ECS 154A Homework 2

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1. Find four four-variable Karnaugh maps with cheaper PoS than SoP.

WX

	00	01	11	10
00	0	1	1	0
01	0	1	1	0
11	1	1	1	1
10	1	1	1	1

YZ

WX

	00	01	11	10
00	1	1	1	1
01	0	0	0	0
11	1	1	1	0
10	1	1	1	1

YZ

WX

	00	01	11	10
00	1	0	1	1
01	1	0	1	1
11	1	1	1	1
10	1	1	1	1

YZ

WX

	00	01	11	10
00	1	0	0	1
01	1	1	0	0
11	1	0	0	0
10	1	0	0	1

YZ

2. Can 1,500,000,000 be represented exactly in single-point floating precision? What is the next number that can be represented?

   Yes, 1,500,000,000 can be represented exactly in single-point floating precision. The next highest number that can be accurately represented is 1,500,000,128

3. Convert each to signed magnitude, one's complement and two's complement.

   (a) 010100100111
       Signed mag: 1319
       Ones' comp: 101011011000
       Twos' comp: 101011011001

   (b) 101101101011
       Signed mag: -2875
       Ones' comp: 010010010100
       Twos' comp: 010010010101

   (c) 010010010111
       Signed mag: 1175
       Ones' comp: 101101101000
       Twos' comp: 101101101001

   (d) 101010010000
       Signed mag: -656
       Ones' comp: 010101101111
       Twos' comp: 010101110000

4. Implement the truth table with 2-1 and 4-1 mux's.