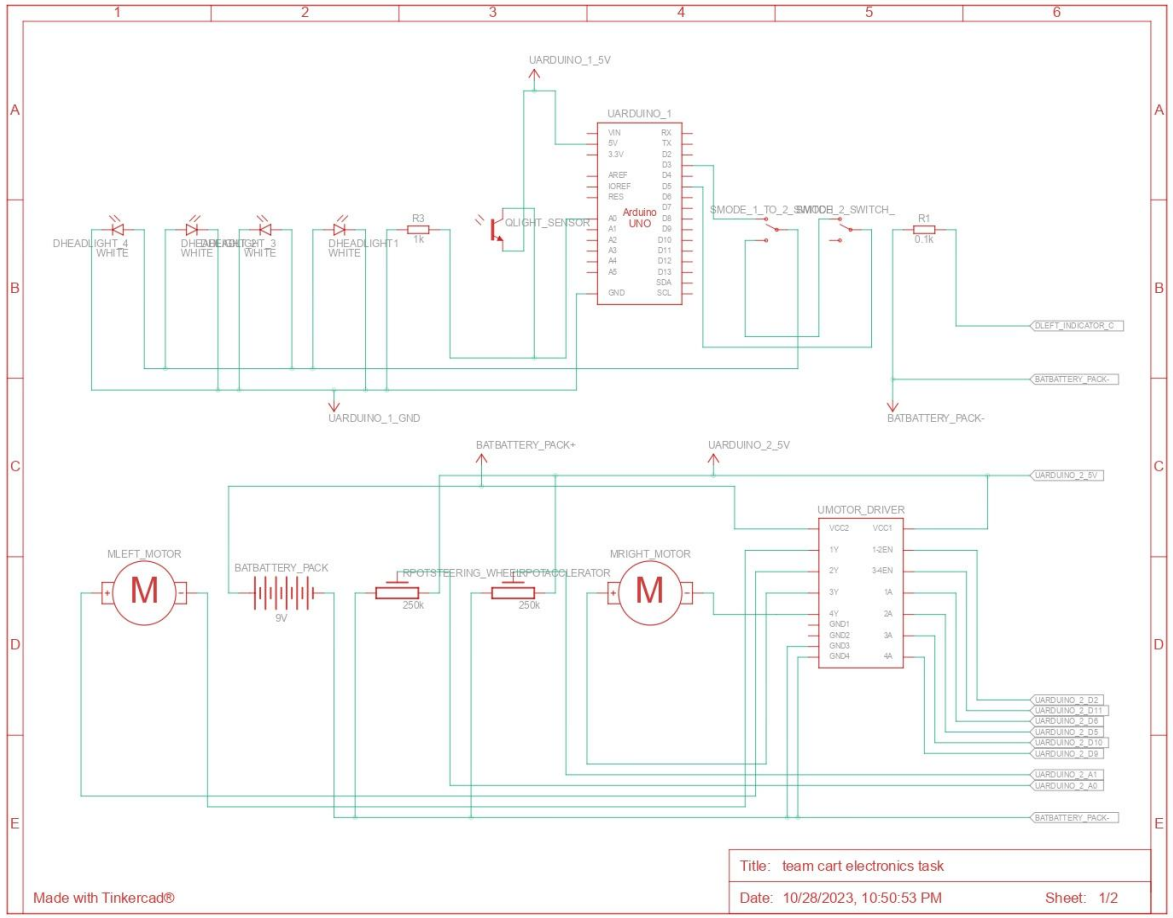
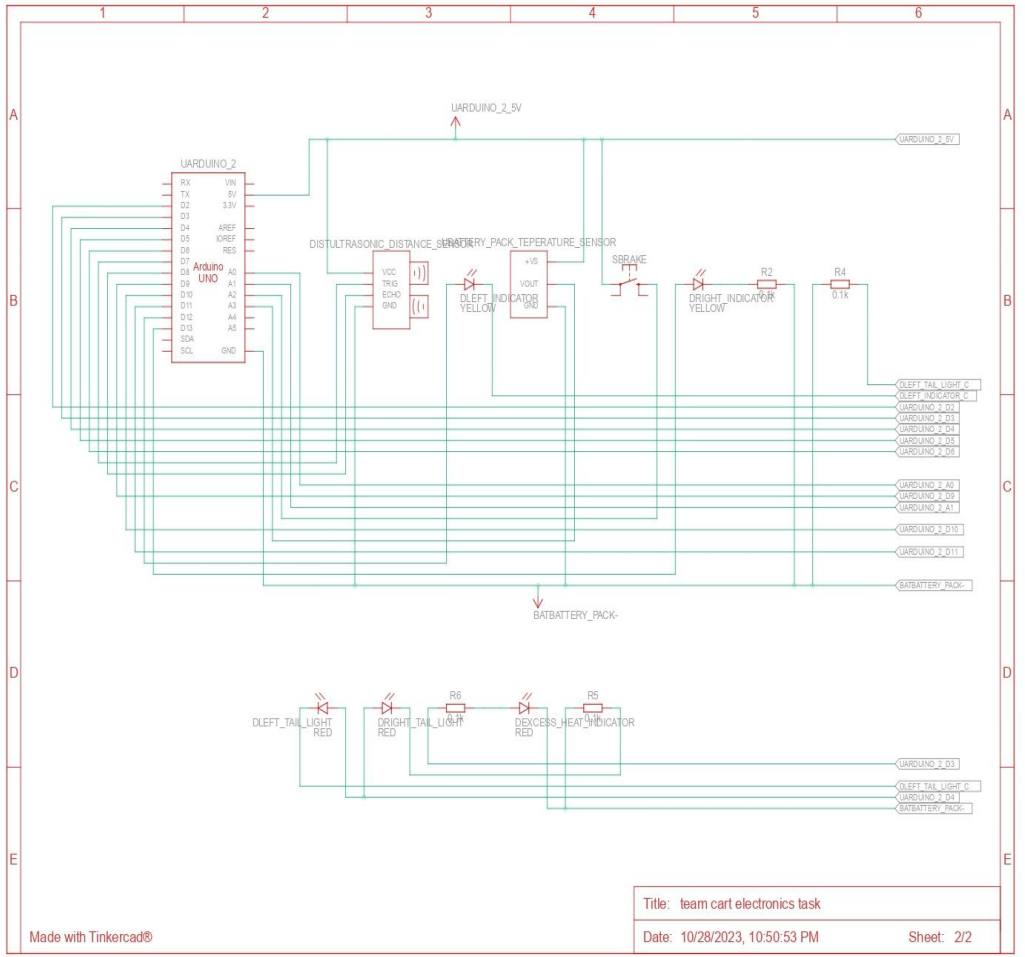
TeamKart Electronics Task Documentation

Components used :-

Name	Quantity	Component
Dheadlight1, Dheadlight 3, Dheadlight 2, Dheadlight 4	4	White LED
Uarduino 1, Uarduino 2	2	Arduino Uno R3
Qlight sensor	1	Ambient Light Sensor [Phototransistor]
R3	1	1 kΩ Resistor
Smode 2 switch , Smode 1 to 2 switch	2	Slideswitch
Mright motor, Mleft motor	2	Hobby Gearmotor
Umotor driver	1	H-bridge Motor Driver
BATbattery pack	1	9V Battery
Rpotacclerator, Rpotsteering wheel	2	250 kΩ Potentiometer
Dleft indicator, Dright indicator	2	Yellow LED
R1, R2, R4, R5, R6	5	0.1 kΩ Resistor
Dleft tail light, Dright tail light, Dexcess heat indicator	3	Red LED
Sbrake	1	Pushbutton
Ubattery pack teperature sensor	1	Temperature Sensor [TMP36]
DISTultrasonic distance sensor	1	Ultrasonic Distance Sensor

Circuit Diagram





Features

1. **Headlights**:

The model is having two modes of headlight white LEDs

Mode1- The headlights will turn on when the Intensity in the light sensor drops below 25% of the maximum intensity.

Mode2- A switch should be used to operate the Headlight.

2. Battery Pack:

The model is having one 9V battery

3 Accelerator and Steering:

a) Model is having a potentiometer used as an accelerator
b) Model is having a potentiometer used as an steering
- If the potentiometer is at the middle (Zero steering angle)
- If the potentiometer is at the Right(positive steering angle)
- If the potentiometer is at the Left(negative steering angle)

c)*The model is also having a differential such that the minimum difference between the rpm of the wheels is 0 and maximum is approx 30 at minimum and maximum steering angle .*

4 Side Indicators:

- If the Steering turns more than 75% in the positive side, a right yellow LED glows up depicting a right turn.

- If the Steering turns more than 75% in the negative side, a left yellow LED glows up depicting a left turn.

5 Motors:

The model is having two Hobby Gearmotors for depicting front motors giving the maximum RPM of 220 .

8 Brake:

Model is having a brake causing the RPM of the motors to go to zero.
And if the brake is pressed then red LEDs corresponding to tail lights
glows up.

9 Safety :

a) A temperature sensor is incorporated to prevent overheating of the battery pack .
When the temperature increases more than 80 degrees the model stops working and
a red light warning signal starts glowing .

b) An ultrasonic distance sensor is used as an emergency braking system to automatically reduce the speed of both motors to 10 RPM whenever the car gets 70 cm near to rigid objects to reduce chances of impacts.

Tinkercad access link -
https://www.tinkercad.com/things/lgbLZBDMbo0?sharecode=2V5zPxEWuj0l2Px91H8ZnjsiH0pc4m9RHek6BCDcOL0

NOTE - Circuit code can be viewed in the Tinkercad link.

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