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Week		Problems with descriptions	Page No.	Signature of the Teacher
1	1.	Write a short report (1–2 pages) on "Resources for Learning and Practicing Java Programming". Your report should include: 1. Official Documentations and Websites 2. Books and E-Books 3. Online Learning Platforms 4. Coding Practice Websites 5. Community and Discussion Forums 6. Your Preferred Resources		
2	1.	What are the software programs that helps to run Java programs?		
	2.	What is JDK and JRE?		
	3.	What is Eclipse IDE?		
	4.	How to run the Java programs in Eclipse/NetBeans IDE?		
3	1.	Write a Java program to add two numbers.		
	2.	Write a Java program to multiply two floating numbers.		
	3.	Write a Java program to display a cube of a number.		
	4.	Write a Java program that takes three numbers as input to calculate and print the average of the numbers.		
	5.	Write a Java program to compute the distance between two points.		
		Optional		
	6.	Write a Java program to swap two numbers using a temporary variable.		
	7.	Write a Java program to calculate the area of a rectangle given its length and breadth.		
	8.	Write a Java program to convert temperature from Celsius to Fahrenheit.		
	9.	Write a Java program that takes two integer inputs and computes their remainder and quotient.		
	10.	Write a Java program to convert temperature from Celsius to Fahrenheit.		
4	1.	Write a java program to check whether the given number is odd or even.		
	2.	Write a java program to find the largest number among the three numbers.		
	3.	Write a Java program that takes a number as input and prints its multiplication table up to 10		
	4.	Write a Java program to calculate the sum of following series: 1 + 2 + 3 + 4 + ... + N		
	5.	Write a Java program to take a number, divide it by 2 and print the result until the number becomes less than 10.		

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4		Optional		
	6.	Write a Java program to check whether a given character is vowel or consonant		
	7.	Write a Java program to find the smallest number among four given numbers.		
	8.	Write a Java program to calculate the sum of all even numbers from 1 up to a given number N.		
	9.	Write a Java program to check whether a given year is a leap year or not.		
	10.	Write a Java program that takes a number as input and prints all its factors.		
5	1.	Write a Java program to insert 10, 20, 30 ....in an array and display them.		
	2.	Write a Java program to calculate the sum of all the array elements.		
	3.	Write a java program to print the following pattern: I / I2 / I23 / I234 / I2345		
	4.	Write a java program to find the sum of following series where n is input by the user. 1+1/2+1/3+1/4+...............+1/n.		
	5.	Write a Java program and compute the sum of the digits of an integer.		
	6.	Write a Java program to calculate the factorial of a number.		
		Optional		
	7.	Write a Java program to find the largest element in a given integer array.		
	8.	Write a Java program to reverse the digits of a given integer.		
	9.	Write a Java program to check if a given number is a palindrome or not.		
	10.	Write a Java program to convert a decimal number into Hexadecimal number and vice-versa.		
	11.	Write a Java program to print the following pattern: * / ** / *** / *** / ** / *		
6	1.	Write a Java program to print the odd numbers from 1 to 99.		
	2.	Write a Java program to check whether a number is prime or not.		
	3.	Write a Java program to swap the first and last elements of an array.		
	4.	Write a Java program to find the maximum and minimum among array elements.		
	5.	Write a Java program to print all prime numbers between 0 to 100.		
	6.	Write a Java program to implement linear search.		
		Optional		
	7.	Write a Java program to print all prime numbers between 0 to 100.		
	8.	Write a Java program to find the second largest element in an array.		
	9.	Write a program to implement Fibonacci series up to N terms (0,1,1,2,3,5....).		
	10	Write a Java program to reverse all elements of an array.		
	11.	Write a Java program to find the frequency of each character in a given string.		

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7	1.	Write a Java function to implement binary search.		
	2.	Write a Java function to arrange the elements of an array in ascending order (Sorting).		
	3.	Write a program to reverse a given string.		
	4.	Write a program to check whether a given string is palindrome or not.		
	5.	Write a program to implement factorial of a number through recursion.		
	6.	Write a program to implement Fibonacci series of a number with and without recursion.		
		Optional		
	7.	Write a Java function to find the greatest common divisor (GCD) of two numbers with and without using recursion.		
	8.	Write a program to check whether two strings are anagrams of each other ("listen" and "silent" are anagrams).		
	9.	Implement quick sort using recursion.		
8	1.	Create a class FRUIT which has data members colour, taste and price. Also create a method display() which will print values of FRUIT object. Create three objects of FRUIT class and call their display() methods.		
	2.	Create a class FRUIT which has data members colour, taste and price. It has a method setDetails() which will set the values of colour, taste and price. Also create a method display() which will print values of FRUIT object.		
	3.	In previous question, set the values of using colour, taste and price using		
	4.	Add one-argument constructor and two-argument constructor in addition to default constructor in FRUIT class.		
	5.	Use the concept of constructor-chaining in the previous question using this().		
		Optional		

	6.	Create a class CAR with the following details:
		
		Data members: model, colour, price
		
		Member Methods:
		
		• setDetails() – to set values of all data members using setters.
		• getDetails() – to get values of all data members using getters.
		• display() – to print all details of the car.
		
		Requirement:
		
		1. Implement default constructor to initialize default values.
		2. Implement a parameterized constructor (with one argument) to set only model.
		3. Implement another parameterized constructor (with two arguments) to set model and colour.
		4. Use constructor chaining to reduce code redundancy.
		5. Create three objects of CAR class using:
		  • Default constructor
		  • One-argument constructor
		  • Two-argument constructor
		6. Set price for each object using the setDetails() method.
		7. Call the display() method for each object.		

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9	1.	Create a class Vehicle, write a method cost() in this class. Create two classes Bus and Train which have their own display() methods and inherit from Vehicle class. Create objects of Bus and Train class and call cost() and display() methods.		
	2.	Create class University which has data members- name and ranking. Create class Faculty that extends University class has data member- name and method- Details(). Create a new class Department which is derived from Faculty and has data member- name, chairman and method- Details() and Display() where Display() method calls		
	3.	Create class Account (Data members- Id, Account_holder_name, Address; Methodsdeposit(), withdraw()). Create two static methods in Account calculateSimpleInterest() and calculateCompoundInterest() and implement them.		
	4.	Create class Account (Data members- Id, Account_holder_name, Address; Methodsdeposit(), withdraw()). Declare deposit() and withdraw() as abstract methods. Declare Account class as abstract. (Create constructor in Account as well).		
	5.	Create two children of Account- Saving (Data Members- Min_balance; Methodsdisplay(), deposit(), withdraw()) and Current (Data MembersMax_withdrawl_limit; Methods-display(),deposit(), withdraw()) . Create constructors for both classes. Implementation of deposit() and withdraw() should be		
		Optional		
	6.	Create a class Shape with a method area(). Create two derived classes Rectangle and Circle that extend Shape. Each class should override the area() method to calculate the area of the respective shape. Create objects of Rectangle and Circle and call their area() methods.		
	7.	Create a class Employee with data members: name, salary, and a method showDetails(). Create a class Manager that extends Employee with an additional data member department. Override the showDetails() method in Manager to display all details, including department. Create an object of Manager and call showDetails().		
	8.	Create an abstract class Appliance with data members brand, power and abstract methods turnOn() and turnOff(). Create two derived classes WashingMachine and Refrigerator that provide their own implementations of turnOn() and turnOff(). Create objects of WashingMachine and Refrigerator and call their methods.		
	9.	Create a class MathOperations with two static methods: findGCD(int a, int b) to calculate the greatest common divisor and findLCM(int a, int b) to calculate the least common multiple. Call these methods without creating an object of MathOperations.		
	10.	Create a class Student with data members rollNo, name, marks. Add a static variable schoolName. Create static method changeSchoolName() to update schoolName. Demonstrate how the static variable is shared among all objects.		
10	1.	Create class Person (Data Member- name, phone). Create two-member inner classes Address (Data Member- House_No, Street, City, State; Method-displayAddr()) and DateOfBirth (Data Member- Day, Month,Year; Method-displayDOB()). Display() is the method of Person class which will display name,		
	2.	Create class Edible. Within that define two static classes Fruit and Vegetable. Fruit class will have two methods- fruitDetails() is a static method and fruitPackaging() is a non-static method. Vegetable class also has similar methods - vegetableDetails() and vegetablePackaging(). Call all the four methods from main method.		
	3.	Create three different minMaxAdd() methods to calculate minimum, maximum and addition of integers, real numbers and characters.		

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10	4.	Create a class ObjectOriented which has methods- abstraction(), polymorphism() and inheritance(). Create a class JavaLanguage which inherits from ObjectOriented class and has its own methodspersistence() and interfaces(). Create an object of JavaLanguage class to access all of its own and parent's methods.		
	5.	In previous question, create a new class C++ which also inherits from ObjectOriented class and has its own methods- template() and friendFunction().Create an object of C++ class to access all of its own and parent's methods.		
	6.	Create class University which has data members- name and ranking. Create class Faculty that extends University class has data membername and method- Details(). Create a new class Department which is derived from Faculty and has data member- name, chairman and methodDetails() and Display() where Display() method calls Details() methods of both Faculty and Department class in its body. Create an object of Department class to Display() method and University ranking.		
		Optional		
	7.	Create a class Employee (Data Members – empName, empId). Create two-member inner classes: • Salary (Data Members – basic, hra, pf; Method – displaySalary() to print salary details) • JoiningDate (Data Members – day, month, year; Method – displayJoiningDate() to print joining date). In the Employee class, create a method displayEmployee() that prints the employee's name, ID, salary details, and joining date.		
	8.	Create a class Shape with overloaded methods area(): • area(int side) – calculates area of a square. • area(int length, int breadth) – calculates area of a rectangle. • area(double radius) – calculates area of a circle.		
	9.	Create a class Vehicle with a method run(). Create subclasses Bike and Car that override the run() method. In the main() method, use a reference of Vehicle to call run() for objects of Bike and Car.		
11	1.	Create an interface Account having methods- deposit(), withdraw() and aboutBank() (aboutBank() is a static method). Create two classes Saving and Current which implement the Account interface. Call the methods of Saving and Current classes in main method.		
	2.	In the previous question, create a new method in Account interfacetakeLoan() (takeLoan() is a default method). takeLoan() method would be implemented by Saving class only. Call the methods of Saving and Current classes in main method.		
	3.	Create interfaces Bike and Scooty, both of which have two methodsoffer() and details() (details() is default method). Create a new class BuySomething which implements both interfaces. To remove ambiguity, create a method details() in BuySomething class as well in which call the details() method of both interfaces. Call the methods of BuySomething class in main method.		
		Optional		
	4.	Create interfaces Bike and Scooty, both of which have two methodsoffer() and details() (details() is default method). Create a new class BuySomething which implements both interfaces. To remove ambiguity, create a method details() in BuySomething class as well in which call the details() method of both interfaces. Call the methods of BuySomething class in main method.		
	5.	Create an interface Device with a method powerOn(). Create another interface SmartDevice that extends Device and adds a method connectWiFi(). Create a class SmartPhone that implements SmartDevice. Demonstrate calling both powerOn() and connectWiFi() using a SmartPhone object in the main() method.		

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12	1.	Write a program that calls a method that throws an exception of type ArithmeticException in a for loop at an undesirable situation (such as divide by zero or taking square root of negative number). Catch the exception and display appropriate message. (Example of Unhecked Exception).		
	2.	Write a program of your choice where a Checked Exception occurs at third function but handled at the first calling function. Use both ways of managing Checked Exception i.e. using try-catch block and throws keyword.		
	3.	You are developing an online banking system where users can transfer money between accounts. If a user tries to withdraw more money than is available in their account, an InsufficientFundsException should be thrown.		
	4.	Create a user-defined exception InvalidAgeException when the age of a person is below 18 years. Use this exception at appropriate place.		
13	1.	Write a Java Program to create a new file.		
	2.	Write a Java Program to write into a file.		
	3.	Write a Java Program to copy one file into another file.		
	4.	Write a java program to find total no. of characters in a file.		
	5.	Write a java program to find total no. of lines in a file.		
14	1.	Write a Java program to: a) Connect with a database of your choice using JDBC API. b) Create an Employee table having employee id, age, name and salary. c) Insert five records in to Employee table. d) Delete any two records.		

GitHub: https://github.com/coder-yaan