

The screenshot shows the Spring Tool Suite 4 IDE interface. On the left is the Package Explorer, showing a project named 'project' with a source folder 'src' containing files 'lab6', 'lab7', 'dhanya.java', 'Main.java', 'MedicalStaff.java', and 'package-info.java'. The main editor displays the code for 'MedicalStaff.java' in the 'package lab7;' namespace. The code defines a base class 'MedicalStaff' with a 'work()' method that prints 'Medical staff performs medical duties.'. It then defines three subclasses: 'Doctor' (extending 'MedicalStaff'), 'Surgeon' (extending 'Doctor'), and 'Nurse' (extending 'MedicalStaff'). Each subclass overrides the 'work()' method to print a specific message. The 'Console' window at the bottom shows the output of the application, indicating that the 'dhanya' Java application was terminated and the three classes performed their respective actions.

```
1 package lab7;
2
3 public class MedicalStaff {
4     void work() {
5         System.out.println("Medical staff performs medical duties.");
6     }
7 }
8
9 // Doctor class extends MedicalStaff
10 class Doctor extends MedicalStaff {
11     @Override
12     void work() {
13         System.out.println("Doctor diagnoses patients and prescribes treatment.");
14     }
15 }
16
17 // Surgeon class extends Doctor (Multilevel Inheritance)
18 class Surgeon extends Doctor {
19     @Override
20     void work() {
21         System.out.println("Surgeon performs surgical operations.");
22     }
23 }
24
25 // Nurse class extends MedicalStaff (Hierarchical Inheritance)
26 class Nurse extends MedicalStaff {
27     @Override
28     void work() {
29         System.out.println("Nurse assists doctors and takes care of patients.");
30     }
31 }
32
33
34
```

Console: X

<terminated> dhanya [Java Application] C:\Users\HP\Documents\New folder\sts-4.26.0.RELEASE\plugins\org.eclipse.jdt.openide\hotspot\jre_full\win32_x86_64\21.0.4.v20240802-1551\jet\bin\java.exe (21-Nov-2024, 12:04:55 pm - 12:04:58 pm) [pid: 22726]

Doctor diagnoses patients and prescribes treatment.
Surgeon performs surgical operations.
Nurse assists doctors and takes care of patients.

The screenshot shows the Eclipse IDE with the `Vehicle.java` file open. The code defines a `Vehicle` class with methods `maximumSpeed()` and `displayTruckInfo()`, and a `Car` subclass that overrides `maximumSpeed()` and adds `displayCarInfo()`. The console output shows the execution of the program, displaying information for a Nissan Sentra, a Harley-Davidson Street 750 motorcycle, and fuel efficiency for a truck.

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55 @Override
56 public double maximumSpeed() {
57     return 60; // Example maximum speed for a truck in mph
58 }
59
60 public void displayTruckInfo() {
61     displayInfo();
62     System.out.println("Payload Capacity: " + payloadCapacity + " tons");
63     System.out.println("Maximum Speed: " + maximumSpeed() + " mph");
64     System.out.println();
65 }
66
67 // Subclass Car
68 class Car extends Vehicle {
69     private int numberOfDoors;
70
71     public Car(String make, String model, int year, String fuelType, int numberOfDoors) {
72         super(make, model, year, fuelType);
73         this.numberOfDoors = numberOfDoors;
74     }
75
76     @Override
77     public double maximumSpeed() {
78         return 120; // Example maximum speed for a car in mph
79     }
80
81     public void displayCarInfo() {
82         displayInfo();
83         System.out.println("Number of Doors: " + numberOfDoors);
84         System.out.println("Maximum Speed: " + maximumSpeed() + " mph");
85         System.out.println();
86     }
87 }
88
```

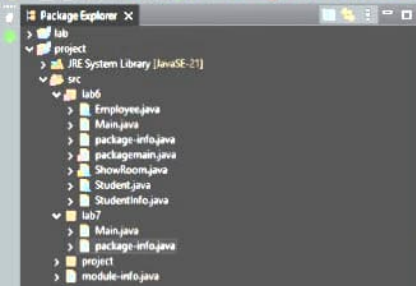
Console Output:

```
<terminated> - meena [Java Application] C:\Users\HPD\Documents\New folder\sts-4.26.0.RELEASE\plugins\org.eclipse.jdt.ui\openjdk.hotspot.jre.full.win32-x86_64.21.0.4\20240802-15551\jre\bin\javaw.exe (21-Nov-2024 12:27:15 pm - 12:27:18 pm) [pid: 18948]

Model: Nissan Sentra
Year: 2021
Fuel Type: Hybrid
Number of Doors: 4
Maximum Speed: 120.0 mph

Motorcycle Information:
Make: Harley-Davidson
Model: Street 750
Year: 2020
Fuel Type: Gasoline
Has Sidecar: No
Maximum Speed: 100.0 mph

Fuel Efficiency for Truck: 25.0 mpg
Distance traveled by Car at 60 mph for 2 hours: 120.0 miles
Distance traveled by Motorcycle at 50 mph for 1.5 hours: 75.0 miles
```



```
1 package lab7; // Define the Person interface
2 interface Person {
3     void speak(); // Method declaration
4 }
5
6 // Student class implementing Person interface
7 class Student implements Person {
8     private String name;
9
10    // Constructor to initialize Student's name
11    public Student(String name) {
12        this.name = name;
13    }
14
15    // Implementing the speak method
16    @Override
17    public void speak() {
18        System.out.println("I am a student. My name is " + name + ".");
19    }
20 }
21
22 // Teacher class implementing Person interface
23 class Teacher implements Person {
24     private String name;
25
26    // Constructor to initialize Teacher's name
27    public Teacher(String name) {
28        this.name = name;
29    }
30
31    // Implementing the speak method
32    @Override
33    public void speak() {
34        System.out.println("I am a teacher. My name is " + name + ".");
35    }
36 }
```

