// Movement Functions

void movement(int movementFrm, int movementTo, unsigned int delayTime, unsigned int wheel)

{

 int i = movementFrm;

 while (i != movementTo) // Acceleralte slowly to stop Backlash

 {

 if (i > movementTo) { i--; }

 else { i++; }

 if (wheel == BOTH) { set\_motors(i, i); }

 else if (wheel == RIGHT\_ONLY) { set\_motors(movementFrm, i); }

 else if (wheel == LEFT\_ONLY) { set\_motors(i, movementFrm); }

 delay\_ms(delayTime);

 }

 if (wheel == BOTH) { set\_motors(movementTo, movementTo); }

 else if (wheel == RIGHT\_ONLY) { set\_motors(movementFrm, movementTo); }

 else if (wheel == LEFT\_ONLY) { set\_motors(movementTo, movementFrm); }

}

void back\_off(int timeForBackOff, int turnValue, int reversalTime)

{

 movement(0, negSpeed, 2, BOTH);

 delay\_ms(reversalTime);

 set\_motors(negSpeed, (negSpeed + turnValue));

 delay\_ms(timeForBackOff);

 movement(negSpeed, 0, 2, BOTH);

}

void initialize()

{

 pololu\_3pi\_init(2000);

// PololuQTRSensorsRC(pins, 5, 4000, 255);

 menu(PRI\_MENU);

 print("Go!");

}

int main()

{

 play\_from\_program\_space(startup);

 initialize();

 read\_line(sensors,IR\_EMITTERS\_ON); // Read the sensor values into the 'sensors' array.

 unsigned int allSensors = (sensors[0] + sensors[1] + sensors[2] + sensors[3] + sensors[4]);

 unsigned int leftSensors = (sensors[0] + sensors[1]);

 unsigned int rightSensors = (sensors[3] + sensors[4]);

 unsigned int turningValue = 0;

 if (allSensors <= 0)

 {

 movement(0, speed, 10, BOTH);

 red\_led(0);

 green\_led(1);

 }

 while(1)

 {

 read\_line(sensors,IR\_EMITTERS\_ON); // Read the sensor values into the 'sensors' array.

 allSensors = (sensors[0] + sensors[1] + sensors[2] + sensors[3] + sensors[4]);

 leftSensors = (sensors[0] + sensors[1]);

 rightSensors = (sensors[3] + sensors[4]);

 turningValue = 0;

 }

// If there is a void

 if (allSensors > 0)

 {

 movement(speed, 0, 2, BOTH);

 int a = (largest\_sensor\_value()); // Outside left sensor is 1, inside is 2

 if (mute != TRUE)

 {

 play\_cliff\_alert();

 }

 red\_led(1);

 green\_led(0);

 clear();

 print("Correct.");

 lcd\_goto\_xy(0, 1);

 // If the void's on the left

 if (a < 2)

 {

 a = (a + 1);

 int b = 0;

 if (a == 1) { a = 2; } // Sets sensor 1 to have a value of 2 and vice versa

 else if (a == 2) { a = 1; } // for easier manipulation

 if (a == 1) { b = (sensors[1]); } // Increases turningValue if outside sensor has a value

 turningValue = ((a \* 100) + b);

 back\_off(80, turningValue, 100);

 print\_long(turningValue);

 set\_motors(0, 0);

 }

 // If the voids on the right

 else if (a > 2)

 {

 a = (((a - 4) \* -1) + 1); // Outside right sensor is 1, inside is 2

 int b = 0;

// if (a == 1) { b = (sensors[1] \* 5); } // Increases turningValue if inside sensor has a value

 turningValue = ((50 \* a) + b);

 back\_off(100, turningValue, 0);

 print\_long(turningValue);

 set\_motors(0, 0);

 }