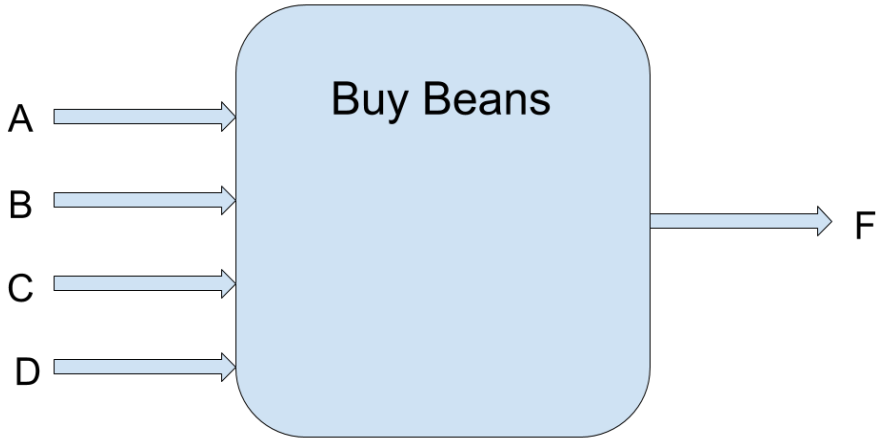
Problem 1

Truth Table & BBD

Index	ABCD	F
0	0000	0
1	0001	1
2	0010	1
3	0011	1
4	0100	1
5	0101	1
6	0110	0
7	0111	1
8	1000	0
9	1001	0
10	1010	1
11	1011	1
12	1100	0
13	1101	0
14	1110	1
15	1111	0



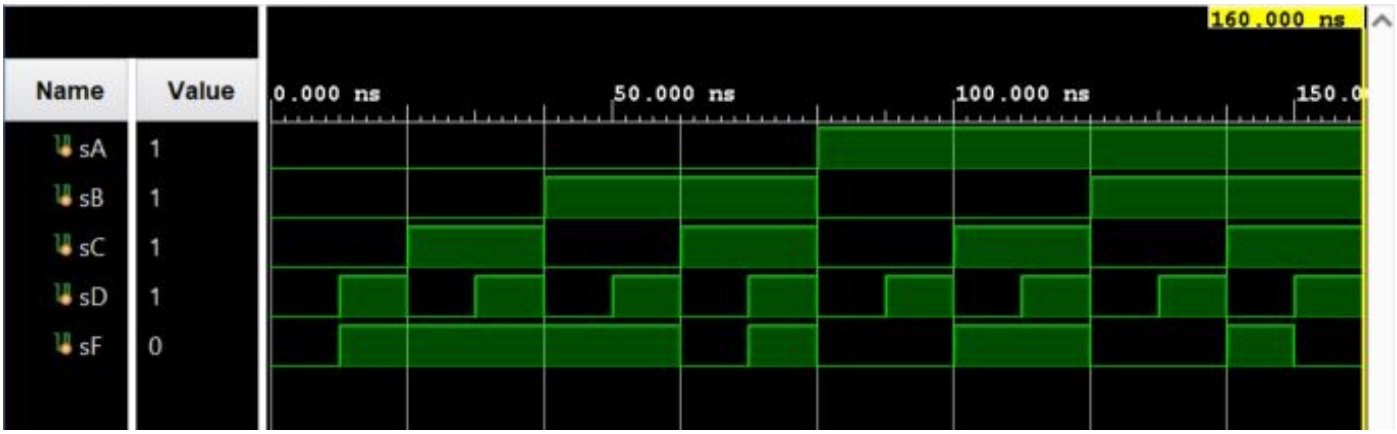
Kmap

			CD		
		00	**01**	**11**	**10**
	00	0	1	1	1
	01	1	1	1	0
AB	**11**	0	0	0	1
	10	0	0	1	1

(Red boxes indicate a shared space between 2 prime implicants)

Equation: f(A, B, C, D) = ~AB~C + A~BC + ~AD + ~A~BC + AC~D

Simulation



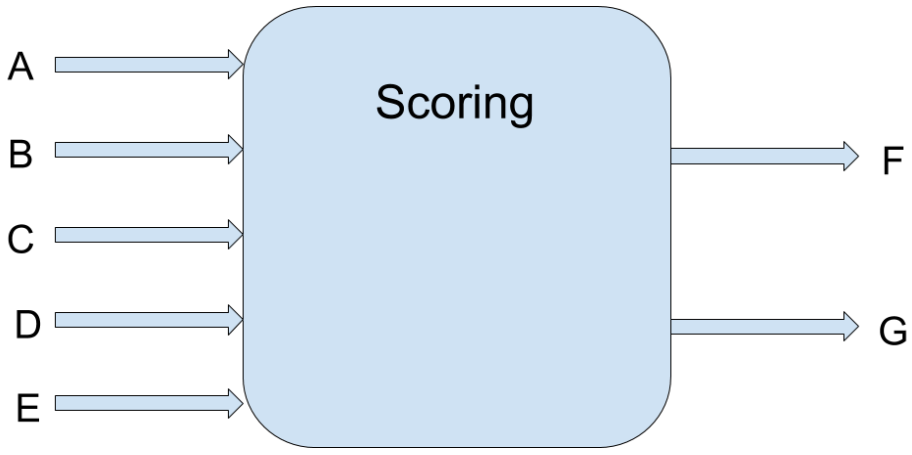
Source code

[Design Source]
[Constraints]
[Simulation]

Problem 2

Truth Table & BBD

Index	ABCDE	F	G
0	00000	0	1
1	00001	0	1
2	00010	0	1
3	00011	0	1
4	00100	0	1
5	00101	0	1
6	00110	0	1
7	00111	1	0
8	01000	0	1
9	01001	0	1
10	01010	0	1
11	01011	1	0
12	01100	0	1
13	01101	1	0



14	01110	1	0
15	01111	1	0
16	10000	0	1
17	10001	0	1
18	10010	0	1
19	10011	1	0
20	10100	0	1
21	10101	1	0
22	10110	1	0
23	10111	1	0
24	11000	0	1
25	11001	1	0
26	11010	1	0
27	11011	1	0
28	11100	1	0
29	11101	1	0
30	11110	1	0
31	11111	1	0

Kmap (For F, G is the opposite)

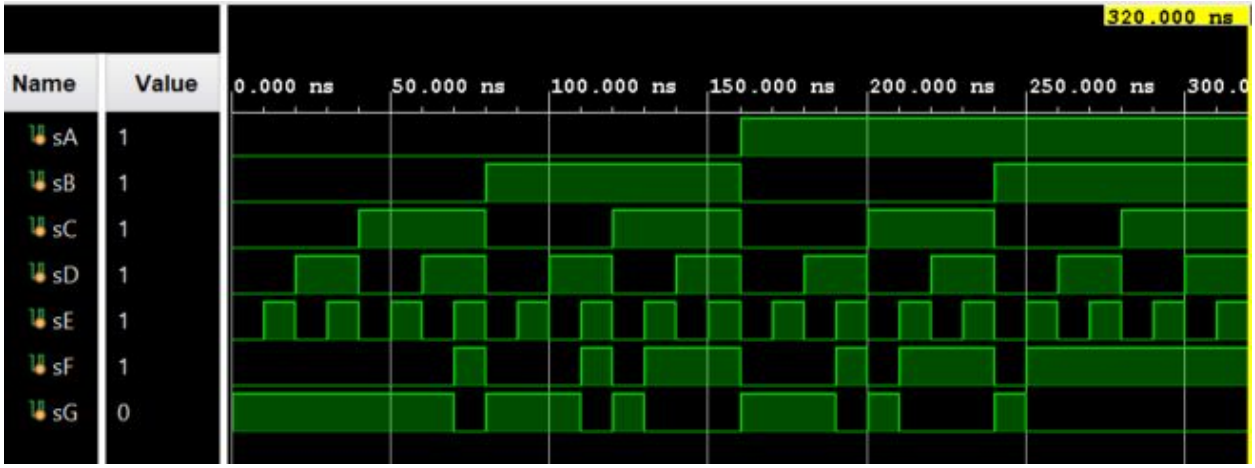
				~A				**A**		
						DE				
		00	**01**	**11**	**10**		**00**	**01**	**11**	**10**
	00	0	0	0	0		0	0	1	0
	01	0	0	1	0		0	1	1	1
BC	**11**	0	1	1	1		1	1	1	1
	10	0	0	1	0		0	1	1	1

(Red boxes indicate a shared space between prime implicants)

Equation: F = f(A, B, C, D, E) = ABC + ADE + ~ABCE + ~ACDE + ~ABCD + ~ABDE + A~BCE + A~BCD + AB~CD + AB~CE

G = ~F

Simulation



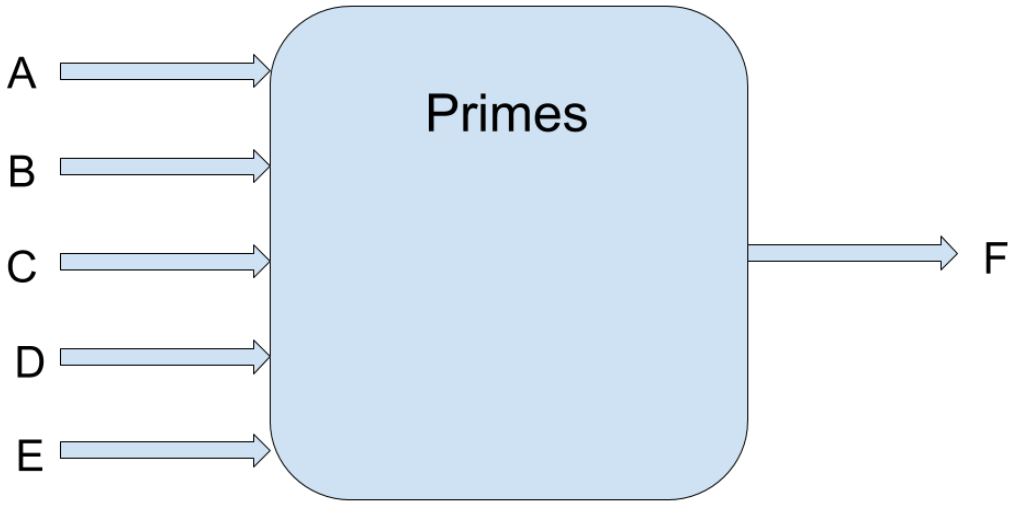
Source Code

[Design Source]
[Constraints]
[Simulation]

Problem 3

Truth Table & BBD

Index	ABCDE	F
0	00000	0
1	00001	0
2	00010	1
3	00011	1
4	00100	0
5	00101	1
6	00110	0
7	00111	1
8	01000	0
9	01001	0
10	01010	0
11	01011	1



12	01100	0
13	01101	1
14	01110	0
15	01111	0
16	10000	0
17	10001	1
18	10010	0
19	10011	1
20	10100	0
21	10101	0
22	10110	0
23	10111	1
24	11000	0
25	11001	0
26	11010	0
27	11011	0
28	11100	0
29	11101	1
30	11110	0
31	11111	1

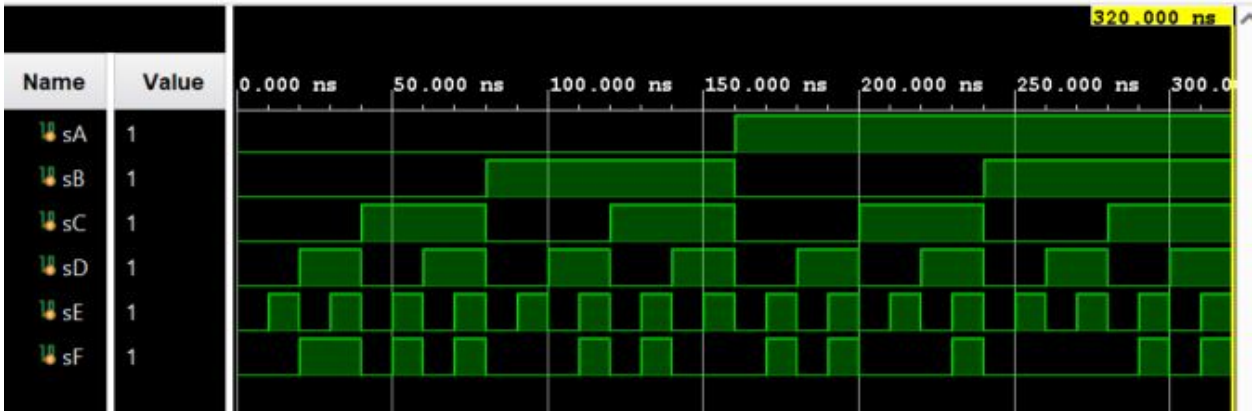
Kmap

				~A				**A**		
						DE				
		00	01	11	**10**		**00**	01	11	**10**
	00	0	0	1	1		0	1	1	0
	01	0	1	1	0		0	0	1	0
BC	11	0	1	0	0		0	1	1	0
	10	0	0	1	0		0	0	0	0

(Red boxes indicate a shared space between prime implicants)

Equation: f(A, B, C, D, E) = ~BDE + ~AC~DE + ~A~B~CD + ~A~CDE + A~B~CE + ABCE

Simulation



Source Code

Design Source
Constraints
Simulation