
ENIGM-DESK

USER GUIDE

V1.0



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1 Introduction

This **user-guide** describes how to setup and use the **ENIGM-DESK** escape game that takes place on a desk. **ENIGM-DESK** is an escape game composed of a digital photo frame, an RFID Reader, a load-cell and a solenoid that can be setup on any desk with a drawer. In this user guide we will go through the different components, how to setup and use the Escape-game as well as a little walk through of the steps leading to completing the game. The actual in depth analysis of clues and steps provided with the game will be treated in a separate Guide since we are planning to allow the user to choose the game difficulty.

This project was realised for a class at the **Unamur** university and alongside my client / teacher **Monsieur Gonzague Yernaux** who I need to tank for his help and all the nice conversations we shared while designing this Escape game.

2 Components

ENIGM-DESK is delivered already assembled, it's composed of a digital frame in which you can find the different electronic components. The remaining components are the solenoid that will need to be fixated at the back of a drawer in order to lock it and unlock it depending on the game stage, a load-cell hidden in a book and a floppy disk drive.

2.1 Digital photo frame



Figure 1: Prototype Digital photo frame

Inside the digital photo frame is located all the main electronics component:

- Raspberry Pi 4 model B (nano-computer).
- Arduino Mega 2560 connected through USB to the Raspberry Pi.
- The force sensitive resistor located on the back of digital photo frame.
- RFID reader MFRC522
- 7 inch touch screen, on the front of digital frame, connected to the Raspberry Pi through micro HDMI.

2.2 Load Cell

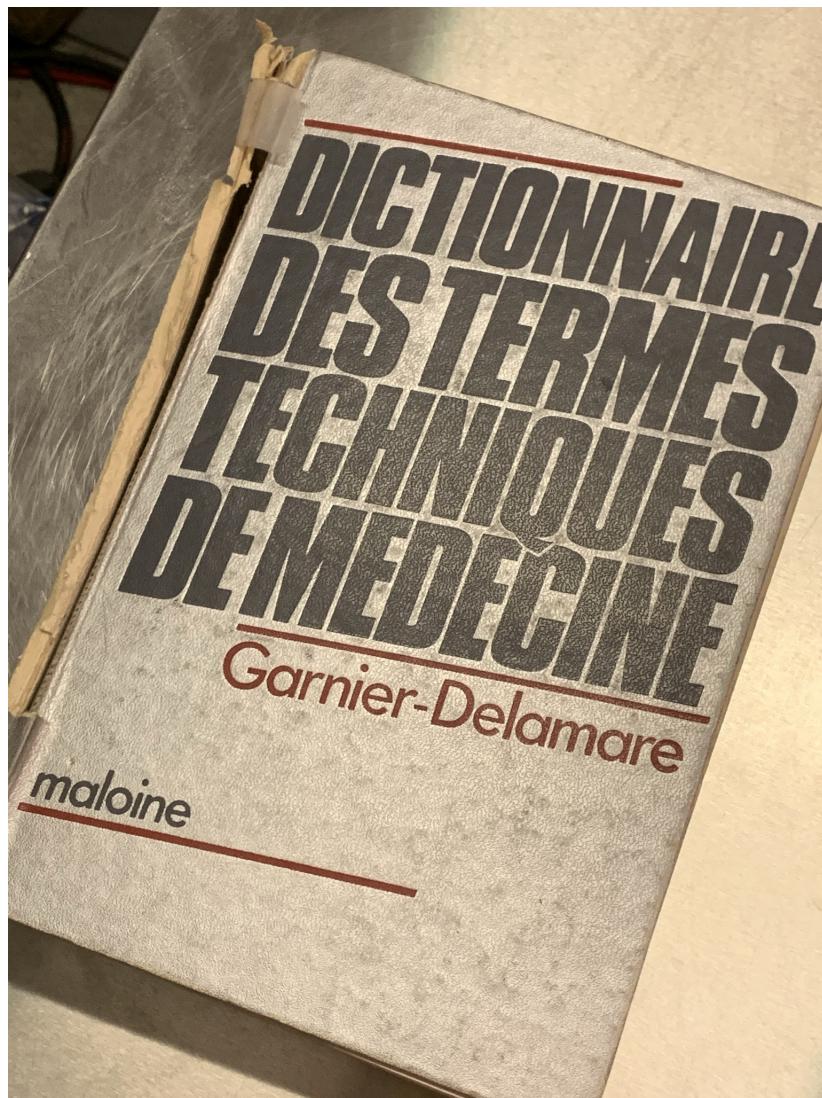


Figure 2: Prototype load cell hidden in a book

The load cell is hidden inside a book as well as the HX711, a "precision 24-bit analog to-digital converter (ADC) designed for weigh scale" connected to it. The converter is then directly connected to the Arduino in the Digital photo frame.

2.3 RFID READER



Figure 3: RFID reader located in the digital photo frame under the red circle

The RFID reader [MFRC522](#) is located on the side of the [Digital photo frame](#). The RFID reader is then directly connected to the Raspberry Pi in the [Digital photo frame](#).

2.4 Floppy disk drive

The floppy disk drive is a standard USB floppy drive, connected to the USB port of the Raspberry Pi in the [Digital photo frame](#).

2.5 Solenoid

The solenoid is loose when delivered and has to be installed at the back of the desk's drawer in order to lock or unlock it depending on the game phases.

2.6 Detailed wiring

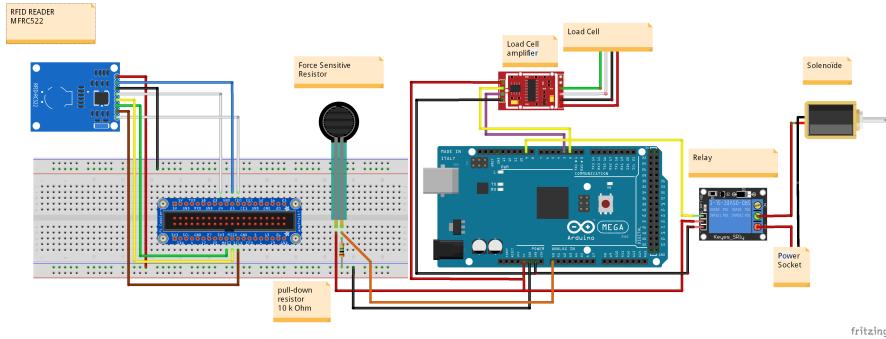


Figure 4: Full electronic circuit done with Fritzing.

3 Setup

3.1 Introduction

The setup of **ENIGM-DESK** is pretty straight forward, it was designed to be easy to install and remove from any desk that has a drawer.

3.2 Installation

The steps of the installation are:

- Put the [Digital photo frame](#) on the desk as well as the floppy disk drive and the book containing the load cell.
- Fixate the [solenoid](#) at the back of the drawer allowing to lock the drawer when needed. You can do it in any way you see fit.
- Plug the [solenoid](#) cables to the cables coming from the Digital photo frame labeled "solenoid".
- Plug the power connector labelled "Raspberry" to the power socket.
- Plug the power connector labelled "Solenoid" to the power socket.
- Switch on the power adaptor.
- Once the Raspberry has fully booted you can press the ENIGM-DESK [icon](#) to launch the game.

4 Game interface

4.1 Introduction

In this section we will discuss the game interface used by the player. The different steps that leads to each interface will be briefly discussed but the detailed version can be found in the **ENIGM-DESK: Game Guide**.

4.2 Starting the game

In order to start the game you will need to press the game icon and choose either "execute" or "execute in terminal"

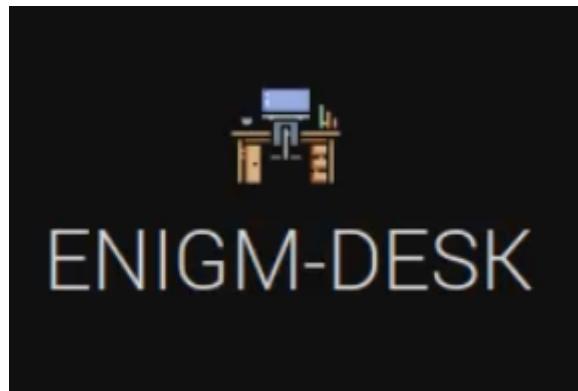


Figure 5: Game icon.

4.3 Game start

Once the game has been started by the game master through the game icon, the screen will display a new image every 20 seconds like any digital photo frame would.

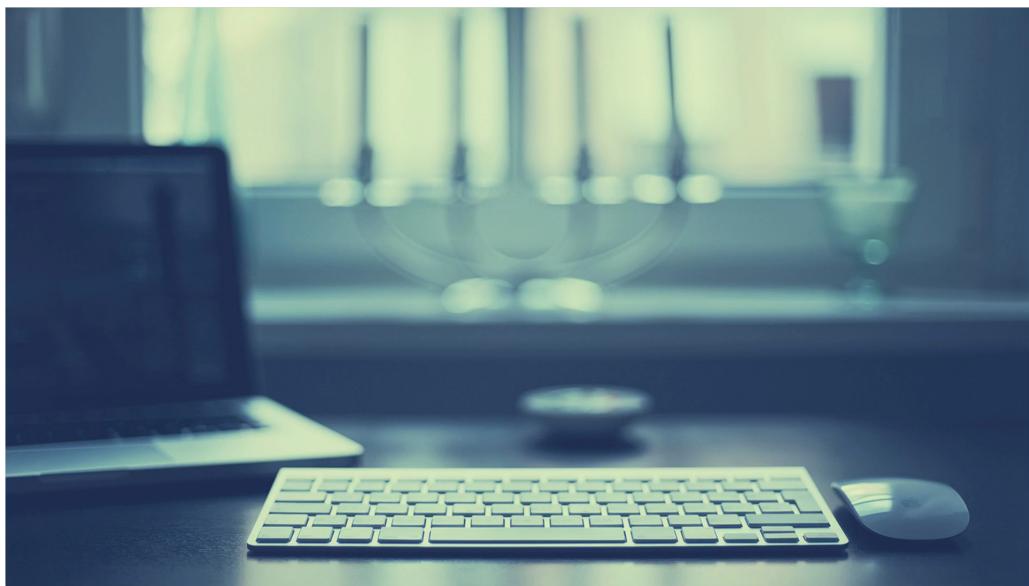


Figure 6: Digital photo frame displaying a new picture every 20 seconds.

4.4 First step

Once the force sensitive resistor located in the back of the [Digital photo frame](#) has been pressed the screen will then display the following message : "Desk Error Detected"

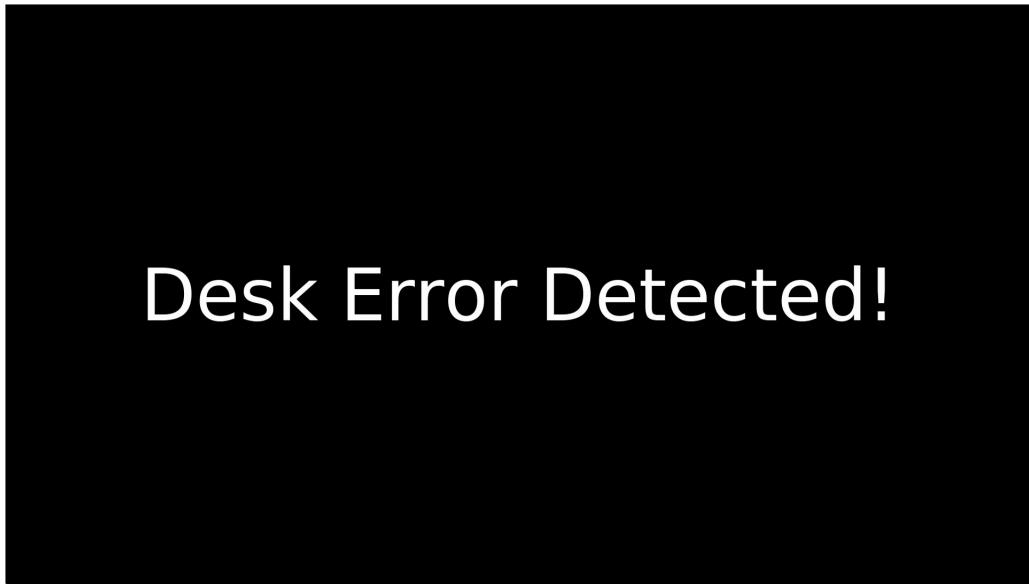


Figure 7: After the player has pressed the FSR

4.5 Second step

Once the load cell hidden in the book has been pressed by in theory cleaning up the desk and piling up the book left on the desk the screen will then display the first actual game interface. This interface is the game menu until the end of the game.

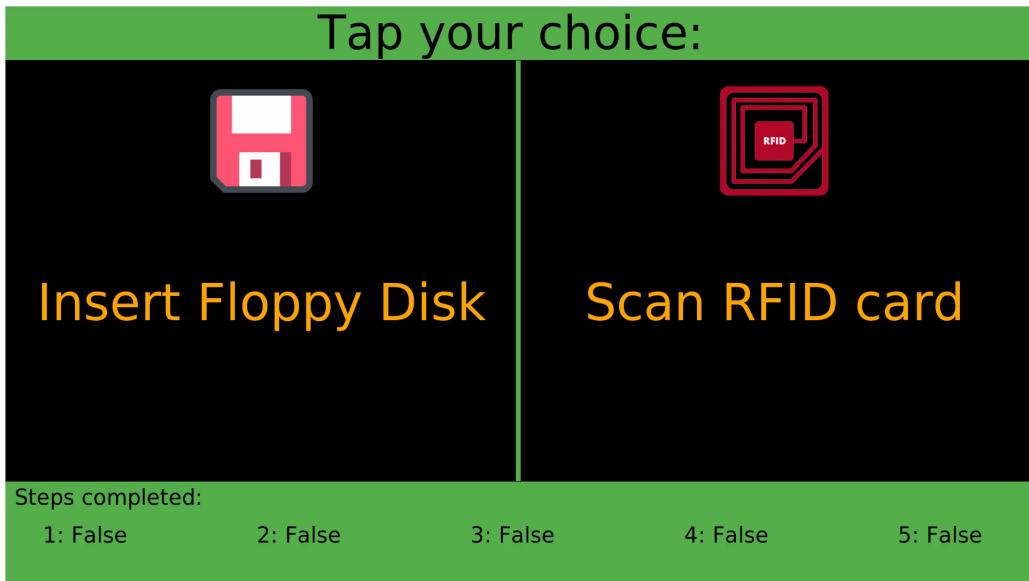


Figure 8: Game menu

The player has then two choices, he can either decide to read data from the floppy disk or scan a badge. Information relative to the game are also displayed on the bottom of the

screen. After that the player will go back to this game menu until he has completed all the necessary card scans.

4.6 RFID scan

The game will idle on the "scanning badge screen" until a scan has been completed or failed.

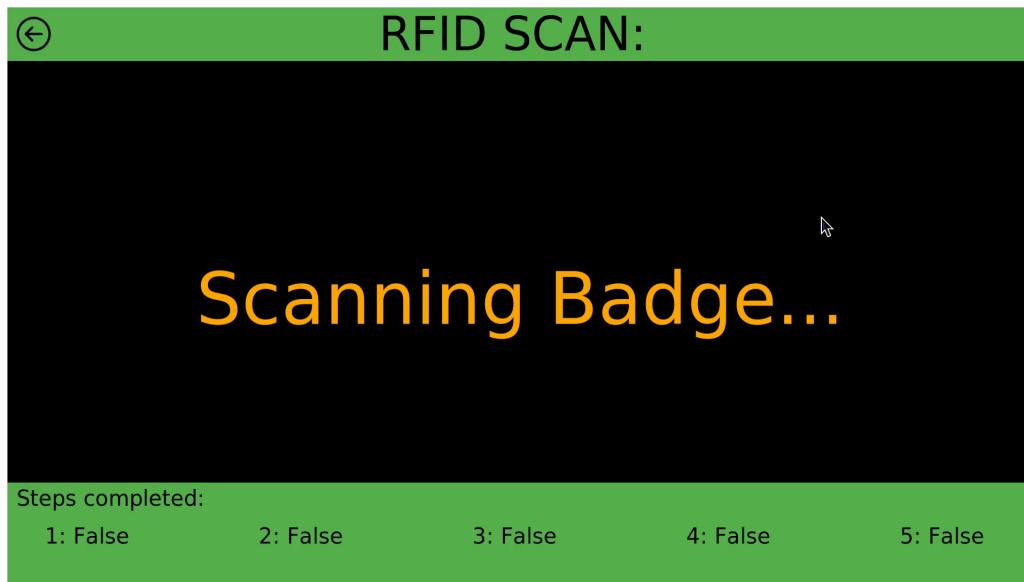


Figure 9: Waiting for RFID scan

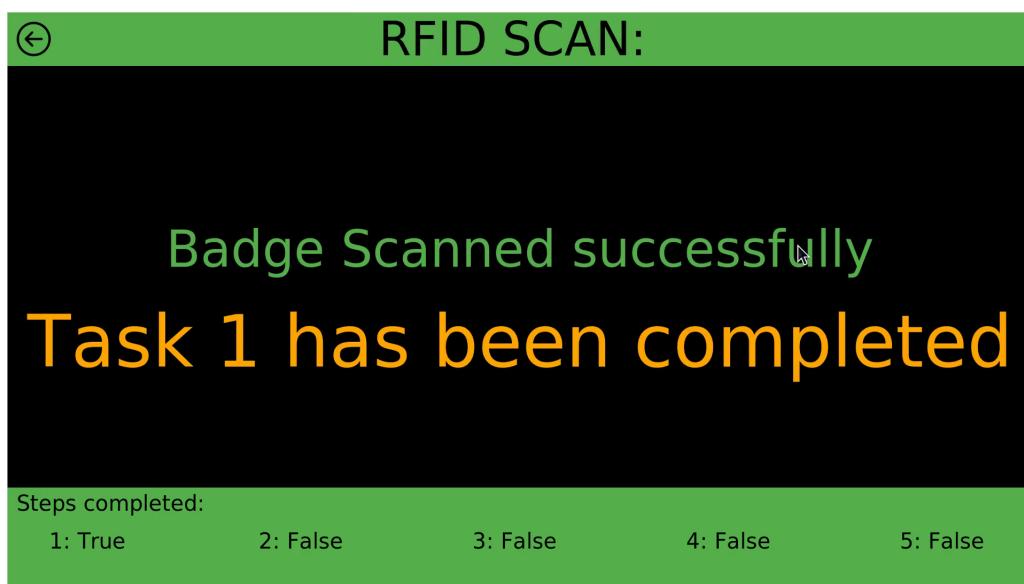


Figure 10: Scan Completed

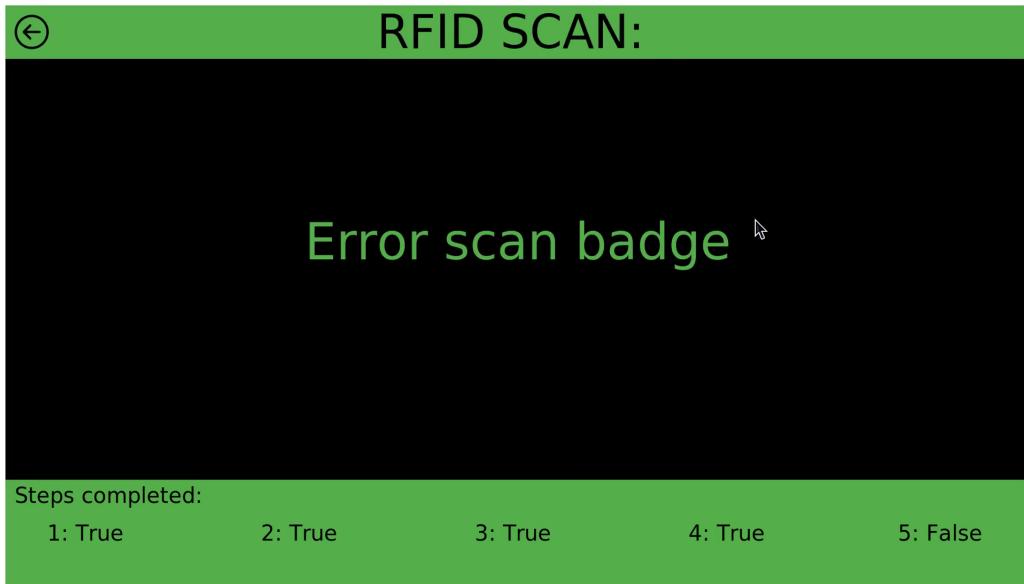


Figure 11: Error scan

The player can then press the "back arrow" on the top left of the screen to go back to the game menu.

4.7 Floppy read

The floppy technology due to its age is fairly slow and necessitate some reassuring message for young players.

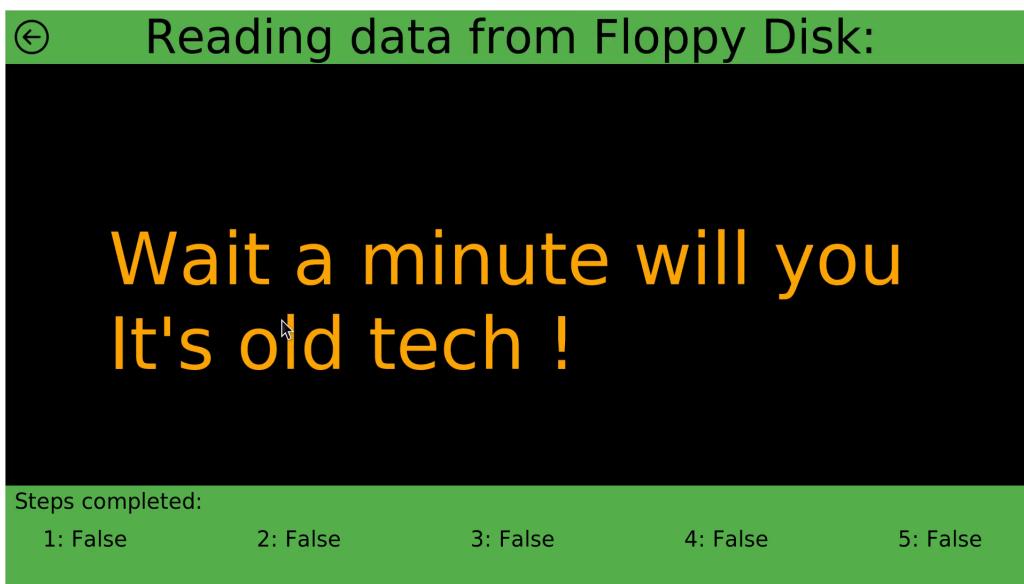


Figure 12: Waiting for floppy disk read

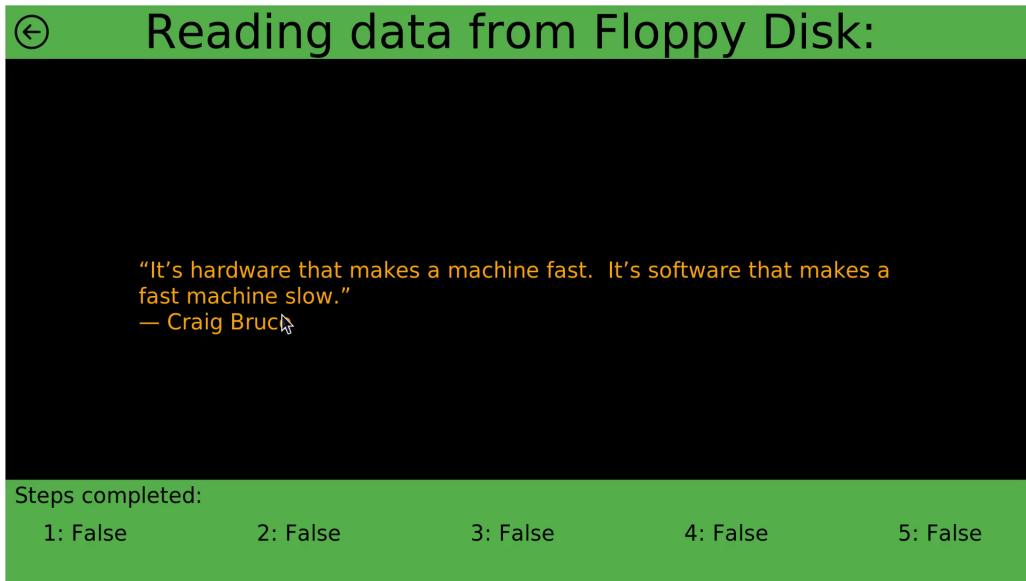


Figure 13: Data read from the floppy disk

4.8 End Screen

Once all the necessary scan have been completed the game won't let the player go back to the game menu by removing the arrow.

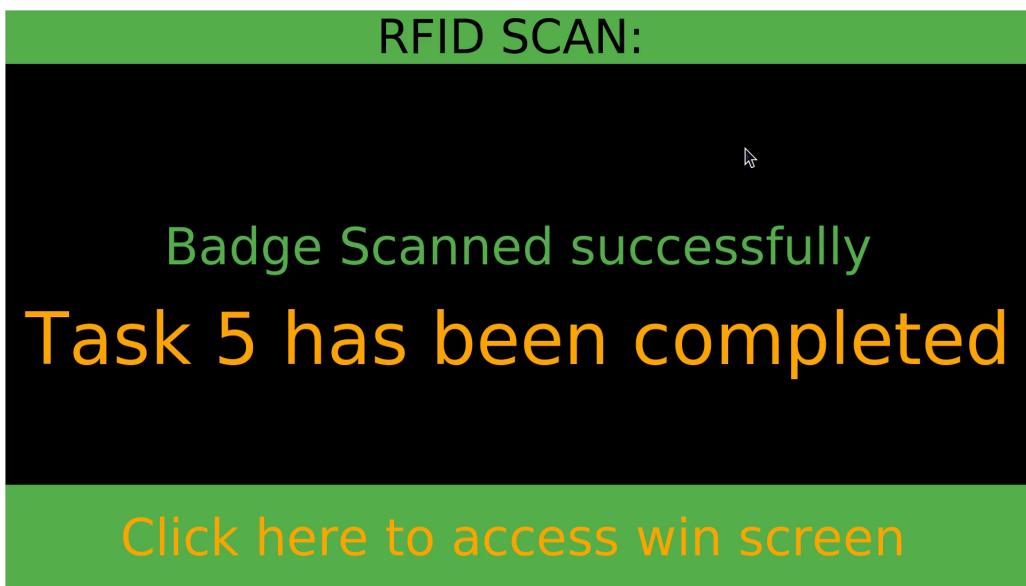


Figure 14: Last scan completed

The information relative to the game will also disappear and be replaced by a clickable zone to move to the victory screen.

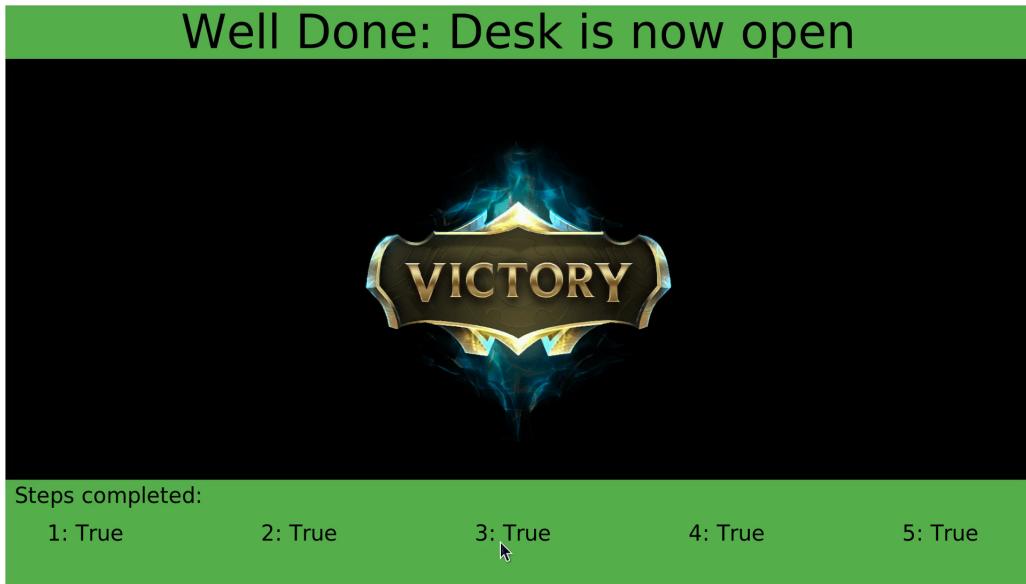


Figure 15: Victory Screen

5 Customize the game

5.1 Change or add digital photo frame images

It's possible to change the images displayed at the beginning of the game, to do so you will need to go in the game folder, open the "PictureFrame" folder and add or replace images there. In order to ensure the best match it's important that the images must be of type ".png" or ".jpeg" and they have the following resolution : "1920x1080".

5.2 Change digital photo frame speed

In order to change that setting you will need to open the game directory and then open the "configuration.py" file with any text editor. Once you have done so you will need to edit the "time between images" value, be mindful that this value is in seconds. Once you have modified the value you can save the document.

5.3 Further questions?

You can contact me at my university email address at : augustin.nogue@student.unamur.be