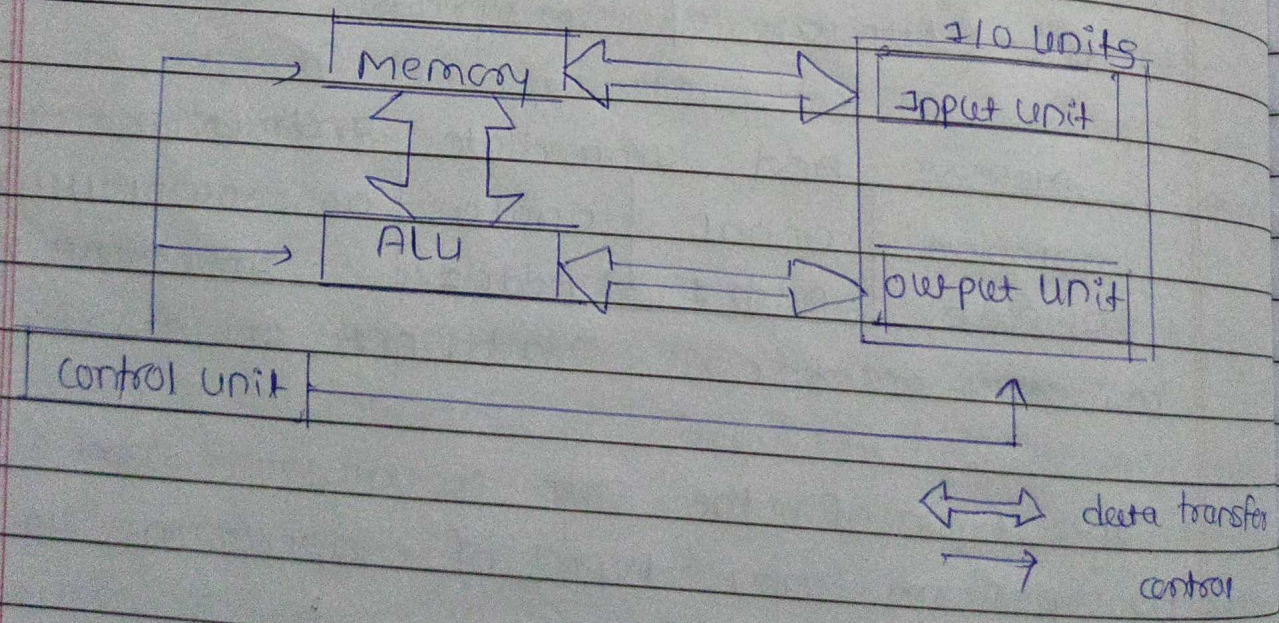
3 Computer Arithmatic

Arithmatic and logic unit : Arithmatic & logic unit is one of the very important part were the operation of the computer system is majorly performed therefore such type of the main unit is popularly known as arithmatic and logic unit.

In the arithmatic operation or unit the addition, like +, -, x, ÷, the unit which perform such type of operation is termed as arithmatic unit and logical unit performes the operation >=, <=, <, > such type of operations are known as the logical unit operation

The diagrammatic representation of arithmatic and logic unit is as follows.



Control unit are three parameters :-

1. Memory
2. ALU
3. Input unit or output unit

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Control unit is the manager of the entire a structure of arithmatic and logic unit. control unit can perform the operation on the basis of three parameter that is control memory, ALU, I/O unit

If memory is available for performing for the ferther task then the input unit will the send the data to with the help of it an input can occupy the memory unit and then it is passon to the arithmatic and logic unit therefore after the operation will get perform the result will get send to be output unit, this cycle will goes on repeating until the entire output is not detected of the instruction set therefore such type of unit is ALU unit.

Integer Representation

Wherever we want to represent our perform the operation at that time you'll have to use the integer representation when the integer representation we want to use at that time we have to make use of binary numbers. Here there are two types of numbers which are used those are 0 & 1. Here 0 & 1 are understable buy the system, and no other representation is used for the computer system.

there are two types of signs are used which are minus (-) and plus (+) minus indicates negative numbers whereas plus indicate positive numbers.

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Fractional component is not used in the integer arithmetic therefore we just have to use only the converted decimal point numbers.

The point is also called as radix. And the digit which is obtained is called binary.

This type of mechanism is basically used to perform the integer arithmetic and are the binary operations which get performed with the help of integers.

* Integer arithmetic

In order to perform the operation of integer arithmetic then it gets followed on the certain rules and regulation.

1. When we perform the addition of two integer numbers then the result which we obtain is also an integer.
   - int + int = int

2. Whenever we perform the substraction of two integers numbers then we will get the required answer in the form of integer.
   - int - int = int

3. Whenever we perform the multiplication of two integer numbers at that time the result will be in the form of integer itself.
   - int x int = int

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3. Whenever we perform the division of integer at that time we will get the final result as integer only. Here no fractional component are used. Therefore we will get only integer value as the main parameter. Therefore this types of rules are very important in order to get the proper arithmetic result. Thus we have to use these rules in order to get the proper required result.

Parameters for operation

- Arithmetic operations gets performed with the help of 3 bits. Here "0" is represented as "000" and "1" is represented as "001" in a 3 bit format. This representation is mostly used to in order to get the proper result and the proper content. All type of arithmetic operation gets performed with the help of 3 bit format in ALU. There this contents are considered as arithmetic content

Floating-point representation

floating-point numbers are also termed as decimal point numbers which are used to place point related data inside it therefore such type of the numbers are termed as floating point numbers.

We can perform all the arithmetic operations with the help of floating point numbers the operation are addition, multiplication, division, substraction these operation can be done directly with the floating point numbers.

The number which comes after a decimal point

is termed as arbitary numbers therefore

eg Let

$0.5 \times 0.25 = 0.125$

Therefore the which we obtained that is 125 such type of the numbers are termed as arbitemy number.

Let's see some rule regarding floating point representation.

① By considering the number of 0 before decimal point we have to place the number belonging to the zero at the power content therefore it is termed as decimal conversion when the number is not specified after the arbitary point with the zero content.

When the conversion gets take place at that point we will turn the number in the decimal point by specifying the point after the number.

e.g $0.125 = 125 \times 10^{-1}$

Whenever we have a huge number in order to convert that number we have to see the number of zero yellocated with the point number and we have to place the number at that point 10 by considering 0.000000 x 5.0.

5.0×10^{6} $-5000000 = 5.0 \times 10^{6}$

e.g $0.12465 = 1.2465 \times 10^{-1}$

- $0.3329 \times$ 2 digit number $= 33.29 \times 10^{-2}$
- $1.6629 \times$ 3 digit decimal number $= 166.29 \times 10^{-1}$
- $1.1114 \times$ decimal 4 digit $= 1111.4 \times 10^{-3}$
- $10.1010 \times$ convert this number into decimal point 4 digit

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② Convert 0.5624 to 5624 convert it into 7 digit number $5624 = 5624.0 \times 10^{-3}$

convert 59.000000 convert it into 6 digit number $59000.0 \times 10^{+4}$
00

Examples on arithmetic

① $0.2 \times 0.8 = 0.16$

0.16 is a number which gives us .16 as arbitary value.

② $0.4 \times 0.86 = 0.744$

0.744 which gives us .744 as the arbitary number

③ $0.87 \times 0.12 = 0.32444$

.32444 as the arbitary number

④ perform the addition of 1.245 and 1.234 and state the arbitrary value

$1.245 \times 1.234 = 2.479$

Here 0.479 is our arbitrary value