

Path Testing

①

Basis Path Testing

For deriving test cases:

Step 1: Using design / code — draw corresponding flow graph

Step 2: Draw DD path graph

Step 3: Determine cyclomatic complexity of the flow graph

Step 4: Determine a basis set of independent paths

Step 5: Prepare test cases that will enforce execution of each path in the basis set.

Independent Paths

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To find independent paths \rightarrow Calculate Cyclomatic complexity.

Cyclomatic Complexity =

$$\text{No. of Edges} - \text{No. of nodes} + 2$$

or

$$\text{No. of Regions} + 1$$

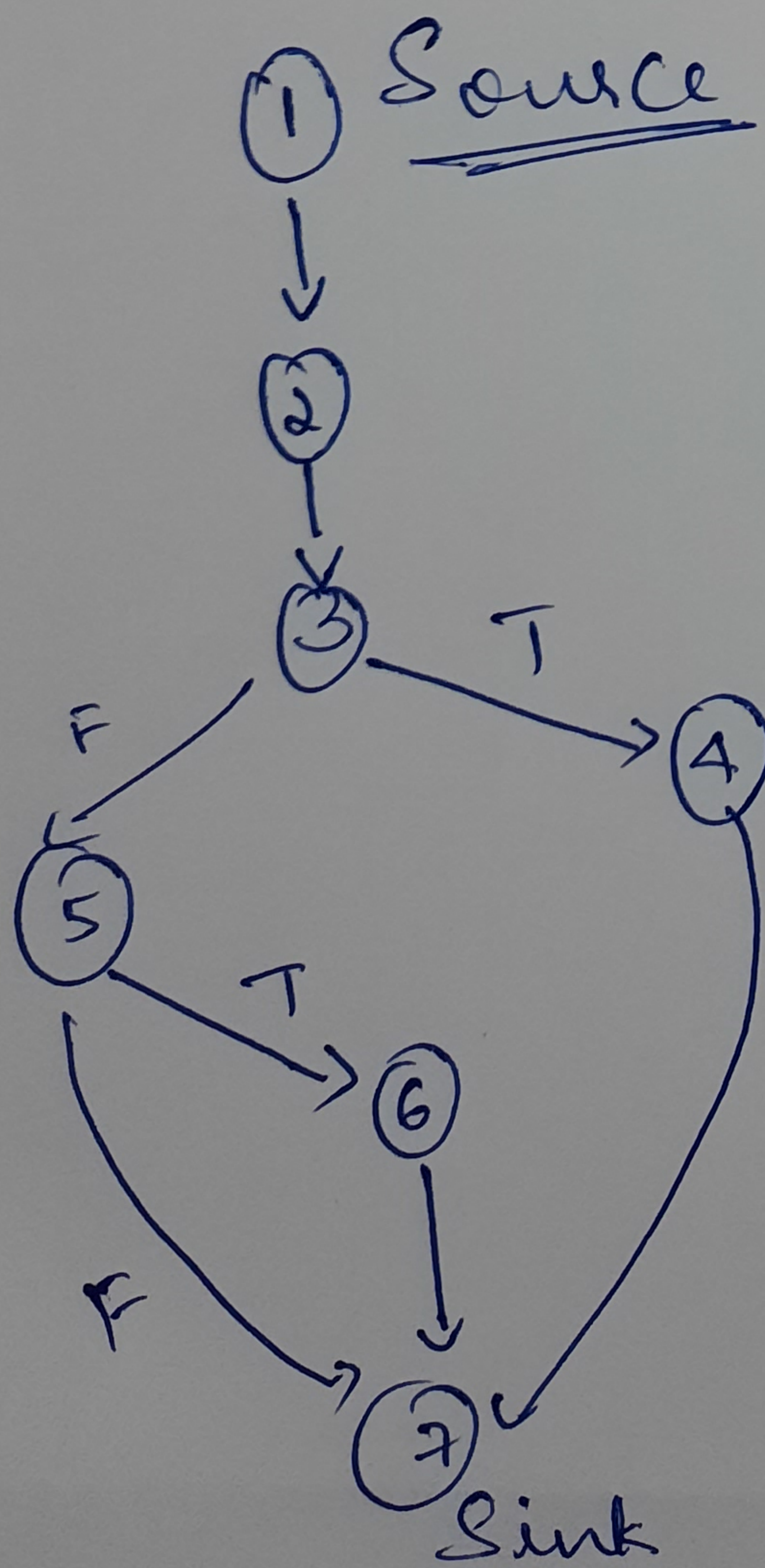
or

$$\text{No. of Decisions} + 1$$

Eg:

- ① printsum (int a, int b) {
- ② int result = a + b;
- ③ if (result > 0)
- ④ printcol ("red", result)
- ⑤ elseif (result < 0)
- ⑥ printcol ("blue", result)
- ⑦ [else do nothing]
- ⑧ }

Control flow graph



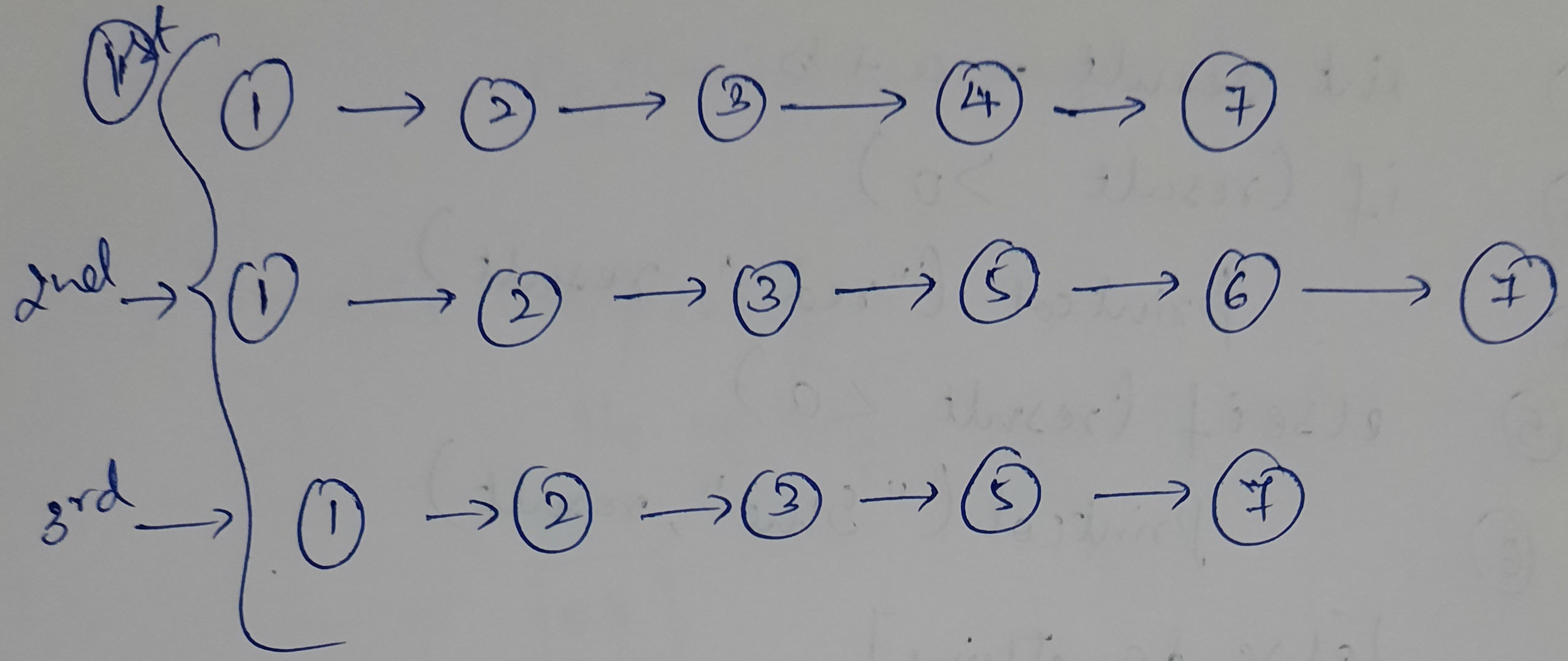
no of independent paths =

$$\frac{\text{no of edges}}{\dots} - \frac{\text{no of nodes}}{\dots} + 2$$

$$= 8 - 7 + 2$$

$$= \underline{\underline{3}}$$

∴ Independent paths are:



Total no of test cases needed = 3

for 100% Path coverage.

Note: Each path should start @
 Source node
 & end with
 Sink node

