05

1 Integer Representation

Unsigned Integers
→ It is refer to a variable capable of holding only positive numbers. Unlike signed, the property of unsigned integers is open for applications in most numeric data types, including short, long, int or char.

Signed Integers
→ Whenever we use negative numbers in day-to-day applications, we usually write a negative sign with the number.

2 Floating-Point Representation

The integer and fractional parts are not given a specified number of bits. Instead, it set aside a particular number of bits for the number and another number of bits to indicate where the decimal place is inside that number.
The floating-point number is expressed,
- 128-bit : 1 sign bit, 112-bit mantissa, 15-bit exponent
- 84-bit : 1 sign bit, 11-bit exponent, 52-bit mantissa

* Arithmetic Logical Unit

ALU performs arithmetic and logical functions. The arithmetic functions are addition, subtraction, multiplication, divisions, etc. The complex operations are performed by making repetitive use of the operations mentioned above. ALU is the key part of the CPU.

* Control Unit

The control unit is one of the crucial components of the CPU. It instructs the complete computer system to perform a particular task. It controls and co-ordinates the functioning of all parts of the computer. It takes instructions from memory and then decodes and executes these instructions.

* Memory Unit

It is also called Random access memory. This unit temporarily stores data, programs, and intermediate & final results of processing. So, it acts as a temporary storage area that holds the data temporarily which is used to run the computer.

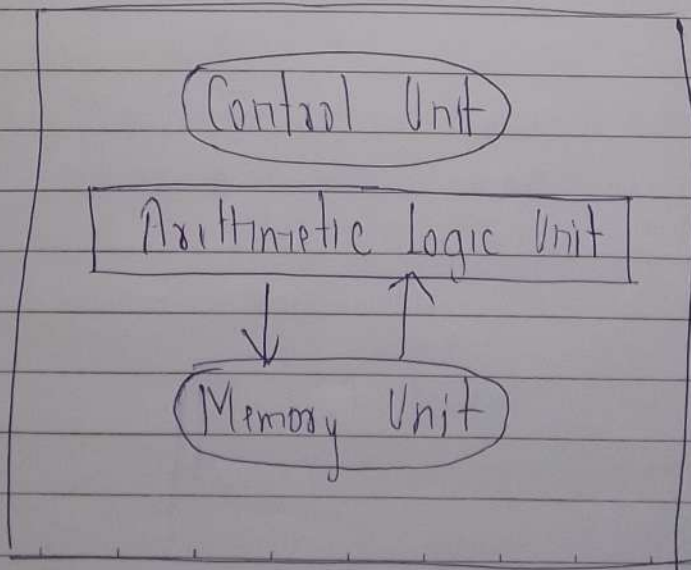
03 Direct Memory Access :-

DMA is a hardware feature in computer systems that allows peripherals and devices to transfer data to and from memory without involving the central processing unit (CPU). It is designed to enhance system performance and efficiency by offloading data transfer tasks from the CPU which can focus on executing other instructions.

Key characters of DMA include :-

i) Efficiency
ii) Parallelism
iii) Reduced CPU
iv) Buffering
v) Control & Co-ordination

04 Explain following parts of the CPU



Central Processing Unit

Q2. There are ~~two~~ types of interrupt

1. Hardware interrupts
2. Software interrupts

* Hardware interrupts

Hardware interrupts are generated by external devices such as keyboard mouse etc. or by internal components like timer, memory management unit or hardware errors.

* Software interupts

These are triggered by software instructions or system calls to request specific actions or services from the OS.

* Exception interupts

Faults: These occur when the CPU encounters an error that can be corrected.
Traps: They are intented to report a condition to the OS or to invoke a specific handler.

g pentium parallel: It was able to process video, audio, and graphic data efficiently by incorporating, Intel, MMX technology

h pentium III: It contains SMD and suppose 3D graphic software.

(i) pentium 4: It implements third-generation address translation that translate a 48-bit.

j core: It is the first intel microprocessor with dual core which is the implementation of 2 processor on a single chip.

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VI Evolution of X-86 architecture are:

a 8080: It was worlds first general purpose microprocessor. It was a 8-bit machine written on 8 bit data path of memory.

b 8086: It was a 16 bit machine and was for more powerful than previous. It has a wider data path of bit.

c 80386: It was Intel's first 32-bits. Due to iES 32 bit architecture, it was able to compete against the complexity and power of mirro computers.

d 80486:- It is introduced the concept of cache technology and main frames introduced. It is multitasking.

e Pentium:- The use of superior techniques was introduced as multiple instruction methods executed in parellel.

f Pentium pro: It is used register remaining, branch prediction, data flow analysis, speculative execution. Advanced optimization techniques in mirro code were also added along with level 2 cache.