void setup() {

// this program powers the ASR Craft to sense objects and drive towards them

// below we will name the pins on the Arduino will drive the motor relays

const int rmr = 45; // rmr stands for right motor reverse, this is the pin we will power when we want the right motor to drive in reverse

const int rmf = 47; // rmf stands for right motor forward, this is the pin we will power when we want the right motor to drive forwards

const int lmr = 49; // lmr stands for left motor reverse, this is the pin we will power when we want the left motor to drive in reverse

const int lmf = 51; // lmf stands for left motor forward, this is the pin we will power when we want the right motor to drive in reverse

// below we will set the pins that drive the motor relays as output only, they will not read any information

pinMode(rmr, OUTPUT); // sets pin 45 as an output

pinMode(rmf, OUTPUT); // sets pin 47 as an output

pinMode(lmr, OUTPUT); // sets pin 49 as an output

pinMode(lmf, OUTPUT); // sets pin 51 as an output

// below we will delay the program for 5 seconds before moving on to next step

delay(5000);

// below we will turn on both motors to the forward direction

digitalWrite (rmf, HIGH); // right motor move forward

digitalWrite (lmf, HIGH); // left motor move forward

// below we will delay the program for 8 seconds before moving on to next step

delay(8000);

// below we will turn the motors off

digitalWrite (rmf, LOW); // stop right motor

digitalWrite (lmf, LOW); // stop left motor

// below we will delay the program for 30 seconds before moving on to the next step

delay (30000);

// below we will pivot the craft to the left by turning the right motor forwards and the left motor backwards

digitalWrite (rmf, HIGH); // right motor forwards

digitalWrite (lmr, HIGH); // left motor backwards

// below we will delay the program for 5 seconds before moving on to next step

delay (5000);

// below we will turn the motors off

digitalWrite (rmf, LOW);

digitalWrite (lmr, LOW);

// below we begin the main monitoring loop

// this loop will repeat over and over until we turn the craft off

}

void loop() {

// main monitoring routine

// below we will name the pins on the Arduio will drive the motor relays

const int rmr = 45; // rmr stands for right motor reverse, this is the pin we will power when we want the right motor to drive in reverse

const int rmf = 47; // rmf stands for right motor forward, this is the pin we will power when we want the right motor to drive forwards

const int lmr = 49; // lmr stands for left motor reverse, this is the pin we will power when we want the left motor to drive in reverse

const int lmf = 51; // lmf stands for left motor forward, this is the pin we will power when we want the right motor to drive in reverse

// below we will set the pins that drive the motor relays as output only, they will not read any information

pinMode(rmr, OUTPUT); // sets pin 45 as an output

pinMode(rmf, OUTPUT); // sets pin 47 as an output

pinMode(lmr, OUTPUT); // sets pin 49 as an output

pinMode(lmf, OUTPUT); // sets pin 51 as an output

// below we will name the pins on the Arduino will be connected to each pir sensors

const int mainsensgnd = 41; // this is the front sensor ground, later we will tell the Arduino to output battery- on this pin

const int mainsenssig = 39; // this is the front sensor signal, this is where the Arduino will look for a signal from this sensor

const int mainsensv = 37; // this is the front sensor power, later we will tell the Arduino to output battery+ on this pin

const int lsensgnd = 36; // this is the left side sensor ground, later we will tell the Arduino to output battery- on this pin

const int lsenssig = 34; // this is the left side sensor signal, this is where the Arduino will look for a signal from this sensor

const int lsensv = 32; // this is the left side sensor power, later we will tell the Arduino to output battery+ on this pin

const int rsensgnd = 33; // this is the right side sensor ground, later we will tell the Arduino to output battery- on this pin

const int rsenssig = 31; // this is the right side sensor signal, this is where the Arduino will look for a signal from this sensor

const int rsensv = 29; // this is the right side sensor power, later we will tell the Arduino to output battery+ on this pin

// below we will set the pins that provide battery+ to the PIR sensors as output only, they will not read any information

// below we will set the pins that provide battery- to the PIR sensors as output only, they will not read any information

// below we will set the pins that read the signal from the PIR sensors as input only,

pinMode(mainsensgnd, OUTPUT); // sets pin that provides battery- to front sensor as output

pinMode(mainsenssig, INPUT); // sets pin for Arduino to read front sensor signal as input

pinMode(mainsensv, OUTPUT); // sets pin that provides battery+ to front sensor as output

pinMode(lsensgnd, OUTPUT); // sets pin that provides battery- to left side sensor as output

pinMode(lsenssig, INPUT); // sets pin for Arduino to read left side sensor signal as input

pinMode(lsensv, OUTPUT); // sets pin that provides battery+ to left side sensor as output

pinMode(rsensgnd, OUTPUT); // sets pin that provides battery- to right side sensor as output

pinMode(rsenssig, INPUT); // sets pin for Arduino to read right side sensor signal as input

pinMode(rsensv, OUTPUT); // sets pin that provides battery+ to right side sensor as output

// below we will tell the Arduino to turn on the sensors by providing battery+ and battery- to them

digitalWrite(mainsensgnd, LOW); // provides battery- to front sensor

digitalWrite(mainsensv, HIGH); // provides battery+ to front sensor

digitalWrite(lsensgnd, LOW); // provides battery- to left side sensor

digitalWrite(lsensv, HIGH); // provides battery+ to left side sensor

digitalWrite(rsensgnd, LOW); // provides battery- to right side sensor

digitalWrite(rsensv, HIGH); // provides battery+ to right side sensor

// below we will read all sensors to see if they see anything

int ssm = 0; // variable for reading main sensor state

int ssl = 0; // variable for reading left side sensor state

int ssr = 0; // variable for reading right side sensor state

ssm = digitalRead(mainsenssig); // reading front sensor

ssl = digitalRead(lsenssig); // reading left side sensor

ssr = digitalRead(rsenssig); // reading right side sensor

// below we will take action if a sensor detected something

// below if front sensor saw somthing we will drive boat forward

if (ssm == HIGH) {

digitalWrite (rmf, HIGH); // turn right motor in forward direction

digitalWrite (lmf, HIGH); // turn left motor in forward direction

}

// if the front sensor didn't see anything below we will check the right sensor

else {

if (ssr == HIGH) {

digitalWrite (lmf, HIGH); // turn left motor in forward direction

digitalWrite (rmr, HIGH); // turn right motor in reverse direction

}

// if neither the front or right sensor saw anything below we will check the left sensor

else{

if (ssl == HIGH){

digitalWrite (lmr, HIGH); // turn left motor in reverse direction

digitalWrite (rmf, HIGH); // turn right motor in forward direction

}

}

}

// below we will build in a 1 second delay before turning off any motor that may be running

delay (1000);

digitalWrite (rmf, LOW);

digitalWrite (rmr, LOW);

digitalWrite (lmf, LOW);

digitalWrite (lmr, LOW);

// next a short delay before starting the loop over

delay (100);

// loop ends here, we will go back to beginning of loop and read sensors again

}