Boston University
Electrical and Computer Engineering
EC464 Senior Design Project

2nd Prototype Test Report

VETCON
BADGE

By

Team 32

Team Members

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Equipment & Setup:

The equipment used for our prototype testing followed the hardware and software specifications listed below.

Hardware:

1. Texas Instruments (TI) MSP430FR2433 LaunchPad™
2. Computer/Laptop
3. Micro USB Cable
4. Breadboard (2 LEDs, Resistors, Wires)

Software:

1. Visual Studio Code
2. PlatformIO

The setup for our prototype testing was very simple. One of our team members, (in this case, John Kircher) cloned our Github repository with our prototype code from the testing branch. The project was then opened with PlatformIO on the Visual Studio Code IDE. Following this, the MSP430FR2433 was connected to the computer with the micro USB cable. Using PlatformIO, the project was built and flashed onto the board ready for demonstration. Furthermore, a breadboard with correct pin connections to 2 LED's was set up.

Measurements Taken:

1. VETCON BADGE displays on startup
2. Main menu displays in terminal
3. User can select from given options
4. User can enter name to nametag
5. User's name can be displayed
6. Game link(s) can be retrieved
7. Online game(s) run (Game 1,2,3)
8. Secret phrase can be retrieved on winning the game(s) (Game 1,2,3)
9. User can reset badge

10. User can select to abort / continue with reset

Upon startup, VETCON text was displayed correctly alongside the menu of options in the terminal. All options were able to be selected by the user during the demonstration. These options included the ability for the user to enter a username, change their username, display their username, and obtain a link to a short game. We demonstrated that attempting to enter a new username when one had already been set would correctly return the error that a username had already been set. We then demonstrated that the badge could be reset and a new username could then be set for the badge. Alongside regular usernames, we also demonstrated two “secret” usernames that would have a unique text output if the user entered them correctly. The first game link functioned correctly and allowed the user to play a dino game. Completion of the game allowed the user to discover another “secret” hidden in the developer console of the end screen. This secret code could then be entered in the fifth secret option of the program, and upon being entered “SUCCESS” was displayed. Upon trying to reenter the secret code, the device did not allow it and instead again displayed “SUCCESS”. Furthermore, we demonstrated that the secret code was created using an XOR cipher and users can decrypt it using clues given from game 1. We then demonstrated the coin flip (game 2). The game functioned correctly and we discussed how a secret code is added into the cookies on the site. We described how a user can utilize the polybius cipher to get to the correct hash, and also how they can wipe their progress on the board using the incorrect hash. We then demonstrated game 3 on Derek’s machine, including the custom game engine that he wrote to allow input from any tsv into the game. The game takes a long time to complete so we did not demonstrate the winning condition but did show that the secret phrase is reachable. We also described the unique losing condition for game 3 which includes a fork bomb on the users machine if they choose a certain option on day 25 of the game. Finally the reset functionality was shown, with the user able to cancel the reset if need be: this takes advantage of both buttons on the MSP430.

Conclusions:

The 2nd prototype testing was a complete success. Games 1 and 2 ran well on the browser, and the demonstration of game 3 went extremely well! Other than that, all of the ASCII graphics displayed fine, and so did the menu. There were no issues this time with any Serial input which was something we updated since the last test. Following all our successes, the group is ready to finish bluetooth implementation and to add the alphanumeric display onto the badge. Additionally, we want to continue Professor Osama's request to "rotate through" different tasks on the team to prevent burnout and continue "having fun."