SNS COLLEGE OF TECHNOLOGY

Kurumbapalayam (Po), Coimbatore – 641 035

An Autonomous Institution

Accredited by NAAC – UGC with 'A++' Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE NAME: 23ITO201- Software Testing (OPEN ELECTIVE)

III YEAR / VI SEMESTER

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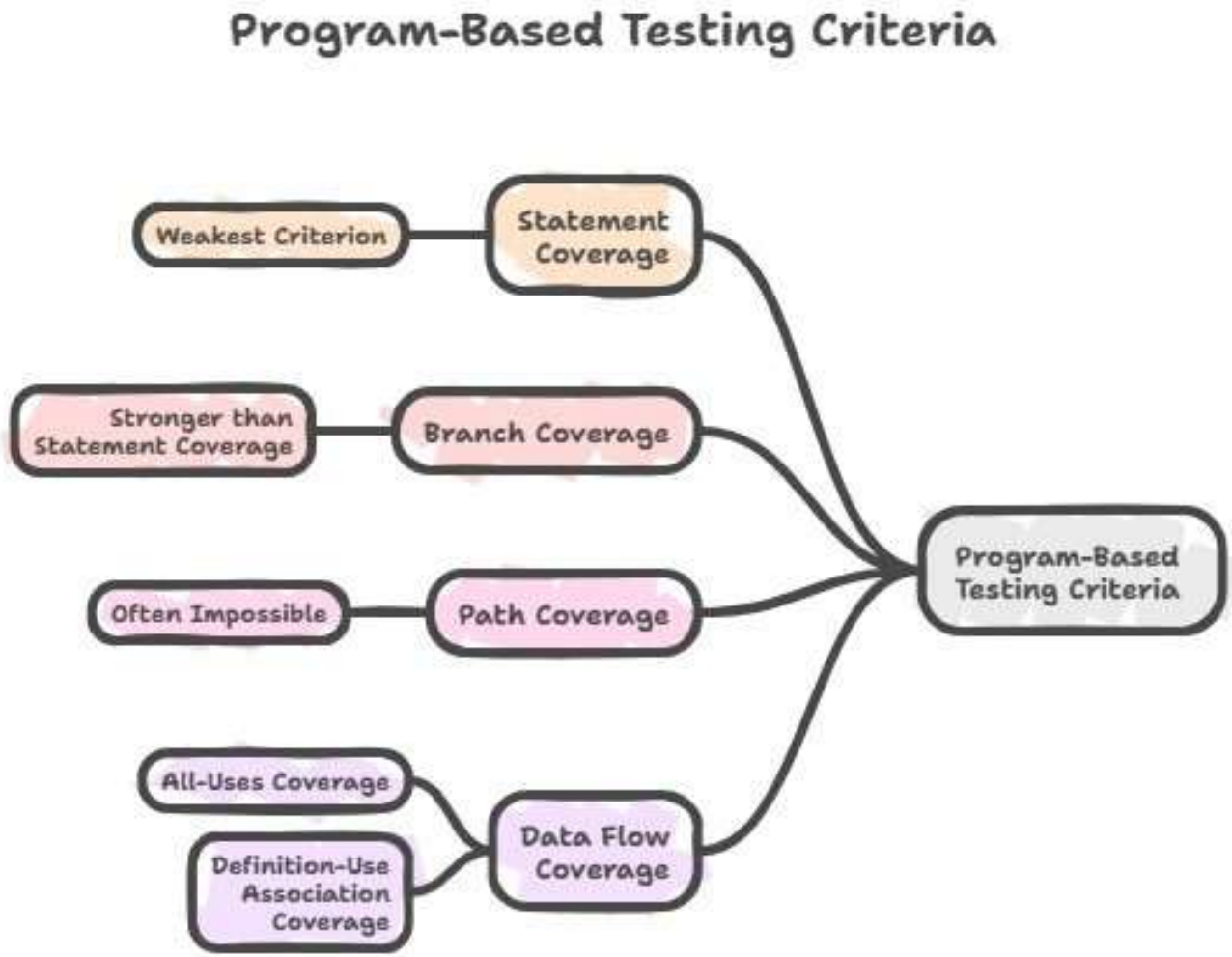
Unit 2 - TEST CASE DESIGN STRATEGIES

Topic : TEST ADEQUACY CRITERIA and STATIC TESTING VS. STRUCTURAL TESTING

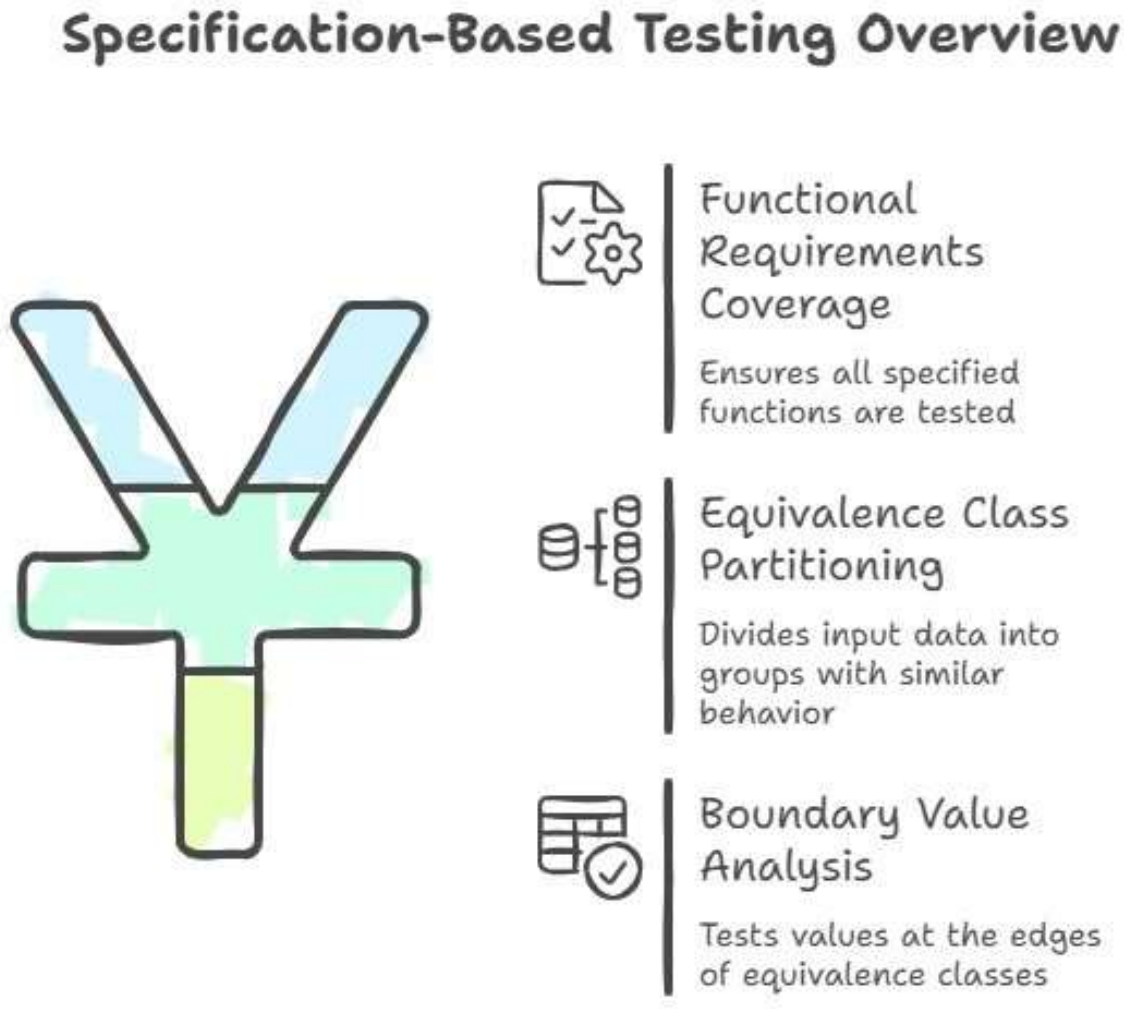
We Will Cover

- Test Adequacy Criteria
- Structural Testing:
  - Use structural coverage to judge tests, create new tests.
  - Statement, Branch, Condition, Path Coverage

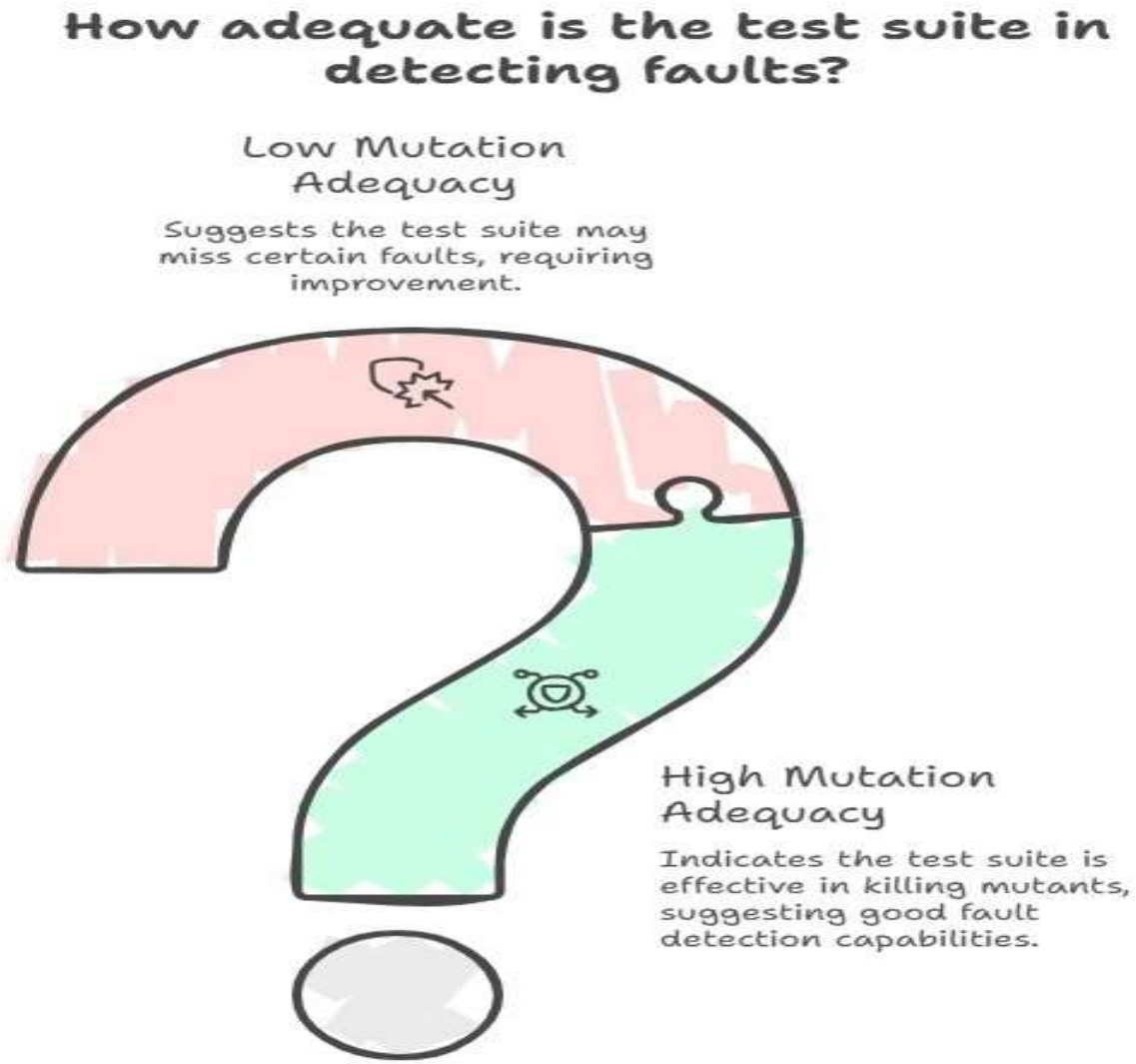
Empathy in Program-Based (Structural) Criteria



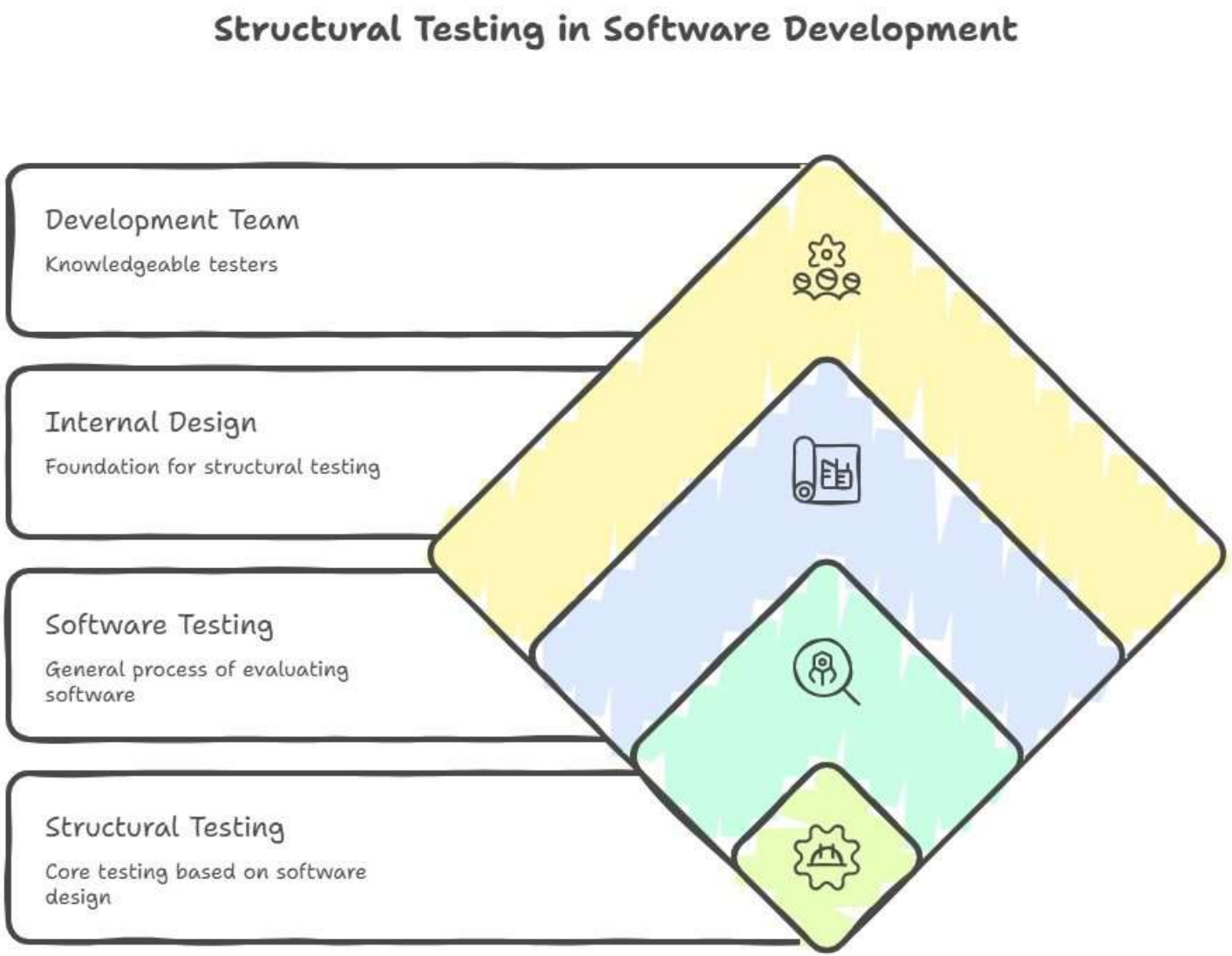
Define - Specification-Based Testing



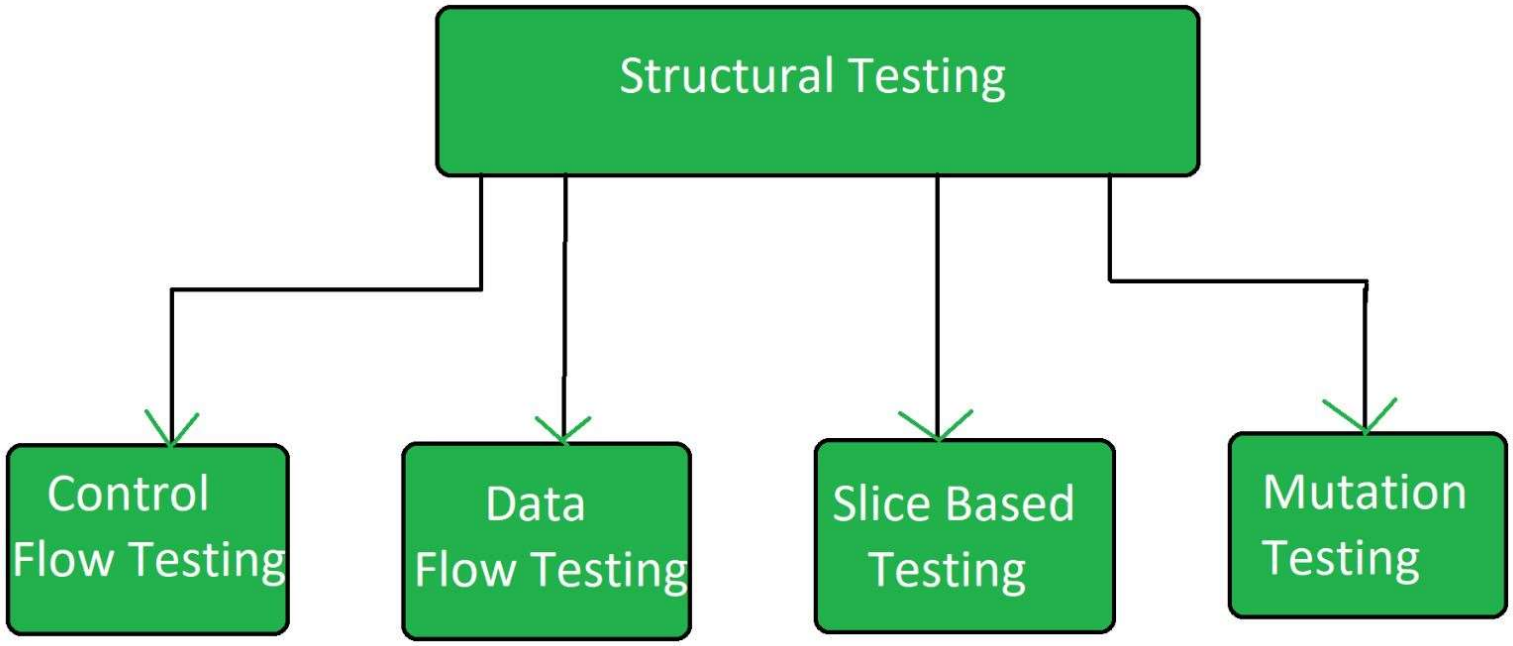
How adequate is the test suite in detecting faults?



Structural testing



Structural Testing - Cont..

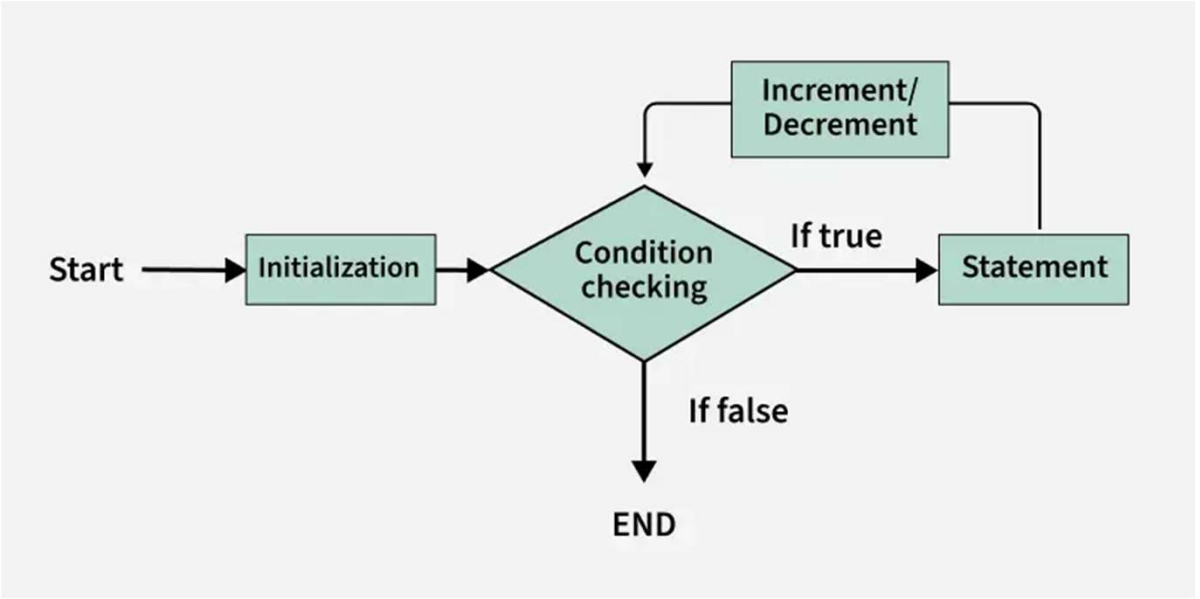


For loop in C program

```
#include <stdio.h>

int main() {

    // Loop to print "Hello GfG" 3 times
    for (int i = 0; i < 3; i++)
{
        printf("Hello GfG\n")
    }
    return 0
}
```



Activity

Draw the CFG and write tests that provide statement, branch, and basic condition coverage over the following code:

```
public int search(String[] A, String what){ int index = 0;
    if ((A.length == 1) && (A[0] == what)){
        return 0;
    } else if (A.length == 0){ return -1;
    } else if (A.length > 1){
        while(index < A.length){
            if (A[index] == what){ return index;
            } else
                index++;
            }
        }
    }
    return -1;
}
```

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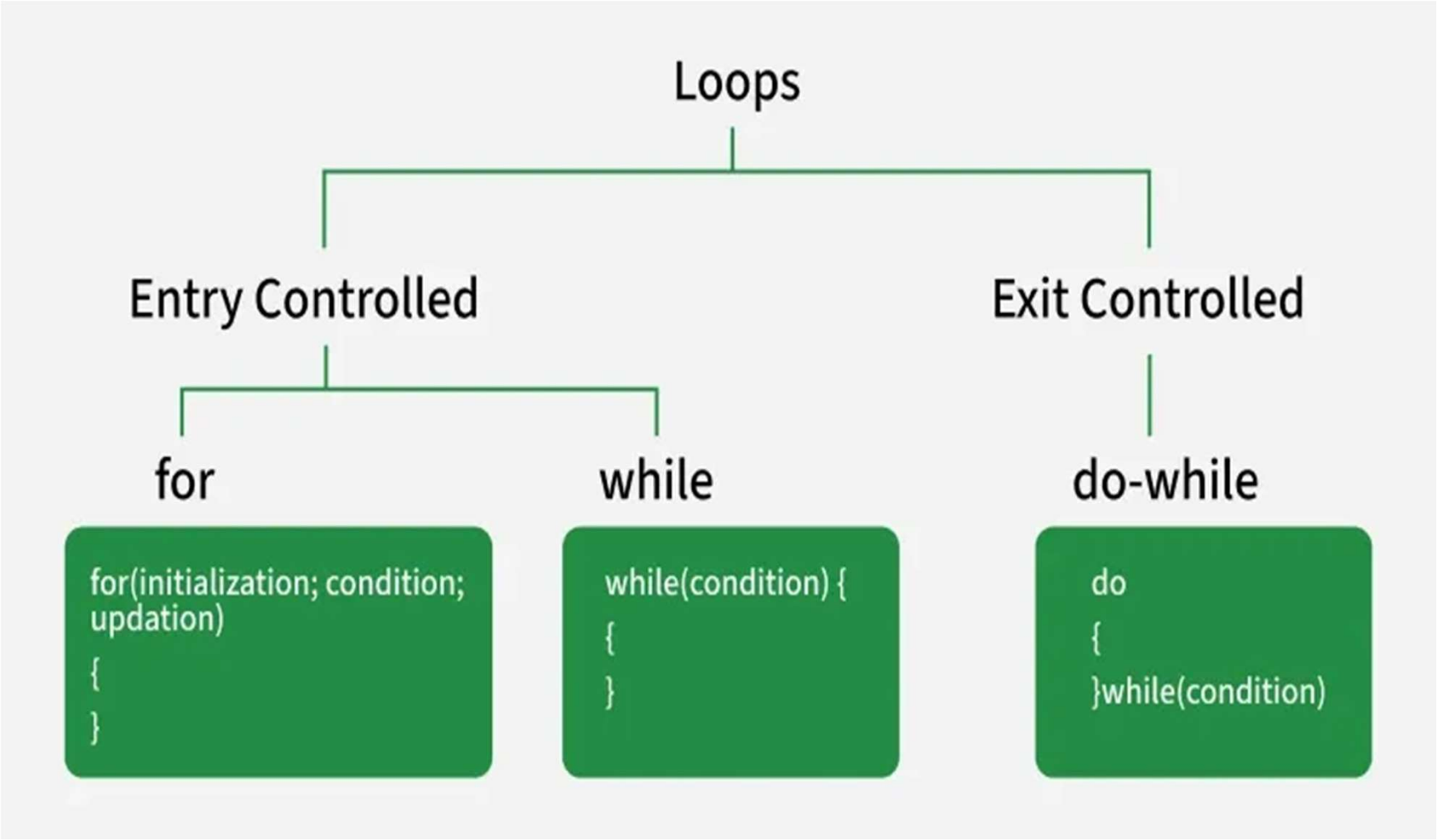
Loops
Entry Controlled
Exit Controlled
for
while
do-while
for(initialization; condition; updation)
{
}
while(condition) {
{
}
do
{
}while(condition)

MCQ

MCQ – Structural Testing (White Box Testing)

1. Structural Testing is also known as:

a) Black Box Testing
b) White Box Testing
c) Grey Box Testing
d) Acceptance Testing

Answer: b) White Box Testing

2. Structural Testing mainly focuses on:

a) User requirements
b) External behavior of software
c) Internal structure of the code
d) UI design

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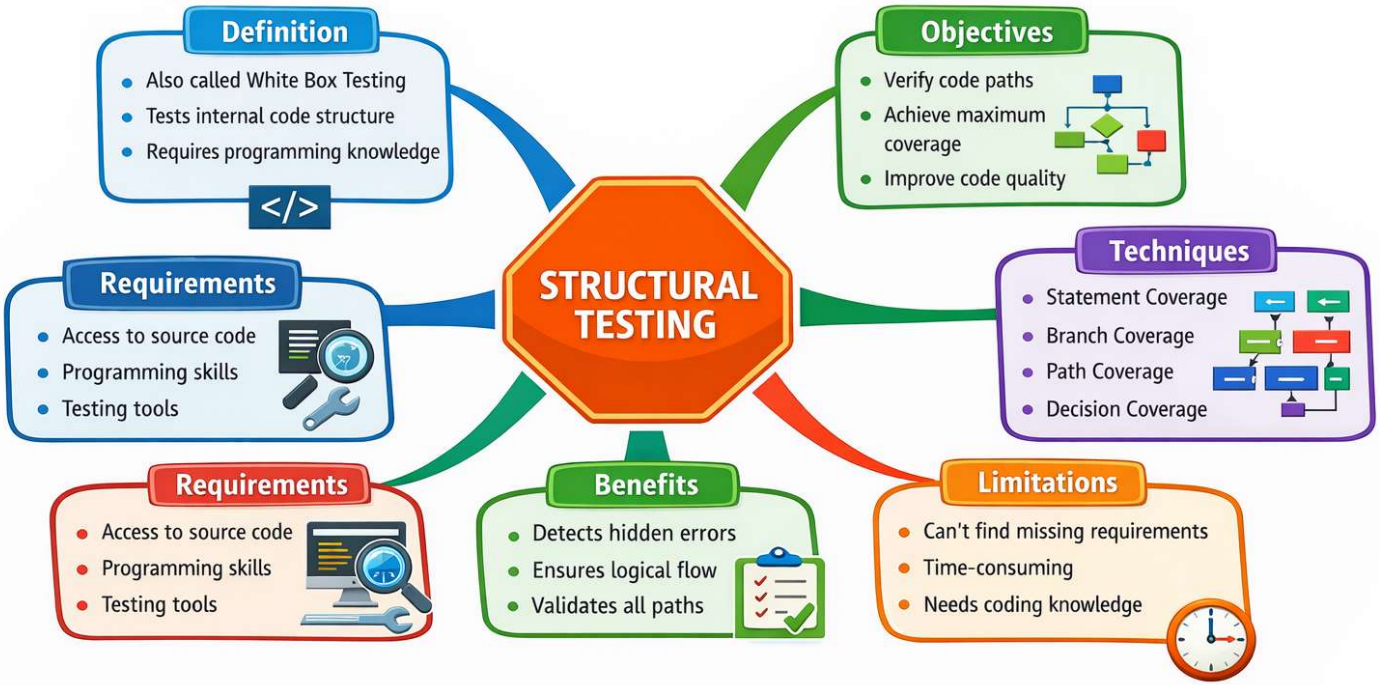
Answer: c) Internal structure of the code

Mind Map


STRUCTURAL TESTING
Definition
Also called White Box Testing
Tests internal code structure
Requires programming knowledge
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Objectives
Verify code paths
Achieve maximum coverage
Improve code quality
Requirements
Access to source code
Programming skills
Testing tools
Techniques
Statement Coverage
Branch Coverage
Path Coverage
Decision Coverage
Requirements
Access to source code
Programming skills
Testing tools
Benefits
Detects hidden errors
Ensures logical flow
Validates all paths
Limitations
Can't find missing requirements
Time-consuming
Needs coding knowledge

TEXT BOOKS	
1.	Srinivasan Desikan and Gopalaswamy Ramesh, ―Software Testing – Principles and Practices, Pearson Education, 2006.
REFERENCES	
1.	Ilene Burnstein, ―Practical Software Testing, Springer International Edition, 2003
2.	Edward Kit, Software Testing in the Real World – Improving the Process‖, Pearson Education, 1995
3.	Boris Beizer, Software Testing Techniques – 2nd Edition, Van Nostrand Reinhold, New York, 1990.
4.	Aditya P. Mathur, ―Foundations of Software Testing _ Fundamental Algorithms and Techniques, Dorling Kindersley (India) Pvt. Ltd., Pearson Education, 2008.

Thank You

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