**Raspberry Pi Final Project**

The project we selected is one based on the game “Minesweeper”. The Minesweeper is a common game that is installed on most computers that come with Windows by default. It is a single-player puzzle game. It consists of an interactive window with squares in it. The objective of the game is to reveal the contents of each square without detonating any of the hidden “mines” in the shortest time possible. The size of the grid and the number of mines are set in advance by the user either by the skill levels or entering numbers for the number of mines and squares in the grid. For most variations of the game, the first square selected contains no mine fields. Most people click around randomly hoping not to hit a mine. However, to master the game, one must play with some strategy.

The player is initially presented with a grid of undifferentiated squares. Some randomly selected squares unknown to the player contain mines, others contain digits that give clues about the number of neighboring mines in each field, and the remaining squares have empty fields. When a square is selected, the contents of its fields are revealed. If a square containing a mine is revealed, the player loses the game. If at least one mine is adjacent to the selected square, a digit is displayed indicating how many adjacent squares contain mines. If no mines are adjacent to the selected square, all the adjacent squares will be recursively revealed. Adjacent squares can be on either the right side, left side, top, bottom or diagonal to the square being evaluated. The player uses the digits to deduce the contents of other squares and uses this information to either reveal more squares or mark a square as containing a mine. The game is won when all mine-free squares are revealed.

Our variation of the game implements the basic play logic of the game. However, instead of having the mines generated at random positions, the mines represent patterns that are identified with the various constellations. The program therefore creates of a set of constellations that can be randomly selected from in each instance of the game. In addition, one of the letters of the name of the constellations flashes on LEDs attached to the RPi using GPIO, hence giving a hint on the shape of the constellation. We may also incorporate audio output to be executed each time the player solves the puzzle. When the player solves the puzzle, a more difficult instance is generated by increasing the size of the grid. The game also keeps record of the player’s name, scores, and the time within which they complete each instance of the puzzle. The players are then ranked according to the level of difficulty they reached, and their speed of solving the puzzles.

We believe that with adequate planning, this project can be idealized into a project and accomplished within the allocated time. Obviously, the project needs to be broken down into smaller tasks and allocated accordingly to the team members.