COMPUTER NUMBER SYSTEM

Number System

A number system in computer ideology is regarded as the method or system of numbering and representing of digits in the computer 'inner' system. In other words, it is a technique used in representing numbers in the computer system architecture. The digital computer represents all kinds of data and information in binary numbers. This implies every value/number that you are saving or feeding into/fetching from the computer system memory has a defined number system. The value/data feed in/fetch from can includes but not limited to: audio, graphics, video, text file, numbers etc. The total number of digits used in a number system is called its base or radix. The base is written after the number as subscript; for instance 10001102 (1000110 base 2), 5610 (56 to base of 10), 718 (71 base 8) etc.

Computer architecture supports following number systems.

Binary number system (Base 2)

Octal number system (Base 8)

Decimal number system (Base 10)

Hexadecimal number system (Base 16)

1. Binary Number System:-A Binary number system has only two digits, which are 0 and 1. Every number (value) is represented with 0 and 1 in this number system. The base of binary number system is 2, because it has only two digits. Though DECIMAL (No 3) is more frequently used in Number representation, BINARY is the number system form which the system/machine accepts.

2. Octal number system:-Octal number system has only eight (8) digits from 0 to 7. Every number (value) is represented with 0,1,2,3,4,5,6 and 7 in this number system. The base of octal number system is 8, because it has only 8 digits.

3. Decimal number system:-Decimal number system has only ten (10) digits from 0 to 9. Every number (value) is represented with 0,1,2,3,4,5,6, 7,8 and 9 in this number system. The base of decimal number system is 10, because it has only 10 digits.

4. Hexadecimal number system:- A Hexadecimal number system has sixteen (16) alphanumeric values from 0 to 9 and A to F. Every number (value) represents with 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E and F in this

   system. The base of hexadecimal number system is 16, because it has

   16 alphanumeric values. Here, we have 0 to 9, representing 0 – 9 but from 10, we

have A is 10, B is 11, C is 12, D is 13, E is 14 and F is 15.

   The table above shows the sample representations

   Number system Base Used digits Example

   Binary 2 0,1 (11110000)2

   Octal 8 0,1,2,3,4,5,6,7 (360)8

   Decimal 10 0,1,2,3,4,5,6,7,8,9 (240)10

   Hexadecimal 16 0,1,2,3,4,5,6,7,8,9,

   A,B,C,D,E,F(F0)16

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