**Problem Set – 8**

1. Create an outer class Library with a static nested class Book. The Book class should have attributes like title, author, and ISBN, and a method displayDetails() to print these details. In the main method, create an instance of the Book class and call displayDetails() to show the book information.
2. Create an outer class Car with an inner class Engine. The Engine class should have a method start() that prints “Engine started” and a method stop() that prints “Engine stopped”. The Car class should have a method drive() that creates an instance of the Engine class and calls its start() and stop() methods.
3. Create an interface EventHandler with a method handleEvent(). In the main method, demonstrate the use of:
4. A local inner class inside a method registerEvent() that implements EventHandler and prints “Event handled by local inner class”.
5. An anonymous inner class that implements EventHandler and prints “Event handled by anonymous inner class”.
6. Write a Java program that takes two integers as input from the user and performs division. Handle the ArithmeticException that occurs if the denominator is zero. Use a try-catch block to catch the exception and display an appropriate error message. Additionally, use a finally block to print “Operation completed” regardless of whether an exception occurs or not.
7. Write a Java program that creates an array of 5 integers and asks the user to enter an index to access the array element. Handle the ArrayIndexOutOfBoundsException if the user enters an invalid index. Use a try-catch block to catch the exception and display an appropriate error message. Use the finally block to print “Array access attempted”.
8. Write a Java program that takes user input for a student's name, roll number, and grade, and writes this information to a file named student.txt using FileWriter. Ensure the program appends the data to the file if it already exists. Handle any exceptions using try-catch and display an appropriate message if an error occurs.

*Sample File Content:*

Name: Aman, Roll Number: 120112, Grade: A

Name: Parul, Roll Number: 120131, Grade: B

1. Write a Java program that reads the contents of a file named student.txt using FileReader and displays the data on the console. Handle FileNotFoundException if the file does not exist and display an appropriate error message. Use a try-catch block for exception handling.