**Programs Demonstrating Exceptions**

**1. NullPointerExceptionThrown.java**

Program that intentionally throws a NullPointerException.

This exception occurs when you try to access or manipulate an object that has a null value.

**//Code**

public class NullPointerExceptionThrown {

public static void main(String[] args) {

String str = null; // Initializing a String variable as null

try {

// Attempting to get the length of a null String

int length = str.length(); // This will throw NullPointerException

} catch (NullPointerException e) {

// Handling the NullPointerException

System.out.println("NullPointerException occurred: " + e.getMessage());

e.printStackTrace(); // Displaying stack trace for more information

}

}

}

**//output**



**2. ArrayIndexOutOfBoundsExceptionThrown.java**

Program that intentionally throws an ArrayIndexOutOfBoundsException.

This exception occurs when you try to access an array element with an index that is out of the array's bounds.

**//code**

public class ArrayIndexOutOfBoundsExceptionThrown {

public static void main(String[] args) {

int[] arr = {1, 2, 3}; // Initializing an array

try {

// Accessing an index outside the array bounds

int element = arr[3]; // This will throw ArrayIndexOutOfBoundsException

} catch (ArrayIndexOutOfBoundsException e) {

// Handling the ArrayIndexOutOfBoundsException

System.out.println("ArrayIndexOutOfBoundsException occurred: " + e.getMessage());

e.printStackTrace(); // Displaying stack trace for more information

}

}

}

**//output**



**3. ClassCastExceptionThrown.java**

Program that intentionally throws a ClassCastException.

This exception occurs when you try to cast an object to a type that it's not compatible with.

**//code**

public class ClassCastExceptionThrown {

public static void main(String[] args) {

try {

Object someObject = "Hello"; // Creating an Object and assigning a String to it

// Attempting to cast the Object to an incompatible type (Integer in this case)

Integer num = (Integer) someObject; // This will throw ClassCastException

} catch (ClassCastException e) {

// Handling the ClassCastException

System.out.println("ClassCastException occurred: " + e.getMessage());

e.printStackTrace(); // Displaying stack trace for more information

}

}

}

**//output**



**4. IllegalArgumentExceptionThrown.java**

Program that intentionally throws an IllegalArgumentException.

This exception occurs when an illegal or inappropriate argument is passed to a method.

**//code**

public class **I**llegalArgumentExceptionThrow**n** {

public static void validateAge(int age) {

if (age < 0 || age > 120) {

throw new IllegalArgumentException("Invalid age: " + age + ". Age must be between 0 and 120.");

}

System.out.println("Valid age: " + age);

}

public static void main(String[] args) {

try {

validateAge(150); // Passing an invalid age

} catch (IllegalArgumentException) {

// Handling the IllegalArgumentException

System.out.println("IllegalArgumentException occurred: " + e.getMessage());

e.printStackTrace(); // Displaying stack trace for more information

}

}

**//output**



**Programs Catching Exceptions**

**1. NullPointerExceptionCatch.java**

Program that catches and handles a NullPointerException, displaying an error message.

**//code (same as 1 above, just with error message.**

public class NullPointerExceptionCatch {

public static void main(String[] args) {

String str = null; // Initializing a String variable as null

try {

// Attempting to get the length of a null String

int length = str.length(); // This will throw NullPointerException

} catch (NullPointerException e) {

// Handling the NullPointerException

System.out.println("Error: NullPointerException caught. Reason - " + e.getMessage());

System.out.println("Please ensure the object is not null before using its methods.");

}

}

}

**//output**



**2. ArrayIndexOutOfBoundsExceptionCatch.java**

Program that catches and handles an ArrayIndexOutOfBoundsException, displaying an error message.

**//code**

public class ArrayIndexOutOfBoundsExceptionCatch {

public static void main(String[] args) {

int[] numbers = { 1, 2, 3 };

try {

// Accessing an index outside the array bounds

int element = numbers[3]; // This will throw ArrayIndexOutOfBoundsException

} catch (ArrayIndexOutOfBoundsException e) {

// Handling the ArrayIndexOutOfBoundsException

System.out.println("Error: ArrayIndexOutOfBoundsException caught. Reason - " + e.getMessage());

System.out.println("Please ensure the index is within the array bounds.");

}

}

}

**//output**



**3. ClassCastExceptionCatch.java**

Program that catches and handles a ClassCastException, displaying an error message.

**//code**

public class ClassCastExceptionCatch {

public static void main(String[] args) {

try {

Object someObject = "Hello"; // Creating an Object and assigning a String to it

// Attempting to cast the Object to an incompatible type (Integer in this case)

Integer num = (Integer) someObject; // This will throw ClassCastException

} catch (ClassCastException e) {

// Handling the ClassCastException

System.out.println("Error: ClassCastException caught. Reason - " + e.getMessage());

System.out.println("Please ensure the object can be cast to the specified type.");

}

}

}

**//output**



**4. IllegalArgumentExceptionCatch.java**

Program that catches and handles an IllegalArgumentException, displaying an error message.

**//code**

public class IllegalArgumentExceptionCatch {

public static void main(String[] args) {

try {

int number = -5; // Initializing a number (int) with an invalid value

if (number < 0) {

throw new IllegalArgumentException("Number cannot be negative: " + number);

}

} catch (IllegalArgumentException e) {

// Handling the IllegalArgumentException

System.out.println("Error: IllegalArgumentException caught. Reason - " + e.getMessage());

System.out.println("Please ensure the argument meets the required conditions.");

}

}

}

**//output**

