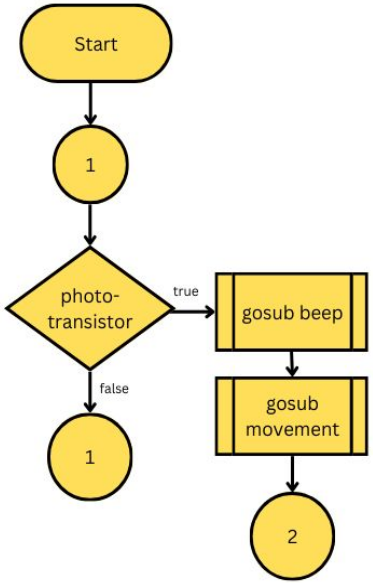
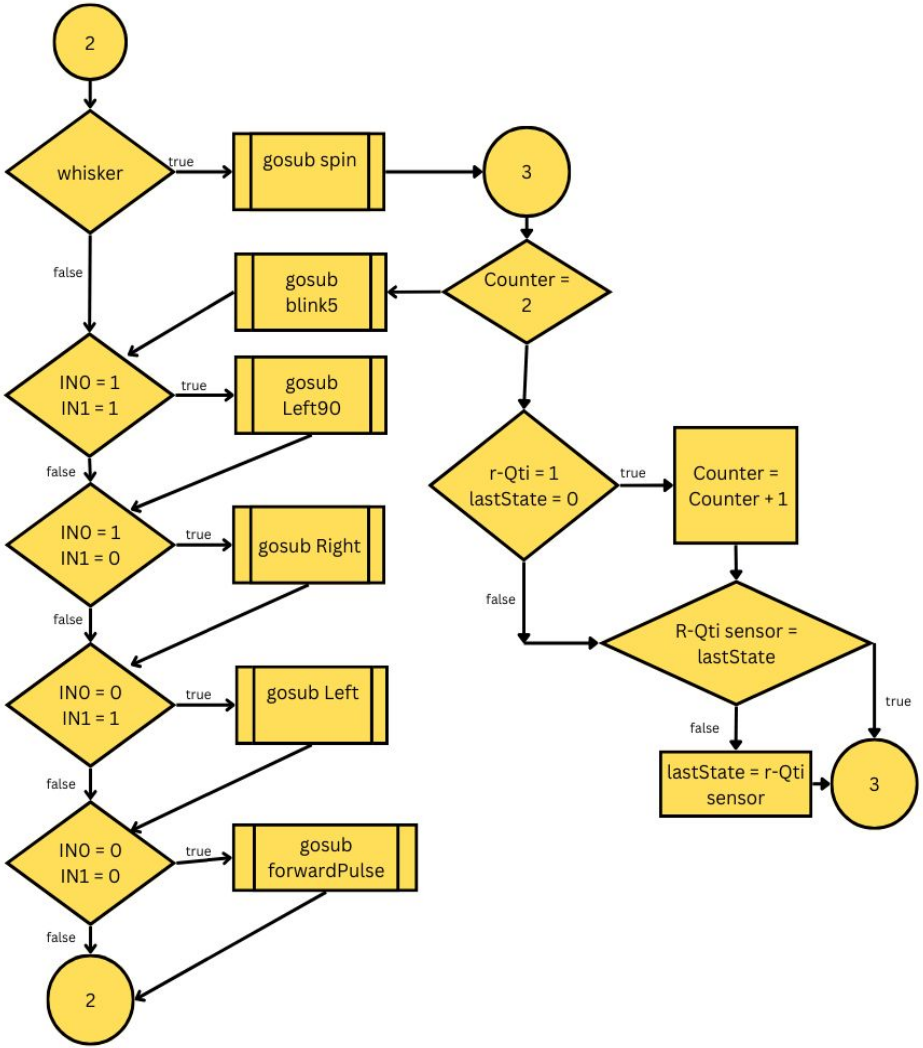
Engineering final

Group 4


Start
1
photo-transistor
true
gosub beep
false
gosub movement
1
2

Flow chart


2
whisker
true
gosub spin
3
false
gosub blink5
Counter = 2
IN0 = 1 IN1 = 1
true
gosub Left90
false
IN0 = 1 IN1 = 0
true
gosub Right
false
IN0 = 0 IN1 = 1
true
gosub Left
false
IN0 = 0 IN1 = 0
true
gosub forwardPulse
false
2
r-Qti = 1 lastState = 0
true
Counter = Counter + 1
false
R-Qti sensor = lastState
true
false
lastState = r-Qti sensor
3

Gosub Spin

```
Spin:
  counter = 0
  DO

    IF (counter = 2)THEN
      RETURN
    ELSEIF (IN1 = 1 AND lastState = 0)THEN
      counter = counter +1
      lastState = 1
    ELSEIF (IN1 = 0 AND lastState = 1)THEN
      lastState = 0
    ENDIF

    PULSOUT 13, 700
    PULSOUT 12, 700
  LOOP
  RETURN
```

The 1 - 1 case

- Decided a left turn would be optimal if mainly going counter-clockwise and hitting the case

```
Left90:
  FOR left90count = 1 TO 18
    PULSOUT 13, 730
    PULSOUT 12, 690
    PAUSE 20
  NEXT
  RETURN
```

Basic subroutines

```
blink5:
  FOR blinkCounter = 1 TO 5
    HIGH 15
    PAUSE 500
    LOW 15
    PAUSE 500
    NEXT
  RETURN
```

```
Forwardpulse:
  PULSOUT 13, 850
  PULSOUT 12, 665
  RETURN
```

```
Left:
  PULSOUT 13, 690
  RETURN
Right:
  PULSOUT 12, 850
  RETURN
```

```
BEEP:
  FREQOUT 3, 3000, 3000
  RETURN
```

Successes

Completed two extra point challenges

- Separated phototransistor into separate conditional loop
- Closed loop 360 used knowledge from previous assessments

Failures

Original working code was very slow to avoid jumping line with sensors

- Slow time - 185 seconds
- Fast time - 49 seconds

Troubleshooting

Determining qti sensor positions

- Started narrow
- Moved wider to give a larger room for correcting movements

1 - 1 case

- Had to turn on inline with the sensors
- Turning on the axis of the wheels or the chassis would leave line