

# 43 Lecture - CS504

## Important Subjective

### 1. What is a syntax error, and how is it different from other bug classes?

**Answer:** A syntax error is a type of bug caused by violations of the programming language's grammar rules. It is different from other bug classes because it prevents the code from being compiled or executed.

### 2. What is a logic error, and why can it be challenging to identify and fix?

**Answer:** A logic error is a bug where the code behaves incorrectly due to flawed implementation. Identifying and fixing logic errors can be challenging because the code compiles and runs, but produces inaccurate results.

### 3. How can boundary errors impact the behavior of a software application?

**Answer:** Boundary errors occur when input values exceed acceptable ranges. They can lead to unexpected behavior, such as crashes or security vulnerabilities, as the code may not handle extreme inputs correctly.

### 4. What are the primary causes of runtime errors, and how can they be prevented?

**Answer:** Runtime errors are caused by issues during code execution, such as null pointer exceptions or division by zero. They can be prevented by using proper error handling and input validation techniques.

### 5. Explain the importance of categorizing bug classes during software development.

**Answer:** Categorizing bug classes helps in understanding the nature of defects and aids in prioritizing and implementing effective debugging and prevention strategies.

### 6. How can type mismatch errors impact the stability of a software application?

**Answer:** Type mismatch errors occur when variables are assigned incompatible data types. They can lead to unexpected behavior and system instability as the program attempts to use data incorrectly.

### 7. What measures can be taken to prevent boundary errors in software code?

**Answer:** To prevent boundary errors, developers should thoroughly validate user inputs, implement proper range checks, and handle edge cases effectively.

**8. Describe a scenario where a logic error caused a critical bug in a software application.**

**Answer:** A logic error in a banking application's interest calculation logic might result in incorrect interest amounts, leading to financial discrepancies for customers.

**9. How can null pointer exceptions be avoided in programming?**

**Answer:** Null pointer exceptions can be avoided by validating pointers before dereferencing and using proper null checks before accessing objects.

**10. Why is it essential to conduct code reviews and static analysis to detect syntax errors early in the development process?**

**Answer:** Code reviews and static analysis help identify syntax errors early, reducing the chances of defects reaching later stages of development and improving overall code quality.