Day wise syllabus for cohort

Session 1,2 :

Q 1. sum of two integer

Q 2. Relation between integer and string

Q 3. sum and message

—**type coercion**.

—Greet the User

Q 4. Accept and print the answer

Q 5. Swap two variables via 3 methods

—Operators and their questions

— Arithmetic - ‘+ , - , * , % , /’

—Relational operator - ‘> , < , ≥ , ≤ , ≠’

—logical operator - ‘&& , ||’

—Unary operator - ‘++, —’

Math functions

—-Math.round()

—-Math.ceil()

—-Math.floor()

—-Math trunc() // remove the decimal part

—-Math.pow()

—-Math.sqrt()

—-Math.cbrt()

—-Math.abs()

—-Math.max()

—-Math.min()

—-Math.random()

—-toFixed()

→Math problems :

Q 6. calculate compound interest

Q 7. Generate OTP

Q 8. Area of triangle by heron’s formula

Q 9. Circumference of circle

Session 3,4 :

→ IF-ELSE :

Q 10.Accept two numbers and print the greatest between them

Q 11.Accept an integer and check whether it is an even number or odd.
Q 12.Accept name and age from the user. Check if the user is a valid voter or not.

Q 13. Accept three numbers and print the greatest among them
Q 14. Accept a year and check if it a leap year or not (google to find out what's a leap year)
Q 15. Shop discount - Description on Graphic
Q 16. Bijli Bill - Description on Graphic

Session 5,6,7 :

—Loop

—For loop

Q 17. Accept an integer and Print hello world n times
Q 18. Print natural number up to n.
Q 19. Reverse for loop. Print n to 1.
Q 20. Take a number as input and print its table

5 * 1 = 5

5 * 2 = 10 ... up to 10 terms

Q 21. Sum up to n terms.

Q 22. Factorial of a number

Q 23. Print the sum of all even & odd numbers in a range seperately.

Q 24. Print all the factors of a number.

Q 25. Check if the number is Prime or not.

Q 26. Write a program to take two inputs a, b & find the value of a raised to the power of b.

Ex - a = 2, b = 5

OP - 2^5 = 32

—break and continue

—while loop

Q 27.sum of digit

Q 28.reverse of number

Q 29.strong number

Q 30.Automorphic number

—Switch Case

—do-while

Q 31. Repeat hello

Q 32. Guess the number

Q 33. Sasta Calculator

Q 34. Project restaurant

Session 7:

—Nested Looping

—Pattern programming

Q 35. Right Angle Traingle

```
*
* *
* * *
* * * *
* * * * *
```

Q 36.

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

Q 37.

```
A
A B
A B C
A B C D
A B C D E
```

Q 38. Inverted Right Angle Triangle

```
* * * * *
* * * *
* * *
* *
*
```

Q 39. mirror right angle traingle

```
        *
      * *
    * * *
  * * * *
* * * * *
```

Q 40.

```
    *
   * *
  * * *
 * * * *
* * * * *
```

Q 41.

```
*     *
 *   *
  * *
   *
```

Q 42.

```
*       *
  *   *
    *
  *   *
*       *
```

Session 8 , 9:

— Array

— Introduction

— Fixed and dynamic size array

— Accept value from user and assign in the array

— Q 43. Sum of array’s element

— Q 44. Max element from array

— Q 45. Second max element from array

— Q 46. Reverse the array

— Q 47. All zeroes to left and all ones to right

— Q 48. Array left Rotation by 1

— Q 49. Array left rotation by K elements

— Q 50. Linear Search an array - If element found print the index else -1

— Binary Search

Session 10:

—Sorting algorithm → Bubble sort , Insertion sort , selection sort

Session 11: Time and Space Complexity

—Complexity

—Time Complexity

—Handling for large input

—Complexity Representation

—Type and Graph

—Generating complexity equation

—TLE

—Space Complexity

—Questions

Session 11 , 12:

—Multi D-Array

—Questions

—Q 51. 1572. Matrix Diagonal Sum

—Q 52. 867. Transpose Matrix
—Q 53. 48. Rotate Image
—Q 54. 54. Spiral Matrix

Session 13 , 14:

—Introduction of String

—methods of string

`length`	Returns string length
`slice(start, end)`	Extracts substring
`substring(start, end)`	Similar to `slice`, but no negative indexes
`substr(start, length)`	Extracts part of string with length
`toUpperCase()`	Converts to uppercase
`toLowerCase()`	Converts to lowercase
`concat()`	Concatenates strings
`trim()`	Removes spaces from both sides
`indexOf(substring)`	Returns first index of substring
`lastIndexOf(substring)`	Returns last index of substring
`includes(substring)`	Checks if substring exists
`startsWith(substring)`	Checks if string starts with substring
`endsWith(substring)`	Checks if string ends with substring
`replace(old, new)`	Replaces first occurrence of substring
`replaceAll(old, new)`	Replaces all occurrences

`split(separator)`	Splits string into an array
`charAt(index)`	Returns character at index
`charCodeAt(index)`	Returns Unicode value of character

— Q 55. Accept a string from user and print its each character on a new line
— Q 56. Accept a string and print it in reverse order
— Q 57. Pallindromic String using Two pointer algorithm (hint: Array reverse algo)
— Q 58. Toggle each alphabet of String
In - AcgDfD Output - aCGdFd

— Q 59. Take an array of strings words and a String Prefix. Print the number of strings
in words that contain pref as a prefix.
Example - Input: words = ["pay","attention","practice","attend"], pref = "at"
Output: 2
-- Q 60. Capitalize first & last character of each word
in the sentence and print the new sentence
Ex - Hello bhai Kaise ho a
HellO Bhal KaisE HO A
Q 61.- Accept a string and print the frequency of each character
present in the string
— Q 62. Check Two Strings are Anagram or Not
Anagrams words have the same word length & same character count
Examples of anagram words are arc and car, state and taste,
night and thing etc.

Session 16,17:

—Set

— Q 63.Jewels and Stones

— Q 64. Check if the pangram or not

— Q 65. 202. Happy Number

—Map

—Q 66.Find the frequency of each element

—Q 67.Two Sum

—Q 68.First letter appears twice

—Q 69.Sort the people

Session 18:

—Bitwise operator

—Q 70.Swap two integers without using third variable

—Q 71.check even or odd

—Q 72.check if the is power of 2

Session 19:

—Introduction on Recursion

—Memory→Stack and Heap

Session 20,21,22:

—Q 73.Print hello n times

—Q 74.Print natural number 1-n / n-1

—Q 75.Factorial / Sum

—Q 76.Fibonacci series

—Maths

—Q 77.GCD

—Q 78.1979.Find the greatest Common divisor

—Q 79.Factors of number -(Brute force and optimize)

—Q 80.Count of primes (Sieve of eratosthenes)

—Q 81. 69.Sqrt(x)

—Q 82. 50.Pow(x,n)

Session 23,24,25:

--Left/Right Rotation by K elements
--in O(n) time & O(n) space
--Q 83. 88. Merge Sorted Array
--Q 84. 26. Remove Duplicates from Sorted Array
--Q 85. 1089. Duplicate Zeros
--Q 86. 283. Move Zeroes
--Q 87. 53. Maximum Subarray / Kadane's Algo
--Q 88. 169. Majority Element / Boyer Moore's Voting Algo
--Q 89. 121. Best Time to Buy and Sell Stock

— Q 90. Sort the Color
--Q 91. 42. Trapping Rain Water
--Q 92. 11. Container With Most Water

—Q 93. 15. 3Sum

Session 26,27:

—Sorting algorithm → Merge Sort , quick sort , cyclic sort

—Problem on question

—Q 94. 268 . Missing Number

—Q 95. 448 . Find all the numbers dissappeared in an array

—Q 96. 41 . First Missing Positive

Session 28,29,30:

—Binary Search

--Q 97. 704. Binary Search
--Q 98. 35. Search Insert Position
--Q 99. 34. Find First and Last Position of Element in Sorted Array
--Q 100. Count of element in the sorted array

--Q 101. 852. Peak Index in a Mountain Array/Find maximum element in bitonic array
--Q 102. 33. Search in Rotated Sorted Array
--Q 103. Book allocation problem B.Q.
Problem - Minimize the maximum number of pages read by a student
Restrictions
Every student must read at least one book
Two students can not read a same book
Allot books in continous manner
https://www.geeksforgeeks.org/allocate-minimum-number-pages/
Idenification - K adjacent
--Q 104. 1011. Capacity To Ship Packages Within D Days
--Q 105. 875. Koko Eating Bananas

Session 31,32:

—Advance problem on Hashing
--Q 106. 349. Intersection of Two Arrays
--Q 107. 560. Subarray Sum Equals K - BQ → 3,9,-2,4,1,-7,2,6,-5,8,-3,-7,6,2,1 k =5
--Q 108. Longest Sub-Array with Sum K

https://practice.geeksforgeeks.org/problems/longest-sub-array-with-sum-k0809/1/
--Q 109. 525. Contiguous Array
--Q 110. 128. Longest Consecutive Sequence
--Q 111. Count distinct elements in every window

https://practice.geeksforgeeks.org/problems/count-distinct-elements-in-every-window/1/

Session 33,34:

—class and object

—constructor

—prototype object

—this key word

—design problems

—Q 112. Q 113. Q 114. Q 115.

Session 35,36,37:

—Introduction on Linkedlist

—Operation on LL

- —Q 116. 707. Design Linked List
  --Q 116. 876. Middle of the Linked List (Two pointer)
  --Q 117. 21. Merge Two Sorted Lists (Try merge two sorted array approach)
  --Q 118. 141. Linked List Cycle
  --Q 119. 83. Remove Duplicates from Sorted List
  --Q 120. 25. Reverse Nodes in k-Group
  --Q 121. 2. Add Two Numbers

Session 38,39,40:

—Implementation of Queue

—Double ended queue

—Implementation of stack

--Q 122. Reverse a queue - Rec / Stack

https://practice.geeksforgeeks.org/problems/queue-reversal/1/
--Q 123. 20. Valid Parentheses
--Q 124. 232. Implement Queue using Stacks
--Q 125. 225. Implement Stack using Queues
--Q 126. Next Larger Element

https://practice.geeksforgeeks.org/problems/next-larger-element-1587115620/1/
--Q 127. Stock Span Problem

https://practice.geeksforgeeks.org/problems/stock-span-problem-1587115621/1

--Q 128. 84. Largest Rectangle in Histogram
--Q 129. 85. Maximal Rectangle

Session 41,42,43,44:

—Advance recursion and backtracking
--Q 130. Tower of Hanoi
--Q 131. Josephus Problem
--Q 132. 1823. Find the Winner of the Circular Game
--Q 133. Power Set

https://practice.geeksforgeeks.org/problems/power-set4302/1
--Q 134. 78. Subsets

--Q 135. 46. Permutations
--Q 136. 90. Subsets II
--Q 137. 17. Letter Combinations of a Phone Number

--Q 138. 39. Combination Sum

--Q 139. 37. Sudoku Solver
--Q 140. 51. N-Queens
--Q 141. 79. Word Search

Session 45,46,47,48:

—Introduction of Binary tree

—Implementation

—Q 142. 94. Binary Tree Inorder Traversal
--Q 143. 144. Binary Tree Preorder Traversal
--Q 144. 145. Binary Tree Postorder Traversal
--Q 145. 104. Maximum Depth of Binary Tree
--Q 146. 102. Binary Tree Level Order Traversal
--Q 147. 101. Symmetric Tree
--Q 148. 112. Path Sum

—Q 149. Invert Binary Tree
--Q 150. 543. Diameter of Binary Tree

--Q 151. 100. Same Tree
--Q 152. Left View

https://practice.geeksforgeeks.org/problems/left-view-of-binary-tree/1
--Q 153. Top View

https://practice.geeksforgeeks.org/problems/top-view-of-binary-tree/1
--Q 154. 236. Lowest Common Ancestor of a Binary Tree
--Q 155. 437. Path Sum III
--Q 156. 105. Construct Binary Tree from Preorder and Inorder Traversal

Session 49, 50:

—Binary Search Tree

—Q 157. 98. Validate Binary Search Tree
--Q 158. 230. Kth Smallest Element in a BST
--Q 159. 450. Delete Node in a BST
--Q 160. 235. Lowest Common Ancestor of a Binary Search Tree