Task 3.1B - Thirsty Crow

Robot Construction and Interfacing

In this task you are required to do the following:

1. Construct the chassis of the robot and the electromagnetic lifting mechanism
2. Interface the DC motors and electromagnet with the ATMEGA2560 Microcontroller
3. Record a video demonstrating the movement of the robot and the triggering of the electromagnet circuit.

Robot Chassis and Electromagnetic Lifting Mechanism Construction

- You have to construct the robot using the electronic and mechanical components already given in the kit.
- You are free to choose any material to construct the chassis of the robot. Make sure the material is sturdy and durable to take the weight of all the components to be mounted on the robot.
- You are free to design the electromagnetic lifting mechanism any way you want. You have been given 1 Servo actuator to incorporate movement to the mechanism (if required).
- Readymade mechanisms are not allowed to be used for construction of the electromagnetic pickup mechanism.
- Please remember, you are not allowed to use any additional sensors or secondary microcontroller to interface with your primary microcontroller. However you may use additional actuators if you want, **with permission from the eYantra team.**

Interfacing of DC Motor and Electromagnet

- Please refer the *3.Assembling the Hardware Testing.pdf* in the Hardware Testing folder for instructions on how to make the connections for motor and electromagnet interfacing.
- In the Task 3.1B folder you will find the AVR project folder named **Crow-Robot.** Open the project using Atmel Studio and you will be able to build and compile the code in this project.
- You are required to make changes to the following functions:
  - *magnet_pin_config()*
  - *motion_pin_config()*
  - *magnet_on()*
  - *magnet_off()*

- *forward()*
- *backward()*
- *right()*
- *left()*
- *soft_left()*
- *soft_right()*
- *stop()*

- You are not allowed to make any changes to the code in the main() function.
- Once you are done, you need to build the project to generate hex file.

Recording the Video Demonstration

- Once you have generated the hex file, you need to burn that hex file onto your Atmega2560 microcontroller.
- If you have made all the connections properly and completed the code in Crow-Robot project correctly, your robot should execute the following in a loop:
  - Move forward for 3 sec
  - Stop
  - Energise Electromagnet
  - Wait 3 Sec.
  - Move backward for 3 sec
  - De-energise magnet.
  - Stop
  - Wait 3 sec.
- Shoot a 60 second video of the robot executing the above maneuvers.
- Name the video as **eYRC#TC#<Team Id>#Task3.1B** and upload it on Youtube as **unlisted**.
- Create a blank text file named **eYRC#TC#<Team Id>#Task3.1B.txt** and copy the Youtube video link to this file.

Great! You have completed Task 3.1