# Mastermind Electronic Edition

**Initial Project Proposal**

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Abstract

1. The main reason for this project topic choice is to re-create an old childhood board game called Mastermind in which player is trying to guess a hidden sequence of colours in limited amount of moves.
2. Each game will have randomly chosen sequence of colours, depending on the constraints it will be from 3 to up to 6 colours, a player will use smartphone application to create the sequence and send it to Arduino either the application or the device will be programmed to check the sequence against the hidden one and show the right answer by lighting LED lights of corresponding colour or white LED lights to show how many colours from the sequence player has selected right.
3. Deliverables:  
   - smartphone application (the game) written with the use of Processing

* Arduino device with premade LED light system and Bluetooth connection with the above application.

**Declaration of authorship: I confirm that the work submitted is mine and that wherever possible the work of others has been clearly acknowledged and referenced.**

**Signature : Michal Bochenek Date: 15/02/2017**

## Introduction

### Background/context

A Mastermind is a game in which one player sets a secret code and the other player is trying to guess the sequence by placing the coloured pins in the holes, with each attempt (usually 12 attempts per game) the player is given feedback on how many colours were guessed right and how many of pins are placed in the right position. The game usually uses 4 pin holes and 6 colours. The proposed solution will differ from the original in such way that the one player is replaced by the randomizing the pin sequence and the colour sequence is being assembled in the application, then sent to the Arduino to show the results (the alternative will be using the application to determine the result to display on the device instead).  
To make things run easier and due to limitation of the multi-coloured LED player will have less colours to choose from yet also less attempts to guess the code.

### Aims and deliverables

Aim of this project is to enhance student knowledge and practical application of the already possessed skills gained during the subject classes.  
The project will intend to deliver:   
- working game – smartphone application  
- Arduino device connecting over Bluetooth with the game app  
- any required documentation containing project technical aspects etc.

Design choices

Recreated Mastermind game with some changes to the rules mentioned in paragraph 1. Possible outcomes are such as the device will use:  
- row of 3-5 LED red lights to show the amount of pins placed in the right position,   
- row of 3-5 white LED lights to display the amount of pins with the right colour,   
- row of 3-5 multi-coloured LED lights displaying the end result as a reward to the player or once the player loses the game,  
- game application with the basic graphical user interface allowing user to select the sequence and send it over to Arduino,   
- outcomes will be strongly influenced by the skill and time limitations of the student

Method

Items required to deliver the project:  
- coloured LED lights   
- cables  
- breadboard(s)  
- Arduino Uno or similar, powered via USB cable or batteries  
- resistors  
- Analog multiplexer corresponding with the number of lights used  
- Android Smartphone with built in Bluetooth  
- Bluetooth transmitter/receiver for Arduino (receiver at least)  
  
  
Technology requirements:   
- Arduino programming development environment  
- Processing to create the Android application, it was discovered that processing can handle Arduino connection with proper expansions so that it can handle both GUI side and communication with the Arduino

Timeline:

|  |  |  |
| --- | --- | --- |
| Date | Deliverable | Comment |
| 17/02/2017 | Project initial documentation |  |
| 24/02/2017 | Project device scheme, and application GUI draft |  |
| 03/03/2017 | Project initial device and GUI working prototypes |  |
| 10/03/2017 | Catch up work |  |
| 17/03/2017 | Development of the application and first release for testing | Testing against the usability and project outputs |
| 24/03/2017 | Any other catch up work if needed | Can continue if time constraint will allow to. |

References

[1]"Arduino Playground - Processing", *Playground.arduino.cc*, 2017. [Online]. Available: http://playground.arduino.cc/Interfacing/Processing. [Accessed: 15- Feb- 2017].

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