**Group 8 – 30: Project Proposal**

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The EV3 robot that we are planning on designing and building is a Chess Playing robot. The robot will have the functionality to take a chosen move and execute the move on the board. It will include a chess timer for two players, as well as the ability to setup and run puzzles for the user to practice their skills. This project is interesting to us as we are all chess players looking for a challenge. This project will be able to challenge chess players with different board setups and difficult positions. We plan to give the robot the ability to replay a previously played match, that is read in from an external file. This will be useful for importing a professional game and analyzing the moves, giving users an opportunity to compare their gameplay to others.

The system will implement motor encoders to move a carriage through two dimensions, with a claw on the carriage. It will use touch sensors to zero the axes, and it will use the buttons for user input. The fourth input for the project comes in the form of file input and will read text files for different problems and board setups.

The system will use a chess clock style timer to display to the users, which will implement timers in EV3. We will use looping for many programs, some of which include while loops to move the carriage to a specified motor encoder location, and for loops to iterate through board positions.

The system will use decisions to measure different inputs and react accordingly, as well as recognize particular events. This includes recognizing when a piece is being taken, which will prompt different movement then just moving a piece to an empty cell would.

The system will use many functions, including but not limited to:

* Moving the carriage to a specific location
* Closing and opening the claw
* Loading a specific board
* Zeroing the machine (on the two axes)
* Getting user input for moves
* Writing relevant data to the screen

Some aspects of the project that may be challenging are the creation of the two-axis machine. Although we have had some experience building claws in Tron Days, it will be quite likely that we will run into issues in the design and building of the machine, given the material restrictions. Another challenge that we anticipate is the accuracy of the machine. Sometimes Lego robots can be imprecise, especially over many movements. Thus, we are planning on making a way to zero the machine with a touch sensor (as a 3D printer does with limit switches) to resolve any issues with inaccuracy.