LAB REPORT

ENGINEERING LABORATORY

ENGR 1204, FALL 2022

Laboratory Exercise #9

Laboratory Name: Sensors And Conditionals

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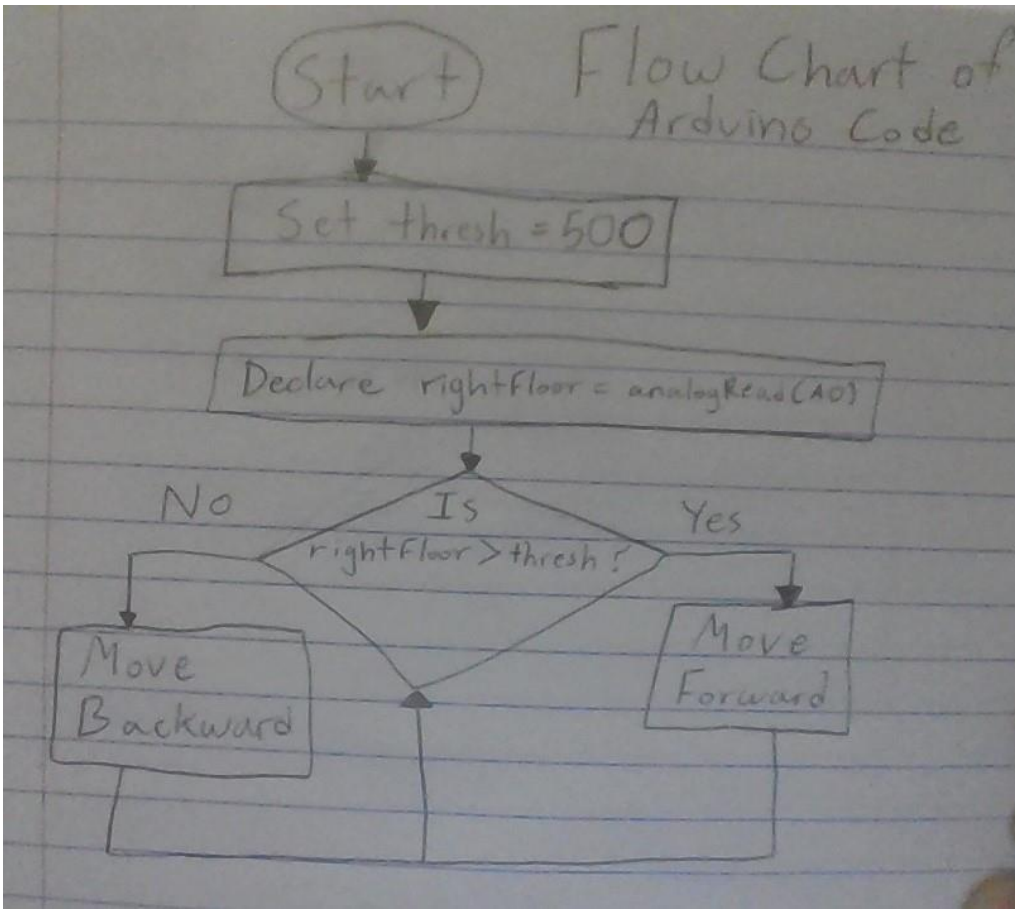
WENTWORTH
Institute of Technology

Objective: This lab tests how floor sensors on a Sumobot controls the movement and direction of the Sumobot's wheels when moving over black colored paper and white colored paper.

Procedure & Results:



This Arduino code was used to control the Sumobot. A global variable (above the setup() function) was added because that variable was used so that the robot knows what to do when hovering over black or white paper. The variable “thresh” was set to a value 500 because the value that was given by the serial monitor when the Sumobot is over white paper was close to 1000 (actual values were 991, 993, 992, etc) and so 500 was the halfway mark. A value above 500 given by the serial monitor means that the Sumobot is over a black piece of paper and the car will move forward. A value below 500 means that the car is over a white piece of paper and the car will move backwards.

The code:

```
if (rightFloor>thresh) {

Timer1.pwm(9,76); //
```

```
Timer1.pwm(10,78); //
}
else {
Timer1.pwm(9,78); //
Timer1.pwm(10,76); //
}
```

shows the process in which the Sumobot goes through when deciding how to move.

Typical Values Observed from Floor Sensor			
Over Black Color		**Over White Color**	
Analog Voltage from DMM	**Number value in Console**	**Analog Voltage from DMM**	**Number value in Console**
0.258 V	50	4.911 V	991
0.259 V	50	4.933 V	993
0.260 V	51	4.929 V	992
0.2606 V	50	4.919 V	987
0.2607 V	51	4.915 V	983

Alligator clips were connected from the Sumobot and onto the DMM. Several values of Analog Voltage was recorded and displayed on the DMM when moving the sensor of the Sumobot over on black and white pieces of paper. This chart also shows the relation between the number value given by the Serial Monitor and the Analog Voltage.

Summary: This lab successfully controlled the Sumobot's movements when over black and white pieces of paper using Arduino Program code. Initially, there were some slight problems with the ordering of certain parts of the code. After looking at the whole code from top-to-bottom multiple times, the variables and if-then statements were placed in their correct order and then the code was able to successfully run.