

A12 - User Manual

Year: 2024 **Semester:** Spring **Team:** 01 **Project:** The Dungeon Crawler
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Assignment Evaluation: See the Rubric in the Brightspace Assignment

1.0 Product Description

The Dungeon Crawler is an electronic game board designed to visualize the dungeon crawling experience popular in role-playing games. The current prototype is based on a simplified rule set of 5e Dungeons and Dragons. The Dungeon Crawler comes with an application that can be used to design maps on a 16x16 hexagonal grid, where a DM can input walls, chests, and place customized players and monsters. The game board will differentiate each of these hex types with different colors and use magnetic sensors to detect the tokens. A keypad and LCD also come on to the board where the players and DM can interact with the board, inputting dice rolls for initiative and combat, move tokens, view stats of each character, and more. The Dungeon Crawler is designed not to replace the beloved genre of role-playing games, but rather enhance the experience.

2.0 Product Illustrations

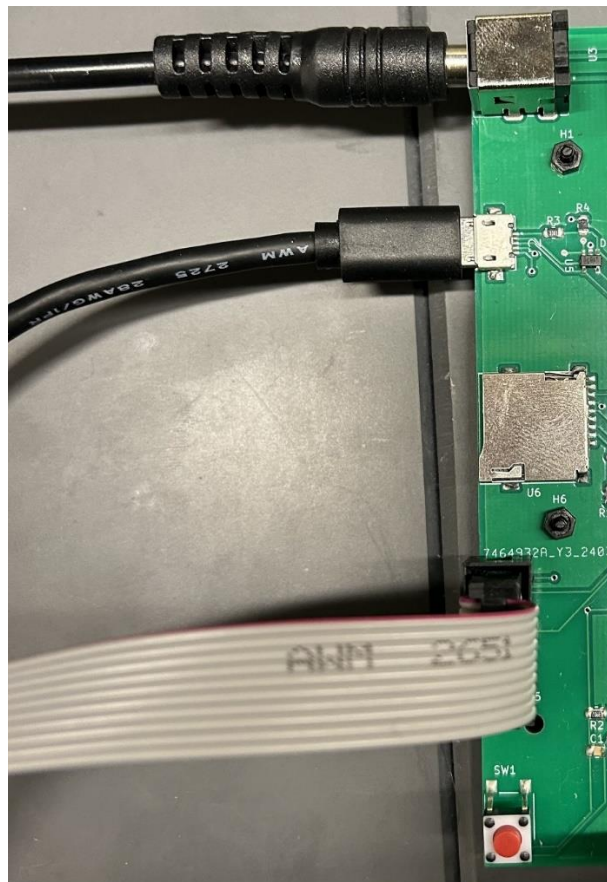


Figure 1. External Inputs and Reset Button

The top slot is for the power cord. The second slot is for the USB cable. The third slot is for the MicroSD, which as of now is non function, so please do not put a card in the slot. While using the product, the fourth slot should have no cable. If it does, it will not work. The final component is the reset button, which can be used to restart the program at any point.

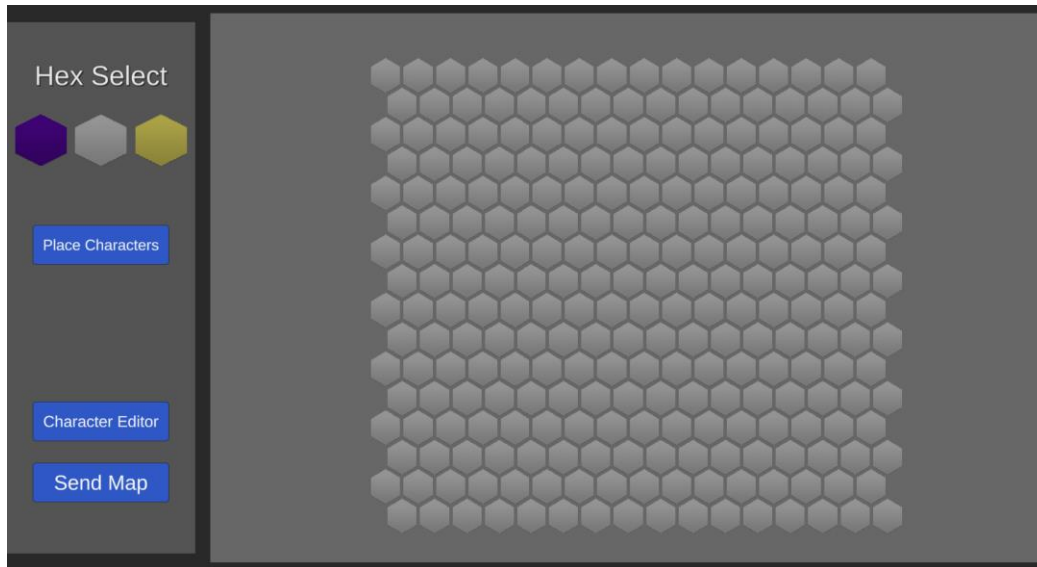


Figure 2. Application: Map Editor

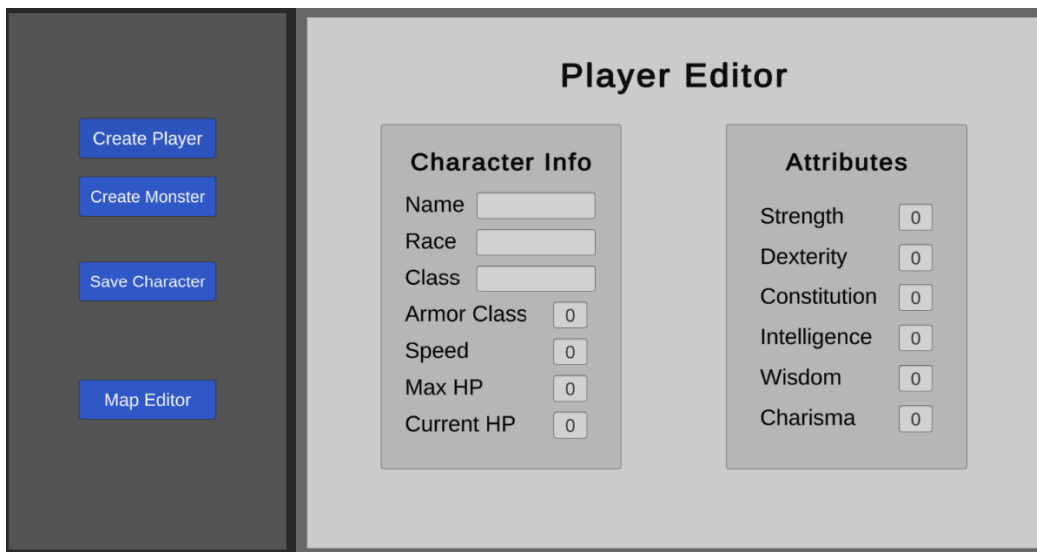


Figure 3. Application: Player Editor

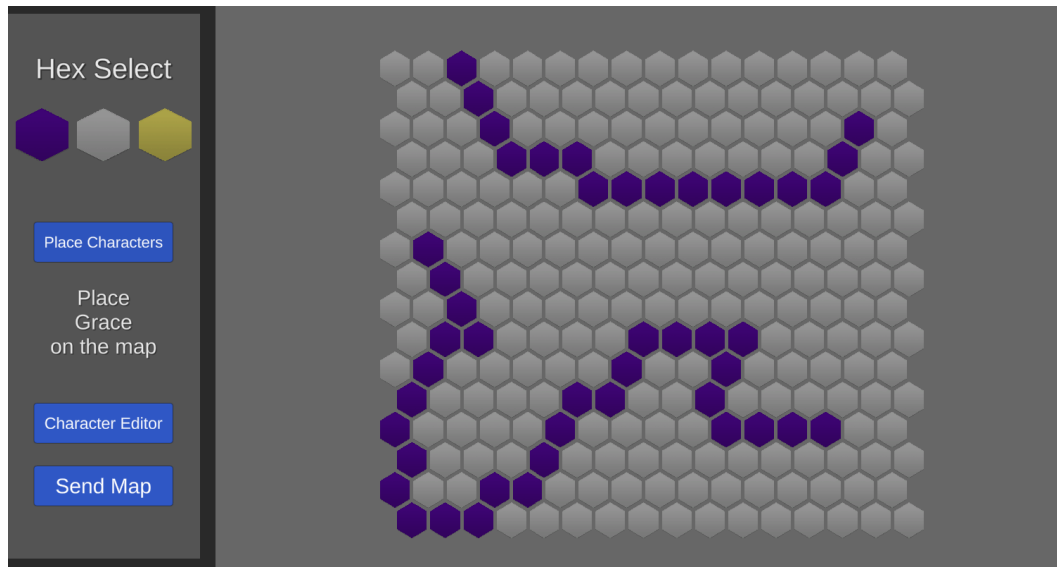


Figure 4. Application: Placing Character



Figure 5. Keypad

The digits 0-9 work as normal, but the other keys are modified. For this product, the asterisk represents the backspace key, the hashtag represents the enter key, A represents scrolling/selecting up, and D represents scrolling/selecting down. The B and C keys are not used.

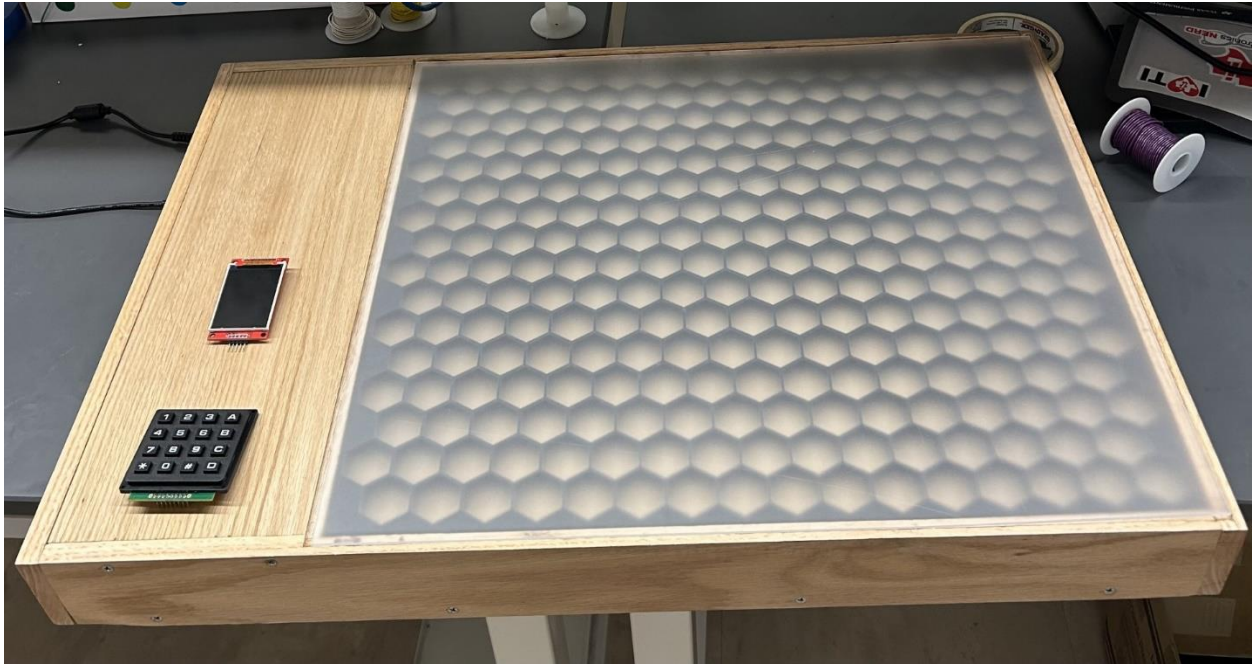


Figure 6. Game Board: Top View



Figure 7. Game Board: Side View

Each component will lay and be plugged in these relative positions. The reset button will be slightly further down from the USB connection.



Figure 8. Tokens

Only tokens provided with the Dungeon Crawler are guaranteed to work.

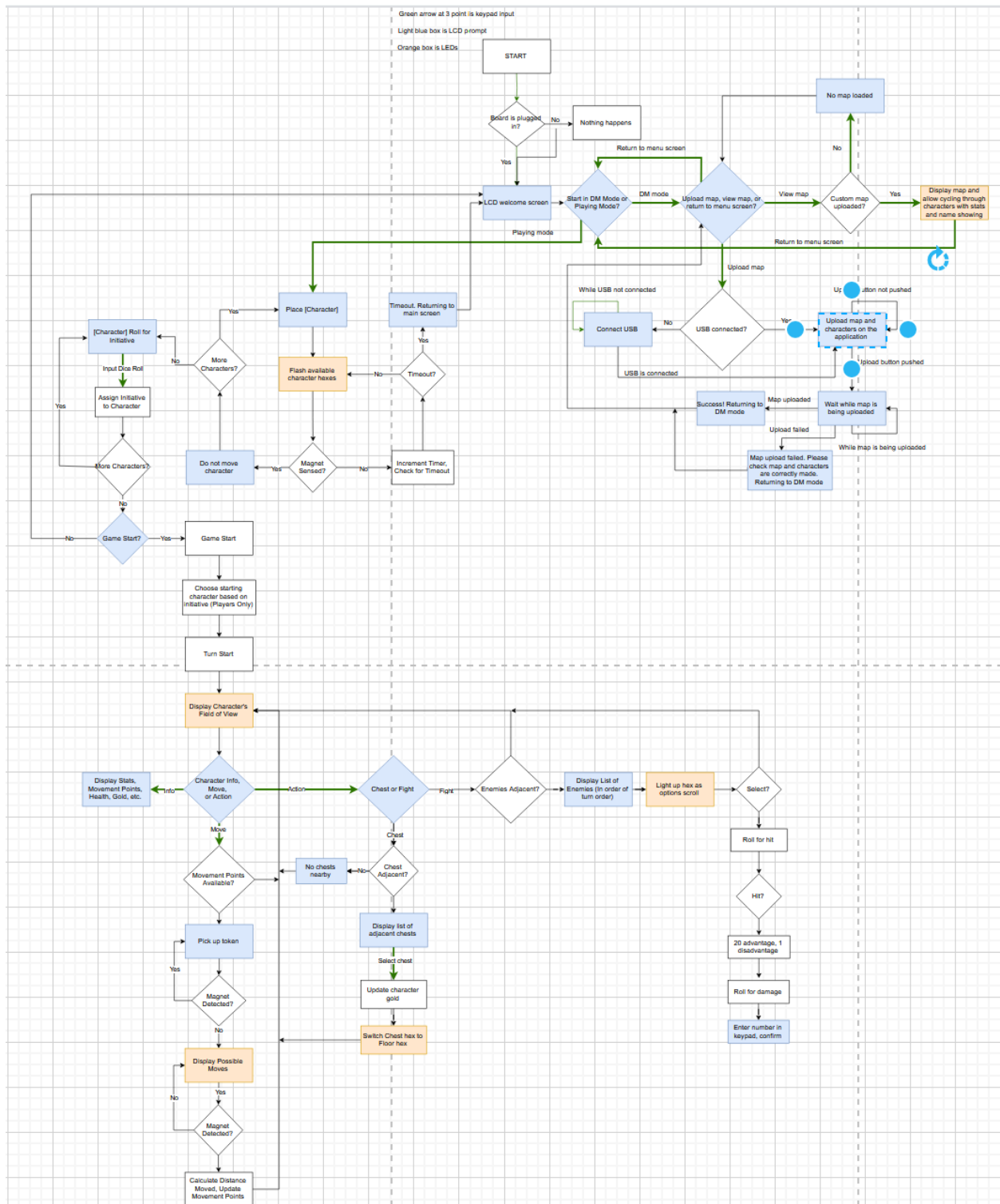


Figure X. Software Flowchart

We pardon the size of the text. Please feel free to copy the image and zoom in at leisure.

3.0 Setup Instructions

For any confusion with the steps below, refer to Figure 1 for the external inputs and reset button, Figures 2-4 for the application, Figure 5 for the keypad, Figures 6-7 for the game board, Figure 8 for the magnets, and Figure 9 for the game flow logic.

To set up the project, please do the following:

1. Acquire all the necessary materials, including the board, the power cord for the board, a micro-USB cable, a laptop with reliable USB ports, magnetic tokens, role-playing dice, and all the information necessary for designing the characters.
2. Plug in The Dungeon Crawler to an outlet and verify that it is on by checking the LCD. It should say "The Dungeon Crawler" on the top of the screen and "Enter The Dungeon" should flash on the bottom of the screen.
3. Plug in the micro-USB cable into the game board and the laptop. The laptop will only be needed for importing the characters and map for the game. The USB connection will be verified at a later step.

4.0 Usage Instructions

For any confusion with the steps below, refer to Figure 1 for the external inputs and reset button, Figures 2-4 for the application, Figure 5 for the keypad, Figures 6-7 for the game board, Figure 8 for the magnets, and Figure 9 for the game flow logic.

To use the product, please do the following:

Creating A Map and Characters:

1. Launch the application for designing the map and characters. This step is needed to play the game. If you only want to design a map and visualize it on the board, that is also possible. Customize the map and characters as you wish. For the hex colors, purple represents the walls, gray represents the floor, yellow represents a chest, blue represents a player, and red represents a monster.
2. To create a map, simply add the wall and chests hexes. By default, the map is all floor hexes. You can drag the mouse to create a line of hexes of the same type. If you make a mistake, you can select any hex and overwrite another. To place a character, a character must first be created. Select Character Editor mode on the application and select whether the character is a player or a monster. Type in all the information for a character and save it. You can create multiple characters. Go back to Map Editor mode and selecting Place Characters. The character placement will be in the order you created and saved them. Players will show up as blue on the map, and monsters will show up as red.

Uploading A Map and Characters:

1. On the game board, hit the enter key on the keypad to go beyond the Welcome Screen. The LCD will now display DM Mode or Playing Mode. DM Mode will allow you to upload the map and view it. Playing Mode will start the process of playing the game. You cannot go into Playing Mode without having a map or characters defined.
2. Go into DM Mode and select Upload Map. If the USB is not connected the LCD will notify you. If you do not plug it in in time, the game board will timeout and return to the previous screen. If the USB is connected, it will ask you to send the map. On the application click on Send Map. The LCD will notify when the map is uploaded.
3. Selecting View Map will allow you to see the map on the board. Not defining any characters in the application will not prohibit this action, so feel free to adjust the map if it does not look as you expected on the board. The Return to Menu option will take you back to the DM Mode and Playing Mode options.

Playing A Game:

1. If you wish to play the game, select Playing Mode. The LCD will now let you place the tokens for all the players and enter the initiative for all the characters. At this point, those playing the game will now be involved, instead of it just being the DM. In order of how

the characters were saved, it will ask you to place a token on the location marked by the DM on the map. After placing the token, you can confirm this is the correct location. Retrying will let you retry with that player. It will not take you back to the beginning. It will then ask you not to remove the token, and now it will ask you to input the initiative. There is a timeout if you do not enter in the value in one minute. For monsters, it will not ask for you to place the token, but it will ask you to define the initiative. After each character has defined the initiative, you can view the stats of the character to verify it is correct. Selecting Continue or Return will automatically go on to the next character.

2. After finishing with all the characters, the game will sort the characters by initiative for the turn order, and the LCD will ask if you wish to start the game or return to the menu. This is a final check that all the information entered was correct.
3. Upon selecting Start Game, the character with the highest initiative will start and go down in descending order, restarting at the beginning. For monsters, they will not be able to be moved until a player can see them or is within a certain distance. Once a monster is activated, they will be inserted in the turn order and the DM can now move and do actions with them. The turn will be indicated by flashing the hex of the player whose turn it is.
4. A player can view their stats, move, use an action, and finish turn. As of now, the options for an action include looting chests and fighting monsters. A monster, via the DM, can move, view their stats, and fight players. Viewing stats works the same way as viewing stats in the game set up, except it will update as their stats change throughout the game.
5. For moving, a character can pick up their token and see the available moves, place their token on an available spot, and confirm their move. The character can move up to the amount of movement points they have, which is equal to their speed. They can choose to move with all their movement points at once or pick a specific path by repeatedly moving in increments, confirming the move, and selecting the Move option again. For looting chests, only available to players, a player must be adjacent to a chest. Upon looting, the gold will be added to the player's stats, and the chest hex will disappear, becoming a floor hex.
6. For fighting a player or a monster, a character must be adjacent to a character of the opposite type. Upon choosing to fight, the character must input the dice roll to see if the attack was successful. If it was not, the action ends. If it was, then the character can input the damage roll and inflict that amount upon the opposing character. The lights will flash to indicate that damage was taken. Timeouts of one minute exist for both dice rolls. When the timeout is reached, the game will return to the character option screen. An action is still available if the timeout is reached.
7. A character will die when their HP is or below zero. The character hex will disappear and be taken out of the turn order. Any gold on the character will go to the character who successfully defeated them.
8. If at any point upon selecting an action and multiple targets are available, the keypad can be used to select which hex is the target. The lights will flash to indicate visually which target is selected.
9. The game ends when either all the players are dead, or all the monsters are dead, and all the chests are looted. If the players win, they can view their updated stats in the same order as the turns. Viewing the stats operates in the same fashion as before. Once all players have viewed their stats, the LCD will then ask to End Game, which is simply a formality. A timeout will occur after one minute, which will automatically end the game and return to the welcome screen.

5.0 Troubleshooting Instructions

Q: What if I sent the wrong information about my map to the board? Does this mean I have to restart?

A: Prior to starting the game, you can return to the menu screen and in DM Mode, you can upload the map again. If the application is open, it will keep the map, so you can make those adjustments without having to create an entire map.

Q: The keypad enters in multiple values when I only selected one. How do I get this to stop?

A: Unfortunately, this is a timing issue that needs to be investigated further, but we implemented a backspace and enter feature that allows you to reenter your number, as well as not fully enter it until it is to your satisfaction.

Q: The board does not register my magnets consistently, causing my character to move in ways I did not want it to. Why is this the case?

A: Our board comes with magnets that work, but if you wish to use different magnets on your tokens, ensure that the magnets are close to the bottom of the token, and do test that the sensors consistently measure your tokens. If you use your own magnet, we cannot guarantee 100% success. To ensure your character moves properly, avoid sliding your tokens across the board, and instead pick them up and place them down in the center of the hex to minimize the amount of interference.

Q: How come the game is not ending even though we defeated all the enemies?

A: It is possible that there is an issue with our code, but most likely there is a chest not looted somewhere, or there is a location that holds a chest or monster that is not accessible due to the map design. Please verify that every location of empty space on the map can be accessed before playing the game. We add in several checks to verify that the map and character placement is correct prior to the game starting. If you are locked and cannot end the game, you can view the stats of each character through the turn order, and then end the game by unplugging the board or hitting the reset button.

Q: The board was accidentally unplugged, and the entire game was lost. Is there a way to save game progress?

A: Unfortunately, at this moment there is no way to save game progress. When the power is lost, the board does a hard reset, where it sets all values and maps to clear to ensure there is no data bloating and corruption. Please ensure there is always a strong power connection.

For more issues and fixes, refer to our website: <https://engineering.purdue.edu/477grp1/>