Types of Static Testing

1. Static Analysis

Tool-driven evaluation of a component or system code (or other work products) without executing it, based on its form, structure, content, or documentation.

Important for safety-critical computer systems (aviation, medical, or nuclear software), so it is an important part of security testing.

Often incorporated into automated software build and distribution tools.

Can be applied efficiently to any work product with a formal structure (typically code or models) for which an appropriate static analysis tool exists. Can even be applied with tools evaluating work products written in natural language such as requirements (checking for spelling, grammar and readability).

2. Reviews

Manual examination and evaluation of work product or process by one or more individuals to detect defects or to provide improvements.

Can be applied to any work product that the participants know how to read and understand.

Work Product Review Process

Planning:
- defining the scope, which includes the purpose of the review, what documents or parts of documents to review, and the quality characteristics to be evaluated
- estimating effort and timeframe
- identifying review characteristics such as the review type with roles, activities, and checklists
- selecting the people to participate in the review and allocating roles
- defining the entry and exit criteria for more formal review types
- checking that entry criteria are met (for more formal review types)

Initiate review:
- distributing the work product and other material, such as issue log forms, checklists, and related work products
- explaining the scope, objectives, process, roles, and work products to the participants
- answering any questions that participants may have about the review

Individual review (individual preparation):
- reviewing all or part of the work product
- noting potential defects, recommendations, and questions

Issue communication and analysis:
- communicating identified potential defects (in a review meeting)
- analyzing potential defects, assigning ownership and status to them
- evaluating and documenting quality characteristics
- evaluating the review findings against the exit criteria to make a review decision (reject; major changes needed; accept, possibly with minor changes)

Fixing and reporting:
- creating defect reports for those findings that require changes to a work product
- fixing defects found in the work product reviewed
- communicating defects to the appropriate person or team
- recording updated status of defects, potentially including the agreement of the comment originator
- gathering metrics
- checking that exit criteria are met
- accepting the work product when the exit criteria are reached

Roles and Responsibilities
(formal review)

Author:
- creates the work product under review
- fixes defects in the work product under review (if necessary)

Management:
- is responsible for review planning
- decides on the execution of reviews
- assigns staff, budget, and time
- monitors ongoing cost-effectiveness
- executes control decisions in the event of inadequate outcomes

Moderator (previously "facilitator"):
- ensures effective running of review meetings (when held)
- mediates, if necessary, between the various points of view
- is often the person upon whom the success of the review depends

Review leader:
- takes overall responsibility for the review
- decides who will be involved and organizes when and where it will take place

Reviewers:
- may be subject matter experts, persons working on the project, stakeholders with an interest in the work product, and/or individuals with specific technical or business backgrounds
- identify potential defects in the work product under review
- may represent different perspectives (tester, developer, user, operator, business analyst, usability expert)

Scribe (recorder):
- collates potential defects found during the individual review activity
- records new potential defects, open points, and decisions from the review meeting (when held)

* In some review types, one person may play more than one role.