Experiment - 3

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Subject Name: Project Based Learning in Java
Subject Code: 23CSH-304

Aim: To write a Java program to calculate the square root of a number entered by the user. Use try-catch to handle invalid inputs(like negative numbers or non-numeric values).

Objective: To understand how to handle invalid inputs using try-catch blocks in java.
Input Used : Java exception classes, try-catch block, Scanner class for input.
Procedure:

1. Prompt the user to input a number.
2. Convert input to a number type using Scanner.
3. Use a try-catch block to handle NumberFormatException and check for negative values.
4. If number is negative, throw exception.
5. If number is valid, print its square root.

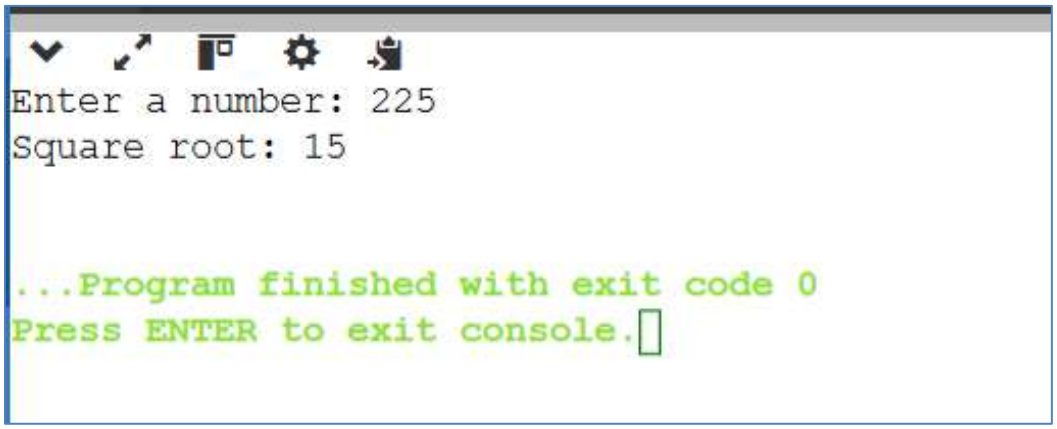
Sample Input -
Enter a number: -19
Sample Output -
Error: Cannot calculate square root of a negative number.

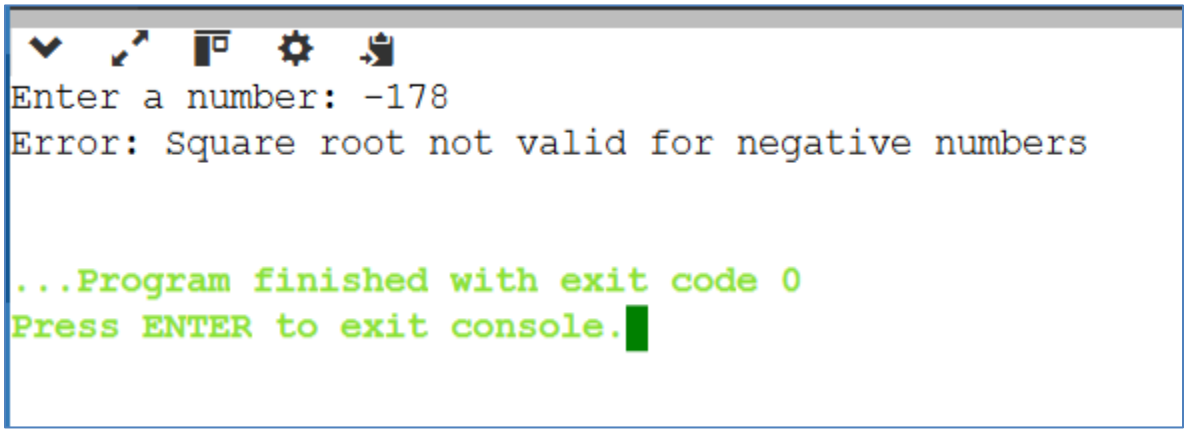
Code -

```
import java.util.Scanner;

class NotValidInput extends Exception {
    public NotValidInput(String msg) {
        super(msg);
    }
}

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
```

```
        System.out.print("Enter a number: ");
        int x = sc.nextInt();

        try {
            if (x < 0) {
                throw new NotValidInput("Square root not valid for negative
numbers");
            }

            int low = 1, high = x, ans = 0;
            while (low <= high) {
                int mid = (low + high) / 2;
                if (mid * mid > x) {
                    high = mid - 1;
                } else if (mid * mid < x) {
                    ans = mid;
                    low = mid + 1;
                } else {
                    System.out.println("Square root: " + mid);
                    return;
                }
            }
            System.out.println("Square root (floor value): " + ans);

        } catch (NotValidInput e) {
            System.out.println("Error: " + e.getMessage());
        }

        sc.close();
    }
}
```

Output -




Enter a number: -178
Error: Square root not valid for negative numbers
...Program finished with exit code 0
Press ENTER to exit console.