

Robots:



Sequential Execution of Instructions

- ⊙ Every command should be executed in order in which it is listed in the **program**.
- ⊙ That is called sequential execution of the program.

Data Representation:

STORING INFORMATION IN A COMPUTER

Computers are used to store different types of information including

- **numbers** 1, 45, 7.3
- **characters** hello, total, 4R
- **graphics** 
- **sound** 

These are stored using **on** and **off** pulses of electricity.

These on and off pulses are the computers own language called **Machine Code**.

The **on** and **off** pulses are easily represented by **1** and **0** which are called **binary digits or bits**. 0 and 1 are called binary digits or bits.

Integers - Positive numbers

Numbers are stored using 8 **binary digits**.

| <u>Decimal number</u> | <u>Binary number</u> |
|-----------------------|----------------------|
| 0 | 00000000 |
| 1 | 00000001 |
| 2 | 00000010 |
| 3 | 00000011 |
| 4 | 00000100 |
| 5 | 00000101 |
| 6 | 00000110 |
| 7 | 00000111 |
| 8 | 00001000 |

A binary number should be written using 8 bits.

Understanding binary numbers

In everyday life 10 decimal numbers are used.

42678 can be seen as : 4 2 6 Binary works 7 8

in a similar way.

11001 can be seen as : 1 1 0 0 1

The base of binary number system is 2.

Changing Decimal numbers to Binary

84 becomes: 84- 64 = 22 0 1 0 1 0 1 0 0

$$20 - 16 = 4$$

$$4 - 4 = 0$$

The base of decimal number system is 10.

| Character | ASCII Code |
|-----------|------------|
| A | 01000001 |
| a | 01100001 |
| % | 10010100 |

Changing Decimal numbers to Binary

86 becomes : 128 64 32 16 8 4 2 1

86 - 64 = 22 0 1 0 1 0 1 1 0

22 - 16 = 6

6 - 4 = 2

2 - 2 = 0

86 converted into binary is 01010110

A binary number should be written using 8 bits.

Text

- text is a symbol or letter on the keyboard.
- text can be represented using **ASCII, American Standard Code for Information Interchange**. ASCII uses 8 bits per character, giving a possible 256 different characters
- ASCII uses 8 bits to represent each character