JAVA Assignment – 2

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```
import java.util.*;
@FunctionalInterface
interface Operation {
    int calculate(int n);
}

public class FunctionalExample {
    public static int square(int n) {
        return n * n;
    }

    public static void main(String[] args) {
        int n = 5;

        Operation anonymous = new Operation() {
            public int calculate(int n) {
                return n * n;
            }
        };
        System.out.println("Square using Anonymous Inner Class: " + anonymous.calculate(n));
```

```
        Operation lambda = (num) -> num * num;
        System.out.println("Square using Lambda Expression: " + lambda.calculate(n));
        Operation methodRef = FunctionalExample::square;
        System.out.println("Square using Method Reference: " + methodRef.calculate(n));
    }
}
```

```
import java.util.*;
import java.util.stream.*;

public class EvenNumbers {
    public static void main(String[] args) {
        List<Integer> numbers = Arrays.asList(3, 8, 12, 5, 7, 10, 15);

        System.out.println("Even numbers:");
        numbers.stream()
               .filter(n -> n % 2 == 0)
               .forEach(System.out::println);
    }
}
```

```
import java.util.*;
import java.util.stream.*;

public class SquareAndFilter {
    public static void main(String[] args) {
        List<Integer> numbers = Arrays.asList(4, 6, 8, 3, 10);

        System.out.println("Squares greater than 50:");
        numbers.stream()
               .map(n -> n * n)        // square each number
               .filter(n -> n > 50)    // keep only those > 50
               .forEach(System.out::println);
    }
}
```

```
import java.util.*;
import java.util.stream.*;

public class NamesStartingWithA {
    public static void main(String[] args) {
        List<String> names = Arrays.asList("Amit", "Rahul", "Anita", "Sneha", "Arjun");

        System.out.println("Names starting with 'A':");
        names.stream()
             .filter(name -> name.startsWith("A"))
             .forEach(System.out::println);
    }
}
```

```
import java.util.*;
import java.util.stream.*;

public class FindMaximum {
    public static void main(String[] args) {
        List<Integer> numbers = Arrays.asList(25, 78, 12, 56, 89, 45);

        int max = numbers.stream()
                         .max(Integer::compare)
                         .orElseThrow();

        System.out.println("Maximum number: " + max);
    }
}
```

```
import java.util.*;
import java.util.stream.*;

public class UppercaseAndSort {
    public static void main(String[] args) {
        List<String> fruits = Arrays.asList("banana", "apple", "mango", "cherry");

        System.out.println("Uppercase and sorted fruits:");
        fruits.stream()
              .map(String::toUpperCase)
              .sorted()
              .forEach(System.out::println);
    }
}
```

```
import java.util.Scanner;

public class DayName {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter day number (1–7): ");
        int day = sc.nextInt();

        String dayName = switch (day) {
            case 1 -> "Monday";
            case 2 -> "Tuesday";
            case 3 -> "Wednesday";
            case 4 -> "Thursday";
            case 5 -> "Friday";
            case 6 -> "Saturday";
            case 7 -> "Sunday";
            default -> "Invalid day number";
        };

        System.out.println("Day: " + dayName);
        sc.close();
    }
}
```

```
import java.util.Scanner;

public class MonthDays {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter month number (1–12): ");
        int month = sc.nextInt();

        int days = switch (month) {
            case 1, 3, 5, 7, 8, 10, 12 -> 31;
            case 4, 6, 9, 11 -> 30;
            case 2 -> 28; // February (normal year)
            default -> 0;
        };

        if (days == 0)
            System.out.println("Invalid month number!");
        else
            System.out.println("Number of days: " + days);

        sc.close();
    }
}
```

```
import java.util.Scanner;

public class MonthDaysLeap {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter month number (1–12): ");
        int month = sc.nextInt();

        System.out.print("Enter year: ");
        int year = sc.nextInt();

        boolean isLeap = (year % 400 == 0) || (year % 4 == 0 && year % 100 != 0);

        int days = switch (month) {
            case 1, 3, 5, 7, 8, 10, 12 -> 31;
            case 4, 6, 9, 11 -> 30;
            case 2 -> isLeap ? 29 : 28;
            default -> 0;
        };

        if (days == 0)
            System.out.println("Invalid month number!");
        else
            System.out.println("Number of days in month: " + days);

        sc.close();
    }
}
```

```
import java.util.*;

record Book(String title, double price, String author) {}

public class BookTest {
    public static void main(String[] args) {
        Book[] books = {
            new Book("Java Basics", 450, "John Doe"),
            new Book("Advanced Java", 600, "Jane Smith"),
            new Book("Data Structures", 750, "Mark Lee")
        };

        System.out.println("Books with price > 500:");
        for (Book b : books) {
            if (b.price() > 500) {
                System.out.println(b.title() + " by " + b.author() + " (₹" + b.price() + ")");
            }
        }
    }
}
```

```
import java.util.*;
sealed class Shape permits Circle, Rectangle, Triangle {
    void area() {
        System.out.println("Area not defined");
    }
}

final class Circle extends Shape {
    double radius;
    Circle(double r) { radius = r; }
    void area() {
        double a = Math.PI * radius * radius;
        System.out.println("Circle area: " + a);
    }
}

final class Rectangle extends Shape {
    double length, width;
    Rectangle(double l, double w) { length = l; width = w; }
    void area() {
        double a = length * width;
        System.out.println("Rectangle area: " + a);
    }
}

final class Triangle extends Shape {
    double base, height;
    Triangle(double b, double h) { base = b; height = h; }
    void area() {
        double a = 0.5 * base * height;
        System.out.println("Triangle area: " + a);
    }
```

```
}

public class ShapeTest {
    public static void main(String[] args) {
        Shape s1 = new Circle(5);
        Shape s2 = new Rectangle(4, 6);
        Shape s3 = new Triangle(3, 7);

        s1.area();
        s2.area();
        s3.area();
    }
}
```

```java
package first;

@FunctionalInterface
interface Operation {
    int calculate(int n);
}

public class FunctionalExample {
    public static int square(int n) {
        return n * n;
    }

    public static void main(String[] args) {
        int n = 5;

        Operation anonymous = new Operation() {
            public int calculate(int n) {
                return n * n;
            }
        };
        System.out.println("Square using Anonymous Inner Class: " + anonymous.calculate(n));

        Operation lambda = (num) -> num * num;
        System.out.println("Square using Lambda Expression: " + lambda.calculate(n));
        Operation methodRef = FunctionalExample::square;
        System.out.println("Square using Method Reference: " + methodRef.calculate(n));
    }
}
```

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```
<terminated> FunctionalExample [Java Application] C:\Users\prate\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_21.0.8.v20250724-1412\jre\bin\javaw.exe  (04-Nov-2025, 10:59:17 am – 10:59:18 am elapsed: 0:00:01.160) [pid: 10652]
Square using Anonymous Inner Class: 25
Square using Lambda Expression: 25
Square using Method Reference: 25
```

```java
package first;

import java.util.*;
import java.util.stream.*;

public class EvenNumber {
    public static void main(String[] args) {
        List<Integer> numbers = Arrays.asList(3, 8, 12, 5, 7, 10, 15);

        System.out.println("Even numbers:");
        numbers.stream()
               .filter(n -> n % 2 == 0)
               .forEach(System.out::println);
    }
}
```

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```
<terminated> EvenNumber [Java Application] C:\Users\prate\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_21.0.8.v20250724-1412\jre\bin\javaw.exe  (04-Nov-20
Even numbers:
8
12
10
```

```java
package first;

import java.util.*;
import java.util.stream.*;

public class SquareAndFilter {
    public static void main(String[] args) {
        List<Integer> numbers = Arrays.asList(4, 6, 8, 3, 10);

        System.out.println("Squares greater than 50:");
        numbers.stream()
               .map(n -> n * n)         // square each number
               .filter(n -> n > 50)     // keep only those > 50
               .forEach(System.out::println);
    }
}
```

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```
<terminated> SquareAndFilter [Java Application] C:\Users\prate\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_21.0.8.v20250724-1412\jre\bin\java
Squares greater than 50:
64
100
```

```java
package first;

import java.util.*;
import java.util.stream.*;

public class NamesStartingWithA {
    public static void main(String[] args) {
        List<String> names = Arrays.asList("Amit", "Rahul", "Anita", "Sneha", "Arjun");

        System.out.println("Names starting with 'A':");
        names.stream()
             .filter(name -> name.startsWith("A"))
             .forEach(System.out::println);
    }
}
```

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```
<terminated> NamesStartingWithA [Java Application] C:\Users\prate\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_21.0.8.v20250724-1412\jre\bin\javaw.exe  (04-Nov-2025, 11:02
Names starting with 'A':
Amit
Anita
Arjun
```

```java
package first;

import java.util.*;
import java.util.stream.*;

public class FindMaximum {
    public static void main(String[] args) {
        List<Integer> numbers = Arrays.asList(25, 78, 12, 56, 89, 45);

        int max = numbers.stream()
                         .max(Integer::compare)
                         .orElseThrow();

        System.out.println("Maximum number: " + max);
    }
}
```

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<terminated> FindMaximum [Java Application] C:\Users\prate\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_21.0.8.v20250724-14

```
Maximum number: 89
```

```java
package first;

import java.util.*;
import java.util.stream.*;

public class UppercaseAndSort {
    public static void main(String[] args) {
        List<String> fruits = Arrays.asList("banana", "apple", "mango", "cherry");

        System.out.println("Uppercase and sorted fruits:");
        fruits.stream()
              .map(String::toUpperCase)
              .sorted()
              .forEach(System.out::println);
    }
}

```

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<terminated> UppercaseAndSort [Java Application] C:\Users\prate\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.f

```
Uppercase and sorted fruits:
APPLE
BANANA
CHERRY
MANGO
```

```java
package first;

import java.util.Scanner;

public class DayName {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter day number (1-7): ");
        int day = sc.nextInt();

        String dayName = switch (day) {
            case 1 -> "Monday";
            case 2 -> "Tuesday";
            case 3 -> "Wednesday";
            case 4 -> "Thursday";
            case 5 -> "Friday";
            case 6 -> "Saturday";
            case 7 -> "Sunday";
            default -> "Invalid day number";
        };

        System.out.println("Day: " + dayName);
        sc.close();
    }
}
```

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<terminated> DayName [Java Application] C:\Users\prate\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_21.0.8.v2025072

```
Enter day number (1-7): 4
Day: Thursday
```

```java
package first;

import java.util.Scanner;

public class MonthsName {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter month number (1-12): ");
        int month = sc.nextInt();

        int days = switch (month) {
            case 1, 3, 5, 7, 8, 10, 12 -> 31;
            case 4, 6, 9, 11 -> 30;
            case 2 -> 28; // February (normal year)
            default -> 0;
        };

        if (days == 0)
            System.out.println("Invalid month number!");
        else
            System.out.println("Number of days: " + days);

        sc.close();
    }
}

```

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<terminated> MonthsName [Java Application] C:\Users\prate\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre

```
Enter month number (1-12): 4
Number of days: 30
```

```java
    }
}

final class Rectangle extends Shape {
    double length, width;
    Rectangle(double l, double w) { length = l; width = w; }
    void area() {
        double a = length * width;
        System.out.println("Rectangle area: " + a);
    }
}

final class Triangle extends Shape {
    double base, height;
    Triangle(double b, double h) { base = b; height = h; }
    void area() {
        double a = 0.5 * base * height;
        System.out.println("Triangle area: " + a);
    }
}

public class ShapeTest {
    public static void main(String[] args) {
        Shape s1 = new Circle(5);
        Shape s2 = new Rectangle(4, 6);
        Shape s3 = new Triangle(3, 7);

        s1.area();
        s2.area();
        s3.area();
    }
}
```

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<terminated> ShapeTest [Java Application] C:\Users\prate\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_21.0.8.v20250724-1412\jre\bin\javaw.exe (04-Nov

```
Circle area: 78.53981633974483
Rectangle area: 24.0
Triangle area: 10.5
```

```java
import java.util.Scanner;

public class MonthDaysLeap {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter month number (1-12): ");
        int month = sc.nextInt();

        System.out.print("Enter year: ");
        int year = sc.nextInt();

        boolean isLeap = (year % 400 == 0) || (year % 4 == 0 && year % 100 != 0);

        int days = switch (month) {
            case 1, 3, 5, 7, 8, 10, 12 -> 31;
            case 4, 6, 9, 11 -> 30;
            case 2 -> isLeap ? 29 : 28;
            default -> 0;
        };

        if (days == 0)
            System.out.println("Invalid month number!");
        else
            System.out.println("Number of days in month: " + days);

        sc.close();
    }
}
```

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erminated> MonthDaysLeap [Java Application] C:\Users\prate\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.f

```
nter month number (1-12): 4
nter year: 2025
umber of days in month: 30
```