## P1.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 1 | 1 | 0 | 1 |
| 0 | 1 | 1 | 0 | 0 |
| 1 | 0 | 0 | 1 | 0 |
| 1 | 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 | 0 |

## P3.

01001100 01101001

+ 01101110 01101011

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10111010 11010100

+ 00100000 01001100

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11011011 00100000

+ 01100001 01111001

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00111100 10011010

+ 01100101 01110010

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10100010 00001100

Therefore, the complement of the sum is 01011101 11110011.

## P4.

1. 00000001 00000010

00000011 00000100

00000101 00000110

00000111 00001000

00001001 00001010

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00011001 00011110

Therefore, the complement of the sum is 11100110 11100001.

1. 01000010 01000011

01000100 01000101

01000110 01000111

01001000 01001001

01001010 01001011

-----------------------------

10011111 10100100

Therefore, the complement of the sum is 01100000 01011011.

1. 01100010 01100011

01100100 01100101

01100110 01100111

01101000 01101001

01101010 01101011

-----------------------------

00000000 00000101

Therefore, the complement of the sum is 11111111 11111010.

## P5.

If we divide 10011 into 1010101010 0000, we get 1011011100, with a remainder of R=0100. Note that, G=10011 is CRC-4-ITU standard.

## P6.

1. we get 1000110000, with a remainder of R=0000.
2. we get 0101010101, with a remainder of R=1111.
3. we get 1011010111, with a remainder of R=1001.