Java 3rd Experiment

1. Write a Java program to calculate the square root of a number entered by the user.

Use try-catch to handle invalid inputs (e.g., negative numbers or non-numeric values).

Java Program:

```
import java.util.Scanner;


public class SquareRootCalculator {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        try {
            System.out.print("Enter a number to calculate its square root: ");
            double number = Double.parseDouble(scanner.nextLine());
            if (number < 0) {
                throw new IllegalArgumentException("Square root of negative number is not defined.");
            }
            double result = Math.sqrt(number);
            System.out.println("The square root of " + number + " is " + result);
        } catch (NumberFormatException e) {
            System.out.println("Invalid input. Please enter a numeric value.");
        } catch (IllegalArgumentException e) {
            System.out.println(e.getMessage());
        } finally {
            scanner.close();
        }
    }
```

}

Example Output:

Enter a number to calculate its square root: 25

The square root of 25.0 is 5.0

Enter a number to calculate its square root: -9

Square root of negative number is not defined.

Enter a number to calculate its square root: abc

Invalid input. Please enter a numeric value.

2. Write a Java program to simulate an ATM withdrawal system.

Java Program:

```
import java.util.Scanner;

public class ATMWithdrawal {
    public static void main(String[] args) {
        final int correctPIN = 1234;
        double balance = 10000.0;
        Scanner scanner = new Scanner(System.in);

        try {
            System.out.print("Enter your PIN: ");
            int enteredPIN = scanner.nextInt();

            if (enteredPIN != correctPIN) {
                throw new SecurityException("Invalid PIN. Access denied.");
            }

            System.out.print("Enter withdrawal amount: ");
            double amount = scanner.nextDouble();

            if (amount > balance) {
                throw new IllegalArgumentException("Insufficient balance.");
            }
```

```
            balance -= amount;
            System.out.println("Withdrawal successful. Amount withdrawn: " + amount);
        } catch (SecurityException e) {
            System.out.println(e.getMessage());
        } catch (IllegalArgumentException e) {
            System.out.println(e.getMessage());
        } catch (Exception e) {
            System.out.println("An unexpected error occurred.");
        } finally {
            System.out.println("Remaining balance: " + balance);
            scanner.close();
        }
    }
}
```

Example Output:

Enter your PIN: 1234

Enter withdrawal amount: 2000

Withdrawal successful. Amount withdrawn: 2000.0

Remaining balance: 8000.0

Enter your PIN: 1111

Invalid PIN. Access denied.

Remaining balance: 10000.0

Enter your PIN: 1234

Enter withdrawal amount: 15000

Insufficient balance.

Remaining balance: 10000.0