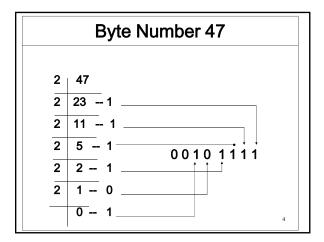
CONVERSION DECIMAL TO BINARY NUMBER SYSTEM

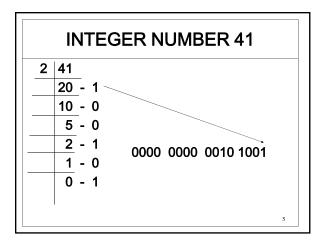
by

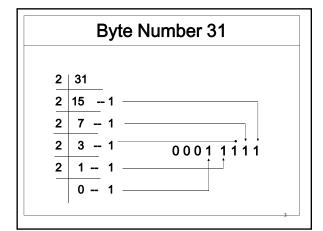
Prof. Dr. M. Akram Tahir

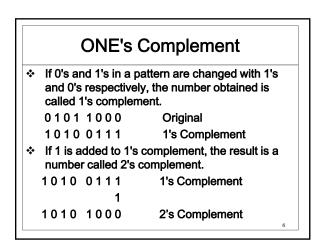


CONVERSION RULES

- The decimal whole number is consecutively divided by 2 and remainder is noted at each turn.
- The division is terminated when quotient equals to 0.
- Write the first remainder in 1st bit ,the 2nd in 2nd bit, continue until the last remainder is exhausted. Pad the remaining bits with zeros.







ONE's Complement

- 1's complement is obtained by inverting the given pattern.
- Inversion means replacing 0 by 1 and 1 by 0.

INTEGER NUMBER -41

Write the number +41

0000 0000 0010 1001

1111 1111 1101 0110 write 1's C

1+ Get 2's C

1111 1111 1101 0111 ⇒ -41

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TWO's Complement

- Adding 1 to 1's complement generates the 2's complement.
- The 2's complement of a +ve number (INTEGER or LONG) gives its NEGATIVE counterpart.

INTEGER NUMBER -650

Write the number +650:

0000 0010 1000 1010

1111 1101 0111 0101 write 1's C

1+ Get 2's C

1111 1101 0111 0110 \Rightarrow -650

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CONVERSION of -ve Numbers

- Negative Decimal numbers are converted to Binary numbers using 2's complement :
- 1. Absolute value of negative number is obtained and converted to binary notation.
- 2. 1's complement is obtained.
- 3. 1 is added to obtain 2's complement.
- The resulting binary number is equivalent to the given negative number.

INTEGER NUMBER -1

First write the number +1

0000 0000 0000 0001

1111 1111 1111 1110 write 1's C

1+ Get 2's C

1111 1111 1111 ⇒ -1

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INTEGER NUMBER -32767

First write the number +32767

0111 1111 1111 1111

1000 0000 0000 0000 write 1's C

1+ Get 2's C

1000 0000 0000 0001 ⇒ - 32767

Can you write INTEGER -32768 by this technique?

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