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Q 1 Write a Java class Car with the following attributes: make, model, year, and color. Implement a constructor that initializes these attributes when an object of the Car class is created. Write a main method to create an instance of Car and display its attributes.
Enhance the Car class from the previous question by adding a parameterized constructor that takes values for make, model, year, and color as arguments. Demonstrate the use of this constructor in the main method

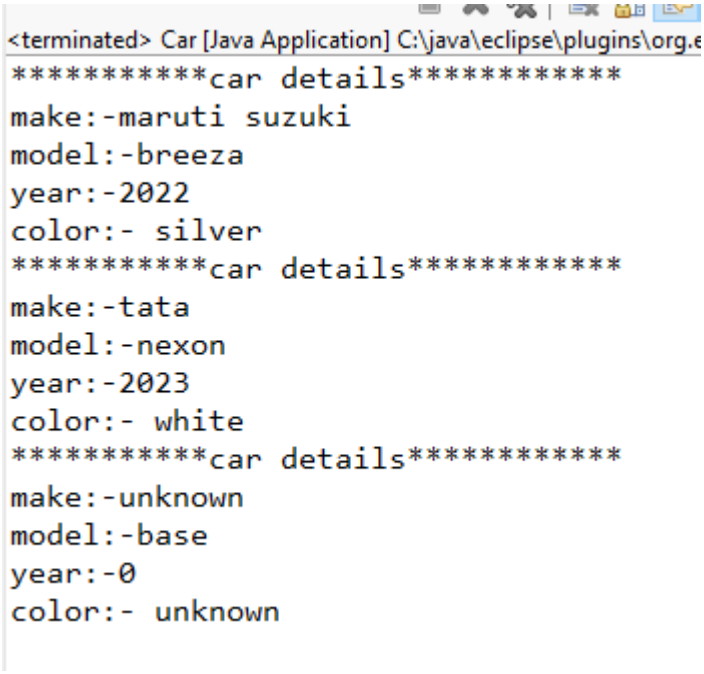
```
package java_FinalAssignment.Que1;

public class Car {
	String make;
	String model;
	int year;
	String color;

	Car(){
		make="unknown";
		model="base";
		year=0;
		color="unknown";
	}
	Car(String make, String model,int year,String color){
		this.make=make;
		this.model=model;
		this.year=year;
		this.color=color;
	}
	public void display() {
		System.out.println("***********car details***********");
		System.out.println("make:-"+make);
		System.out.println("model:-"+model);
		System.out.println("year:-"+year);
		System.out.println("color:- "+color);
	}
	public static void main(String[] args) {
		// TODO Auto-generated method stub
		Car breeza = new Car("maruti
suzuki","breeza",2022,"silver");
		breeza.display();
		Car nexon = new Car("tata","nexon",2023,"white");
		nexon.display();
		Car test = new Car();
		test.display();

	}

}
```



Q 2 Create a class named Book with the following attributes:
è title (String): to store the title of the book.
è author (String): to store the author of the book.
è isbn (String): to store the ISBN number of the book.
Implement a constructor to initialize these attributes.

- In the main method, create an array named library that can hold up to 5 Book objects.
- Initialize the library array with different Book objects. You can choose any books you like or create fictional ones.
- Write a method named displayLibrary that takes the library array as a parameter and displays the details of each book in the array.
- Write a method named searchBook that takes the library array and a book title as parameters. This method should search for the book with the given title in the library array and display its details if found. If the book is not found, it should print a message indicating that the book is not in the library.

Book.java

```
package java_FinalAssignment.Que2;

public class Book {
	String title;
	String author;
	String isbn;//): to store the ISBN number of the book.
	Book(){
		title="Unknown";
		author="Unknown";
		isbn="000000";
	}
	Book(String title,String author,String isbn){
		this.title=title;
		this.author=author;
		this.isbn=isbn;
	}
```

```
       public void displayDetails() {
              System.out.println("Title: " + title);
              System.out.println("Author: " + author);
              System.out.println("ISBN: " + isbn);
          }
}
```

Library.java

```
package java_FinalAssignment.Que2;

public class Library{
      public static void displayLibrary (Book[] library) {
            for(Book b:library) {
                  b.displayDetails();
                  System.out.println();
            }
      }
       public static void searchBook(Book[] library, String title) {
             boolean found = false;
             for(Book b:library) {
                   if (b.title.equalsIgnoreCase(title)) {
                      b.displayDetails();
                      found = true;
                      break; // Exit the loop once the book is found
                  }
             }
             if(!found) {
                   System.out.println("Book not found! ");
             }
       }
      public static void main(String[] args) {
            Book[] library= new Book[5];
            library[0] = new Book("book1", "author1",
"9780061120084");
        library[1] = new Book("book2", "author2", "9780451524935");
        library[2] = new Book("book3", "author3", "9780743273565");
        library[3] = new Book("book4", "author4", "9781503280786");
        library[4] = new Book("book5", "author5", "9780316769488");
        System.out.println("Library Inventory:");
        displayLibrary(library);
        System.out.println("\nSearching for 'book5':");
        searchBook(library, "book5");

        System.out.println("\nSearching for 'book7':");
        searchBook(library, "book7");
      }

}
```

```
<terminated> Library [Java Application] C:\java\eclipse\
Library Inventory:
Title: book1
Author: author1
ISBN: 9780061120084

Title: book2
Author: author2
ISBN: 9780451524935

Title: book3
Author: author3
ISBN: 9780743273565

Title: book4
Author: author4
ISBN: 9781503280786

Title: book5
Author: author5
ISBN: 9780316769488


Searching for 'book5':
Title: book5
Author: author5
ISBN: 9780316769488

Searching for 'book7':
Book not found!
```

Q 3 Create a class named Student with the following attributes:

1) name (String): to store the name of the student.
2) id (int): to store the student ID.
3) grade (double): to store the grade of the student.

Implement a constructor to initialize these attributes.

è In the main method, create an array named studentArray that can hold up to 10 Student objects.
è Initialize the studentArray array with different Student objects. You can use fictional student data for this.
è Write a method named displayStudents that takes the studentArray array as a parameter and displays the details of each student in the array.

è Write a method named sortStudents that takes the studentArray array as a parameter and sorts the array based on the grades of the students in ascending order. You can use any sorting algorithm of your choice (e.g., bubble sort)

```
package java_FinalAssignment.que3;

public class Student {
	String name;
	int id;
	double grade;
```

```
	Student(){
		name="Unknown";
		id=0;
		grade=0.00;
	}
	Student(String name,int id,double grade){
		this.name=name;
		this.id=id;
		this.grade=grade;
	}
	 public void displayDetails() {
		System.out.println("Name: " + name);
		System.out.println("ID: " + id);
		System.out.println("Grade: " + grade);
		System.out.println();
	    }
	public static void displayStudents(Student[]studentArray) {
		for(Student s:studentArray) {
			s.displayDetails();
		}
	}
	public static void sortStudents (Student[]studentArray ) {
//		Bubble Sort algorithm
		for(int i=0;i<studentArray.length-1;i++) {
			for(int j=0;j<studentArray.length-1-i;j++) {
				if (studentArray[j].grade > studentArray[j +
1].grade) {
                    // Swap the students
                    Student temp = studentArray[j];
                    studentArray[j] = studentArray[j + 1];
                    studentArray[j + 1] = temp;
                    }
                }
            }
        }

	public static void main(String[] args) {
		// TODO Auto-generated method stub
		Student[]studentArray = new Student[10];
		studentArray[0]= new Student("Sanjana",1,97.23);
		studentArray[1]= new Student("Rishabh",2,94.29);
		studentArray[2]= new Student("Akarsh",3,92.55);
		studentArray[3]= new Student("Suman",4,67.56);
		studentArray[4]= new Student("Ashwini",5,87.98);
		studentArray[5]= new Student("Shashank",6,65.55);
		studentArray[6]= new Student("Gaurang",7,79.78);
		studentArray[7]= new Student("Pawan",8,91.67);
		studentArray[8]= new Student("Kishor",9,78.53);
		studentArray[9]= new Student("Sneha",10,79.93);
```

```
            System.out.println("Before Sorting (by Grade):");
        displayStudents(studentArray);

        // Sort the students by grades in ascending order
        sortStudents(studentArray);

        // Display the students after sorting
        System.out.println("After Sorting (by Grade):");
        displayStudents(studentArray);
    }

}
```

```
<terminated> Student [Java Application] C:\java\eclip
*****Before Sorting (by Grade):
Name: Sanjana
ID: 1
Grade: 97.23

Name: Rishabh
ID: 2
Grade: 94.29

Name: Akarsh
ID: 3
Grade: 92.55

Name: Suman
ID: 4
Grade: 67.56

Name: Ashwini
ID: 5
Grade: 87.98

Name: Shashank
ID: 6
Grade: 65.55

Name: Gaurang
ID: 7
Grade: 79.78

Name: Pawan
ID: 8
Grade: 91.67

Name: Kishor
ID: 9
Grade: 78.53

Name: Sneha
ID: 10
Grade: 79.93

**********After Sorting (by Grade):
Name: Shashank
ID: 6
Grade: 65.55

Name: Suman
ID: 4
Grade: 67.56

Name: Kishor
ID: 9
Grade: 78.53

Name: Gaurang
ID: 7
Grade: 79.78

Name: Sneha
ID: 10
Grade: 79.93

Name: Ashwini
ID: 5
Grade: 87.98

Name: Pawan
ID: 8
Grade: 91.67

Name: Akarsh
ID: 3
Grade: 92.55

Name: Rishabh
ID: 2
Grade: 94.29

Name: Sanjana
ID: 1
Grade: 97.23
```

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Q 4 Write below mention question on paper and take picture of it and paste snapshot in above word file

a) which version of java you used _____
b) Types of variables in java _____
c) Differentiate method overloading and overriding
d) Explain constructor and types of constructor in java
e) what is constructor chaining ?
f) Explain concept of priority Queue .
g) Explain multithreading and synchronization in java .
i) Explain dead lock situation

j) explain recursion using any one example
k) Explain JDK ,JRE and JVM
L) Explain Object oriented programming
M) explain use of lambda expression

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