Assignment NO - 03.

* Software testing and quality Assurance

1 How Inspection differs from walkthrough ? explain the Formal review process in detail).

2. explain informal and Formal Review process.

3 write a note on -

(a) data Flow Analysis.

(b) control Flow Analysis.

4 write a note on static analysis by tools. (Automated Static analysis).

5 what is Desk checking ?

1 How Inspection differs from walk-through ? explain the Formal review process in detail.

Ans → * walkthrough →

walkthrough is a method of conducting informal group / individual review. In a walkthrough, author describes and explain coork product in a informal meeting. to his peers or or supervisor to get Feedback. Here, validity of the proposed solution For work product is checked.

It is cheaper to make changes when design is on the paper rather than at time of conversion. walkthrough is a static method of quality assurance. Walkthrough are informal meetings but with purpose.

* Inspection →

An inspection is defined as Formal rigorous, in depth group review designed to identify problems as close to their point of origin as possible. Inspections improve reliability, availabity, and maintainability of s/w product.

Anything readable that is produced during the s/w development can be inspected. Inspections can be combined with structured, systematic testing to provide a powerful tool for creating defect-free programs.

Inspection activity follows a specified process and participants play well-defined roles an inspection team consists of three to eight members who plays roles of moderator, author, reader, recorder and inspector.

For example →

designer can acts as inspector during code inspections while a quality assurance representative can act as standard enforcer.

* Stages in the inspections process →

① planning →

Inspection is planned by moderator.

② Overview meeting →

Author describes background of work product.

③ preparation →

each inspector examines work product to identify possible defects.

④ Inspection meeting →

during this meeting reader reads through work product, part by part and inspectors points out the defects for every part.

⑤ Rework →

Author makes changes to work product according to action plans from the inspection meeting.

⑥ Follow-up →

changes made by author are checked to make sure that everything is correct.

2. explain informal and formal review process.

Ans → * ~~Informal~~ review ~~process~~ →

A review is a type of testing where a group of people discuss the product produced by the developer, detect errors and try to correct them in ~~the~~ ~~software~~ a systematic manner.

Reviews play a key role in the s/w testing process.

* Types of reviews →

① informal reviews
② Formal reviews.

* Informal reviews →

~~Take~~ Informal reviews take place between two or three people. The review conference is scheduled at their convenience

- This meeting is generally scheduled during the free time of the team members.

- There is no planning for the meeting.

- If any error occur, they are not corrected in the informal reviews.

- There is no guidance from the team.

- This review is less effective compared to the formal review.

* Formal reviews →

Formal reviews take place among a team of three to five members. In the formal review, the members discuss the software model.

- This meeting is scheduled beforehand. This gives the team members time to prepare.

- This meeting consists of a professional team that identifies and corrects errors in the model.

- This meeting does not exceed two hours.

3 write a note on →

ⓐ data Flow Analysis.

ⓑ control Flow Analysis

Ans → ⓐ data Flow Analysis →

data Flow analysis is Technique for gathering information about the possible set of values calculated at various point in a computer program. It attempts to obtain particular information at each point in a procedure. Usually it is enough to obtain this information at the boundaries of basic blocks, since From that it is easy to compute the information at the points in the basic blocks.

Basic terminologies →

① definition point →

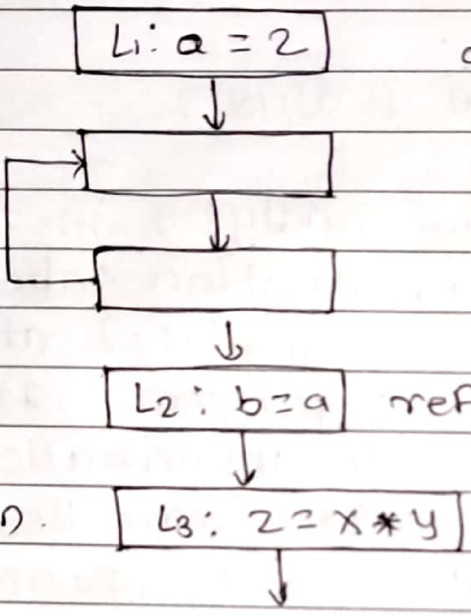
a point in a program containing some definition.

② Reference point →

a point in a program containing a reference to a data item.

③ evaluation point →

a point in a program containing evaluation or expression.



(b) control Flow Analysis (CFA) →

It is a static-code-analysis technique for determining the control flow of a program. The control flow is expressed as a control-flow graph (CFG).

Control flow testing is a testing technique that comes under white box testing. The aim of this technique is to determine the execution order of statements or instructions of the program through a control structure. The control structure of a program is used to develop a test.

case For the program. In this technique. a particular part of a large program is selected by the tester to set the testing path. It is mostly used in unit testing Test cases represented by control graph. of the program.

control Flow graph is Formed from. the node, edge, decision nod, junction node. to specify all possible execution. path.

notations used For control Flow graph.

① node.

② edge.

③ decision node.

④ Junction node.

4 write a note on static analysis by tools (Automated static Analysis).

Ans → * static analysis by tools (automated static analysis) →

static analysis tools refer to a wide array of tools that examine source code, executable, or even documentation to find problems before they happen; without actually running the code. These tools very greatly in scope and purpose, ranging from compiler-level checks for logical errors, to code styling enforcement, to cloud-based suites of tools that cover everything from documentation, formatting to code complexity analysis.

put simply, you could think of static analysis tools as anything that helps you maintain a healthy code base without having to actually run that code.

static analysis tools can help us reduce and avoid these issues all-togather by making it easier to find fix and fix these issues before they have significant impact on our projects.

This type of analysis addresses weaknesses is source code that might lead to vulnerabilities. of course, This may also be achived through manual code reviews

* Static code analysis tools →.

① Ada control →

A tool to control occurrences of various entities or programming patterns in Ada code, used for checking coding Standard, enforcement to safety related, rules, and support for various manual, inspections feature automatic fixing ~~code review~~ of validations.

② Apache Yetus →

A collection of build and release tools. included is the 'precommit' module that is used to execute full and partial/patch CI. builds that provides static analysis of code via other tools as part of a configurable report. Built-in support may be extended with plug-ins. It is supported by Java and python.

③ Astree. →.

· Finds all potential runtime errors

and data reces by abstract interpretation, can prove their absence, and can prove functional assertions; tailored towords safety-critical c code.

④ code peer →

An advanced static analysis tool that detects potential run-time logic errors in ada programs.

⑤ code scene →

Behavioral analysis of code. Helps identify, prioritize and manage technical debt, measures organizational aspects of developer teams automated pull request integrations. It is supported by various programming languages as c, c++, c#, Java.

5. What is Desk checking ?

Ans → * desk check →

A desk check is an informal non-computerized or manual process for verifying the programming and logic of and algorithm before the program is launched. A Desk check helps programmer to find bugs and errors which would prevent the application from Functioning properly.

Although a useful technique for spotting errors, modern debugging applications and tools have made desk checks less relevent and not as essential as they previously were.

Desk checking is an informal manual test that programmers can use to verify coding and algorithm logic before a program launch. This enables them to spot errors that might prevent a program from working as it should. modern debugging tools make desk checking less essential than it was in the past, but it can still be a useful way to spotting Logic errors.