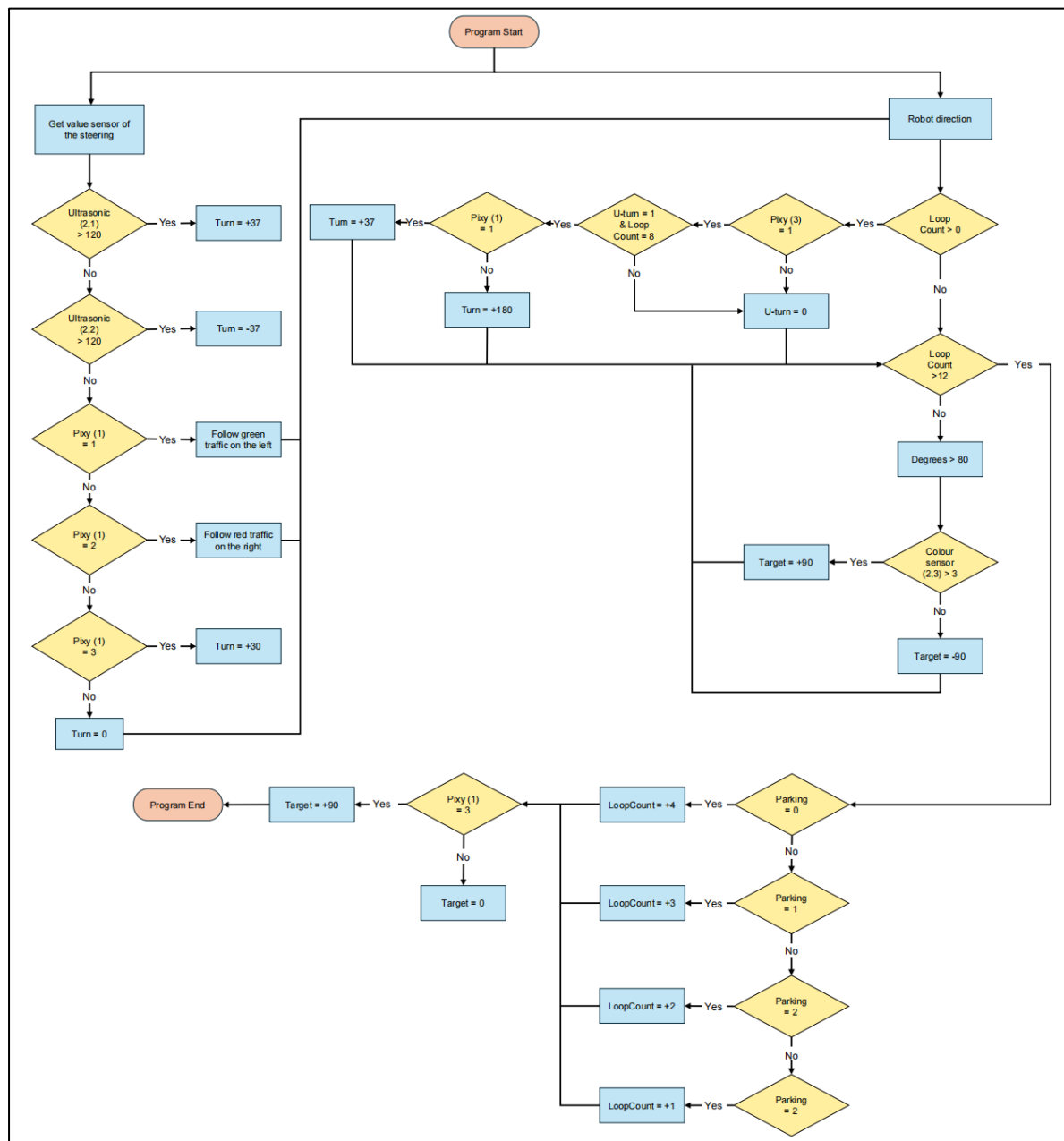


### 3.2 Obstacle Challenge

The **Pixy 2 Camera** is the primary sensor that helps the robot with this mission. The Pixy 2 camera on top is used **to determine the presence of traffic sign**. The steering will turn to the right if the traffic sign is red, and to the left if the sign is green. It is also used to **determine the parking lot** and do the parking when the robot completes 3 laps of the round. The robot will be able to determine if the traffic sign is green or red with the aid of the Pixy 2 camera behind it. The robot must make a U-turn in the third round if the final traffic sign is red. The color sensor is used to **detect the blue and orange line on the map**. When the robot's **color sensor** in front of it detects an orange line, it turns clockwise; when it detects a blue line, it turns counterclockwise. The purpose of the **gyro sensors** remains unchanged which is to **ensure that the robot moves in a straight line and to precisely control its rotation**. To keep the robot from hitting the wall, both sides of the ultrasonic sensor ensure that it always maintains a safe distance between the inner and outside walls.

Diagram below shows the flowchart for the Obstacle Challenge:



The following are explanations of the code that is used in the robot for the Obstacle Challenge.

1. **Getting direction and turning:** The robot uses the color sensor to check the line on the game field. When the first line it detects is orange, then it will run clockwise and the same concept for the counterclockwise. Then, it uses the gyro sensor to get the heading direction.

```
If Sensor.ReadRawValue(4,0) > 3 Then 'orange
  CW = 1
  Speaker.Tone(100,50,50)
Else
  CW = -1
  Speaker.Tone(100,1200,50)
EndIf

target = target - 89.50 * CW
```

2. **Avoid Walls:** The robot uses both sides of the ultrasonic sensor to check the value of the distance between the robot. The value is used to prevent the robot from colliding with the wall.

```
If leftwall < 110 And wallCheck=1 And Math.Abs(@relativeHeading)<45 Then
  Speaker.Tone(100,220,50) 'ORI 140
  leftwallturn = -20
Else
  leftwallturn = 0
EndIf

If rightwall < 130 And wallCheck=1 And Math.Abs(@relativeHeading)<45 Then
  Speaker.Tone(100,660,50) 'ORI 150
  rightwallturn = 20
Else
  rightwallturn = 0
EndIf
```

3. **Avoid traffic sign:** The robot uses the upper Pixy 2 Camera to detect the presence of the traffic sign. The steering will turn to the right side if the traffic sign is red, and to the left side if the sign is green.


```
If greenDistance < pillardistance Then
    pillarturn=((avoidGreenpixel-greenx)*greeny/100)*0.30
    lastPillar=-1
ElseIf redDistance < pillardistance Then
    pillarturn=((avoidRedpixel-redx)*redy/100)*0.30
    lastPillar=1
```

4. **U-turn:** The robot uses the behind Pixy 2 Camera to detect the traffic sign placed behind of the robot. If the traffic sign is red, then it will do a U-turn when the third laps start.

```
If lastRedY>lastGreenY Then
    uturn=1
    uTurnPiller=1
    If greenx>50 And greenx<200 Then
        uTurnPiller=-1 'green
    EndIf
EndIf
```

5. **Parking:** The robot uses the upper Pixy 2 Camera to detect the magenta parking lot and do parking after completing 3 laps for the challenge.

CheckParking=0



```
Sub CheckParking
    While loopCount<5
        If cw=1 Then
            If pinkx>0 And pinkx<150 Then
                parking=loopCount
                Speaker.Tone(100,800,1)
            EndIf
        Else
            If pinkx>180 Then
                Speaker.Tone(100,800,1)
                parking=loopCount
            EndIf
        EndIf
    EndWhile
EndSub
```