**MOTOR CODE**

The whole code is constructed with the help of many helper functions :

1:int quadrant(x\_axis,y\_axis)

takes the x axis co-ordinate and y axis co-ordinate and returns a integer value denoting the octant in which the joystick is currently in . the function is based on the idea of geometry that points which lie on opposite side of a line gives a scalar of opposite sign when satisfied in that equation of the line .

Equation of the two diagonals are :

1. m=y-x;
2. n=1024-y-x;

2. : F1,F2,f1,f2 // gives the PWM VALUE FOR MOTORS

Takes in x\_axis , y\_axis co – ordinate along with some other parameters and gives out the PWM value .

For finding the relationship among the x\_axis ,y\_axis co-ordinate , PWM values of left side motors and right side motors these functions are developed . after analysing each octant independently I came up with four equations which perfectly relate these variables to each other keeping in mind the problem of sudden change of direction of motors when going from 8th octant to 7th  octant and 3th octant to 4th  octant .

F1 : (255/512)\*(y-512)\*m

F2: F1-(F1/(y-512))\*(x-512)\*m’

f1 : (255/1024)\*(x-y)\*m

f2: (255/512)\*(x-512)\*m’-f1

en1 : enable pin of left side of motor driver L293D // pwm value

en2: enable pin of right side of motor driver L293D // pwm value

1st octant : en1: F1() m=1

En2: F2() m’=1

2nd octant: en1: F2() m=1

En2: F1() m’=-1

3rd octant : en1: f2() m=-1

En2: f1() m’=-1

4th octant: en1: f2() m=-1

En2: f1() m’=-1

5th octant: en1: F1() m=-1

En2: F2() m’=1

6th octant: en1: F2() m=-1

En2: F1() m’=-1

7th octant: en1: f2() m=1

En2: f1() m’=1

8th octant : en1: f2() m=1

En2: f1() m’=1

3. set ()

This function sets the direction of the motor . precisely it sets the INPUT PIN 1,2,3,4 OF L293D.

In 1st and 2nd octant both the motors are in forward direction .

In 5th  and 6th octant both the motors are in backward direction.

In 3rd and 4th octant left motor is in backward direction and right motor is in forward direction .

In 7th and 8th octant left side motor is in forward direction and right motor is in backward direction .

4.decide()

Its helps to decide that which function among F1,…f2 is perfectly suitable for en 1 nd en2 for a particular value of octant.

5. drive()

It incorporates all the helper function together so that all the functions work in perfect harmony to decide the correct value and direction of motor velocity.