LINE FOLLOWER ROBOT 04/18/2022

Line Follower Robot (Combinational-logic)

Forward Direction

		Input		Output
	Α	В	C	Left Motor FD
0	0	0	0	0
1	0	0	1	0
2	0	1	0	1
3	0	1	1	0
4	1	0	0	1
5	1	0	1	1
6	1	1	0	1
7	1	1	1	1

OUTPUT =	ADC	ADC	ADC	ADC	ADC
()	$\Delta \mathbf{R} \mathbf{I} +$	ΔKI			

		Input		Output
	Α	В	С	Right Motor FD
0	0	0	0	0
1	0	0	1	1
2	0	1	0	1
3	0	1	1	1
4	1	0	0	0
5	1	0	1	1
6	1	1	0	0
7	1	1	1	1

 $\mathsf{OUTPUT} = \overline{\mathbf{A}}\overline{\mathbf{B}}\mathbf{C} + \overline{\mathbf{A}}\mathbf{B}\overline{\mathbf{C}} + \overline{\mathbf{A}}\mathbf{B}\mathbf{C} + \mathbf{A}\overline{\mathbf{B}}\mathbf{C} + \mathbf{A}\mathbf{B}\mathbf{C}$

Backward Direction

		INPUT	•	Output
	Α	В	C	Left Motor BD
0	0	0	0	0
1	0	0	1	1
2	0	1	0	0
3	0	1	1 1 1	
4	1	0 0		0
5	1	0	1	0
6	1	1	0	0
7	1	1	1	0
1				

 $\mathsf{OUTPUT} = \overline{A}\overline{B}C + \overline{A}BC$

		INPUT	•	Output		
	Α	В	C	Right Motor BD		
0	0	0	0	0		
1	0	0	1	0		
2	0	1	0	0		
3	0	1	1 0			
4	1	0 0		1		
5	1	0	1	0		
6	1	1	0	1		
7	1	1 1 1		0		
				•		

OUTPUT = $A\overline{B}\overline{C} + AB\overline{C}$

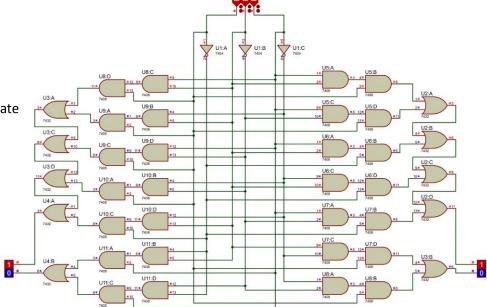
Simulation

Number of used gates:

28 AND-Gate, 10 OR-Gate, 3 NOT-Gate

Number of used ICs:

7 (7408), **3** (7432), **1** (7404)



LINE FOLLOWER ROBOT OMMSM

LINE FOLLOWER ROBOT 04/18/2022

Line Follower Robot (Enhanced)

		Input		Output		
	Α	В	С	Left Motor FD		
0	0	0	0	0		
1	0	0	1	0		
2	0	1	0	1		
3	0	1	1	0		
4	1	0	0	1		
5	1	1 0		1		
6	1	1	0	1		
7	1	1	1	1		

OUTPUT = $\overline{A}B\overline{C} + A\overline{B}\overline{C} + A\overline{B}C + AB\overline{C} + ABC$

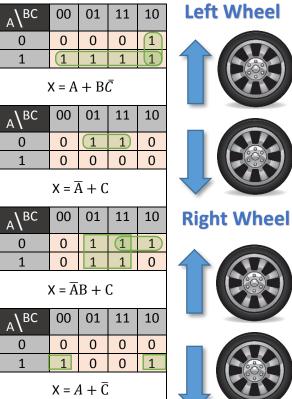
		Input		Output
	A B		C	Right Motor FD
0	0	0	0	0
1	0	0	1	1
2	0	1	0	1
3	0	1	1	1
4	1	0	0	0
5	1	0	1	1
6	1	1	0	0
7	1	1	1	1

 $OUTPUT = \overline{A}\overline{B}C + \overline{A}B\overline{C} + \overline{A}BC + A\overline{B}C + ABC$

		NPU1	Г	Output
	Α	В	С	Left Motor BD
0	0	0	0	0
1	0	0	1	1
2	0	1	0	0
3	0	1	1	1
4	1	0	0	0
5	1	0	1	0
6	1	1	0	0
_		1	1	0
7	1			-
				BC + ABC
	0		T = A	-
	0	UTPU	T = A	BC + ABC
	0	UTPU N PU 1	$T = \overline{A}$	BC + ABC
7	O I A	UTPU NPU1 B	T = Ā	BC + ABC Output Right Motor BD
7	O A O	UTPU NPU1 B 0	T = A	BC + ABC Output Right Motor BD 0
7 0 1 2 3	O A O O	NPU1 B 0	T = A	BC + ABC Output Right Motor BD 0
7 0 1 2 3 4	O A O O O	NPUT B 0 0	T = \overline{A} C 0 1 0	Output Right Motor BD 0 0 0
7 0 1 2 3	O A O O O O	NPU1 B 0 1	T = A	Output Right Motor BD 0 0 0 0

OUTPUT = $A\overline{B}\overline{C} + AB\overline{C}$

A^{BC}	00	01	11	10			
0	0	0	0	1			
1	1	1	1	1			
	X = A	+ B(Ē				
A^{BC}	00	01	11	10			
0	0	1	1	0			
1	0	0	0	0			
	$X = \overline{A}$	$\bar{A} + C$	1				
A^{BC}	00	01	11	10			
0	0	1	1	1			
1	0	1	1	0			
	$X = \overline{A}$	B + (
A^{BC}	00	01	11	10			
0	0	0	0	0			
1	1	0	0	1			
$X = A + \overline{C}$							



Simulation

Number of used gates:

