Design Explanation
Group A2

We opted for a Superhero car themed design because we believe farmers are our greatest Superheroes. Our design has multiple layers for placing the components. Our aim was to have a clean looking design and to hide the components and wires inside the robot. We have discussed our major design decisions below:

Figure ii: Final Design

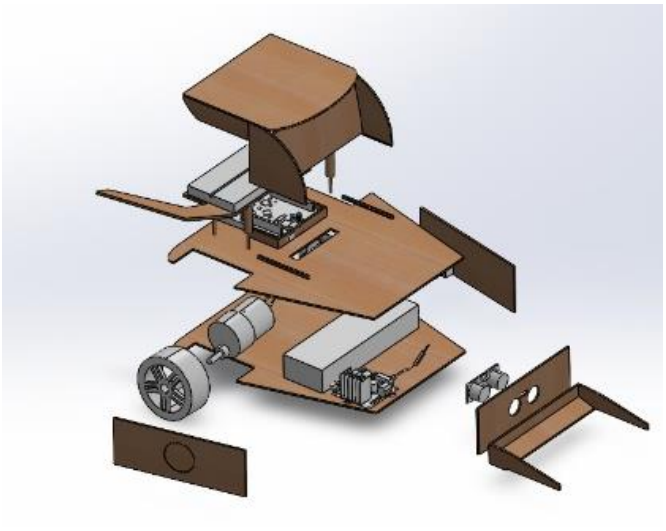

Figure ii: Exploded View

The bottom layer holds the motors, the battery, and the motor driver. The RGB color sensor and the IR sensors are attached to the external surface of the bottom layer, facing the floor. The wires from the sensors travel through a hole to the internal cabin and then to the breadboard. This way we have minimized wire visibility to give the robot a clean and nice outlook.

We have used two brackets to attach the motor to the main chassis. We opted this design so that we can detach the motor, if necessary, by simply unscrewing the brackets. The motors, motor driver and the battery are placed together to minimize wire travel.

The second layer acts as the cover for the first layer. It is attached to the first layer with fixed screws on the back end and using magnet on the front end. It has a hinge in the middle. We can detach the magnet and fold the front half of the cover to access and inspect the components on the first layer. The second layer holds the Arduino on its back end. It also has a hole near the hinge for all the wires from the bottom layer to come out and connect to the Arduino and the breadboard.

On top of the second layer there is a small stage for placing the breadboard. This stage covers the Arduino and is attached to the second layer using 2 columns. The shape of this stage gives the car it's themed look.

We have a harvester attached to the front of the bottom layer. Initially the requirements included collecting objects from the grid using a harvester. We designed the harvester symmetrically with the breadboard stage to complete the look. The whole car has a narrow front, wide back shape just for design purpose.