**Lab 8**

**1.Write a program that tries to access an element outside the bounds of an array and handles the ArrayIndexOutOfBoundsException by printing a user-friendly message.**

**Program**

**package** lab8;

**public** **class** ArrayIndexExceptionHandling {

**public** **static** **void** main(String[] args) {

**int**[] array = {1, 2, 3, 4, 5};

**try** {

// Trying to access an element outside the bounds of the array

**int** value = array[5];

System.***out***.println("Value at index 5: " + value);

} **catch** (ArrayIndexOutOfBoundsException e) {

// Handling the exception and printing a user-friendly message

System.***out***.println("Array index out of bounds! Please access a valid index.");

}

}

}

**Output**

****

**2. Write a program that attempts to divide a number by zero and handles the ArithmeticException by printing a message that division by zero is not allowed.**

**Program**

**package** lab8;

**public** **class** DivideByZeroHandling {

**public** **static** **void** main(String[] args) {

**int** numerator = 10;

**int** denominator = 0;

**try** {

**int** result = numerator / denominator; // Attempting division by zero

System.***out***.println("Result of division: " + result);

} **catch** (ArithmeticException e) {

System.***out***.println("Division by zero is not allowed!");

}

}

}

**Output**

****

**3. Write a Java program that reads an integer input from the user and throws an IllegalArgumentException if the input is negative. Display an appropriate message when the exception is caught.**

**Program**

**package** lab8;

**import** java.util.Scanner;

**public** **class** NegativeNumberHandling {

**public** **static** **void** main(String[] args) {

Scanner scanner = **new** Scanner(System.***in***);

System.***out***.print("Enter a positive integer: ");

**int** number = scanner.nextInt();

**try** {

**if** (number < 0) {

**throw** **new** IllegalArgumentException("Negative numbers are not allowed!");

}

System.***out***.println("You entered: " + number);

} **catch** (IllegalArgumentException e) {

System.***out***.println("Exception caught: " + e.getMessage());

} **finally** {

scanner.close(); // Close the scanner to prevent resource leak

}

}

}

**Output**

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**4. Define a custom exception called InvalidAgeException. Write a Java program that throws this exception if the age provided is less than 18. Handle the exception and display an appropriate message.**

**Program**

**package** lab8;

//Custom exception class

**class** InvalidAgeException **extends** Exception {

**public** InvalidAgeException(String message) {

**super**(message);

}

}

**package** lab8;

**import** java.util.Scanner;

//Main class

**public** **class** CustomExceptionExample {

**public** **static** **void** main(String[] args) {

Scanner scanner = **new** Scanner(System.***in***);

System.***out***.print("Enter your age: ");

**int** age = scanner.nextInt();

**try** {

*validateAge*(age); // Check if age is valid

System.***out***.println("Age validation successful. Proceed with your application.");

} **catch** (InvalidAgeException e) {

System.***out***.println("Exception caught: " + e.getMessage());

} **finally** {

scanner.close();

}

}

// Method to validate age and throw InvalidAgeException if age is less than 18

**public** **static** **void** validateAge(**int** age) **throws** InvalidAgeException {

**if** (age < 18) {

**throw** **new** InvalidAgeException("Age must be 18 years or older.");

}

}

}

**Output**

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**5. Write a Java program that has a method to validate a user's email address. The method should throw a custom exception InvalidEmailException if the email does not contain @ and .. Handle the exception in the main method**

**Program**

**package** lab8;

//Custom exception class

**class** InvalidEmailException **extends** Exception {

**public** InvalidEmailException(String message) {

**super**(message);

}

}

**package** lab8;

**import** java.util.Scanner;

//Main class

**public** **class** EmailValidationExample {

**public** **static** **void** main(String[] args) {

Scanner scanner = **new** Scanner(System.***in***);

System.***out***.print("Enter your email address: ");

String email = scanner.nextLine();

**try** {

*validateEmail*(email); // Check if email is valid

System.***out***.println("Email validation successful. Proceed with your registration.");

} **catch** (InvalidEmailException e) {

System.***out***.println("Exception caught: " + e.getMessage());

} **finally** {

scanner.close();

}

}

// Method to validate email and throw InvalidEmailException if invalid

**public** **static** **void** validateEmail(String email) **throws** InvalidEmailException {

**if** (!email.contains("@") || !email.contains(".")) {

**throw** **new** InvalidEmailException("Invalid email address format.");

}

}

}

**Output**

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