

Unit 5

Unit 5: Exception Handling

1. Try-Catch-Finally Example

```
java
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public class TryCatchFinallyExample {
    public static void main(String[] args) {
        try {
            int result = 10 / 0; // This will cause ArithmeticException
            System.out.println("Result: " + result);
        } catch (ArithmeticException e) {
            System.out.println("Caught an arithmetic exception: " +
e.getMessage());
        } finally {
            System.out.println("Finally block always executes.");
        }
    }
}
```

// Try block runs risky code, catch handles exception, finally runs always.

2. throw and throws Example

```
java
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public class ThrowThrowsExample {

    // Method that throws an exception
    public static void checkAge(int age) throws IllegalArgumentException {
        if (age < 18) {
            throw new IllegalArgumentException("Age must be 18 or older.");
        } else {
            System.out.println("Age is valid.");
        }
    }

    public static void main(String[] args) {
        try {
            checkAge(15); // This will throw an exception
        } catch (IllegalArgumentException e) {
            System.out.println("Exception caught: " + e.getMessage());
        }
    }
}
```

// throws declares exception, throw actually throws it.

3. Java Built-in Exceptions Example

```
java
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public class BuiltInExceptionsExample {
    public static void main(String[] args) {
        // ArrayIndexOutOfBoundsException example
        try {
            int[] arr = {1, 2, 3};
            System.out.println(arr[5]); // Invalid index
        } catch (ArrayIndexOutOfBoundsException e) {
            System.out.println("Caught exception: " + e);
        }

        // NullPointerException example
        try {
            String str = null;
            System.out.println(str.length()); // Null string
        } catch (NullPointerException e) {
            System.out.println("Caught exception: " + e);
        }
    }
}
```

// Demonstrates some common built-in exceptions.

4. User-Defined Exception Example

```
java
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// Custom exception class
class MyException extends Exception {
    public MyException(String message) {
        super(message);
    }
}

public class UserDefinedExceptionExample {

    static void validate(int number) throws MyException {
        if (number < 1) {
            throw new MyException("Number must be positive.");
        } else {
            System.out.println("Number is valid: " + number);
        }
    }

    public static void main(String[] args) {
        try {
            validate(-5); // Will throw custom exception
        } catch (MyException e) {
            System.out.println("Caught user-defined exception: " +
e.getMessage());
        }
    }
}
```

// Custom exception by extending Exception class.