Check Your Understanding:

1. Convert the decimal number 934 to binary.

Ans: The answer for the binary representation of the decimal number 934 is 1110100110₂.

Solution process: To convert the decimal number **934** to binary, I use division method. Then we take remainder in the reverse order.

1. Convert the 8-bit Two’s complement number 1010 1011 to decimal. (As the number is given in 2’s complement form, so first you have to find the actual number and then convert it into its decimal equivalent). Also show this in Hexadecimal.

Ans:

The answer of its decimal equivalent is -8510

Solution process: To convert 8-bit Two’s complement number 1010 1011 back to decimal, follow these steps: (1) flip all the bits, (2) add 1, and (3) interpret the result as a binary representation of the magnitude and add a negative sign.

Ans:

The answer of its Hexadecimal equivalent is AB16

Solution process: To convert 8-bit Two’s complement number 1010 1011 to hexadecimal, follow these steps: (1) split the binary number into two 4-bit group, i.e. 1010 and 1011, (2) convert each group to hexadecimal

1. Writ down the benefit of Two's complement over signed magnitude and the process of converting one's complement to two's complement.

Ans:

Benefits of Two’s complement:

1. There is only one representation for zero in two's complement representation. This can simplify arithmetic operations, and logical operations and improve efficiency accordingly.
2. Two’s complement has Unified Addition and Subtraction, which means both positive and negative numbers can be added or subtracted using the same binary addition rules.
3. Two’s complement can automatically handle carry issue through ignoring the carry that beyond the most significant bit when encountering any overflow condition, i.e., obtaining a result which is too large (>127) or two small (< -128) to be represented in 8- bit two’s complement. This handling ensures the result is correct answer.
4. Consider the two binary numbers 11111 and 1011. When these two binary numbers are multiplied, they produce a new binary number N. Determine this binary number N.

Ans: N is 101010101(no limitation on 8-bits representation?)

1. Discuss ASCII code. What are the relation of 'A' and 'a' and '0', and '5' and integer value zero.