

Group 5 Project Plan

Group Members

- Sadaf Ayub, s224027
- Frederik Danielsen, s214718
- Joachim Touveneau Petersen, s194296
- Melek Büsra Özel, s221706

Project Title

Smart Security Box System

Project Idea Description

The idea is to implement a secure storage system for valuables. The box holds a lock with a motor attached to it. We intend to design a physical box, for which access is controlled by a 4-digit code that is entered using a potentiometer along with a button. An LCD display is used to notify the user on whether the code entry is correct or incorrect, such as a message that reads "Access Granted/Denied". After three consecutive incorrect code entries, an additional audible alarm is triggered. For correct code entry, the motor runs to unlock the box. To lock the door again, simply press the rotary encoder.

Any access attempt is logged remotely on ThingSpeak. With this, the owner is able to monitor and review any interactions with the Smart Security Box. The password can be controlled and changed from a separate keypad by uploading this to a web server. The new password is then sent to the chosen box when access is requested.

In addition, this system is able to run on multiple boxes, which can be connected and identified by ID's (however, only one box will be present at the presentation). The boxes are connected to the cloud. A Keypad module is then used to assign the box an ID and change/choose password from a separate device.

Required Hardware

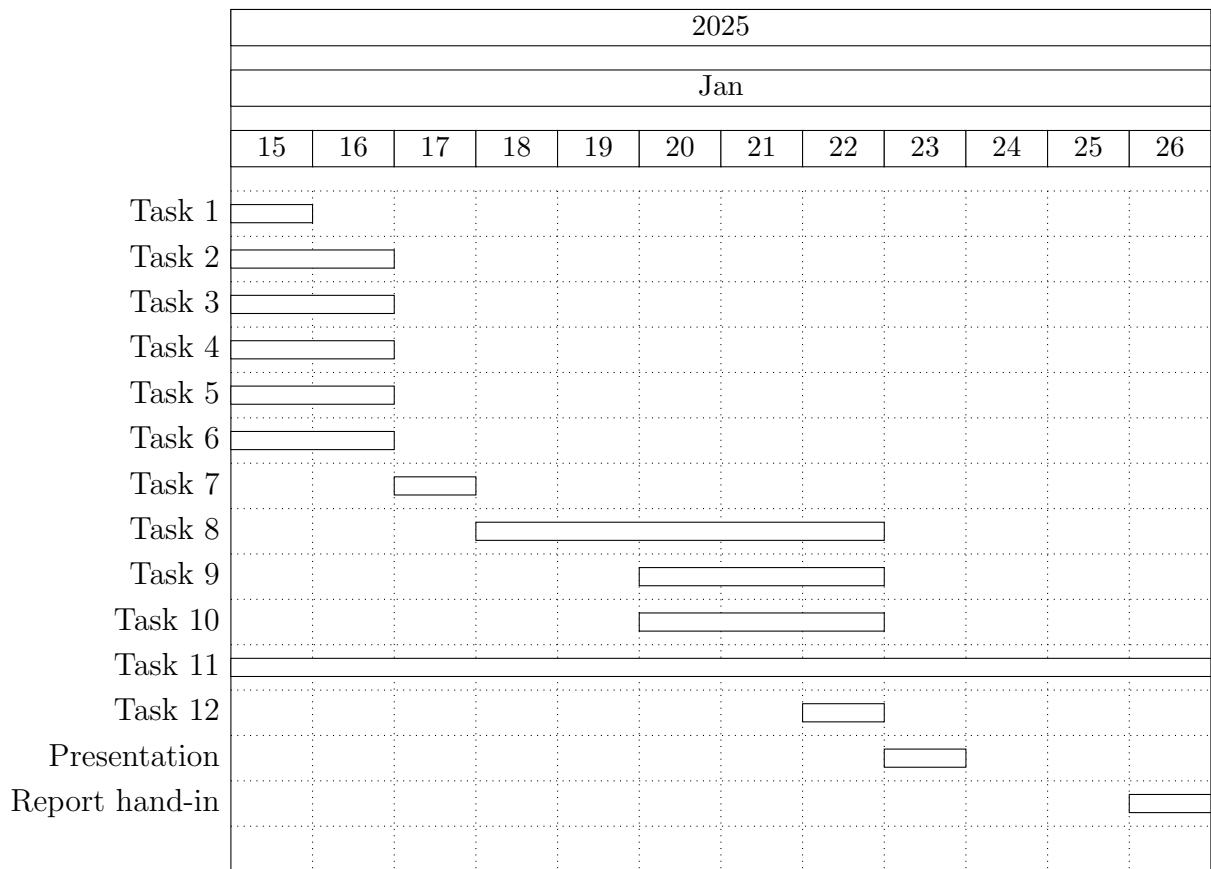
- Arduino UNO R3
- ESP8266
- Red, yellow, and green LED

- $2 \times$ LCD screen
- Membrane switch Keypad
- Potentiometer
- button
- Servo Motor

Task Responsibilities

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- **Reading 4 numbers from Potentiometer:** Joachim
- **Security Box LCD screen:** Frederik
- **LED lights:** Melek
- **Servo motor:** Sadaf
- **ESP8266 integration and setup:** Sadaf & Frederik
- **Alarm buzzer:** Frederik
- **Box creation:** Frederik & Joachim
- **Box-password module communication:** Melek & Sadaf & Joachim
- **Merge and combination of code and hardware:** All
- **Report:** All
- **Fritz documentation:** Melek
- **Doxygen documentation:** All

Project Timeline



- **Task 1:** Incorporate feedback and adjust errors in the project plan, and otherwise begin to work on separate branches.
- **Task 2:** Reading 4 numbers from Potentiometer
- **Task 3:** Implement LCD screen and code to show the password and status.
- **Task 4:** Get the Servo motor to run
- **Task 5:** Find a way to integrate ESP8266 integration (hopefully minimizing delay)
- **Task 6:** Get the alarm buzzer to work and to set off when an incorrect password is entered thrice.
- **Task 7:** Start merging the parts that are ready.
- **Task 8:** Box creation
- **Task 9:** Add keypad and new LCD screen functionalities
- **Task 10:** Merge and combination of all code and hardware.
- **Task 11:** Work on report.
- **Task 12:** Work on poster.
- **Report Hand-in:** Hand-in report 26/01, before 23:59.