

CD ROM

1. compact disk read only memory
2. cd rom approx 700 mb data store kar saktा h
3. iska data transfer rate 1.4 to 1.6 mb/sec hota h
4. cd ki thickness 1.2 mm hoti h
5. सीडी-रोम एक ऑप्टिकल डिस्क है जिसका use कंप्यूटर डेटा को पढ़ने के लिए किया जाता h
लेकिन उस पर लिखा नहीं जा सकता।
6. jo data ko read karne k liye lasers ka use karte h



7.

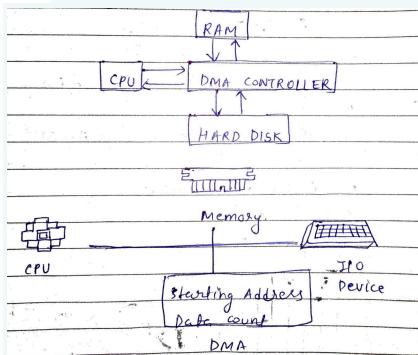
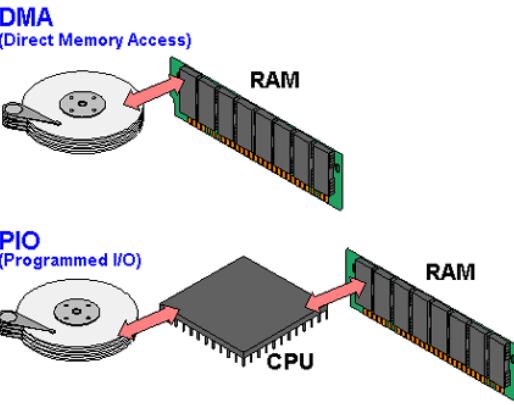
DVD ROM

1. digital versatile disk read only memory
2. dvds 4.7 gb data store kar saktा h
3. iska data transfer rate 11mb/sec hota h
4. iski thickness 0.6 mm hoti h
5. DVD-ROM एक optical डिस्क है जिसका use डेटा पढ़ने के लिए किया जाता है
लेकिन उस पर जानकारी लिखी नहीं जा सकती
6. dvds shorter wavelength laser use karta h
jo data ko read karne k liye lasers ka use karti h



DMA DIRECT MEMORY ACCESS

1. dma ram aur Hardisk k bich data transfer karta h
bina cpu ko baar bar involve kiye
2. benefits: isse cpu ka direct interaction nhi hota h
jis se cpu apne task par focus rheta h
3. aur cpu par burden kam hota h
Eejisse system performance improve hoti h
4. ex: large file copy karte waqt dma directly data move karta h
Jisme cpu disturb nhi hota h



FUNCTIONS:

1. DATA TRANSFER

dma ka main kaam hota h data ko devices aur memory k beech me transfer karna bina cpu ko involve kiye

2. REDUCE CPU LOAD

data transfer process me cpu kam disturb hota h jisse cpu apne current tasks par focus rhta h

3. IMPROVE SYSTEM PERFORMANCE

cpu ko data transfer karne k liye wait nhi karna padta Jisse overall system performance imporve hota h

4. HANDLE LARGE DATA

dma efficiently handle large files ya volumes Ko handle karne me help karta h

5. PARALLEL PROCESSING

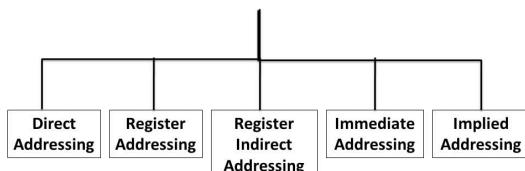
dma multiple devices k saath data transfer ko support karta h jisse system ki speed aur efficiency badhti h

ADDRESSING MODES

1. computer instruction processor ko batata hai data ko kese find karta h

2. Yah sabse better address nikaalne mein madad karta hai
3. CPU data ka location find karta h
4. data memory mein kaise store hota hai

Addressing Modes of Microprocessor 8085



Base register addressing

ek addressing mode hai

jismein **base register** ke value

ko **address field** ke value ke saath jodkar operand ka

effective address nikala jata h

Yeh memory mein kisi bhi data ya instruction ko access kiya jata h

Relative addressing

operand ka effective address register ke value

aur instruction ke address part ko jodkar calculate kiya jata hai

Register addressing, index addressing, direct addressing,

Combination logic

1. Ye current input se output decide karta hai

Ye digital circuit hote h

Past input output ko influence nahi karta

2. output current input par depend karta h
3. Isme Memory element ya storage nahin hota
4. Ismein time ka concept nahin hota
5. Example And, or, xor, gates arithmetic circuits

Sequential logic

1. Ye current input aur past input se output decide karta h
2. output current input aur past input par depend karta h
3. Ismein memory element ya storage hota ha jo information ko store karta hai
4. Ismein time ka concept hota hai jisse sequential processing hoti ha
5. Example flip flop register, memory units in PC

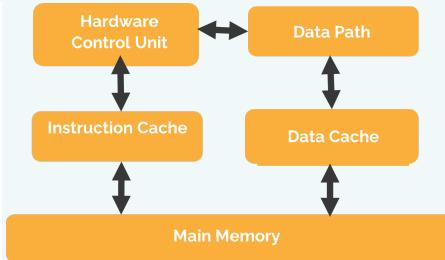
JK FLIP FLOP

JK flip flop 75% sr flip flop hota h

RISC

1. Reduce instruction set computer
2. Ismein Less number of instruction variable length hote H
3. Ismein few number of addressing modes hote Hain
4. Iski cost Kam hoti hai
5. Ismein single cycle instruction hota hai

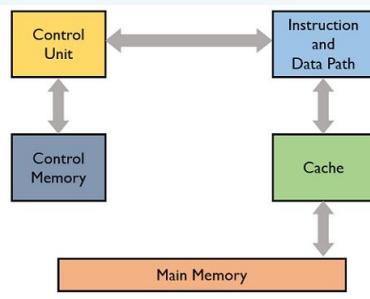
6. Ye hardwired control unit ko support karta hai



CISC

Complex instruction set computer

1. Ismein large number of instruction variable length hote H
2. Ismein instruction format hota hai
3. Ismein large number of addressing modes hote Hain
4. Iski Cost jyada hoti hai
5. Ismein Several instruction hote Hain
6. Ye micro programmed control unit ko support karta hai



- 7.

CISC Architecture

RISC ARCHITECTURE

reduced instruction set computer types :

1. simple instruction set

Computer aur microprocessor k liye basic command h

Isme me kam instruction chalte h

isse processor ka architechture simple hota h

isme instruction easy to understand hota h

isme memory se data laane ka process fast hota h

2. large register set

Ek bada set hota h jisme multiple instruction hote h

Isme jyaada registers chalte h

isse processor ka architechture simple hota h

Isme processor ko baar baar memory se data

Maangne ki jaroorat nhi padti

Isme instruction samajhna thoda muskil hota h

memory se data laane ka process slow hota h

3. fixed length instructions

Isme me saare instruction same size k hote h

jisse isse samajhna aur aage badhana pipeline asan ho jata h

jab ek instruction chalta h to processor next instruction

Ko laana shuru karta h

4. load store architechture

Isme instruction memory se data lekar register me load hote h
aur registers se data wapas memory me bhejte h
isse processor ka design simple aur effiecient banta h

USE OF LARGE REGISTER FILE IN RISC

large register file

Ek storage me zyada se zyada calculations ke liye
temporary data rakha jaa sakta hai.

Risc cisc k compared zyaada register file use karta h
ye design memory access kam karta h aur processing speed bad jati h

advantages

faster data access

reduced memory traffic

imporved compiler optimisation

diagram

cpu k andar high speed memory location

ka ek chota block socho

in location ko alag alag numbers diye jaate h
aur ye data k liye temprory storage compartments
ki tarhe kaam karte h

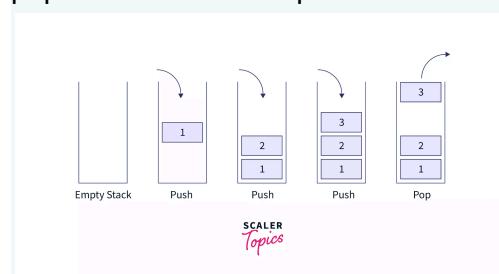
ye hi memory locations ka block risc register file h

push or pop

asssembly me stack me data ko jodne aur nikalne k operation hote h

push: data ko stack k upar add karta h

pop: data ko stack k upar se nikalta h



Ram

Random access Memory

Temporary storage hota hai

Data ko MBS mein store karta hai

Nature mein volatile hota hai

Data ko fast write karta hai

Application processing mein use Kiya jata hai



Rom

Read only memory

Yah permanent storage hota hai

Data ko GBS mein store karta hai

Nature mein non volatile hota hai

Data ko slow write karta hai

PC ke startup process mein use Kiya jata hai



.COM

Executable program ka file extension hai

Ek purana format hai

MS dos mein use Kiya jata hai

Limited size hota hai 64 kb

Simple to create hota hai

.EXE

Executable program ka file extension hai

Modern format hai

Windows mein use Kiya jata hai

Iska size large hota hai

Complex to create hota hai

Aaj ke Yug mein standard format use Kiya jata hai Windows mein

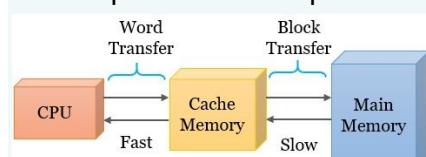
Cache memory

Ye Chhota, Tej memory h Jo CPU aur ram ke bich mein hota hai

Ye information aur instruction ka use karta hai Aur use बार-बार store karta hai

CPU data ko Ram se directly nahin Lata jise data ko jaldi access kar sakte hain

Ise computer ki overall performance acchi Ho jaati hai



11. Direct memory cache kaise kam karta hai

Har Ek ram block Ko cache mein Ek particular line se map Kiya jata h

Yah mapping mein memory adress ke block adress portion ko use Kiya jata hai

Diagram

Ismein cache ko cache memory mein Bata jata hai

har Ek cache mein data aur ek tag hota hai

Tag batata hai ki data kaun si main memory block se juda hai

CPU data mangta hai to wo pahle cache mein check karta hai

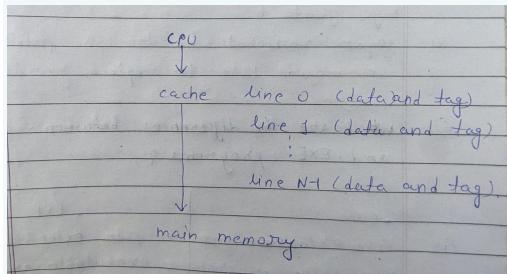
Agar data cache mein mil jata hai To use quickli retrieve kar lete hain(cache hit)

Agar data cache memory me nahin milta to use main memory se laya jata hai

(Catche miss)

Aur ek variable cache line mein load kiya jata hai

Agar jarurat ho to vah pahle se maujud data ko replace kar data hai



flag register

CPU operation ke bare mein information ko store karta hai

Yah aise chhote switches hote hain jinhen on off kiya jata hai

Yah instruction ke result per depend hote hai

D ₇	D ₆	D ₅	D ₄	D ₃	D ₂	D ₁	D ₀
S	Z		AC		P		CY

Zero Flag

Calculation ka result zero hai ya nahin

Sign flag

Result positive hai ya nahin

Overflow flag

Arithmetic operation mein overflow hua ya nahin

Programmer een flag registers ka use program ke flow ko control karne k liye conditional jump instruction ki help se karte Hain

Ex. Mov ax,5; AX mein 5 store karo

Add ax, 3; AX mein 3 add karo

; zero Flag check

Hierarchy of Memory

1. Computer me storage ka organisation hota h
jo levels based hota h pyramid style me

2. Jisme register, cache memory, main memory,
magnet disc, magnetic tape hote h

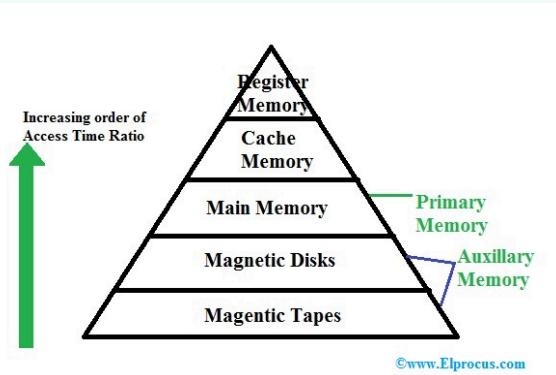
3. Speed, size, and cost par based hota h

Memory System

1. Computer ko chalane k liye memory me
data aur instructions ko store karta h

2. Data ko permanent ya temporary store karte h

Memory management karte h



REGISTER MEMORY

Register memory CPU में सबसे तेज memory hoti h
और छोटी मेमोरी होती है

जो DATA aur instruction ko handle karti h

CACHE MEMORY

Ye Chhota, Tej memory h

Jo CPU aur ram ke bich mein hota hai

Ye information aur instruction ka use karta h

Aur use बार-बार store karta hai

CPU data ko Ram se directly nahin Lata

jise data ko jaldi access kar sakte hain

Primary memory

Computer ki temporary memory hoti hai

Iska access time fast hota hai

Ye cpu se direct communicate karti hai

Ye size mein Smallest hoti hai hoti hai

Iska nature volatile hota hai

Ye expensive hoti hai

Ise main memory bhi kaha jata hai

Example Ram, ROM

Secondary memory

Ye computer ki permanent memory hoti h

Iska access time slow hota hai

Yah CPU se direct communicate nahin karti

Ise CPU ki jarurat Hoti hai ees operation ko karne ke liye

Ye size mein biggest hoti hai

Yah cheapest hoti hai

Ise auxiliary memory bhi kaha jata hai

Example HDD SSD SD card pen drive

COMPUTER SYSTEM ft.von neumann arch.

Hardware aur software ka combination hota h

jo ek saath milkar kaam karta h aur

Information ko process karta h aur tasks ko perform karta h

Von Neumann architecture

1. Ek computer architecture hai
2. jismein CPU, memory, input aur output

device ek sath kam karte hain.

2. ek hi memory mein data aur program ko store karte h

3. aur program counter ka istemal karke

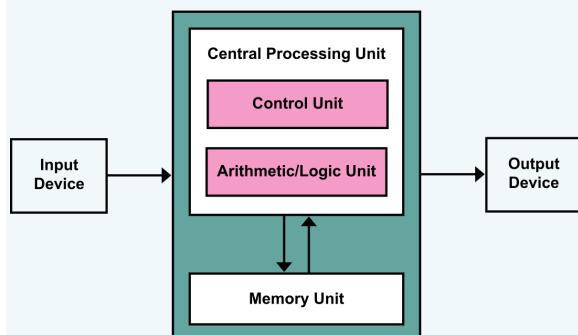
inhe sequential order mein execute karti hai.

4. aaj ke lagbhag sabhi computeron mein iska use hota hai.

5. Yeh bottleneck se suffer karta h

CPU memory ko access karne ke liye

ek hi bus ka istemal karta hai.



OTHER POINTS

1. CPU memory se instruction ko fetch karta h

2. CPU instruction ko decode karta h

3. CPU instruction ko execute karta h

4. CPU result ko memory mein store karta hai.

ADV

Von Neumann architecture bhot flexible h

Von Neumann architecture ko program karna aasan hai.

DIS

Von Neumann architecture mein bottleneck ho sakti hai.

बॉटलनेक प्रोसेसर और मेमोरी के बीच डेटा ट्रांसफर की धीमी गति को कहते हैं।

Von Neumann architecture mein security risk ho sakti hai

CPU

कंप्यूटर का दिमाग main part होता है

जो calculation aur instructions ko handle karta h

ALU

Arithmetic Logic Unit

Ye numbers ke saath arithmetic Aur logic operation perform karta h

CU

Control Unit

instructions ko read karta hai

Aur ALU ko control karta hai

Input output k saare operation ko control karta hai

MU

Ye temporary storage hota h jha instruction,

Result aur data store hote h

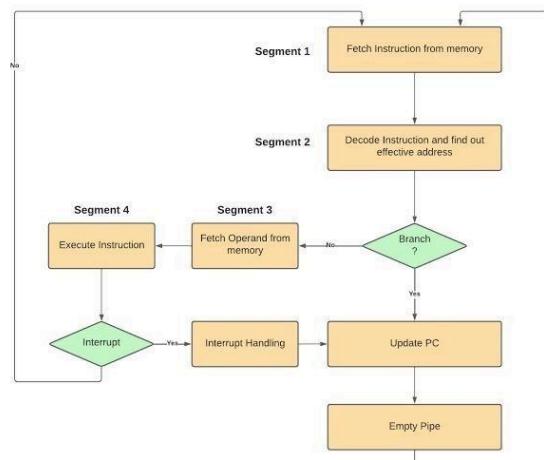
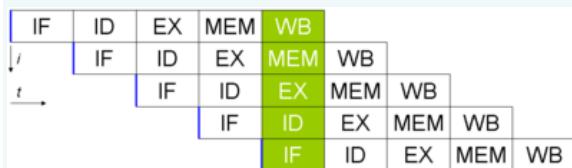
REGISTER

Register computer ki memory mein ek Chhota hissa hota h

yah Tej hota hai aur iska use data ko Store aur flow karne k liye hota h

instruction pipeline

1. Instruction pipeline एक ऐसा तरीका है
 2. जिससे CPU एक साथ कई instructions पर काम कर सकता है,
जिससे उसकी performance बढ़ जाती है
 2. ek esa tarika h jisse computer tez kaaam karta h
 3. computer me instruction ko step by step process karte h
har step me kuch specific task hote h
 4. saara kaam teji sse hota h
- jisse performance overall improve hoti h



Instruction cycle

1. Command ka chakkar lagana
2. Computer kisi bhi task ko complete karne k liye oos process ko kuch steps me divide karta h
3. Een steps ko follow karta h –
command ko laana (fetch)
samajhna (decode)
karna (execute) aur phir
Agli command k liye ready ho jata h
4. Ees cycle ko hum instruction cycle kehte h jo computer ko instruction follow karne me help karti h
5. The instruction cycle is the repetitive process by which the central processing unit (CPU) fetches, decodes, and executes instructions from memory to carry out

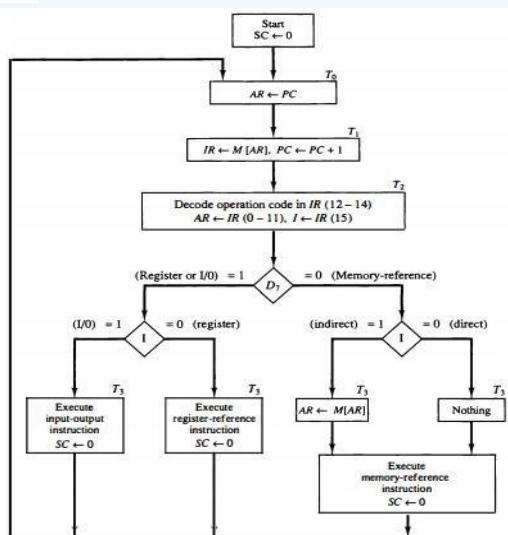
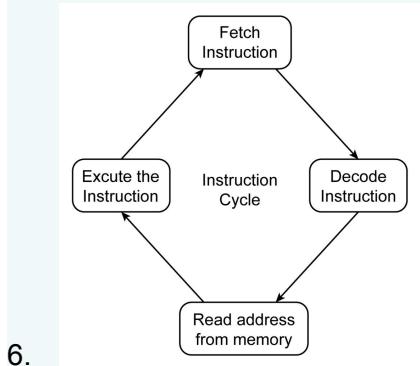


Figure Flowchart for instruction cycle (initial configuration).

LAYOUT OF MAGNETIC DISC

1. Ek Hardisk HDD hoti
2. hai jo ek specific layout ka use karke data ko store karta h
2. Ye magnetic material ka banaa hota hai
Jismein circular patterns coated hote Hain

Access time components :

Seek time

Batata hai Head ko desired track per le jaane mein

Kitna time lagta hai

Rotational latency

Batata hai Head ke niche wale sector ko dhundhne mein

Kitna time lagta hai

Transfer time

data ko padhne ya likhane mein Kitna time

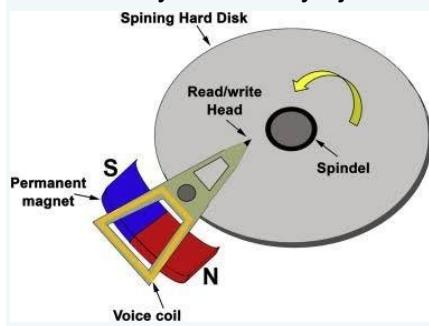
Lagta hai

jab heads position mein hote Hain

Optimise access time

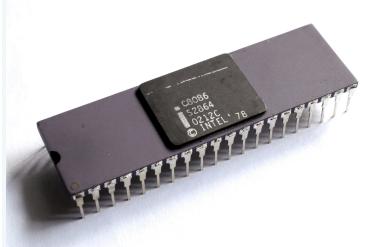
1. Seek time, rotational delay aur transfer time ko kam karke performance ko improve Kiya jata hai

2. Caching aur disk layout optimisation Jaise technology
Se efficiency ko bhadaya jata h



8086 Microprocessor CPU se related

1. 8086 microprocessor ek computer chip hai
2. 8086 microprocessor cpu ka main feature hai
Jo data ko process karta h
3. large amount of data ko handle karta h
aur fast computing karta h
4. Iska use mainly personal computers mein hota tha ex ibm pc



Structures

1. ALU

Arithmetic Logic Unit

Ye numbers ke upar arithmetic aur logic operation perform karta h

Ye computations ko handle karta hai.

2. CU

Control Unit

instructions ko read karta hai aur aLU ko control karta h

Input output k saare operation ko control karta hai

3. REGISTER

Register computer ki memory mein ek Chhota hissa hota hai ye Tej hota hai aur iska use data ko Store aur flow karne k liye Kiya jata h

4. BUS SYSTEM

bus system ek communication network h jo data ko registers, memory, aur other components ke beech transfer karta hai

5. CLOCK SYSTEM

clock system ek timing mechanism h Jo microprocessor ke operations ko synchronize karta hai

Isse microprocessor ki speed ko control kya jata hai

what are the different kinds of interrupts

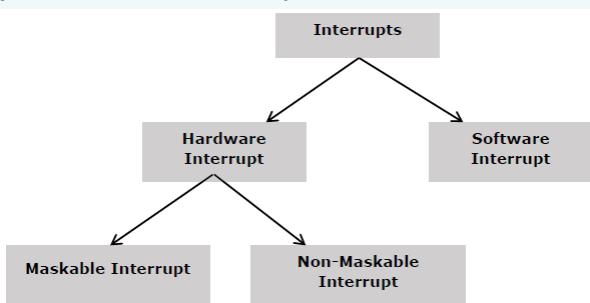
how does CPU know that an interrupt has occurred.

Interruption

ek signal hota hai jo CPU ka ek specific task ko rok kar ek dusra task karne ke liye force karta hai.

Interrupts

CPU ke liye emergency messages hote h jo kaam ko temporarily rok deti hain.



Types of Interrupts:

Hardware Interrupts: External devices ko control karte h jisse response milta h, jaise keyboard ka key press karne par Display par show hota h

Software Interrupts: Programs se software ko control karte h aur jab CPU ke process use Kiya jata h Jese coding karke ek app banaya gaya

CPU ko kaise pata chalta hai ki interrupt hua hai:

external device ya program Interrupt
line wire ko ek signal bhejte h
phir CPU ko inform karte hain
CPU phir apna current kam rok deta h jha se choda h wahi se save karta h
phir interrupt ko handle karta hai.
Jisse important task ko turant attention milta h

Hardwired Control

Hardwired control electronic circuits
Se bana control system hai
yeh bataata hai ki computer ka different parts kab kya karte h

Example: simple calculators

Micro Programmed Control

Microprogrammed control ek control unit ka design hai
Jismein control signals ko microprogram
Ke roop me store kiya jaata hai
control memory me chhote chhote instructions ka ek set hota hai
Example: Modern CPU

Hardwired

1. Hardwired ki speed fast hoti hai
2. Hardwired ki flexibility ko change karna difficult hota hai
3. Hardwired ki cost jyada hoti hai
4. Hardwired mein complex circuit hote Hain
5. Hardwired ka example simple calculators

Micro programmed

1. Iski speed slow hoti hai
2. Iski flexibility ko change karna aasan hota hai
3. Yah kam kharchila hota hai
4. isme simple circuits hote Hain
5. Example modern CPU s

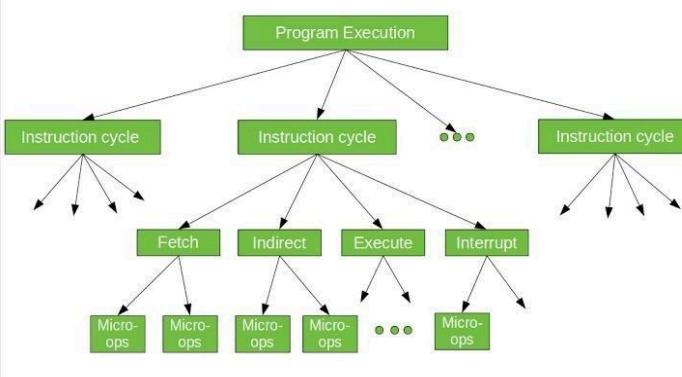
What is a micro-operation ? Explain the sequence of micro-operations

required to fetch an instruction stored in the memory in the context of a Von Neumann machine

Micro-operation

Ek basic operation hai Jo CPU per perform hota hai

Jo low level operations ko milakar pura machine instruction execute hota hai
steps follow hoti h



Micro-Operation: Yeh chhoti si operation hoti hai jo CPU mein hoti hai.

Fetch Operation: Instruction ko lekar aane ke liye command di jati hai.

MAR Memory Address Register

memory mein data aur instructions ke location ka address rakhta hai.

MR Memory Read Operation:

Memory me Data ko read karne ka operation hota h

MDR Memory Data Register

Memory se aaya data ismein load hota hai.

Jo temporary store hota h

IR Instruction Register

CPU ka part hota hai Jo current mein executed hua instruction ko store karta h

PC Program Counter

Agla instruction ka address batane ke liye Program Counter ko update kiya jata h

Ek register hota hai Agle executive instruction k memory address ko track karta h

SRAM

1. Sram mein lower access time hota hai
2. Yah faster hota hai
3. Yah storage component me transistor use karta hai
4. Jisse har bit ke information ko store karta hai

Data ko maintain karne ke liye

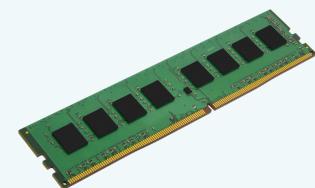
5. Cache memory mein use Kiya jata hai
6. Sram expensive hota hai
7. Iski density less hoti hai



8.

DRAM

1. DRAM main higher access time hota hai
2. Ye slow hota hai
3. Yeh storage component mein capacitor use karta hai
4. Ye each bit of data ko store karta h
5. Main memory mein use Kiya jata h
6. Iska average price hota h
7. Iski density high hoti hai



8.

Maskable external

1. Ismein priority kam hoti hai
2. Yah vectored aur non vectored dono hota hai
3. Pheripherical device ke sath interface mein use Kiya jata hai
4. Ye masked aur made pending ho sakta hai
5. Iska response time Low hota h

Non maskable internal

1. Ismein higher priority hoti hai
2. Ismein sab kuchh vectored hota hai
3. Ise emergency purpose ke liye use Kiya jata hai
4. Yah Masked aur made pending nahin ho sakta
5. Iska response time high hota hai



RAID

Redundant Array of Independent Disks

jo data ko **redundant** aur **protected** rakhne ke liye

kai hard disk drives ko ek sath jodti hai

RAID data ki **copies** banakar **safe** rakhta hai

taki agar koi ek hard disk drive fail ho jaati h to dusri copy se

Backup liya ja sakta h

alag alag hard drives ko jodne ka तरीका है

jisse data redundancy या performance badhaya jata h

REDUNDANT ARRAY OF INDEPENDENT DISKS
(RAID)



TYPES

1. RAID 0 striping

Data ko multiple disk par divide karke storage k space ko

Increase karta h par security provide nhi karta h

2. RAID 1 mirroring

Data ki complete copy dusre hard disk par rakhi jati taki drive

Kharab hone par bhi data save rahe

3. RAID 5 stripping with distributed parity

Bhot saari harddisk ko milakar ek badi storage banata h

Jo disk kharab hone par data bach jata h

4. RAID 6 stripping with double parity

Agar same time me 2 hard drive fail ho jati h

tab data ya information ko protect karta h

5. RAID 10 mirrored striping

Ek storage setup h, jo disk mirroring aur stripping ko milakar

Data ko save aur performance dono badahata h

PROGRAMMED IO

Programmed io me cpu physical device se directly data transfer ko control karta h

Jese keyboard, monitors, printers

1. Start

Process shuru hota h

2. Cpu waits

Cpu device se input signal ka wait karta
data transfer k liye Phir ready hojata h

3. i/o

Cpu data transfer shuru karta h device se data padta h input
Aur fir uspe data likhta h output

4. Check status

Cpu device ki status check karta h ki data transfer poora hua h ya nahi

5. Loop

Agar data transfer pura nahi ho pata to cpu loop wapas step 3 par jata h
Aur fir se data transfer ko continue rakhta h

6. End

Jab transfer poora hojata h tab process khatam ho jata h

Master slave flip flop

Master slave flip flop ek digital circuit hai

Jo binary data ko store Karta hai

ismein JK flip flop master aur slave Jude hote Hain

Master

Clock signal ke badhate hue edge per data capture karta hai

Slave

Clock signal ke ghatate hue edge per master se data capture hota hai

Ye 2 step process hota hai

Binary data ko reliable aur stable tarike se store karta hai

Diagram mein

Clock signal cp master aur Slave flip flop data ke beech flow ko control karta hai

Jab cp high hota hai tap master Apne input j aur k par data capture karta hai

Jab cp low hota h tab slave master se data latch kar leta h aur output q update hojata h

