Computer Studies Form Three

# Data representation in a computer

Data in computers is represented in a form that human find hard to understand but easy for computers to understand. Computer language is represented in numbers but which are different to what humans use in their daily lives. In computer language, numbers are used to represent pictures, text, voice, instructions e.t.c

## Number systems and their representations

A number system is a set of symbols used to represent values derived from a common base or radix.

Number systems can be classified into four major categories namely:

1. Decimal number system
2. Binary number system
3. Octal number system
4. Hexadecimal number system

## Decimal number system

* Decimal number system has ten digits ranging from 0-9. And because this system has 10 digits it’s called **a base 10 number system or denary number system**.
* A decimal number should always be written with a subscript 10 e.g. X10 but because it’s the most commonly used number system in the world, the subscript is ignored. However in this topic, its necessary to denote the subscript because we are dealing with various number systems.
* The magnitude of a number system is evaluated using three parameters namely:
1. *Absolute value*
2. *Place value or positional value*
3. *Base value*
	* **The absolute value** is the magnitude of a digit. *For example:* in a number 67948 digit 9 has a value of 9 so, 9 is the absolute value
	* **The place value** of a digit in a number refers to the position of the digit making the number. *for example:* the place value of 9 in a number 67948 is hundreds
	* **The base value** of a number is also known as the **radix**. Since 67948 is a decimal or a 10 number system, it can be written as 6794810. Where subscript 10 is referred as the radix or base value.
* This kind of number system is what we mostly use in our daily lives

## Questions

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| **Add** | **Subtract** | **Multiply** |
| 177610+58610= 236210 | 10010-4510= 5510 | 6710 x 6710= 448910 |
| 58910+78910= | 5710-3410= | 4510 x 2310= |
| 1010+2010= | 7510-1010= | 3410 x 1410= |
| 68310+8910= | 6710-710= | 2410 x 4310= |
| 78410+784510= | 8910-6710= | 1310 x 7610= |