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The CodER Youth Organisation's Scenarios Handbook

Title: Cyber War



Cyber War

Instruction guide

1. Introduction

Targeted audience

- i. Age: 14+
- ii. Level: Beginner/Intermediate
- iii. Group size: 2-5 people
- iv. Type of target group: Individuals interested in action and technology escape rooms, with beginner level knowledge on programming.

2. The ER scenario

a. Storyline

The players are a group of scientists who are active in defending human rights and the environment etc. An evil organization kidnaps their most important member, a woman named Daphne, an experienced programmer and brilliant mind for her young age. The purpose of the evil organization is to stop the actions of the scientists, and kidnapping their colleague is the perfect way to accomplish that. The players go and quietly break into the laboratory where Daphne is being held hostage, but as soon as they manage to free her from her cell, suddenly the doors close mechanically and an evil voice warns them over the loudspeakers that he will not let them leave so easily and that in 1 hour the agents of the evil organization will be there to imprison them all.

b. Objective of the game

Essentially what the players have to do as a team is to start a "cyber war" with the organization's mastermind who remotely controls the space's electronic systems and keeps them locked in there. They will need to breach cameras, get into the computer system, reverse obstacles that will be put in their way and finally open the main door and leave the lab before the agents come.

1. Creating the setting

a. Needed materials/ equipment

- 1 computer/ laptop with internet connection and Python installed
- 1 BBC: Microbit microcontroller

- 3 push buttons for the microbit
- 6 alligator wires (3 green, 3 black)
- 1 padlock with three digits
- 1 small box that can be locked with the padlock (into the box must fit the BBC:Microbit and the torch)
- 1 bluelight pen
- 1 torch
- A piece of paper with the following message “*Only this microcontroller knows the PIN of my laptop. Try to find the PIN and shed light on the truth!*”
- 1 web camera
- A book named “Libraries and Commands”

b. Setup of the room

The first things that the players notice is a table with a laptop, a blue marker and a locked box. There is also a camera (used for the Game Master but also serves purpose for a puzzle) and other things such as books hidden from the players. The laptop should have Python already installed and a file with a script that has some errors that need to be fixed by the players.

c. To have in mind

Keep in mind that “Daphne” is always in the room to assist and make the room enjoyable and playable even for players who have zero knowledge on programming. The laptop should have at least an 11th generation i3 cpu to execute tasks without a problem.

2. The game

a. The game master

The Game Master will introduce the story to the players and try to create an engaging environment. To make the room more immersive, the GM can be an actual character, who meets the players before they enter the room. She might say something like this:

“I finally got to know you up close! You are the scientists I read about on the internet. I believe that what you are doing to create a better tomorrow for everyone deserves congratulations. But I know why you're here... I saw them.. I saw them with my own eyes peeking through my window shutters.. They've kidnapped Daphne, your programmer, haven't they? I saw where they took her, but of course where else? In their laboratory, where they do all their illegal activities. Everyone in town knows what they are doing but no one dares to react out of fear. I can show you where it is, but I can't come with you. Unfortunately if they find out that I helped you it won't end well.. This building is the lab, that's where they keep Daphne. Good luck and... be careful!”

b. Hints

Daphne is actually an actor who stays in the room with the players through the whole story and serves two purposes. 1. To create an immersive environment for the players, i.e. act scared, act happy when they free her from the cell, act anxious when the time passes, so the players can match her vibe and feel part of a real story. 2. To be the hints provider. She is an experienced programmer after all, so she can help and provide hints whenever players get stuck on a puzzle and generally guide them. To avoid the players' constant questions to Daphne and to avoid the claim: "*Since Daphne is an experienced programmer, why doesn't she solve the whole room and just run away?*" Daphne will inform the players that members of the organization gave her water to drink, but from then on she was asleep until the players entered the lab and woke her up. She thinks that she was given some kind of hypnotic to prevent her from escaping, so Daphne doesn't always have a clear mind to cooperate 100% with the team and use her knowledge. Sometimes her thinking is clouded while other times she returns to normal.

c. Proposed riddles

Challenge #1

SETUP

There is a table in the room. There are some objects on the table:

- A blue light marker (one side has a pen that writes invisibly and the other side has a special flashlight)
- A box locked with a padlock with 3 digits. On the box we have written the code of the combination of the padlock with the blue light pen. Therefore, the code is not visible to the players unless they use the special flashlight of the pen.
- A computer/laptop. The players do not have the PIN to unlock the laptop yet.

EXPECTED STEPS

The expected steps of the players based on the available tools are:

- Activate the laptop (The players don't have the pin)
- Try to open the box (The players don't have the 3 digits to unlock the padlet)
- The only thing available to the players is the blue light marker. Players are expected to notice the flashlight and start looking for the code.

SOLUTION

The players find the 3 digits written with the invisible pen on the box and finally unlock the box.

Challenge #2

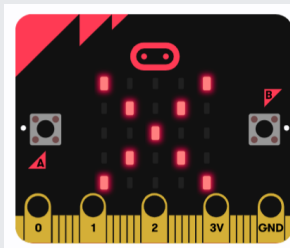
SETUP

The players find inside the box:

- 1 torch
- 1 BBC: Microbit microcontroller
- The following note on a piece of paper: *“Only this microcontroller knows the PIN of my laptop. Try to find the PIN and shed light on the truth!”*

EXPECTED STEPS

- The players will probably press the microbit's A & B buttons. If they press them, nothing happens and a big X will appear on the LED screen.



SOLUTION

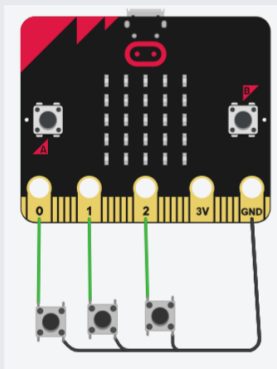
The players might use the torch in order to “shed light on the truth” as the note was saying. If they shed light on the microbit board (the board has a built-in light sensor), the PIN code for the laptop will appear on the led screen.

Challenge #3

SETUP

The players have activated the laptop. There is a text file on the desktop. When the players open the file, there is the following message:

“You must carefully make the following connection using our microcontroller! Look around the lab to find the right electronic components. Only if the correct connection is made will the buttons reveal the code!”



EXPECTED STEPS

- The players have to find the components and create the circuit.

SOLUTION

- The players press the buttons and the code reveals on the led screen.

Challenge #4

SETUP

The players know that the mastermind is watching them from a camera. Their purpose is to disable it so they can navigate the room with greater comfort, keep him busy and create confusion. For this puzzle, they will use the Python programming language and an integrated development environment (IDE) called IDLE, which comes with Python when you install it.

In order to solve this puzzle, the players will need to execute a Python program that will turn off the camera. They need to figure out how to send a precise message to the camera to make it malfunction and stop sending video footage to the mastermind.

The camera needs to hear the short string of text "disable_camera" as its message. The camera will turn off and stop sending video when it receives this message. The participants must figure out how to link their laptop, which is on the same network as the camera, to the camera in order to convey this message.

To send this message to the camera, the players will need to fill a Python program that uses a networking library called sockets. Sockets allow programs to communicate with each other over a network connection, like the internet or a local network.

The players will view a socket object that connects to the IP address and port number of the camera. Once the connection is established, they can send the "disable_camera" message to the camera using the send() method of the socket object. If the message is received by the camera, it will shut down and stop transmitting video.

EXPECTED STEPS

- Players will find and open the python file in the laptop.
- Previously the players must have solved a riddle that gives them a 3 digit number: **127**. These are the last digits of the camera's IP Address.
- Somewhere in the room our players will find a book named "Libraries and Commands". In this book they will find different types of commands, libraries and programming languages, listed alphabetically. If they navigate to P and find Python, they will notice a section named "Camera". One of the messages listed is called disable_camera and the description above says "**Message used to disable a camera**".

SOLUTION

- Our players will view this code when they open the python file:

```
import socket
```

```
client_socket = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
```

```
ip_address = "192.168.1.???"
```

```
port_number = 8080
```

```
client_socket.connect((ip_address, port_number))
```

```
message = ?
```

```
client_socket.send(message.encode())
```

```
client_socket.close()
```

What they need to do is to fill the missing parts with the right values.

The first missing part needs to be filled like this: **ip_address = "192.168.1.127"**

The second missing part needs to be filled like this: **message = "disable_camera"**

If the players enter the correct values and they run the program by executing the Python script, they will view a message on screen saying **"Camera Disabled Successfully"**

1. In case of success

Players solve the final puzzle that opens the main door before the agents of the evil organization show up. They manage to leave the laboratory safe and sound and can continue their work towards a better world.

2. In case of failure

Agents of the evil organization arrive at the laboratory and arrest the players. Now everyone is a prisoner.

Created by: Secret Citizens(Tasos & Giannis) & Margarita Velentza

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