**SNEC**

**Snake Navigation and Entertaining Challenge**

**Capstone Project Submission by:**

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**Description:**

We have made a snake game with our own elements. As the algorithm for snake game already exists all over the internet, we decided to take it up a notch by not just making the game, but also adding an opponent, so that it feels like a snake game only, but more competitive and challenging. The whole game is also made to run on an Arduino board with a TFT display shield using minimal and basic graphics.

**Motivation:**

For our first major project we wanted to keep it simple yet we wanted to do something new and special. We wanted to take something that already exists and make it more exciting.

**Highlights:**

* We have used arrays for the movement of snake body.
* Used Arduino library and Mcufriend library in the code.
* Each member has developed separate functions which are used together to make the game run.
* A simple path finding algorithm has been made for the opponent snake
* Various levels of difficulty can be chosen for the game.
* Serial communication with a pc is used to control the player snake in the game.

**Learnings:**

* An ingenious use of array for snake Navigation.
* Detailed use of various functions together and their implementations in game development.
* Teamwork in developing project.
* Developing an organised and legible code.
* Debugging code.
* Using an Arduino.
* Simple Graphics creation.
* Using TFT display shield with Arduino.
* Serial communication of Arduino with PC.

**Scope for improvement:**

* Better algorithm for opponent snake
* Polished graphics
* Better user interface
* Addition of Multiplayer
* More memory efficient code
* More organised code

**Future scope:**

* Online multiplayer gameplay
* Monetisation of game
* Modding and Customisation

**Contributions:**

**Arkapal Haldar-**

Worked on moveSnake() function that is used to control the player snake. And also worked on the check collision functions used to check if the snakes are colliding with themself. So that game over can be done.

**Jyotiraditya Bag-**

Worked on moveSnake2() function that is an algorithm for the opponent snake to move by itself. Also responsible for split screen gameplay logic and General planning of game structure. Implementation of game in Arduino.

**Shreyansh Shashwat-**

Worked on the main loop function of the game, combining all functions together. Developed The initialisation function startGame(). Responsible for general logic structure of game. Level selection algorithm. Bounding the snakes to their respective side.

**Sujal Shankar-**

Worked on the functions that deal with spawning the apple, and also despawning of apple when eaten, i.e. the spawnApple() , spawnApple2() and eatApple(), eatApple2() functions. Keeping track of score and highscore.

**Sidharth Patra-**

Worked on display functions like start game scene, game over screen, draw snake. Displaying scores and highscores, version information. Helped in all display related functions like display of apple and splitting screen. Making screen clearing function.

**Experiences:**

Went though a myriad of versions and tons of debugging to reach the latest version which is close to our planned project.  
Faced problems in game logic like Snake not moving according to plan, colliding with itself and dying instantly. Some times apple spawned inside the snake, we had to debug that too. Bounding of the snake was also an issue. The team members went through the various library functions of Arduino before applying. But through team effort and revisions of code, we finally achieved a playable version.