34365 IoT Prototyping 2022

Simons game specifications

In part I of the IoT prototyping course, you will rebuild your own version of the popular Simons Game from the 80'ies. If you don't know the game, you can see it in action here: https://www.youtube.com/watch?v=1Yqj76Q4jJ4

MB Simon and Pocket Simon

The Simon game has three game modes:

1. Single Player (game 1) – The game generates a sequence of lights and sounds which the player must follow, the sequence grows by one colour every turn and ends when the player makes a mistake or repeats the maximum number of colours in a sequence (which is dependent on the skill level setting)

   The game also features 4 skill levels:
   1. Repeat a sequence of 8 colours
   2. Repeat a sequence of 14 colours
   3. Repeat a sequence of 20 colours
   4. Repeat a sequence of 31 colours

2. Multi Player (game 2) – The game begins with Simon displaying a colour, the first player must repeat the colour and then select another colour, subsequent players must enter the current sequence and then add one more, the next player then selects the sequence of colours entered

so far and then one more and so on until a player makes a mistake (or a sequence of 31 colours is achieved).

3. Multi Player (game 3) – This game is identical to game one, however each player owns one or more colours and is responsible for pressing it during the sequence. If a colour is incorrectly selected that colour is removed from the game and the game continues (with a new colour sequence) until only one colour is left (the winner)

SIMONS GAME PROJECT TASKS

Tasks 0-5 & 11: compulsory Tasks 6-10: extra

Task 0:

- Sit down with your group members and discuss on who you would like to work (meeting times, where to keep components, prototypes, how to share files, etc.
- Make sure that everybody learns also the difficult parts – don't just do what you are best at or always do in group work. Make sure that everybody gets around Arduino programming, electronics, design, backend, etc.
- Make a timeplane / workschedule with milestones

Task 1:

- Conduct a market analysis for the game. Could there be other areas where the game could be used, in addition to entertainment? (Use the slides from Where to Play)
- Could the game be designed in a different way to be more inclusive? (Use the ability prompt cards)

Task 2:

- Connect the Arduino, LEDs, buttons, buzzer, etc on the breadboard
- Program Game mode 1 with 4 skill levels
- Output game mode and sequence length on LCD screen

Task 3:

- Output sequence length (current and longest) on Azure, Webserver or Thingspeak
- Use wifi technology to send the data

Task 4:

- Compact your electronics, move from breadboard to soldering board
- Draw a circuit diagram (using for example the Fritzing tool or draw.io)

Task 5:

- Design a 3D casing and print it in the lab or Skylab and then assemble the prototype

Task 6:

- Implement Game mode 2 and 3

Task 7:

- Create sounds for the game

Task 8:

- Play with Azure, Webserver or Thingspeak, how to visualize the game. Send requests “downlink” to the game, i.e. read the color sequence from Thingsspeak or Webserver instead of random. Play with APP design

Task 9:

- Experiment with sending data using LoraWAN technology.

Task 10:

- Experiment with powering technologies (power-banks, batteries, etc.)

Task 11:

- Document your game in a report, max 8 pages plus the market slides
- As part of the report, describe the working method in your group. Who worked on what and how did you work together
- Hand-ins: report (incl. market slides, ability considerations and working method), all code, 3D design files, circuit diagram, video of game in action
- **Deadline: Monday, 24. of October**