

# Programming Assignment

November 2, 2016

Create a variable speed motor driver using the Timer modules as described in class. The driver interface should include the following:

```
void initialize_left_motor();
void brake_left_motor();
void coast_left_motor();
void engage_left_motor_forward();
void engage_left_motor_reverse();
void set_left_motor_duty_cycle( uint8_t duty_cycle);
uint8_t left_motor_duty_cycle();
void initialize_right_motor();
void brake_right_motor();
void coast_right_motor();
void engage_right_motor_forward();
void engage_right_motor_reverse();
void set_right_motor_duty_cycle( uint8_t duty_cycle);
uint8_t right_motor_duty_cycle();
```

Create a demonstration program that:

1. Lights a LED upon program start
2. Waits for a button press on any button
3. Performs the following sequence of movements exactly once, with a 1s delay between movements:
  - (a) Moves the robot forward at full speed for 1s
  - (b) Moves the robot in reverse at half speed for 2s
  - (c) Pivots the robot counterclockwise at 25% speed for approximately 1 revolution
  - (d) Pivots the robot clockwise at 10% speed for approximately 1 revolution
  - (e) Travels in an obvious forward arc for t seconds (you choose the radius and time t) interface
  - (f) Performs the inverse operation to e
4. The robot should be at approximately its starting position and the program should return to step 2