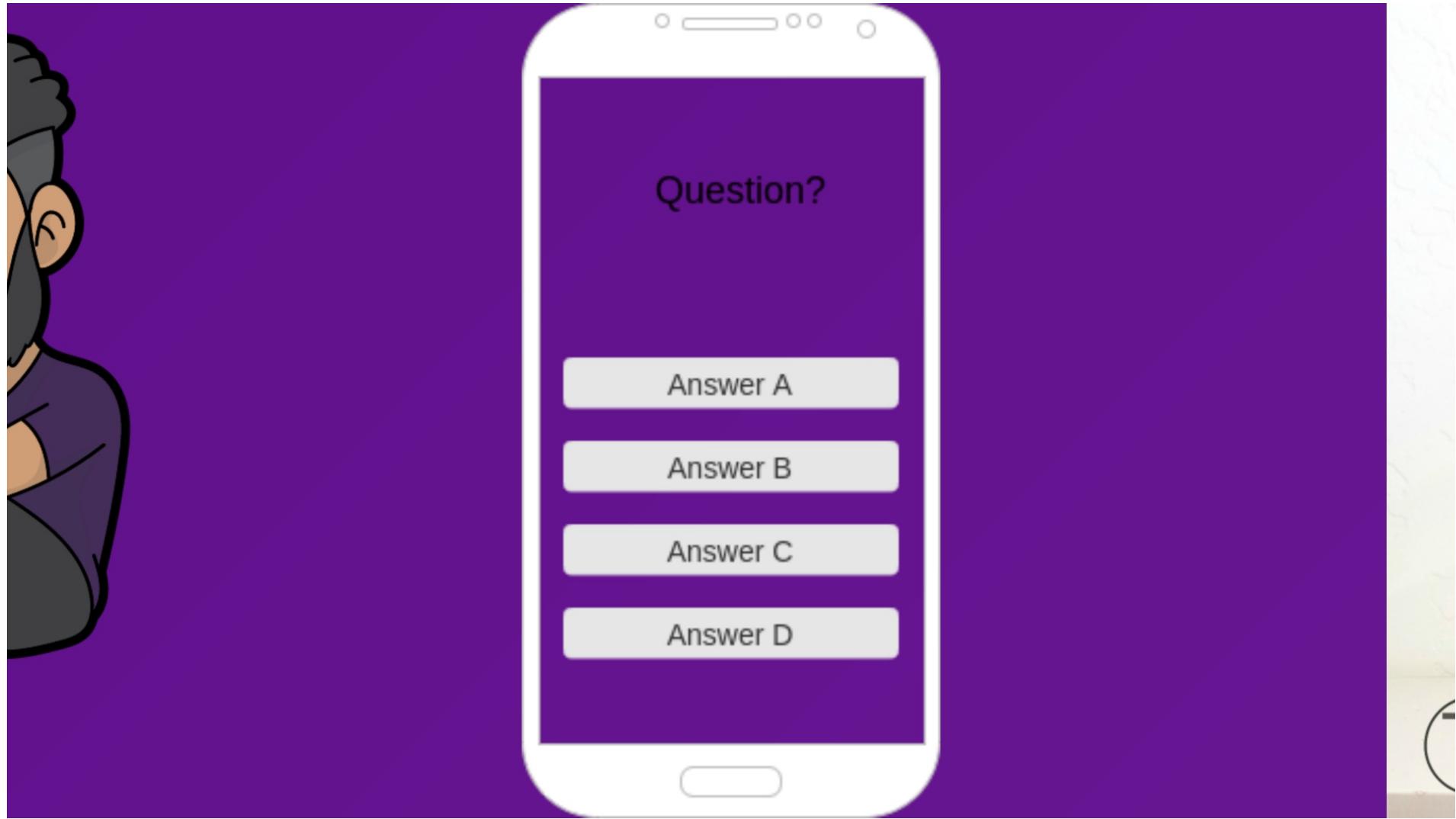
Link the learning process with  
a direct reward



<https://www.buildsomething.com/plans/PA57A1F77F2D3B445/Desktop-Candy-Dispenser>

[https://commons.wikimedia.org/wiki/File:Cartoon\\_Man\\_Using\\_His\\_Smartphone\\_To\\_Surf\\_The\\_Internet.svg](https://commons.wikimedia.org/wiki/File:Cartoon_Man_Using_His_Smartphone_To_Surf_The_Internet.svg)







## **Project Introduction**

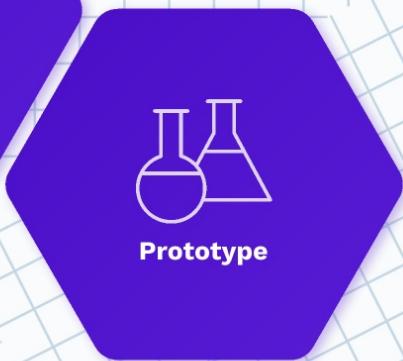
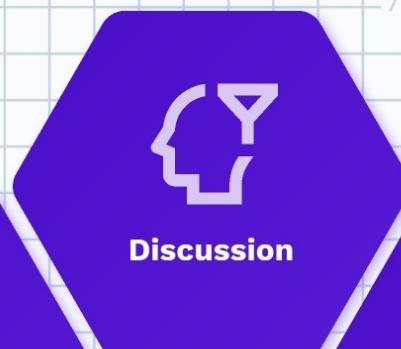
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How can the motivation to learn something improved?

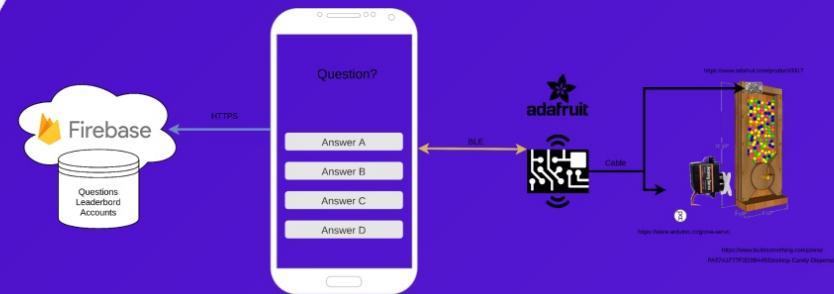
Idea

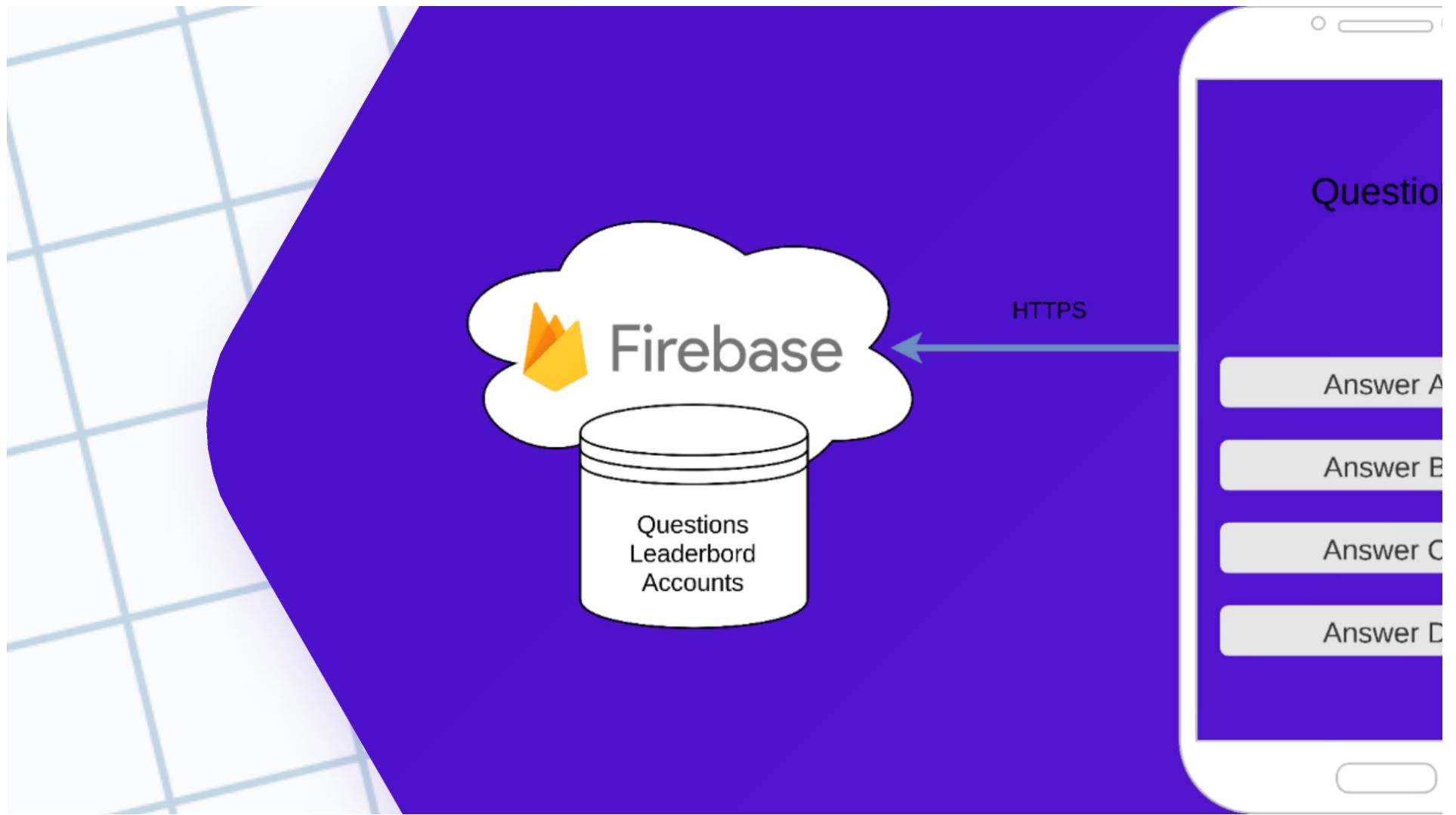
# Quiz M&M Dispenser

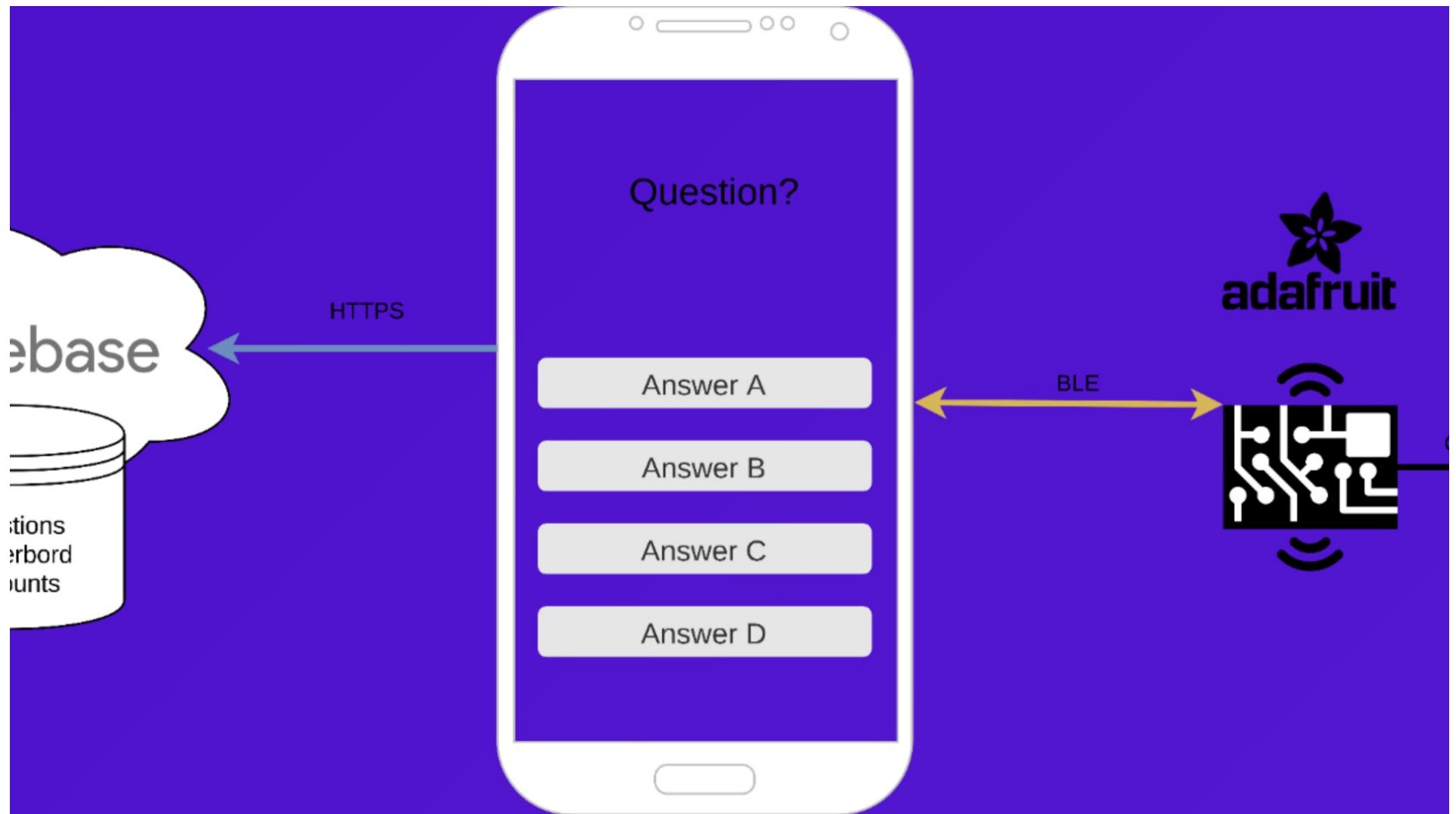
Martin Radinger  
Nikolai Strässle  
Pascal Steiner

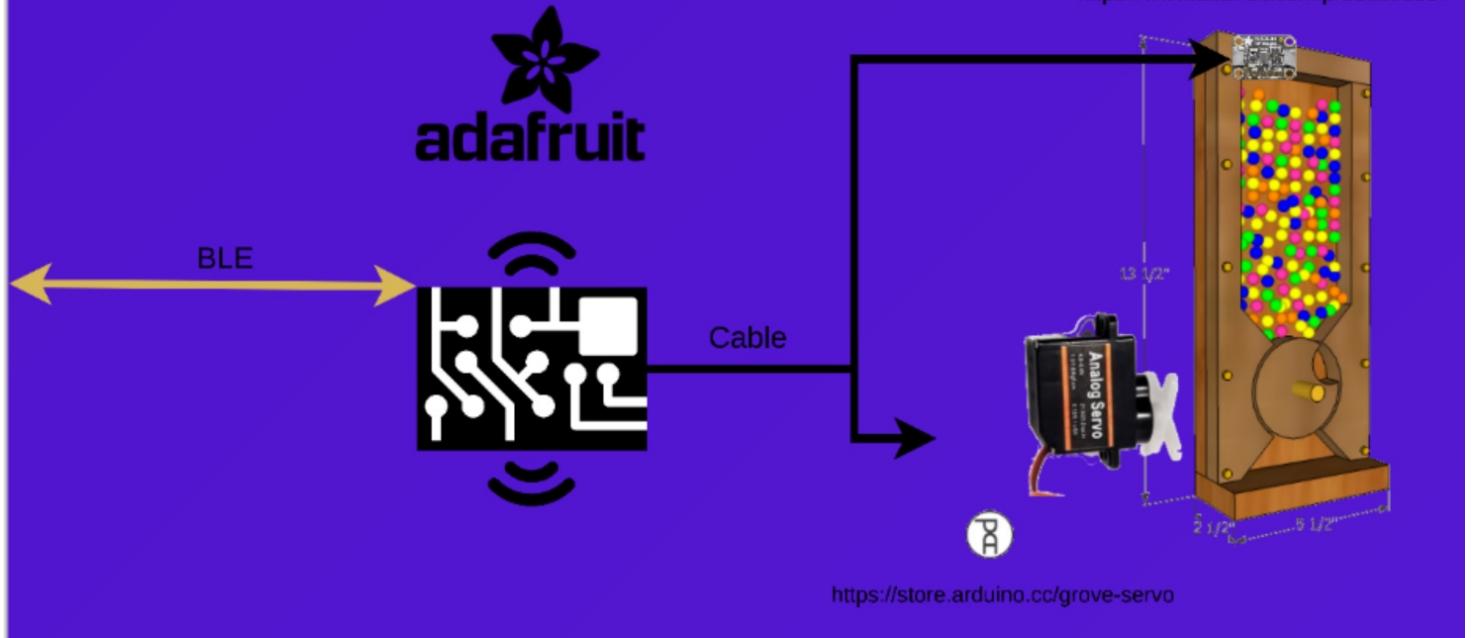
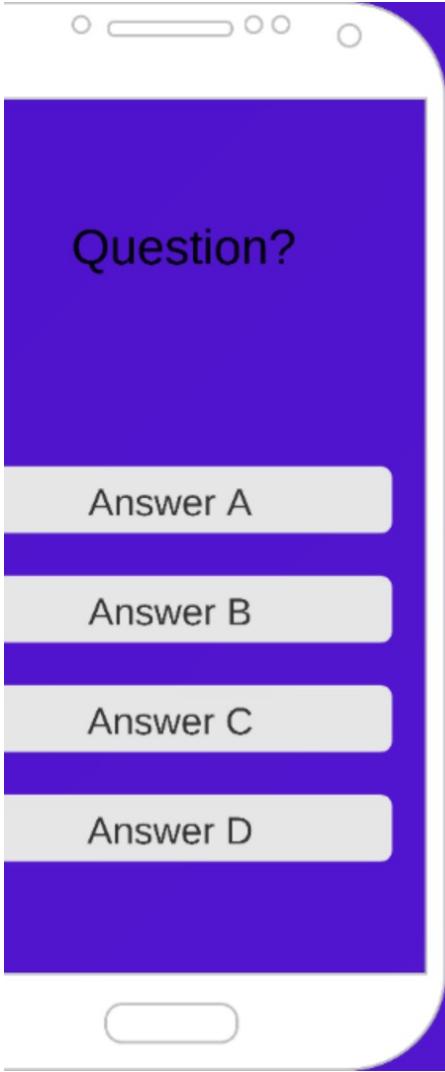


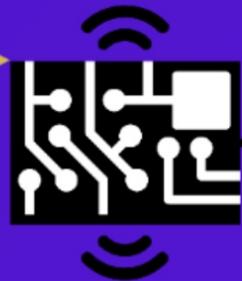
## Architecture





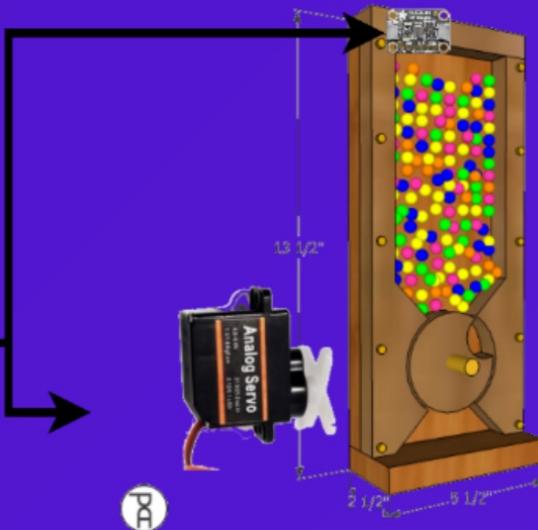






Cable

<https://www.adafruit.com/product/3317>



<https://store.arduino.cc/grove-servo>

<https://www.buildsomething.com/plans/PA57A1F77F2D3B445/Desktop-Candy-Dispenser>

## **Firebase**

---

- Authentication
- Database for questions
- Database for the leaderboard

## Architecture



Firebase

BLE

Sensor & Actuator

## BLE

Custom GATT Service (113A0001-FD33-441B-9A57-E9F1C29633D3)

3 custom GATT Characteristics:

- Notify Dispenser State (113A0002-FD33-441B-9A57-E9F1C29633D3)
- Write Dispense (113A0003-FD33-441B-9A57-E9F1C29633D3)
- Notify Filling Level (113A0004-FD33-441B-9A57-E9F1C29633D3)

## Architecture



Firebase

BLE

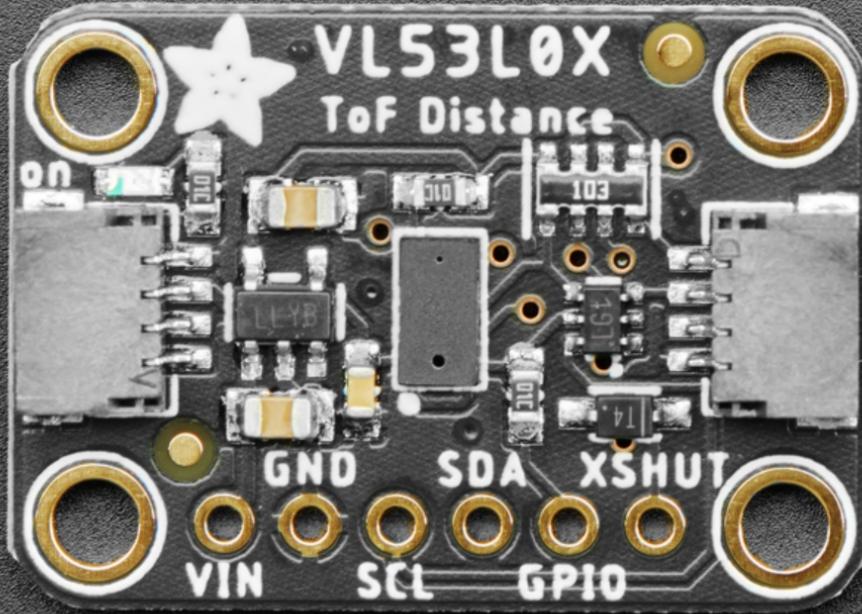
Sensor & Actuator

## Sensor & Actuator



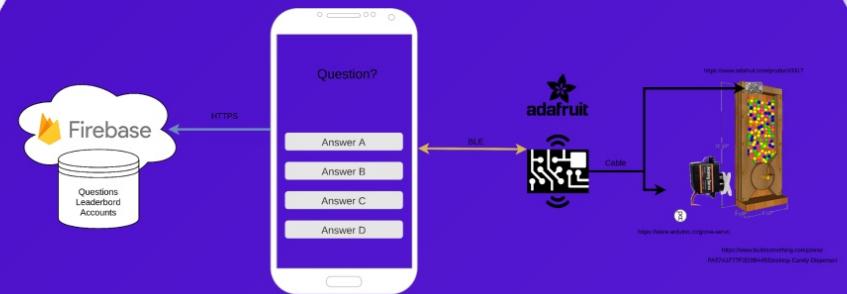
<https://www.adafruit.com/product/3317>

<https://store.arduino.cc/grove-servo>





## Architecture



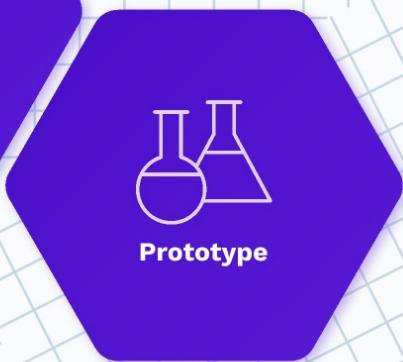
Firebase

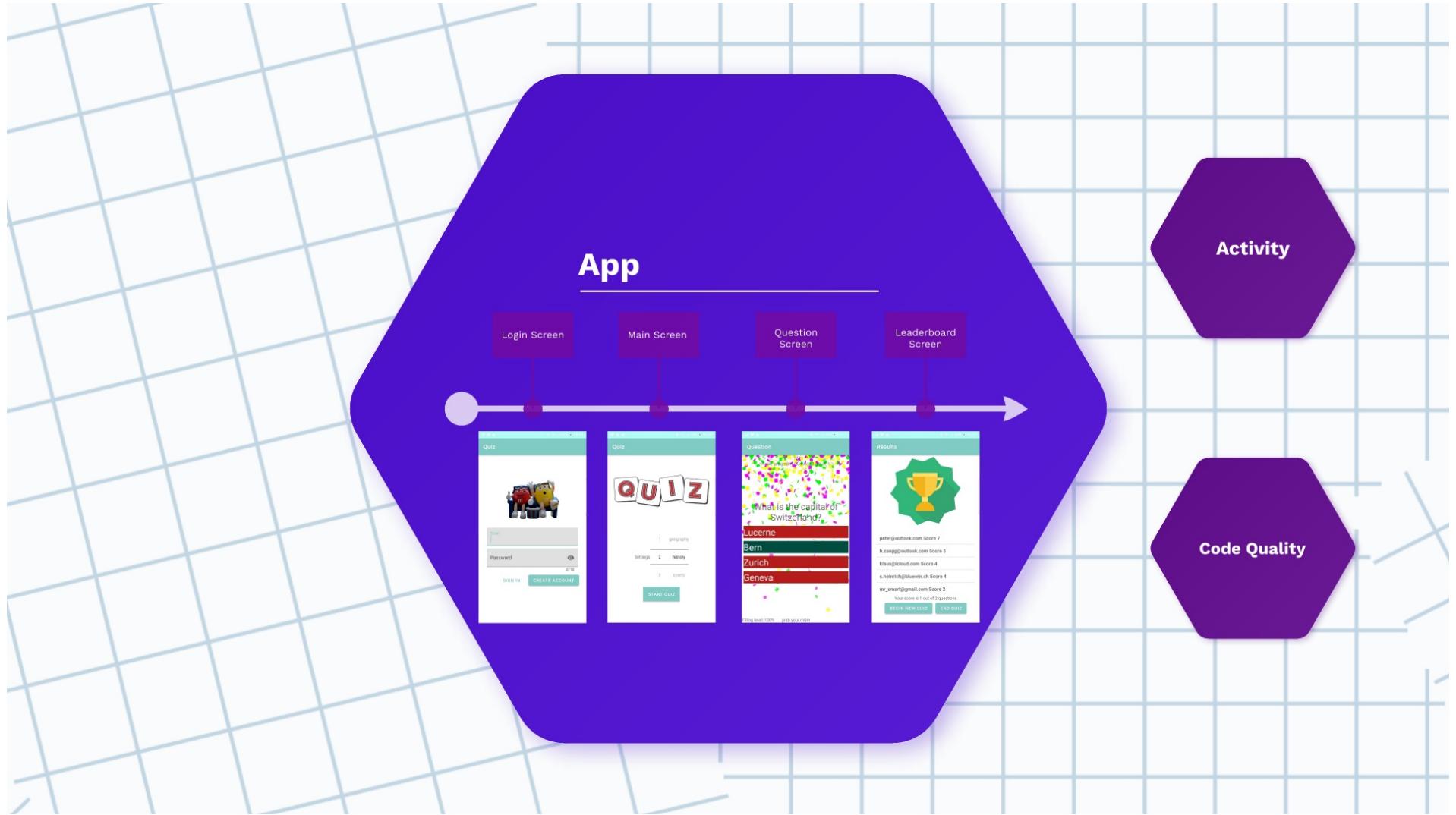
BLE

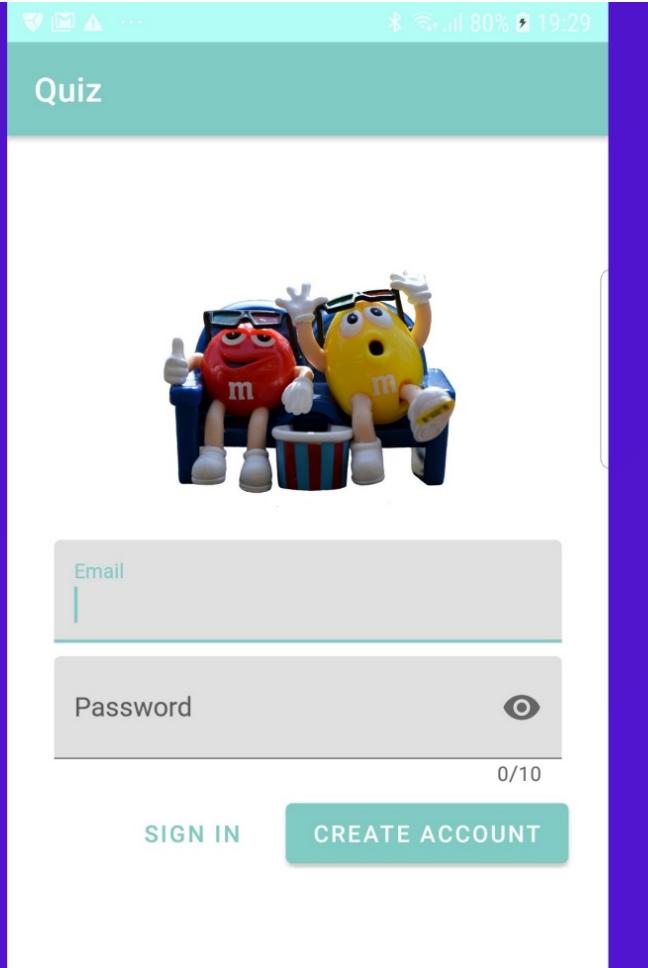
Sensor & Actuator

# Quiz M&M Dispenser

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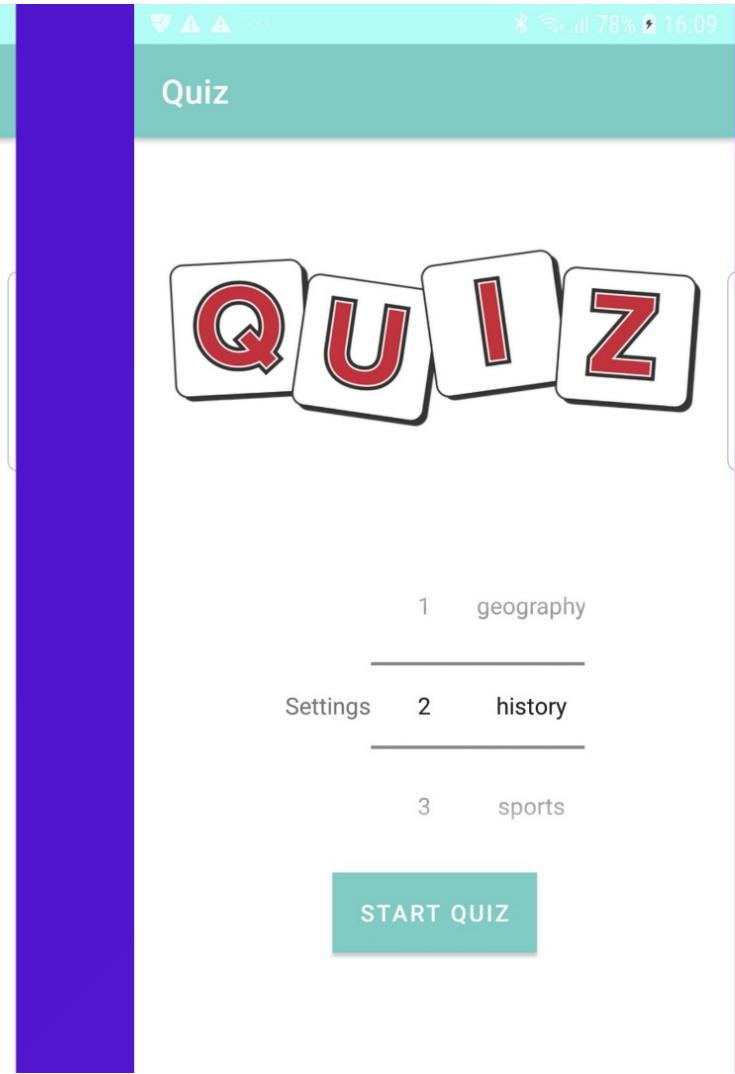
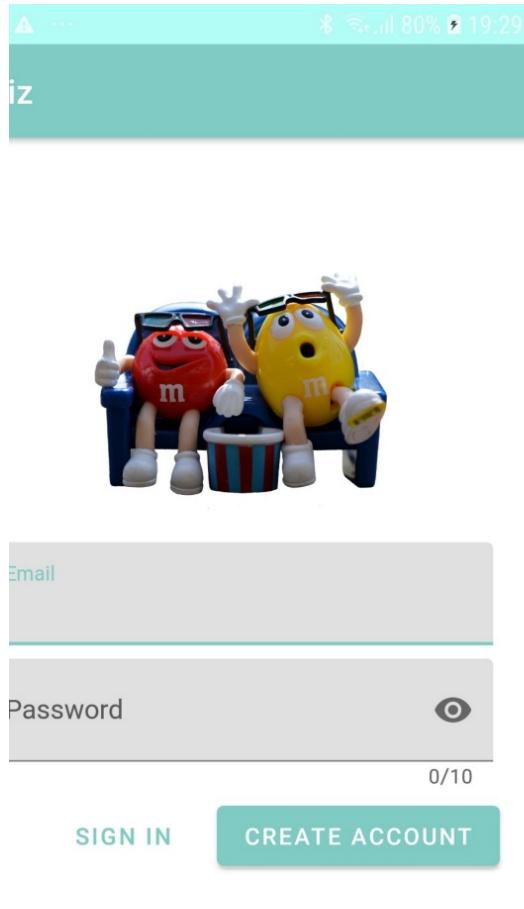


1 geography

Settings 2 history

3 sports

START QUIZ



The image consists of three vertically stacked screenshots of a mobile application titled "QUIZ".

**Start Screen (Left):**

- Large "QUIZ" logo at the top.
- Navigation bar with three items: 1 geography, 2 history, and 3 sports.
- A large green "START QUIZ" button at the bottom.

**Question Screen (Middle):**

- Header: "Question" and "Topic geography Question 1 Out of 1" with a timestamp of 16:09.
- Background: Confetti falling.
- Text: "What is the capital of Switzerland?"
- List of four options:
  - Lucerne (red background)
  - Bern (dark green background)
  - Zurich (red background)
  - Geneva (red background)
- Text at the bottom: "Filling level: 100% grab your m&m"

**Results Screen (Right):**

- Header: "Results" with a timestamp of 16:17.
- Icon: A golden trophy inside a green hexagonal frame.
- List of users with their scores:
  - peter@outlook.com Score 7
  - h.zaugg@outlook.com Score 5
  - klaus@icloud.com Score 4
  - s.heinrich@bluewin.ch Score 4
  - mr\_smart@gmail.com Score 2
- Text: "Your score is 1 out of 2 questions"
- Buttons: "BEGIN NEW QUIZ" and "END QUIZ" at the bottom.



Filling level: 100% grab your m&m

Question

Topic: geography Question: 1 out of 1

What is the capital of Switzerland?

Berne

Bern

Zürich

Berna

Level: 100% grab your m&m

Results

peter@outlook.com Score 7

h.zaugg@outlook.com Score 5

klaus@icloud.com Score 4

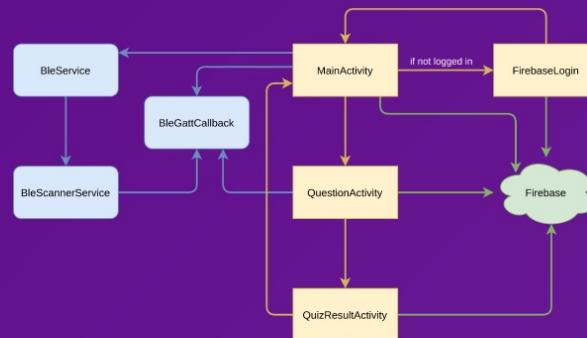
s.heinrich@bluewin.ch Score 4

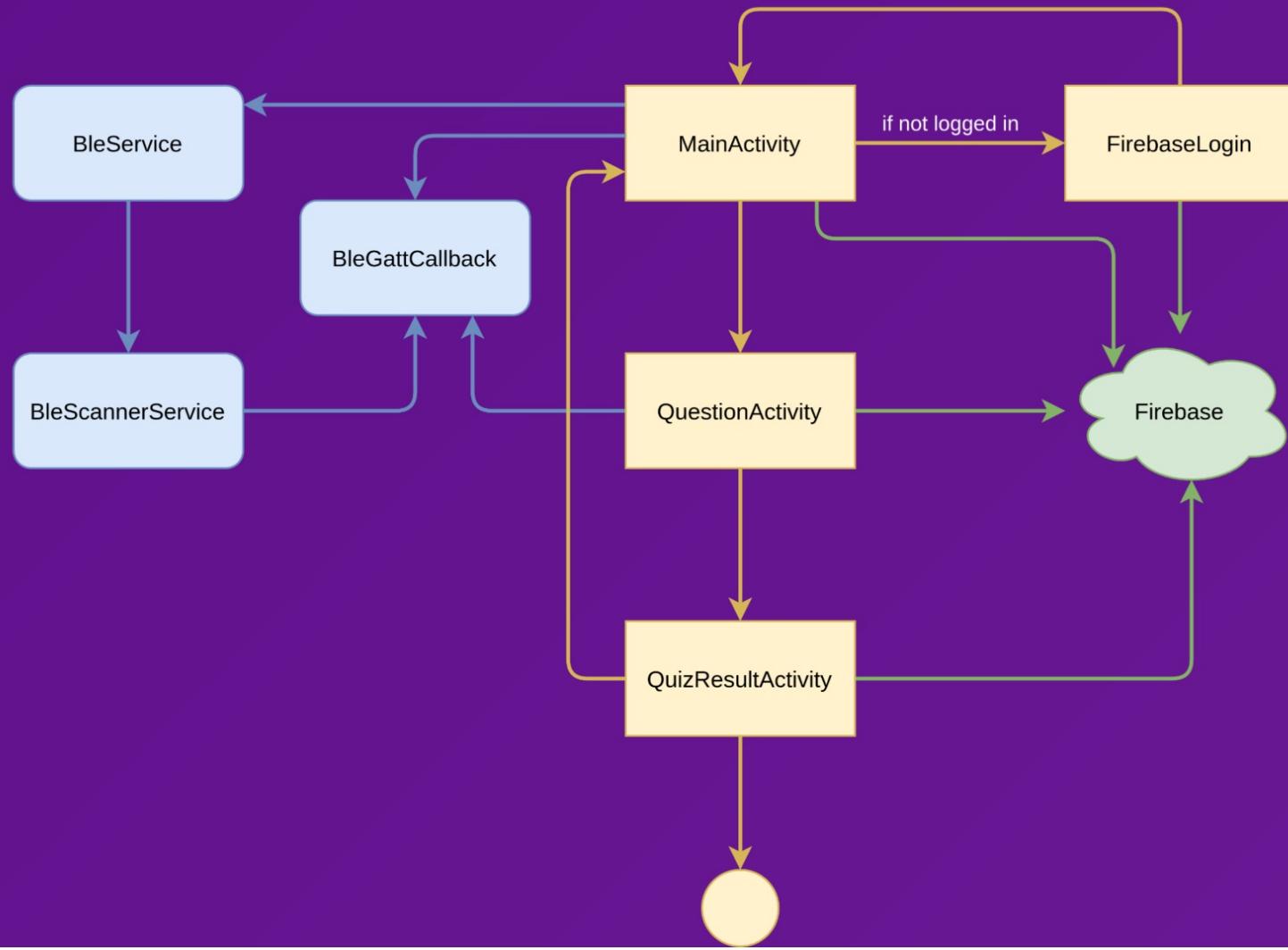
mr\_smart@gmail.com Score 2

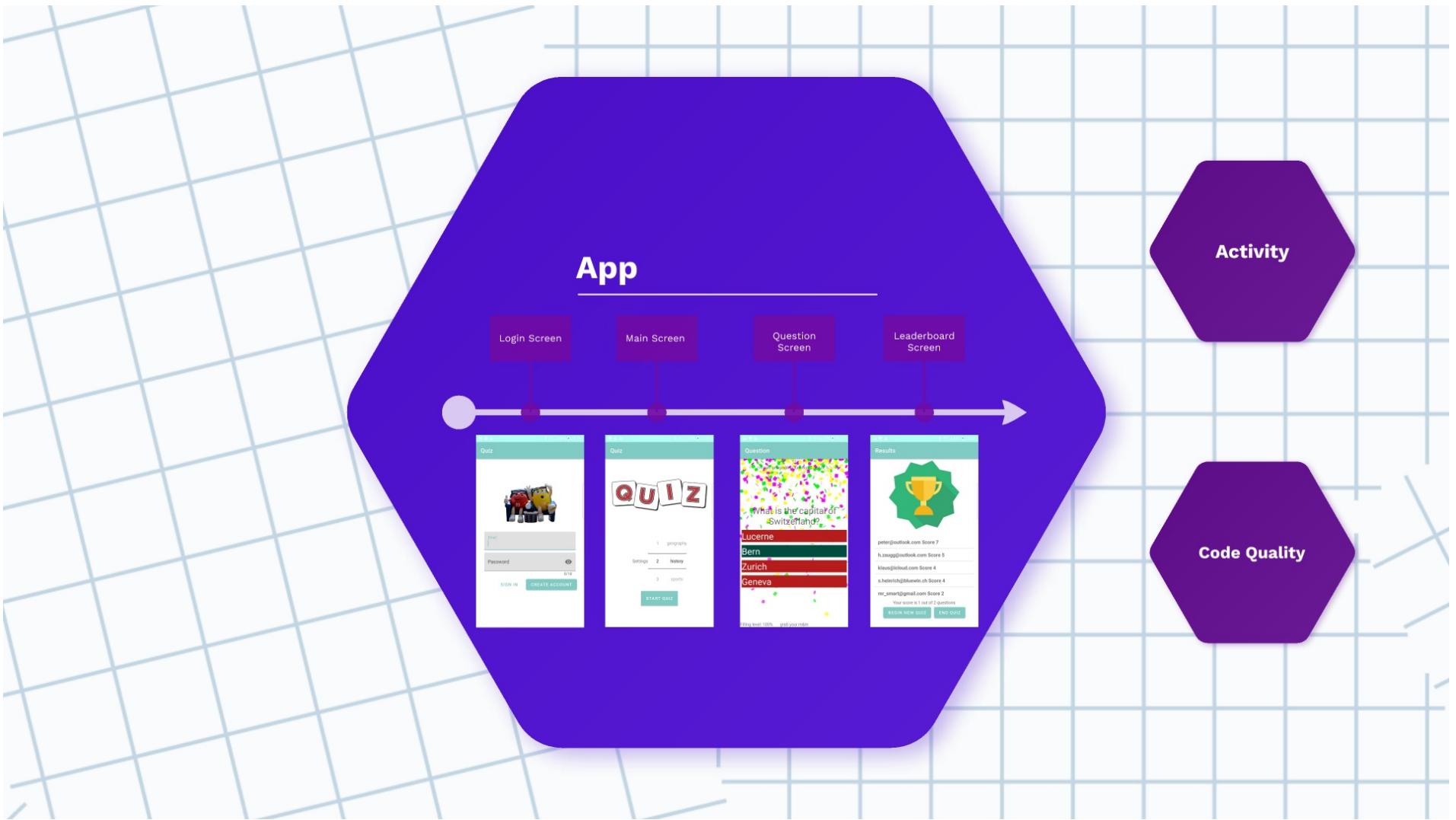
Your score is 1 out of 2 questions

BEGIN NEW QUIZ END QUIZ

## Activity

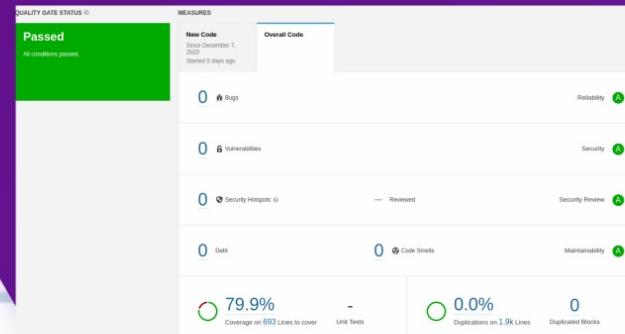






## Code Quality

- 44 Unit Tests
- 8 End-2-End Tests
- 0 Security Issues
- 0 Bugs



## QUALITY GATE STATUS ⓘ

**Passed**

All conditions passed.

## MEASURES

### New Code

Since December 7,  
2020  
Started 5 days ago

### Overall Code

0 🐞 Bugs

Reliability A

0 🔒 Vulnerabilities

Security A

0 🛡️ Security Hotspots ⓘ

— Reviewed

Security Review A

0 💸 Debt

0 💩 Code Smells

Maintainability A



**79.9%**

Coverage on [693 Lines to cover](#)

-

Unit Tests



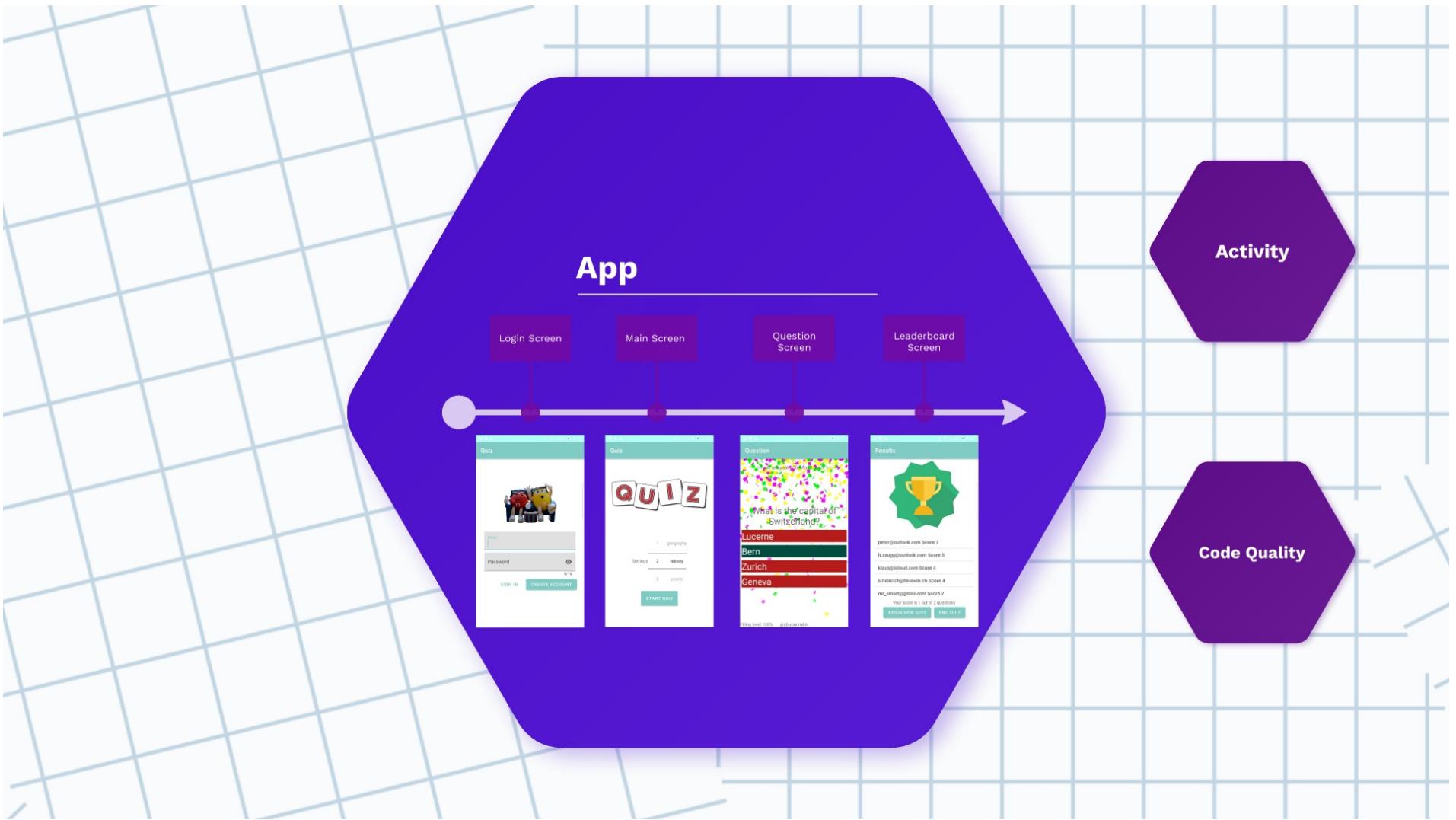
**0.0%**

Duplications on [1.9k Lines](#)



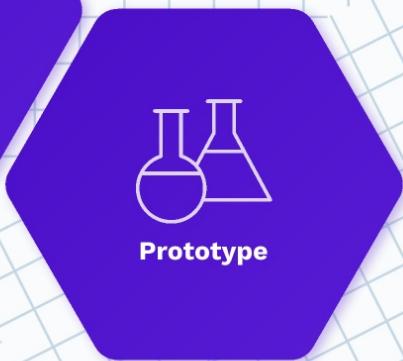
**0**

Duplicated Blocks



# Quiz M&M Dispenser

Martin Radinger  
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## Discussion



### Achievements

- BLE Connection Android <-> Arduino
- Usage of sensors and actors
- writing unit and End-2-End tests

### Problems

- Android Testing without experience is hard
- Debugging BLE connection was complicated
- Including sensors and actuator in a construction consumes a lot of time

### Outlook

## Outlook



- Improve the dispenser construction  
(e.g. hide electronic parts)
- Add a duel feature
- iOS application
- Automatic reorder new M&M's if the filling level is lower than 10%

## Discussion



### Achievements

- BLE Connection Android <-> Arduino
- Usage of sensors and actors
- writing unit and End-2-End tests

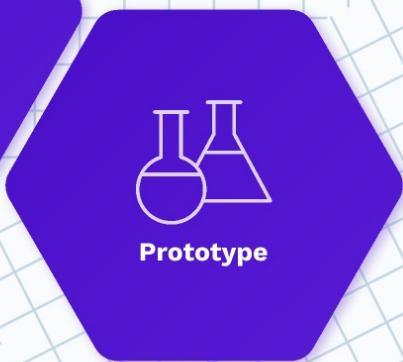
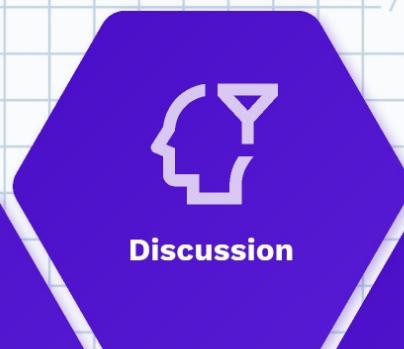
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### Outlook

# Quiz M&M Dispenser

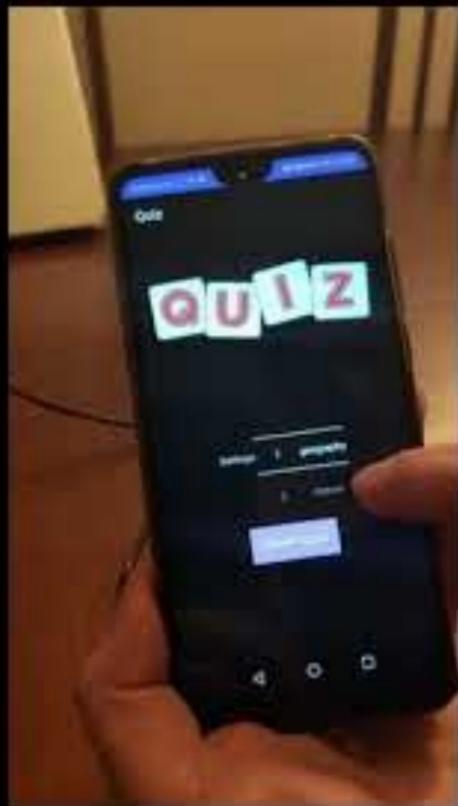
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Pascal Steiner



## Prototype

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# Quiz M&M Dispenser

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