

F. Forklift Robot

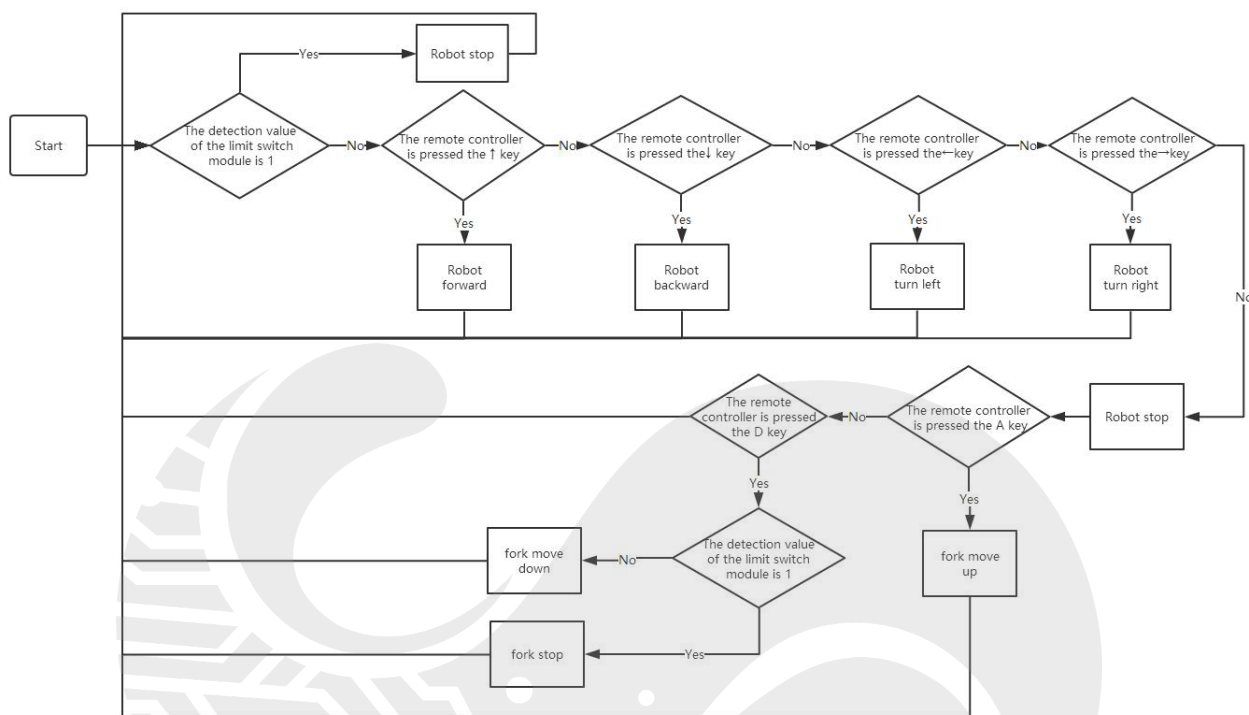
Material

1. Forklift Robot
2. Computer



Project #1: IR Control Robot with Limit Switch

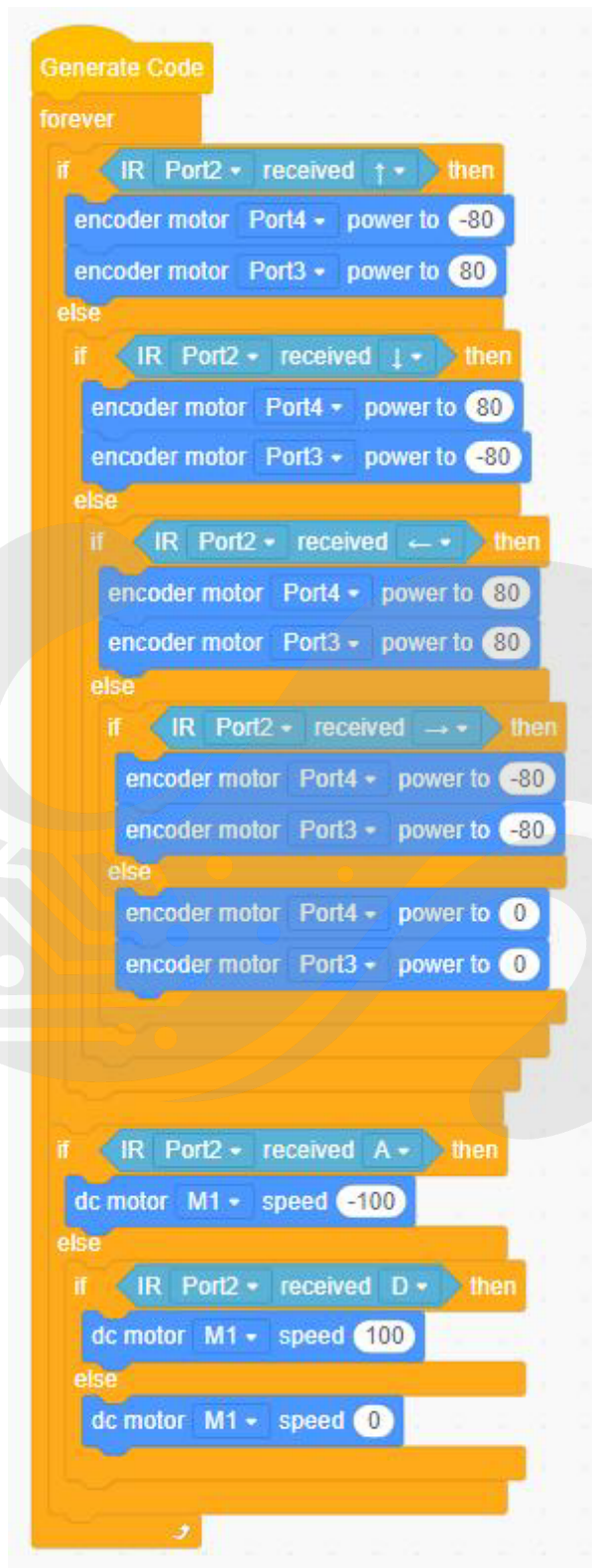
Program Idea



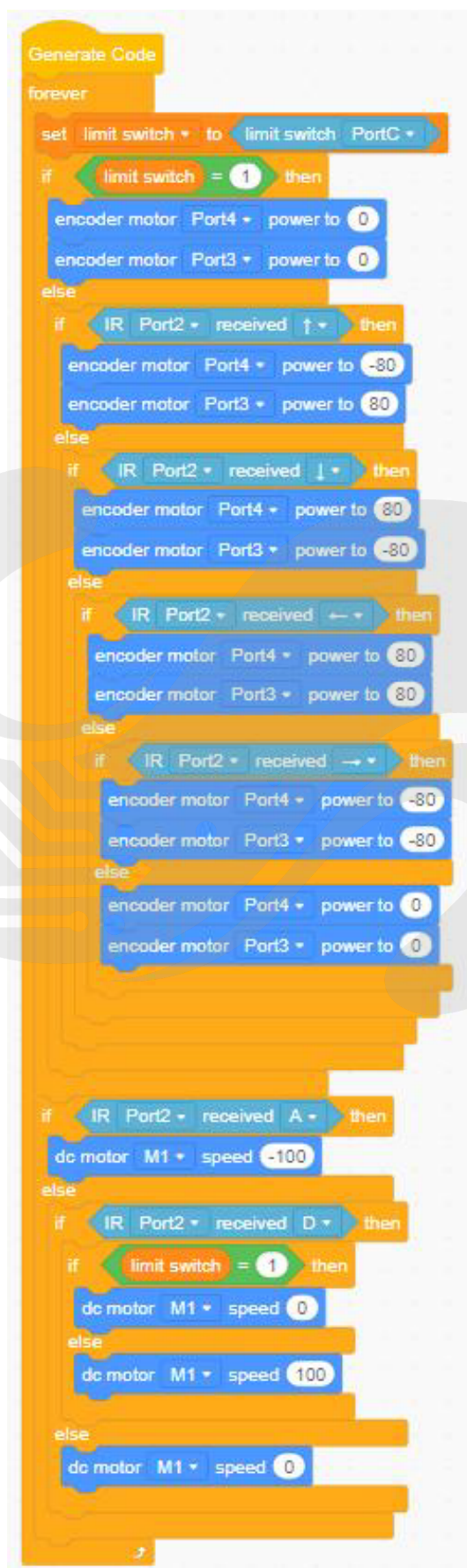
Note: When the detected value of limit switch module is 1, press the direction key of the remote controller, the robot cannot move, otherwise the limit switch module will be damaged.

Reference Code – IR Control Robot

	The block checks if the plunger of limit switch is pressed. If the plunger is being pressed, the block returns "true"; if it is not, it returns "false".
--	---



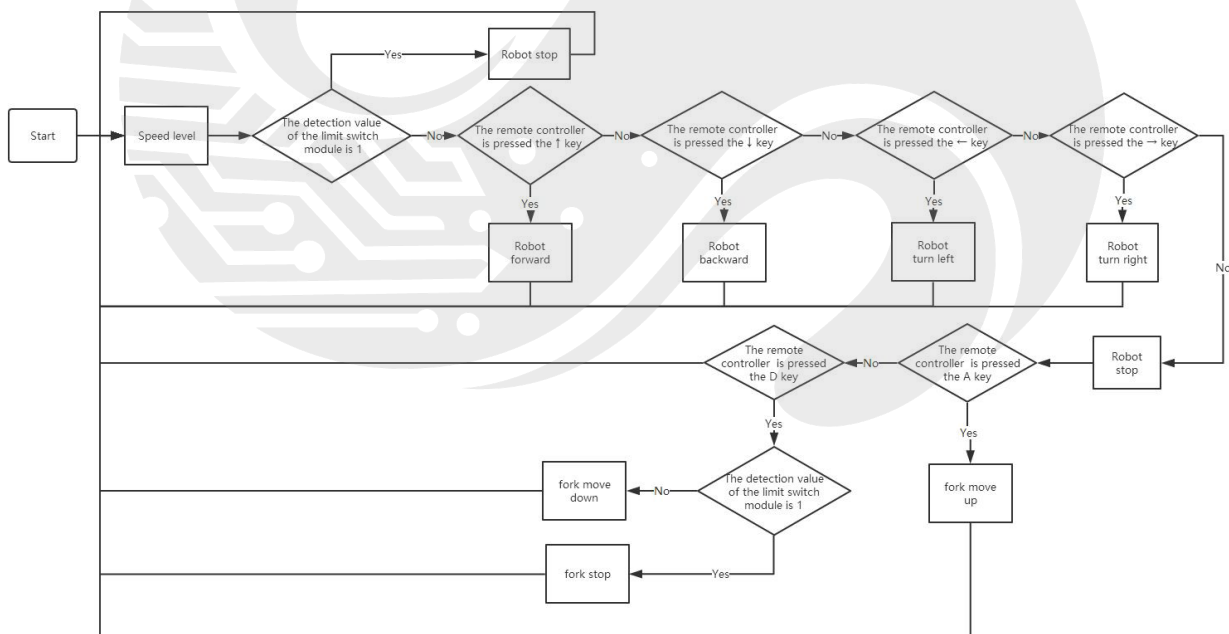
Reference Code – IR Control Robot with Limit Switch

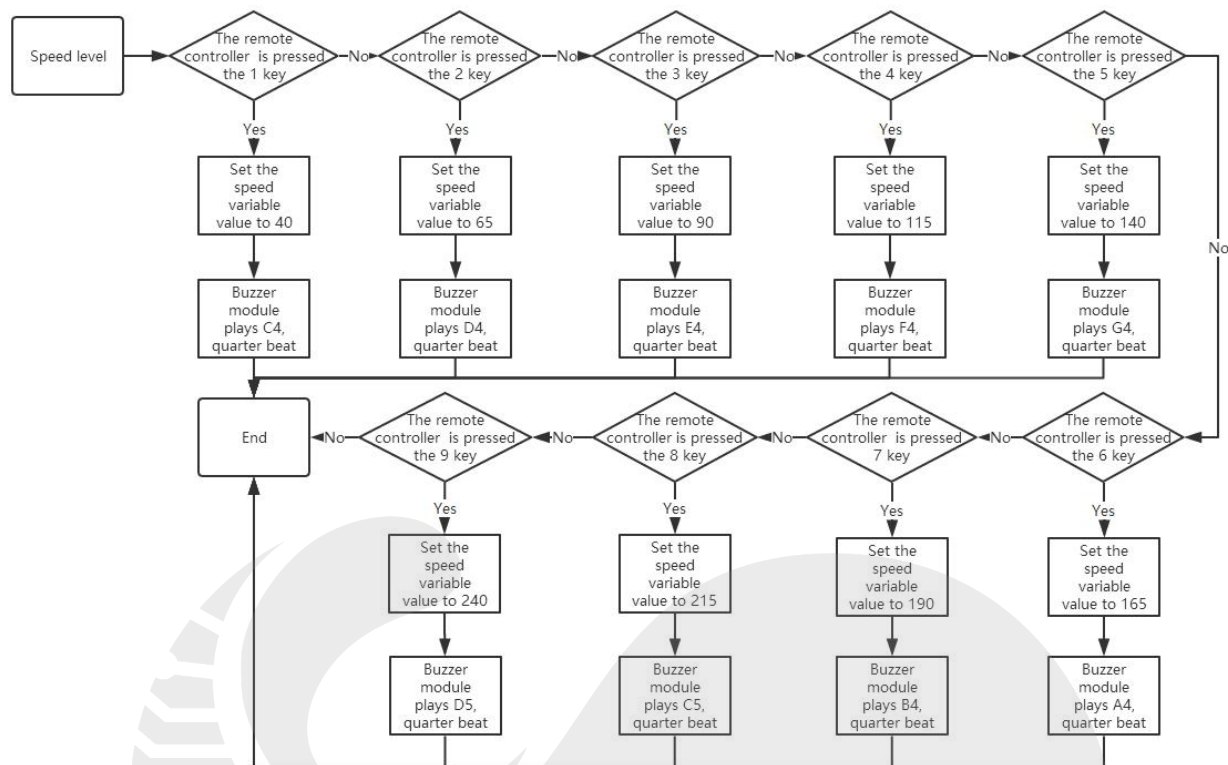


Project #2: IR Speed Control Forklift Robot

Use the up, down, left and right buttons of the IR remote controller to control the movement of the robot in all directions, use the A and D buttons of the remote controller to control the up and down movement of the fork of the forklift robot, use the numeral buttons of the remote controller to revise the movement speed of the robot, and make different sounds while pressing the remote controller buttons. In the process of programming, try to use the modular building blocks to make the logic of the program clearly.

Program Idea





Reference Code

My Blocks

Make a Block

define Custom block	Define a series of blocks, or a procedure.
Custom block	This block refers to the defined block, or procedure.

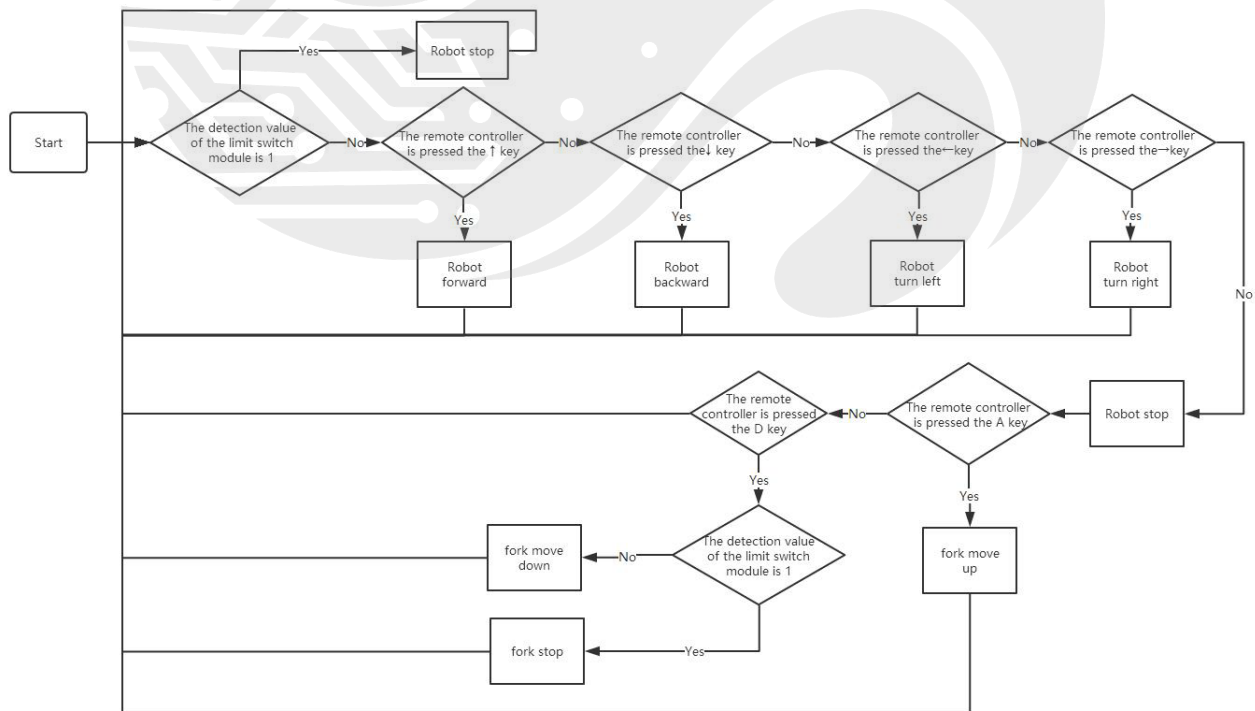
Extension: Use the line-following sensor on forklift robot, to realize automatic line-following and objects on the designed route.

ARDUINO

Project #1: IR Control Robot with Limith Switch Arduino

Use the up, down, left and right buttons of the remote controller to make robot move forward, backward, left turn and right turn, use the A and D buttons of the remote controller to control up and down movement of fork of the forklift robot, and limit the moving range of the fork through the limit switch module.

Program Idea



Note: When the detected value of limit switch module is 1, press the direction key of the remote controller, the robot cannot move, otherwise the limit switch module will be damaged.

Reference Code – IR Control Robot Arduino

```
#include<WeELF328P.h>

void update();

WeInfraredReceiver ir(PORT_2);
WeEncoderMotor encoder_4(PORT_4);
WeEncoderMotor encoder_3(PORT_3);
WeDCMotor dc_1(1);

void setup(){
    ir.begin();
}

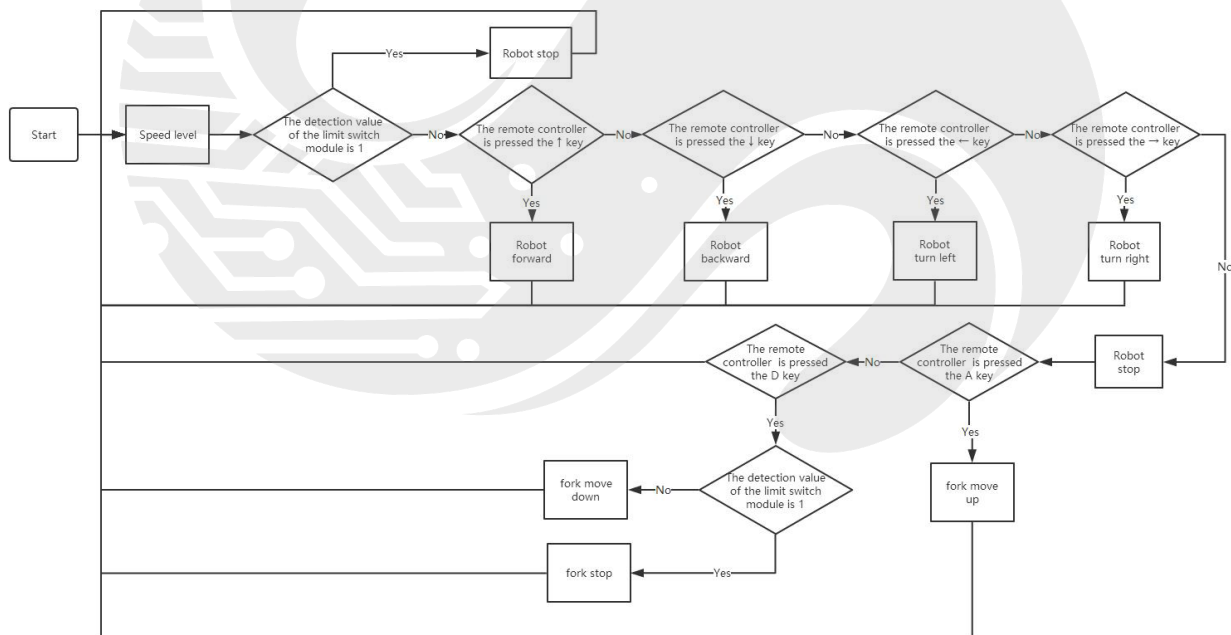
void loop(){
    update();
    if(ir.isKeyPressed(IR_CONTROLLER_UP)){
        encoder_4.run(-80);
        encoder_3.run(80);
    }else if(ir.isKeyPressed(IR_CONTROLLER_DOWN)){
        encoder_4.run(80);
        encoder_3.run(-80);
    }else if(ir.isKeyPressed(IR_CONTROLLER_LEFT)){
        encoder_4.run(80);
        encoder_3.run(80);
    }else if(ir.isKeyPressed(IR_CONTROLLER_RIGHT)){
        encoder_4.run(-80);
        encoder_3.run(-80);
    }else{
        encoder_4.run(0);
        encoder_3.run(0);
    }
    if(ir.isKeyPressed(IR_CONTROLLER_A)){
        dc_1.run(-100);
    }else if(ir.isKeyPressed(IR_CONTROLLER_D)){
        dc_1.run(100);
    }else{
        dc_1.run(0);
    }
}

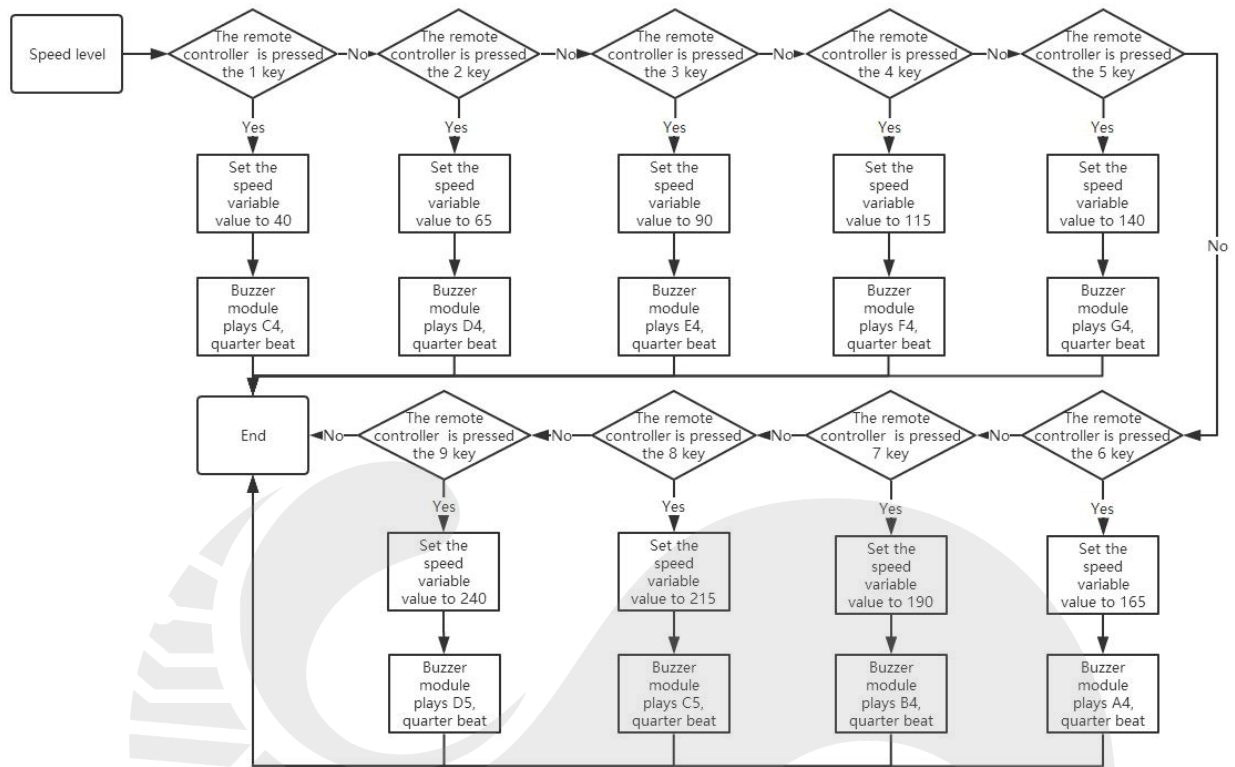
void update(){
    ir.loop();
}
```

Project #2: IR Speed Control Forklift Arduino

Use the up, down, left and right buttons of the IR remote controller to control the movement of the robot in all directions, use the A and D buttons of the remote controller to control the up and down movement of the fork of the forklift robot, use the numeral buttons of the remote controller to revise the movement speed of the robot, and make different sounds while pressing the remote controller buttons. In the process of programming, try to use the modular building blocks to make the logic of the program clearly.

Program Idea





Reference Code #A

```
#include<WeELF328P.h>

void update();

WeInfraredReceiver ir(PORT_2);
WeEncoderMotor encoder_4(PORT_4);
WeEncoderMotor encoder_3(PORT_3);
WeDCMotor dc_1(1);

void setup(){
    ir.begin();
}

void loop(){
    update();
    if(ir.isKeyPressed(IR_CONTROLLER_UP)){
        encoder_4.run(-80);
        encoder_3.run(80);
    }else if(ir.isKeyPressed(IR_CONTROLLER_DOWN)){
        encoder_4.run(80);
        encoder_3.run(-80);
    }else if(ir.isKeyPressed(IR_CONTROLLER_LEFT)){
        encoder_4.run(80);
        encoder_3.run(80);
    }else if(ir.isKeyPressed(IR_CONTROLLER_RIGHT)){
        encoder_4.run(-80);
        encoder_3.run(-80);
    }else{
        encoder_4.run(0);
        encoder_3.run(0);
    }
    if(ir.isKeyPressed(IR_CONTROLLER_A)){
        dc_1.run(-100);
    }else if(ir.isKeyPressed(IR_CONTROLLER_D)){
        dc_1.run(100);
    }else{
        dc_1.run(0);
    }
}

void update(){
    ir.loop();
}
```

Reference Code #B

```
#include<WeELF328P.h>

//      Speed level()
void f_Speed_level();
//      movement("number1", "number2")
void f_movement(double l_number1, double l_number2);
void update();

WeInfraredReceiver ir(PORT_2);
WeBuzzer buzzer(OnBoard_Buzzer);
WeEncoderMotor encoder_3(PORT_3);
WeEncoderMotor encoder_4(PORT_4);
WeDCMotor dc_1(1);
double v_speed;           //speed;
double v_Limit_switch_detection_value;           //Limit switch detection value;

void setup(){
    ir.begin();
    pinMode(PORT_C, INPUT);

    v_speed = 80;
}

void loop(){
    update();
    f_Speed_level();           //Speed level
    v_Limit_switch_detection_value = digitalRead(PORT_C);
    //Limit switch detection value
    if(v_Limit_switch_detection_value/*Limit switch detection value*/ == 1){
        f_movement(0, 0);
    }else if(ir.isKeyPressed(IR_CONTROLLER_UP)){
        f_movement(v_speed, 0 - v_speed);
    }else if(ir.isKeyPressed(IR_CONTROLLER_DOWN)){
        f_movement(0 - v_speed, v_speed);
    }else if(ir.isKeyPressed(IR_CONTROLLER_LEFT)){
        f_movement(v_speed, v_speed);
    }else if(ir.isKeyPressed(IR_CONTROLLER_RIGHT)){
        f_movement(0 - v_speed, 0 - v_speed);
    }else{
        f_movement(0, 0);
    }
    if(ir.isKeyPressed(IR_CONTROLLER_A)){
        dc_1.run(-100);
    }
}
```

Reference Code #B

```

else if(ir.isKeyPressed(IR_CONTROLLER_D)){
    if(v_Limit_switch_detection_value/*Limit switch detection value*/ == 1){
        dc_1.run(0);
    }else{
        dc_1.run(100);
    }
}
}

//      Speed level()
void f_Speed_level(){
    if(ir.isKeyPressed(IR_CONTROLLER_1)){
        v_speed = 40;
        buzzer.tone(262, 250);
    }else if(ir.isKeyPressed(IR_CONTROLLER_2)){
        v_speed = 65;
        buzzer.tone(294, 250);
    }else if(ir.isKeyPressed(IR_CONTROLLER_3)){
        v_speed = 90;
        buzzer.tone(330, 250);
    }else if(ir.isKeyPressed(IR_CONTROLLER_4)){
        v_speed = 115;
        buzzer.tone(349, 250);
    }else if(ir.isKeyPressed(IR_CONTROLLER_5)){
        v_speed = 140;
        buzzer.tone(392, 250);
    }else if(ir.isKeyPressed(IR_CONTROLLER_6)){
        v_speed = 165;
        buzzer.tone(440, 250);
    }else if(ir.isKeyPressed(IR_CONTROLLER_7)){
        v_speed = 190;
        buzzer.tone(494, 250);
    }else if(ir.isKeyPressed(IR_CONTROLLER_8)){
        v_speed = 215;
        buzzer.tone(523, 250);
    }else if(ir.isKeyPressed(IR_CONTROLLER_9)){
        v_speed = 240;
        buzzer.tone(587, 250);
    }
}

```

Reference Code #B

```
    }  
}  
  
//      movement("number1", "number2")  
void f_movement(double l_number1, double l_number2){  
    encoder_3.run(l_number1);  
    encoder_4.run(l_number2);  
}  
  
void update(){  
    ir.loop();  
}
```

