1) Design patterns / Solid principles

2) Collections and generics

3) Functional interfaces

4) JAVA 8 (Optional , Stream api, Lambda, Date and time , Method reference , class reference)

5) Improvements done in Java 8 in collections and garbage collectors

6) Multithreading with Executers and synchronization, life cycle and inter thread communication . atomicity, locking and , volatile

7) Exception and its hierarchy, Exception propagation, throw and throws, Custome exception

25% Concepts

75 % Coding

8) Fundamental concepts (Loops and Patterns coding , String ,array, Oops, JVM , JDK, Memories mamgement, statuc and final , finalize)

9) Serialization, cloneable

<https://docs.oracle.com/javase/8/docs/api/java/lang/String.html>

Topics (Coding 6 hrs mandatory, Fundamental concepts(Logical operatots m jdk, jvm, memory structure, keywords, methods, oops)

----------------------------------------Java Basics--------------------------------------------------------------  
1. What is the difference between JDK and JRE?  
2. What is Java Virtual Machine (JVM)?  
3. What are the different types of memory areas allocated by JVM?  
4. What is JIT compiler?  
5. How Java platform is different from other platforms?  
6. Why people say that Java is 'write once and run anywhere' language?  
7. How does ClassLoader work in Java?  
8. Do you think ‘main’ used for main method is a keyword in Java?  
9. Can we write main method as public void static instead of public static  
void?  
10. In Java, if we do not specify any value for local variables, then what  
will be the default value of the local variables?  
11. Let say, we run a java class without passing any arguments. What will  
be the value of String array of arguments in Main method?  
12. What is the difference between byte and char data types in Java?

-------------------------------------------------------------------OOPS---------------------------------------------------------  
13. What are the main principles of Object Oriented Programming?  
14. What is the difference between Object Oriented Programming  
language and Object Based Programming language?  
15. In Java what is the default value of an object reference defined as an  
instance variable in an Object?  
16. Why do we need constructor in Java?  
17. Why do we need default constructor in Java classes?  
18. What is the value returned by Constructor in Java?  
19. Can we inherit a Constructor?  
20. Why constructors cannot be final, static, or abstract in Java?  
---------------------------Inheritance---------------------------------  
21. What is the purpose of ‘this’ keyword in java?  
22. Explain the concept of Inheritance?  
23. Which class in Java is superclass of every other class?  
24. Why Java does not support multiple inheritance?  
25. In OOPS, what is meant by composition?  
26. How aggregation and composition are different concepts?  
27. Why there are no pointers in Java?  
28. If there are no pointers in Java, then why do we get  
NullPointerException?  
29. What is the purpose of ‘super’ keyword in java?  
30. Is it possible to use this() and super() both in same constructor?  
31. What is the meaning of object cloning in Java?  
----------------------------Static---------------------------------------  
32. In Java, why do we use static variable?  
33. Why it is not a good practice to create static variables in Java?  
34. What is the purpose of static method in Java?  
35. Why do we mark main method as static in Java?  
36. In what scenario do we use a static block?  
37. Is it possible to execute a program without defining a main() method?  
38. What happens when static modifier is not mentioned in the signature  
of main method?  
39. What is the difference between static method and instance method in  
Java?  
----------------------------Method Overloading and Overriding------------  
40. What is the other name of Method Overloading?  
41. How will you implement method overloading in Java?  
42. What kinds of argument variations are allowed in Method  
Overloading?  
43. Why it is not possible to do method overloading by changing return  
type of method in java?  
44. Is it allowed to overload main() method in Java?  
45. How do we implement method overriding in Java?  
46. Are we allowed to override a static method in Java?  
47. Why Java does not allow overriding a static method?  
48. Is it allowed to override an overloaded method?  
49. What is the difference between method overloading and method  
overriding in Java?  
50. Does Java allow virtual functions?  
51. What is meant by covariant return type in Java?  
------------------------Polymorphism----------------------------------------  
52. What is Runtime Polymorphism?  
53. Is it possible to achieve Runtime Polymorphism by data members in  
Java?  
54. Explain the difference between static and dynamic binding?  
Abstraction  
55. What is Abstraction in Object Oriented programming?  
56. How is Abstraction different from Encapsulation?  
57. What is an abstract class in Java?  
58. Is it allowed to mark a method abstract method without marking the  
class abstract?  
59. Is it allowed to mark a method abstract as well as final?  
60. Can we instantiate an abstract class in Java?  
61. What is an interface in Java?  
62. Is it allowed to mark an interface method as static?  
63. Why an Interface cannot be marked as final in Java?  
64. What is a marker interface?  
65. What can we use instead of Marker interface?  
66. How Annotations are better than Marker Interfaces?  
67. What is the difference between abstract class and interface in Java?  
68. Does Java allow us to use private and protected modifiers for  
variables in interfaces?  
69. How can we cast to an object reference to an interface reference?  
------------------------------------Final---------------------------------------  
70. How can you change the value of a final variable in Java?  
71. Can a class be marked final in Java?  
72. How can we create a final method in Java?  
73. How can we prohibit inheritance in Java?  
74. Why Integer class in final in Java?  
75. What is a blank final variable in Java?  
76. How can we initialize a blank final variable?  
77. Is it allowed to declare main method as final?  
------------------------------------Package-------------------------------------  
78. What is the purpose of package in Java?  
79. What is java.lang package?  
80. Which is the most important class in Java?  
81. Is it mandatory to import java.lang package every time?  
82. Can you import same package or class twice in your class?  
83. What is a static import in Java?

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Kindly Go though This guided fullstack Project <https://capgemini.udemy.com/course/full-stack-angular-spring-boot-tutorial/learn/lecture/17149362#overview>

For JAVA please go through this link: <https://capgemini.udemy.com/course/java-se-programming/learn/quiz/4823158#overview>

String, Exceptions, Collection FW, JAVA 8(Lambda , Stream API, Method ref, Date and Time api, Optional classes).

Logical coding on Numbers

Collection

1) Hierarchy- Of  Collection framework

2) Different classes which are present in List , Set and Queue , Map

3) List=> ArrayList ,LinkedList and Vector , stack

4) Queue => Priority queue, ArrayDeque

5) Set-> Hashset  , LinkedHasset , treeset

6) Map - > TrreMap , Hashtable , HashMap and Linkedhashmap

all type of loops including .foreach();

Comparator and comparable to sort the elements, Generics

<https://www.w3resource.com/java-exercises/collection/index.php>

<https://www.w3resource.com/java-tutorial/index.php>

**Exercise 1**: Create a method which accepts a hash map and return the values of the map in sorted order as a List.

|  |  |
| --- | --- |
| Method Name | getValues |
| Method Description | Get the values of a map in sorted order |
| Argument | HashMap |
| Return Type | List |
| Logic | Return the values of a hash map in sorted order |

**Exercise2 Collection:** Create a method that accepts a character array and count the number of times each character is present in the array.

|  |  |
| --- | --- |
| Method Name | countChars |
| Method Description | method that accepts a character array and count the number of times each character is present in the array. |
| Argument | char[] arr |
| Return Type | Map<Character, Integer> |
| Logic |  |

(()))

1

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1

())))

3

()

0

 [1,2,2,4]

Map<Intgers , Interger >

{missing number , max repeated number  }

Write a function to reverse a LinkedList without using the built-in Collections.reverse() method.

Given an ArrayList<Integer>, write a method to remove duplicate elements.

What is the Java Collection Framework, and what are its main interfaces?  
What is the difference between Collection and Collections in Java?  
What are the advantages of using Java collections over arrays?  
What is the difference between List, Set, and Map interfaces?  
Why does Map not extend Collection?  
Explain the Iterator and ListIterator interfaces. What are the main differences?  
How does the fail-fast behavior of an iterator work?  
What are the differences between HashMap and Hashtable?  
What is the difference between ArrayList and LinkedList? When should each be used?  
What is the difference between TreeMap, HashMap, and LinkedHashMap?  
  
List-Specific Questions

What is the difference between ArrayList and Vector? Why is ArrayList preferred?  
How would you efficiently remove duplicate elements from an ArrayList?  
How does the subList method in ArrayList work, and how does it affect the original list?  
What are some scenarios where LinkedList would be preferable to ArrayList?  
Can you explain how Stack is implemented in Java and discuss some alternatives?  
  
Set-Specific Questions

What are the key differences between HashSet, LinkedHashSet, and TreeSet?  
How does HashSet ensure that it only contains unique elements?  
What is the purpose of the Comparable and Comparator interfaces in a TreeSet?  
When and why would you use a LinkedHashSet instead of a HashSet?  
How would you remove all elements from a Set that exist in another Collection?  
  
Map-Specific Questions

What is the difference between HashMap and TreeMap?  
How does LinkedHashMap maintain the insertion order of elements?  
What is the purpose of WeakHashMap in Java, and how is it different from HashMap?  
How can you synchronize a HashMap if it’s inherently not thread-safe?

Queue and Deque Questions  
What is the difference between Queue and Deque in Java?  
How does PriorityQueue order elements, and how would you customize this ordering?  
Explain the difference between ArrayDeque and LinkedList as Deque implementations.  
What are the differences between peek(), poll(), and remove() in a Queue?  
How would you implement a blocking queue in Java, and when would it be useful?