

1. Explain Different Types of Errors in Java:

- Syntax Errors: These occur when the syntax rules of the Java language are violated, such as missing semicolons or parentheses.
- Runtime Errors: These occur during the program's execution, causing abnormal termination, e.g., division by zero.
- Logical Errors: These occur when the logic of the program is incorrect, leading to incorrect results.
- Compile-Time Errors: Errors detected by the compiler, such as type mismatches or missing classes.

2. What is an Exception in Java:

An exception in Java is an event that disrupts the normal flow of a program's execution. It represents an error or unexpected behavior.

Example:

If you try to divide a number by zero, Java will throw an `ArithmeticException`.

3. How Can You Handle Exceptions in Java? Explain with an Example:

Exceptions in Java can be handled using `try`, `catch`, `finally`, and `throw/throws` blocks.

Example:

```
public class ExceptionExample {  
    public static void main(String[] args) {  
        try {  
            int result = 10 / 0; // This will throw ArithmeticException  
        } catch (ArithmeticException e) {  
            System.out.println("Error: Division by zero is not allowed.");  
        } finally {  
            System.out.println("This block always executes.");  
        }  
    }  
}
```

```
}  
  
}
```

Output:

Error: Division by zero is not allowed.

This block always executes.

4. Why Do We Need Exception Handling in Java:

- Maintain Flow: Exception handling allows the program to continue executing even after an error occurs.
- Improved Code Structure: Separates error-handling code from regular code.
- Error Propagation: Allows errors to be propagated to higher levels in the call stack.
- Resource Management: Ensures that resources are properly closed even in case of an error.

5. What is the Difference Between Exception and Error in Java:

- Exception:
 - A problem that occurs during the execution of a program and can be caught and handled.
 - Examples: IOException, NullPointerException, ArithmeticException.
- Error:
 - A more serious problem that is generally not recoverable and occurs at the JVM level.
 - Examples: OutOfMemoryError, StackOverflowError.

6. Name the Different Types of Exceptions in Java:

- Checked Exceptions: Exceptions that are checked at compile time, e.g., IOException, SQLException.
- Unchecked Exceptions: Exceptions that occur at runtime and are not checked at compile time, e.g., NullPointerException, ArrayIndexOutOfBoundsException.
- Errors: Serious problems that are usually not handled by the program, e.g., OutOfMemoryError, StackOverflowError.

7. Can We Just Use try Instead of finally and catch Blocks:

No, you cannot use a try block alone. It must be followed by either at least one catch block or a finally block, or both.

Example:

```
try {  
    // risky code  
} finally {  
    // code that always executes  
}
```