Numerical Systems

Binary number system:

Computers do not deal with letters, words and images, but rather convert these inputs into the binary system, which is the language that a computer understands. The binary system is a number system consisting of two numbers (0,1) and its basis is the number 2

Example

Decimal system	Binary system
0	0000
1	0001
2	0010
3	0011
4	0100

- **This system is characterized by ease of processing inside the computer because it consists of two numbers only, as it deals on the basis of the electrical voltage used in it, as the number 1 indicates the presence of an electrical voltage and thus turns on the light, while the number 0 indicates the absence of an electrical voltage and thus the light goes out.**

Decimal number system

It is one of the numbering systems and is called decimal because it consists of 10 digits (0,1,2,3.......9 and the base for it is 10 .

This system supports the property of decimal fractions using the comma, so it is mainly used with microprocessors.

- It is difficult for computers, and it needs a large storage space, as each number in the decimal system needs a space of 4 bits to represent it, and thus requires effort and time from the processor.

Ex : $(67)_{10}$

$(345)_{10}$

octal system

It is one of the counting systems and its basis is (8) and it consists of eight digits (0,1.2, ...7). Each number needs 3 bits to represent it in the computer and therefore needs a large storage space.

Ex : $(35)_8$

$(136)_8$

Hexadecimal number system

It is a numbering system that uses 16 digits (0,1,2,...., 9 A,B,C,D,E,F) Where A = 10 ,B=11,C=12,D=13,E=14,C=15

Ex : $(A7)_{16}$

$(5C)_{16}$

** It is considered one of the most difficult types of numerical systems, so programmers use it to enhance the security of websites