

DT228-1 Car Lab 1.

Objective:

Develop a timing and control system for a remote control car which will allow it navigate around an obstacle course in the laboratory.

Equipment

MSP430 launchpad, Remote control car with 3V control unit wired for Launchpad control.

Input/Output List:

| I/O Bit | Function |
|---------|--|
| P1.0 | When 0 causes the car to drive forwards |
| P1.1 | When 0 causes the car to drive backwards |
| P1.2 | When 0 cause the car to turn right |
| P1.3 | When 0 causes the car to turn left |

Instructions

- (1) Using the LED attached to P1.0 write a delay function with the following prototype:
void delay(long milliseconds); // delay for stated number of milliseconds
You should test this by flashing the LED on and off and counting flashes over a period (timed using the PC clock/phone/watch)
- 2) Write the set of library functions for controlling the car (e.g. TurnLeft(), Stop(), GoForward() etc.)
- 3) Examine the obstacle course and determine the correct sequence of car manoeuvres.
- 4) By trial and error adjust the timing of each manoeuvres such that the car negotiates the course

Skeleton program

```
#include "io430.h"
// declare any constants and bitmasks here.
// prototype all functions here
void SysInit();
// Global variables here
// Main function
void main()
{
    SysInit();
    while(1) { // main control loop goes here
    }
}
void SysInit()
{
    WDTCTL = WDTPW + WDTHOLD; // disable watchdog timer for debugging purposes.
    // set chip running at 1MHz (factory calibrated)
    DCOCTL = CALDCO_1MHZ;
    BCSCCTL1 = CALBC1_1MHZ;
    // set up data direction registers etc. here
}
```