COMPUTER SCIENCE

PRACTICE SET - 1

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Q1) Which of the following syntax is used to declare attribute list?

a) <#ATTLIST Name AttDefs>
b) <?ATTLIST Name AttDefs>
c) <!ATTLIST Name AttDefs>
d) <+ATTLIST Name AttDefs>

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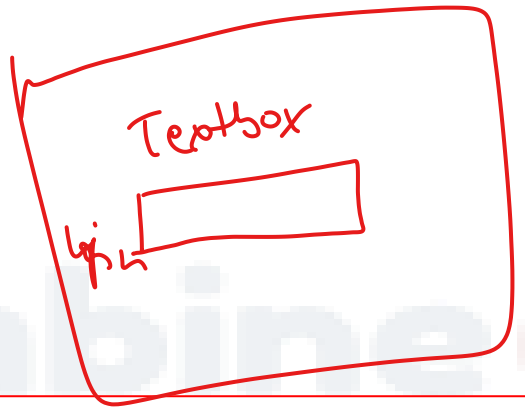


A DTD defines the structure and the legal elements and attributes of an XML document.

XML DTD
Syntax :
<!ATTLIST element-name attribute-name attribute-type attribute-value>

The Building Blocks of XML Documents are:

- Elements – main building block
- Attributes – extra information
- Entities - Some characters have a special meaning in XML
- PCDATA - PCDATA means parsed character data.
- CDATA - CDATA means character data.

Elements are the **main building blocks** of both XML and HTML documents.
Examples of HTML elements are "body" and "table".
Examples of XML elements could be "note" and "message".
Elements can contain text, other elements, or be empty.
Examples of empty HTML elements are "hr", "br" and "img".

Attributes provide **extra information about elements**.
Attributes are always placed inside the opening tag of an element. Attributes always come in name/value pairs.

Entities

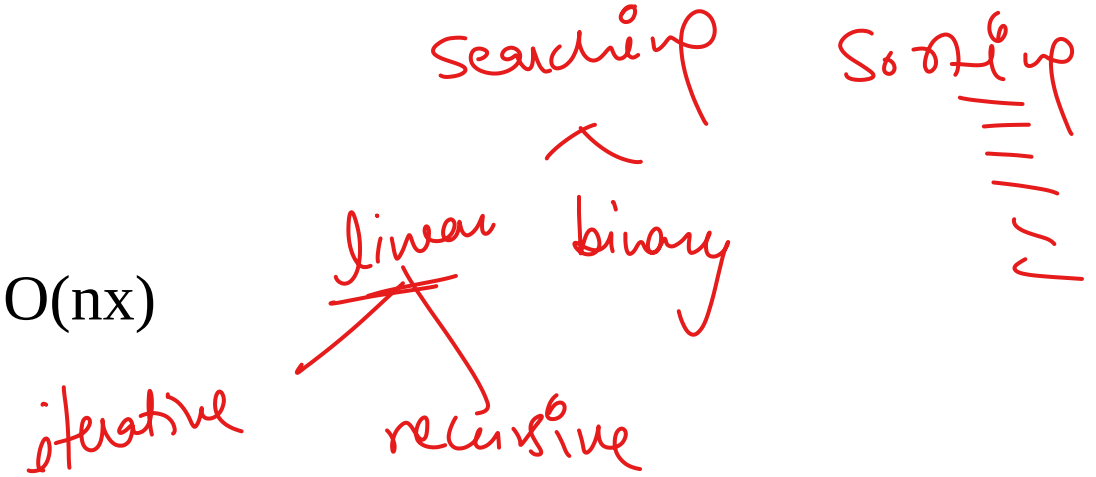
&lt;	<
&gt;	>
&amp;	&
&quot;	"
&apos;	'

PCDATA is text that WILL be parsed by a parser. The text will be examined by the parser for entities and markup.
Tags inside the text will be treated as markup and entities will be expanded.
Example: &, <, or > characters to be represented by the & < and > entities, respectively.

CDATA is text that will NOT be parsed by a parser. Tags inside the text will NOT be treated as markup and entities will not be expanded.

Q2) What is the worst case runtime of linear search(recursive) algorithm?

a) O(n) b) O(logn) c) O(n2) d) O(nx)



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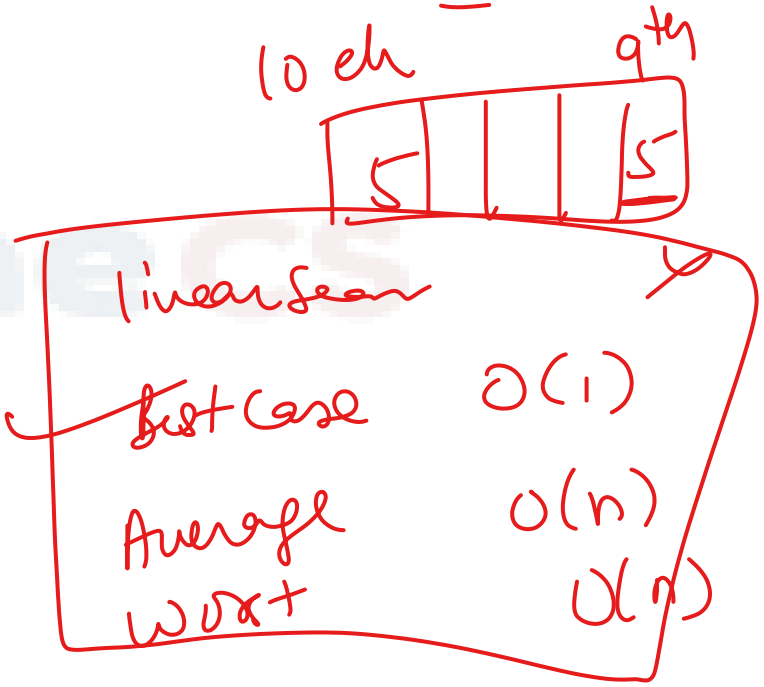
Explanation: A linear search algorithm, whether recursive or iterative, works by sequentially comparing each element in the input with the target value. In the worst-case, the target element is either the last element or not present in the list at all. This means the algorithm needs to compare the target with every element in the input, leading to a time complexity of O(n).

Not efficient to use for large data inputs.



Algorithm	Time Complexity		
	Best	Average	Worst
Selection Sort	Ω(n^2)	θ(n^2)	O(n^2)
Bubble Sort	Ω(n)	θ(n^2)	O(n^2)
Insertion Sort	Ω(n)	θ(n^2)	O(n^2)
Heap Sort	Ω(n log(n))	θ(n log(n))	O(n log(n))
Quick Sort	Ω(n log(n))	θ(n log(n))	O(n^2)
Tree Sort	Ω(n log(n))	θ(n log(n))	O(n^2)
Merge Sort	Ω(n log(n))	θ(n log(n))	O(n log(n))
Bucket Sort	Ω(n+k)	θ(n+k)	O(n^2)
Counting Sort	O(n+k)	O(n+k)	O(n+k)
Radix Sort	Ω(nk)	θ(nk)	O(nk)

Q3) Which of the following is not a stable sorting algorithm?

a) Quick sort b) Cocktail sort
c) Bubble sort d) Merge sort

Q3) Which of the following is not a stable sorting algorithm?

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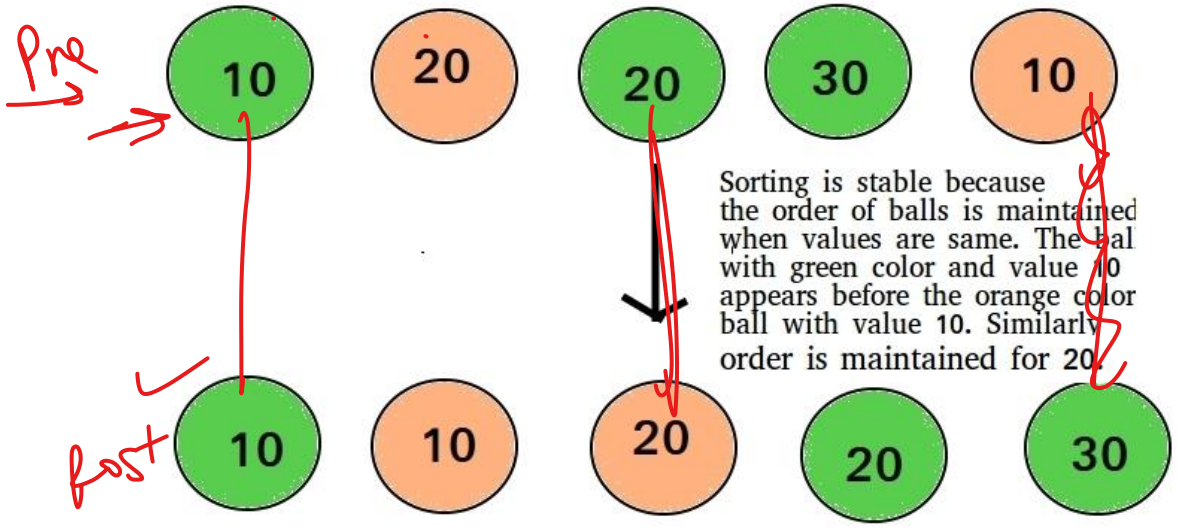
What is stable sorting?

A stable sorting algorithm maintains the relative order of elements with equal keys
Stability means that equivalent elements retain their relative positions, after sorting.



Stable Sort

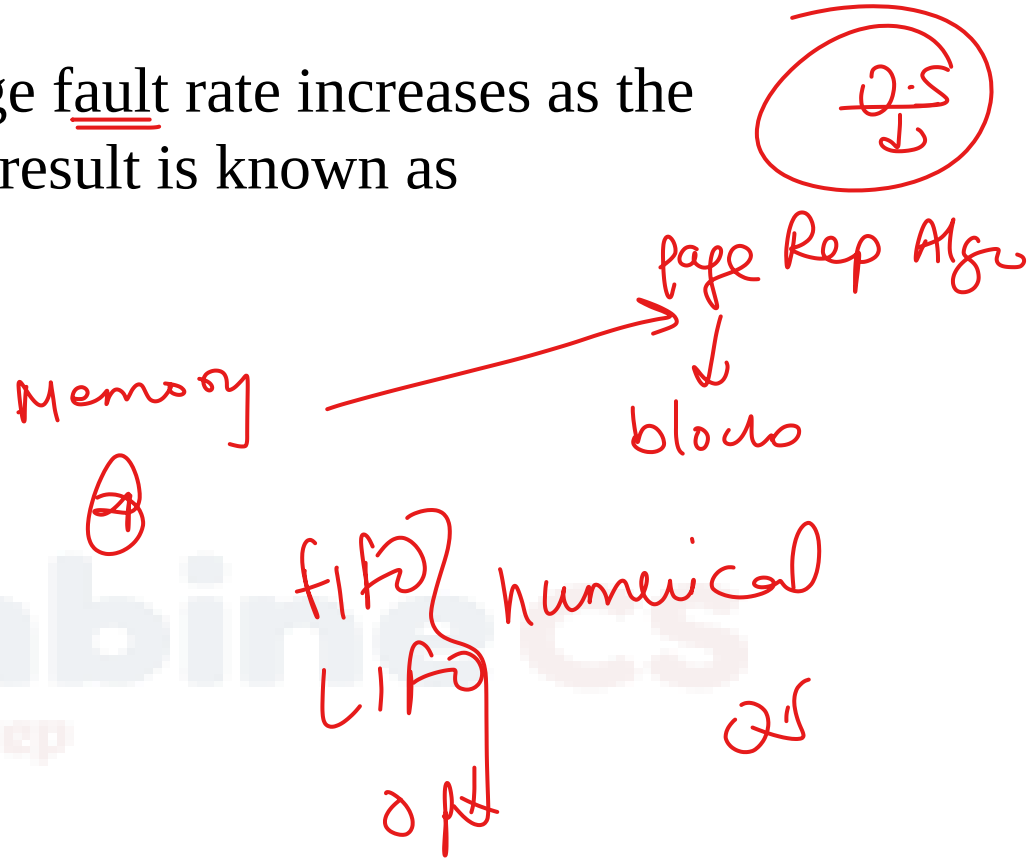
1. Bubble Sort
2. Insertion Sort
3. Merge Sort
4. Count Sort
5. Radix Sort
6. Cocktail sort

Unstable Sort

1. Quick Sort
2. Heap Sort
3. Selection Sort

Q4) In page replacement algorithms if the page fault rate increases as the number of allocated frames increases then the result is known as _____.

a) Frame allocation problem
b) Greater fault problem
c) Contrast anomaly
d) Belady's anomaly



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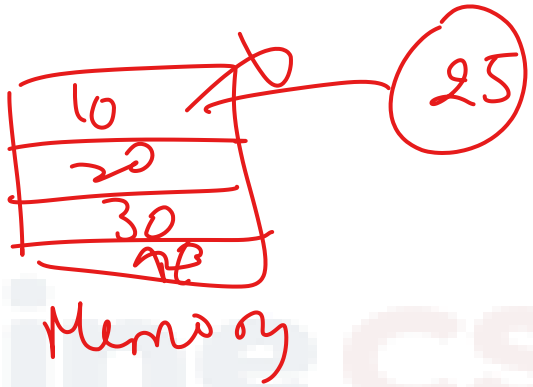

Belady's anomaly occurs in FIFO page replacement policy.

Page Fault: A page fault occurs when a page is not found in main memory and needs to be retrieved from secondary storage (like a hard drive).

Q5) Machine that places the request to access the data, is generally called as _____. (KVS PGT 2018)

a)Server machine
b)Client machine
c)Request machine
d)Response machine

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Q6) If the prolog of a well-formed XML document includes DTD and the rest of the document conform to the structure defined in DTD then it is called as ……

a) Internal structure
b) Good xml documents
c) Valid XML document
d) Minimalist XML document

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a) Internal structure
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If a well-formed XML document includes a DTD in its prolog and the rest of the document conforms to the structure defined in that DTD, it is called a valid XML document. A DTD specifies the rules for the structure, elements, and attributes of an XML document. When an XML document adheres to both the well-formedness rules of XML and the rules defined in its DTD, it is considered valid.

In other words a well formed XML document does not need a DTD, but it must conform to the XML syntax rules. If all tags in a document are correctly formed and follow XML guidelines, then a document is considered as well formed."

Q7) Which of the following is true?

I) A program by itself is a process

II) A process is a passive entity

a) I only

b) II only

c) Both I and II

d) Not both I and II

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A program is a set of instructions, while a process is the active execution of those instructions. A program is a passive entity stored in memory, whereas a process is an active entity that uses system resources like CPU and memory to execute.

Q8) Which of the following IPC is fastest amongst all?

a) message Queue
b) semaphore
c) shared memory
d) all are equal

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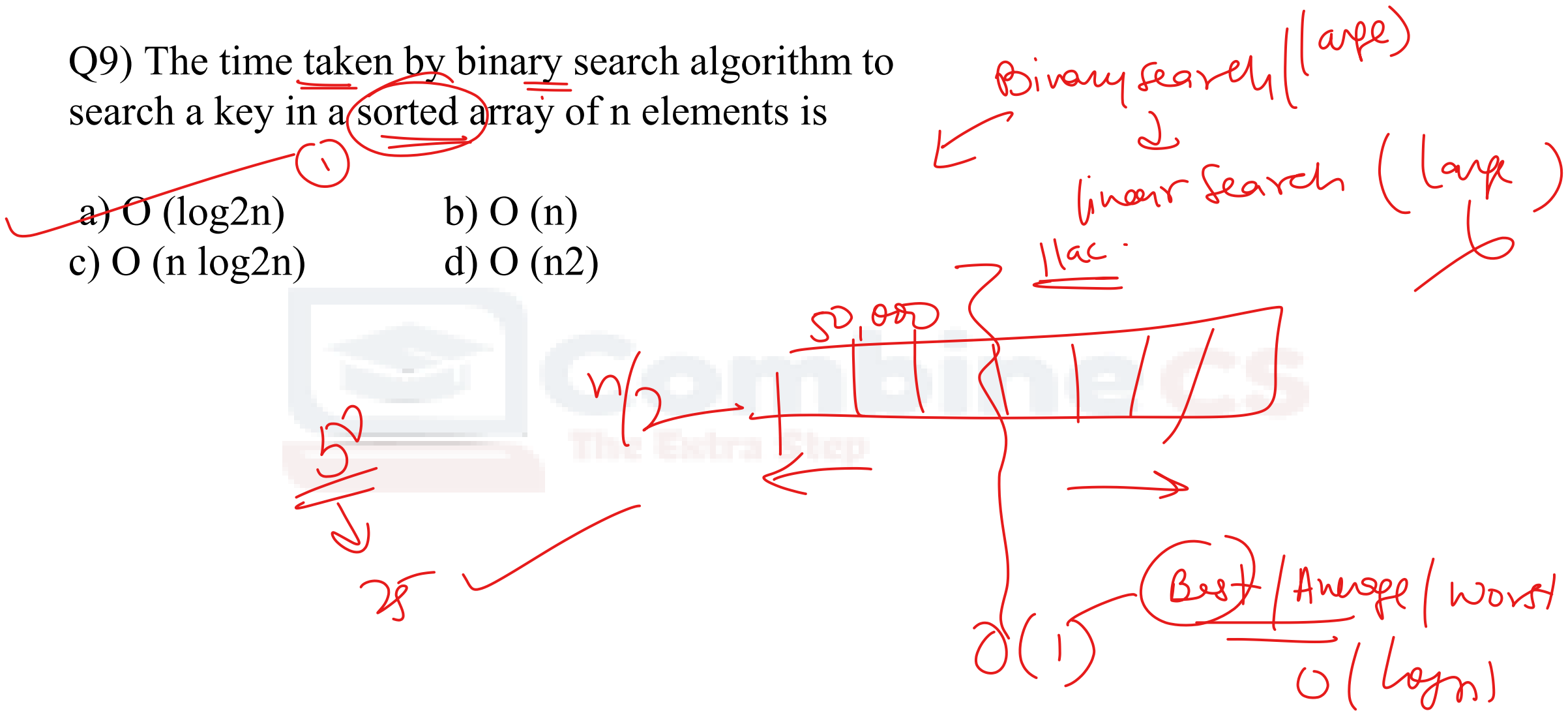
Shared memory is considered the fastest IPC method because it directly allows processes to access the same memory region, eliminating the need for data copying involved in other methods like message queues.

Semaphores are not an IPC mechanism itself, but rather a synchronization tool used to manage access to shared resources, not for data transfer.

Q9) The time taken by binary search algorithm to search a key in a sorted array of n elements is

a) O (log2n)
b) O (n)
c) O (n log2n)
d) O (n2)



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$\log_2 n$

Q10) If x is a set and the set contains the real number between 1 and 2, then the set is _____.

a) Empty set
b) Finite set
c) Infinite set
d) None of the mentioned

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xml DTD - 6

Q11)The keyword PCDATA stands for

a) Passed correct data
b) Passed character data
c) Parsed correct data
d) Parsed character data

Q12) In SQL, ... is an Aggregate function.

a) SELECT
b) CREATE
c) AVG
d) MODIFY

Q12) In SQL, ... is an Aggregate function.

a) SELECT b) CREATE
c) AVG d) MODIFY

MIN() - returns the smallest value within the selected column
MAX() - returns the largest value within the selected column
COUNT() - returns the number of rows in a set
SUM() - returns the total sum of a numerical column
AVG() - returns the average value of a numerical column

Q13) Which one of the following commands is a type of Data Definition Language command?

DML →

DCL →

DiL —

DDL

a) Create b) Update

c) Delete d) Merge

Q13) Which one of the following commands is a type of Data Definition Language command?

a) Create
b) Update
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formula

Q14) Minimum number of edges in a binary tree having n nodes.

a) n-1
b) n
c) n+1
d) n2 n^2

Binary Tree
→ 0
→ 1
→ 2

eg

child-0
n=1
e=0

child-1
n=2
e=1

child-2
n=3
e=2

Q14) Minimum number of edges in a binary tree having n nodes.

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c) n+1 d) n2

Q15) In which of the following addressing mode operand is specified in the instruction itself.

a) Direct addressing mode
b) Register addressing mode
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In immediate addressing mode, the operand itself is specified directly within the instruction. For example, in the instruction "ADD #5", the value 5 is the operand and is directly included in the instruction.

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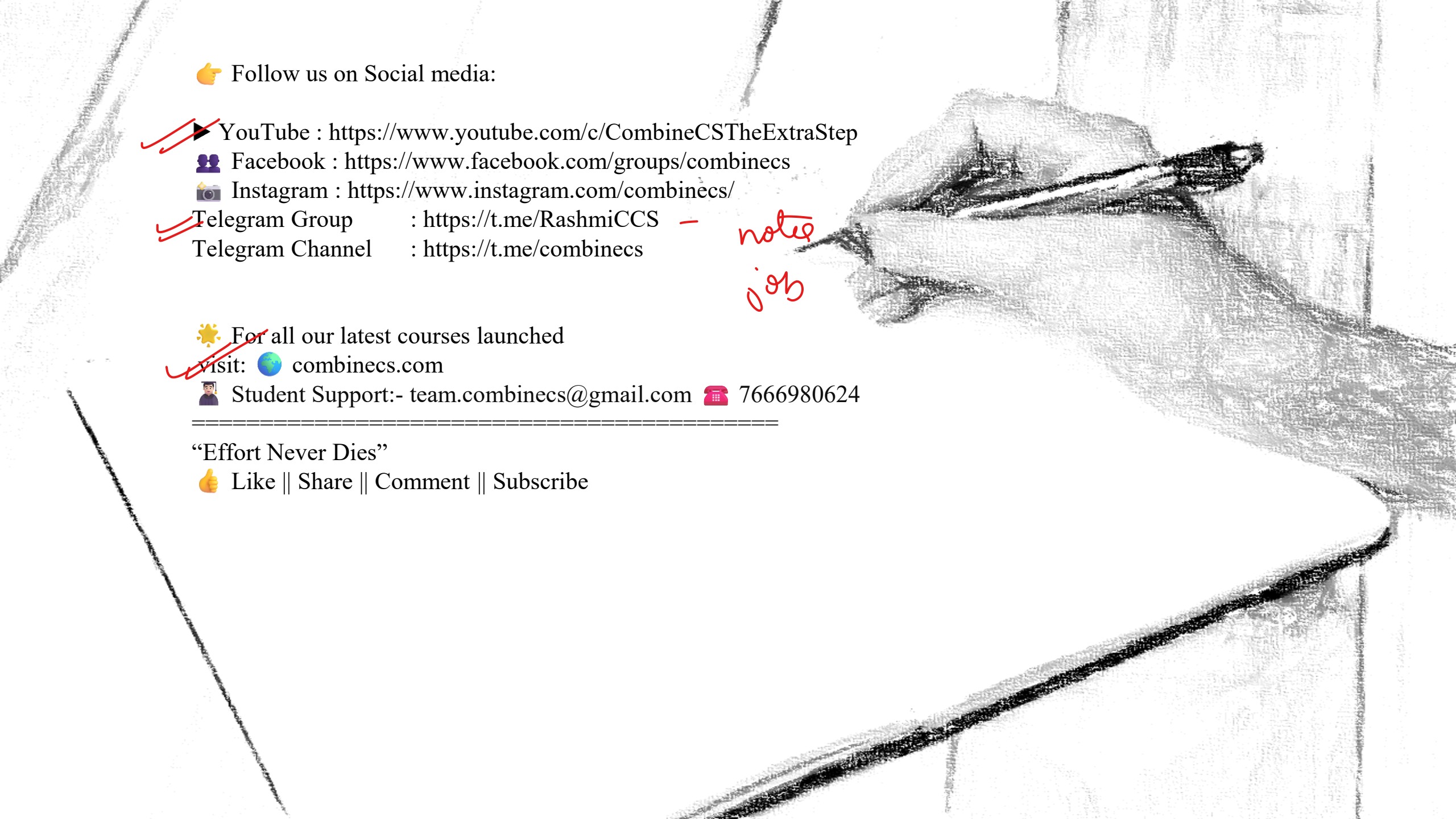

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