Server

1. Explain the difference between == and .equals() in Java.

== this operation checks if 2 objects references point to the same object in memory, .equals() check if the content of 2 objects are same or equal.

2. What is a constructor in Java, and when is it called?

It is special kind of method, and very important in OOP. The main purpose of this function is to initialize the object when they are being created. They have same names as class names with no return type. These methods are automatically called when an object is created by using new keyword.

3. What is the difference between ArrayList and LinkedList in Java?

The main difference between these 2 is how they perform operations. ArrayList gives us faster access to elements but has slower insertion and deletions. Worst case scenario when performing this operation in the middle. On the other hand LinkedList is better for insertions and deletion, but heavy for retrieving elements, especially last as it will have to travel all the way to end.

4. Explain the purpose of StringBuilder in Java and why it is preferred over String for certain operations.

In Java as string is not mutable, and the StringBuilder is used to create/manipulate mutable strings. StringBuilder allows us to make changes to the string without creating new objects. When working with strings it is better to use StringBuilder as it is efficient because it uses the same string instead of creating new object, and makes it memory efficient. As also I have used for question 6.

5. Write a Java method that takes an array of integers and returns the largest number.

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| *public static int largestNumber(int [] arr){*  *if(arr == null || arr.length==0){*  *return 0;*  *}*  *int max =arr[0];*  *for (int i : arr) {*  *if( i > max){*  *max = i;*  *}*  *}*  *return max;*  *}* |

6. Write a Java method to reverse a String.

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| *Solution for string: class Solution {*  *public static void reverseString(String s) {*  *StringBuilder newStr = new StringBuilder(s);*  *char temp;*  *for(int i =0;i<(newStr.length()/2);i++){*  *temp = newStr.charAt(i);*  *newStr.setCharAt(i, newStr.charAt((newStr.length() - 1) - i));*  *newStr.setCharAt(((newStr.length() - 1) - i), temp);*  *}*  *String reversedStr = newStr.toString();*  *System.out.println("Reversed string: " + reversedStr);*  *}*  *}*  *There is 1 question on Leetcode using char array, this is how I did that using similar approach:  class Solution {*  *public void reverseString(char[] s) {*  *char temp = 0;*  *for(int i =0;i<(s.length/2);i++){*  *temp = s[i];*  *s[i] = s[s.length-1-i];*  *s[s.length-1-i] = temp;*  *}*  *}*  *}* |

7. Write an iterative Java method to calculate the factorial of a given integer n.

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| *public static int factorialByLoop(int n){*  *int answer = 1;*  *for(int i=1;i<=n;i++){*  *answer \*= i;*  *}*  *return answer;*  *}* |

8. Write an recursive Java method to calculate the factorial of a given integer

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| *public static int factorialByRec(int n){*  *if (n==1 || n==0){*  *return 1;*  *}*  *return n \* factorialByRec(n-1);*  *}* |

Database

1. What is the difference between INNER JOIN and LEFT JOIN?

The main difference between these 2 is that, how the data is retrieved between 2 tables. In Inner join, only those rows are returned which have a match in both tables. Left join on the other hand returns all the rows from left table and the matched rows from right table. It will return null for the right table columns if there is no match

2. Write a SQL query to retrieve all columns from the Employees table where the department is “Sales” and the salary is above 50,000.

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| *SELECT \* FROM Employees as E Where E.Dept = ‘Sales’ and E.Salary >=50000;* |

3. Explain what a primary key is and why it’s important in a database.

Primary key in simple words is the unique identifier for row, and it can’t repeat, also makes sure there are no null values in this column. 1 column or multiple columns can be primary key in case of multiple we call it composite primary key.

4. What is the purpose of the GROUP BY clause, and how is it commonly used?

GROUP BY is used when there are multiple rows which share the same values in 1 or more columns and these rows can be grouped together. It is mostly used in aggregate functions SUM(), COUNT(), AVG, MAX etc.

5. How would you write a SQL query to find the total number of employees in each department in a Departments table?

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| *SELECT D.DepartmentName, COUNT(E.EmployeeNumber) AS TotalEmployees FROM Employee AS E INNER JOIN Department AS D ON E.DepartmentID = D.DepartmentID GROUP BY D.DepartmentName;* |

6. Write a SQL query to get the top 5 highest-paid employees from the Employees table.

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| *SELECT EmployeeName, Salary FROM Employee ORDER BY Salary DESC LIMIT 5;* |

7. How would you update the salary of an employee to 60,000 where the employee\_id is 101?

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| *UPDATE Employee SET Salary = 60000 WHERE employee\_id = 101;* |

8. Write a SQL query to find all employees who have the same department\_id as an employee named “John Doe” in the Employees table.

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| *SELECT \* FROM Employee WHERE dept\_id IN (SELECT dept\_id FROM Employee WHERE employee\_name = 'John Doe');* |

9. Explain the difference between UNION and UNION ALL in SQL.

The key difference between UNION and UNION ALL is that UNION removes duplicate rows and UNION ALL does not remove duplicate rows and brings all. This way UNION ALL becomes faster than UNION as it doesn’t spend time on removing duplicate.

10. What is a foreign key, and why is it used in databases?

Foreign key is a column or multiple columns which is/are used to create a link between 2 tables’ data. We also use this as it prevents from inserting invalid data into table, for example inserting foreign key we will get foreign key constraint, so we don’t add invalid data. We use foreign key when joining 2 or more tables together, this is also needed when doing normalization. Another great use case of foreign key is that it optimizes the query.

Client:

I don’t have much experience in front end, I have worked in Backend till now, I have started learning full stack, also hoping if I get this role, I can learn more of frontend. Unfortunately, I could not answer questions on frontend.

1. How would you create a CSS class that makes text bold, italic, and underlined?

2. Describe the difference between margin and padding.

3. What’s the difference between display: inline, display: block, and display: inline-block?

4. How can you apply styles only on specific screen sizes using CSS?

5. What is a pseudo-class, and can you give an example of when you’d use one?

6. What is semantic HTML, and why is it important for web development? Can you give examples of semantic elements?

7. Why is web accessibility important, and what is one way you can improve it on a web app?

8. What role does semantic HTML play in accessibility?

9. Describe the difference between the types: text, email, and number. When would you use each type?

10. Can you briefly explain what a service worker is and how it enhances a web app?

11. How would you use jQuery to select all paragraphs on a page? Can you provide a simple example?

12. Describe how you would use jQuery to retrieve the value from a specific cell in the same row as a clicked button in a table. Additionally, explain how you would update another cell in that same row with a new value.