**Debugging** is the process of finding and fixing logical or runtime errors (bugs) in your Java program.  
It helps you:

* Understand how your program executes.
* Identify incorrect values in variables.
* Check why a particular condition or output isn’t behaving as expected.

**Common Types of Errors**

| **Type** | **Description** | **Example** |
| --- | --- | --- |
| **Syntax Error** | Caused by breaking Java’s grammar rules | Missing semicolon ; |
| **Runtime Error** | Occurs during execution (e.g., divide by zero, null pointer) | NullPointerException |
| **Logical Error** | Code runs but gives wrong output | Incorrect formula used |

Debugging Techniques in Java

**Control Program Flow**

| **Button** | **Action** | **Shortcut** |
| --- | --- | --- |
| **▶️ Resume Program** | **Continue execution until next breakpoint** | **F9** |
| **⏭ Step Over** | **Execute current line and move to the next** | **F8** |
| **⏎ Step Into** | **Enter inside a method being called** | **F7** |
| **↩️ Step Out** | **Exit the current method and return to caller** | **Shift + F8** |
| **⏹ Stop** | **End debugging session** | **Ctrl + F2** |
| **What is Recursion?**  **Recursion means a method calling itself — directly or indirectly — to solve a problem.** |  |  |