

Sug 5

Design process steps (5 steps)

- Empathize, Define, Ideate, Deliver and Test
 - Discovery

Empathize (Discovery): It's about really getting to know the people who will use it, and understand what they think. You need to learn (or) collect (or) grab (or) copy.

Longer: (even ~~more~~ ~~gradual~~) What issues your errors.

Define: Focus on understanding
are facing and how they handle it. them now
[men and issue face self (D&P) handle self]

Ideate & Create: here designers are creative. The outcome of the step is some sort of design by creating a sample

[Sample কলান এবং Send করো),

Deliver: It involves presentations, meeting and use of tools like figma, Photoshop etc.

[Presentation, meeting 21% (21 deliver)]

Test: Best Design Come from Continuously making them better based on feedback. On the basis of feedback. It can update and improvement continuously.

Design Methodologies

Top down: It uses the modular approach to develop the system of the system. Start on highest level module moves on the lowest level.

Lvl 0

Main module

Lvl 1
Sub module 1

Sub module 2

Sub module 3

Sub.M1.1

Sub. M1.2

Sub. M2.1

Sub M2.2

Sub mod.3.1

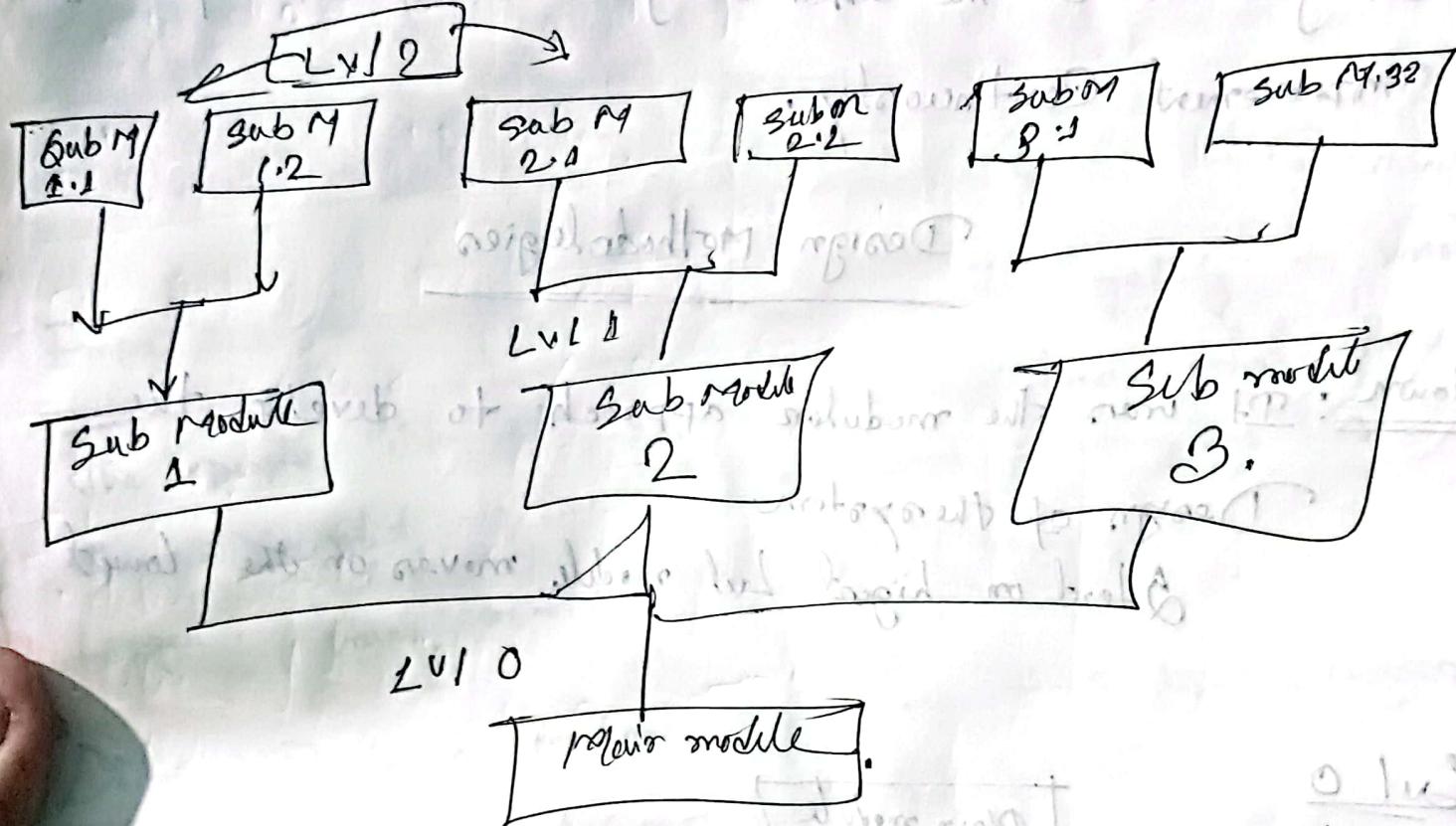
Sub M3.2

Lvl 3

Bottom up domain strategy:

follow modular approach to develop the design
basic (low) \rightarrow high

→ from \downarrow \rightarrow Main module



Modularization: minimize the complexity and to manage

the problem by subdividing it into smaller
Segment and modularization.

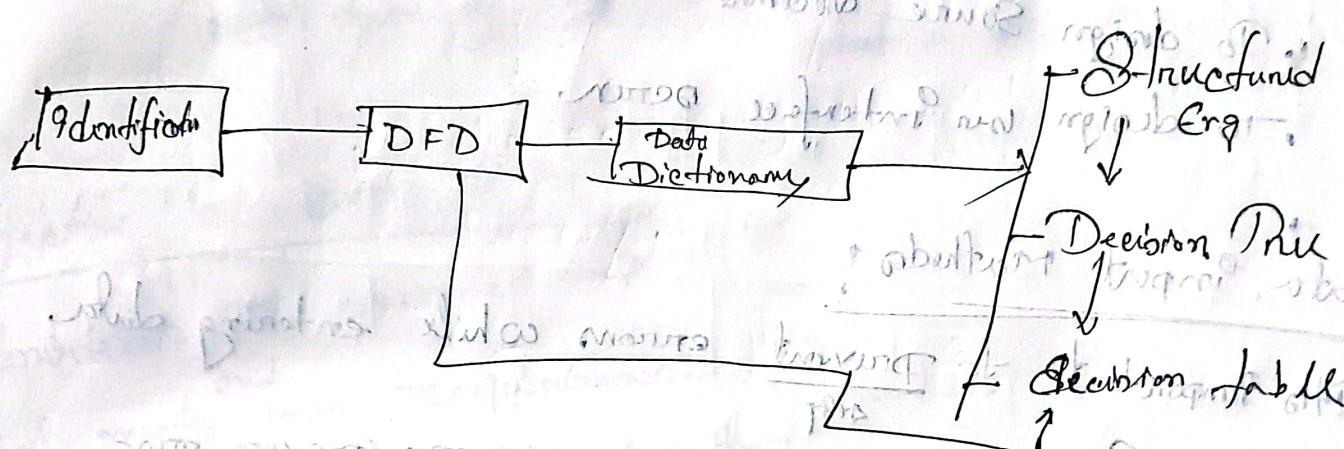
So that critical interface test first

- Multiple programs work together

- Problem control and Structure improved.

Structured Design:

Data flow based methodology to help identify the input & output of the system.



Input Design: In info system, Input Proce (and data) then data-then processed to produce output

(Quality of Input determines the Quality of output)

Properties

- It serves specific purpose like recording, retrieving what are the input & the information.
- It ensures proper accuracy.
- It should be easy to fill.
- It focuses on user attention, simplicity.

Objectives of Input Design

- To design data entry
 - To reduce Input volume
Source document.
 - To design
 - To design user Interface screen

Data import methods:

Data Input methods: errors while entering data
Data input methods to prevent errors while entering data
Data entry errors can be due to operator (User, operator etc.)

ପ୍ରକାଶ

- Clean construction
 - Clean from design.
 - Reducing by stocks
 - Immediate error feedback

Popular Impul Method

- Offline Data Input method.
 - online " " "
 - Computer readable ~~method~~ from.
 - Interactive Data Input

Output Design

- During output design identify the type of outputs needed and consider the necessary controls and prototype.

Objectives of Output Design

- Eliminate unwanted output
- That meets user requirements.
- deliver appropriate quantity of output
- Available for making Good decision.

From

From design is a product of input and output design and a document of specified data. It provides field for data from Application in order to meet user request.

Designing From, Should know

- Who will use them
- where could they be delivered
- purpose of the from

(From)

Objection of Good from design

- To keep the screen simple, clear caption.
- Use the right form to achieve its goal.
- Ensure the form is filled out correctly.
- Make the form attractive with the help of graphics.
- Helps people move around the form easily.

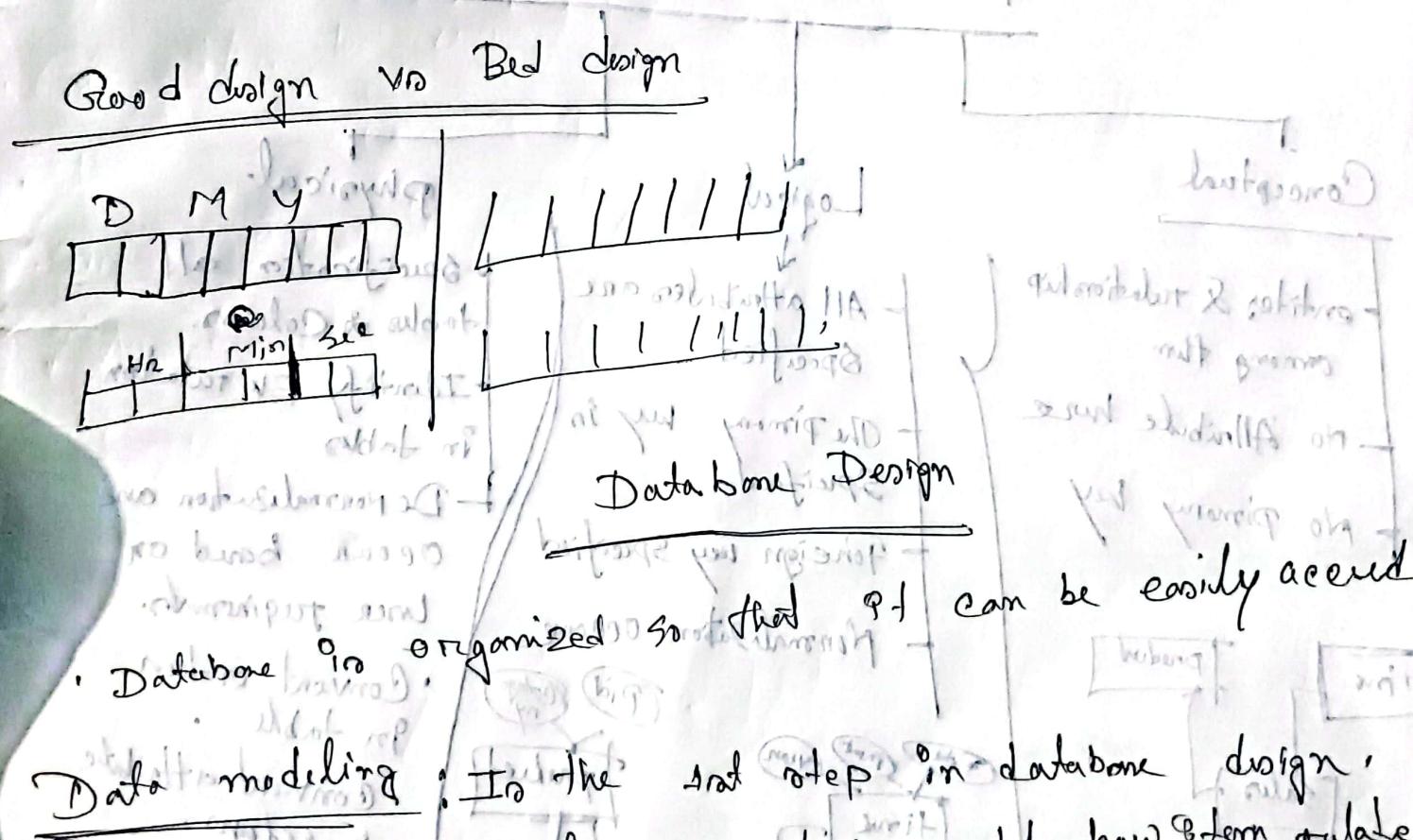
Good from design

4 guidelines should be followed:

- Make form easy to fill in.
- Make sure forms complete the purpose of design.
- Design forms to ensure proper finish.
- Keep form attractive.

marking from easy to fill (7 main section)

- Heading . Identification & access instruction . Body
 - Signature . Relation . Comments
- Data Input
- on line — directly enters data
 - off line — from fill by user



Data modeling : In the first step in database design, create conceptual model how & term relate each other

Concept (for front end and user)

- Data model involves Conceptual \rightarrow Logical model - to a Schema

Conceptual \rightarrow Logical \rightarrow Physical \rightarrow Implementation

↓

Entities and relationships
Cardinality

End Scheme

Division and implemented DBMS

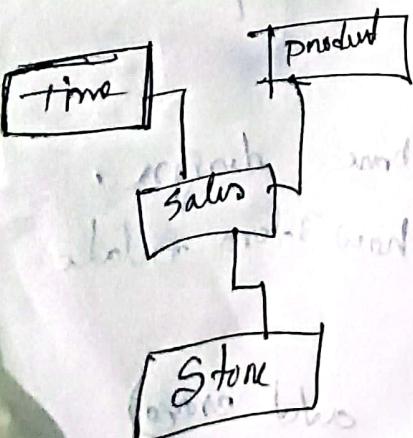
Phase of Database Design

Conceptual

Entities & relationship among them

No attribute here

No primary key



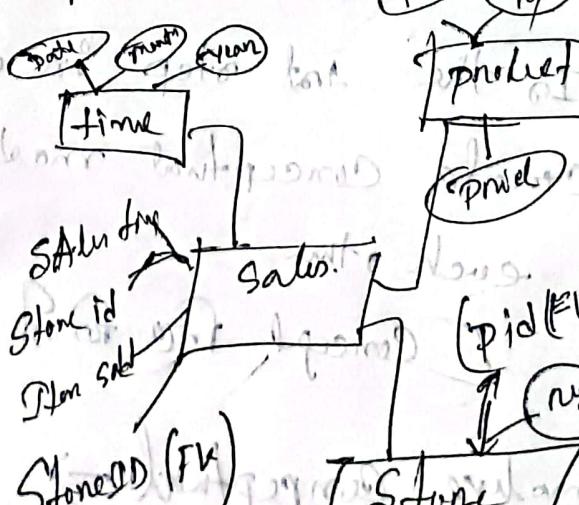
Logical

All attributes are specified

The primary key is specified

Foreign key specified

Normalization occurs



Physical

Specification of all tables & columns

Identify FK relations in tables

De-normalization occurs based on user requirements

Convert entities in table

Convert attributes in columns

Stone ID - INT

Prod. ID - INT

Date ID - INT

Sales Am - INT

QAD

(Testing) Seg - 6

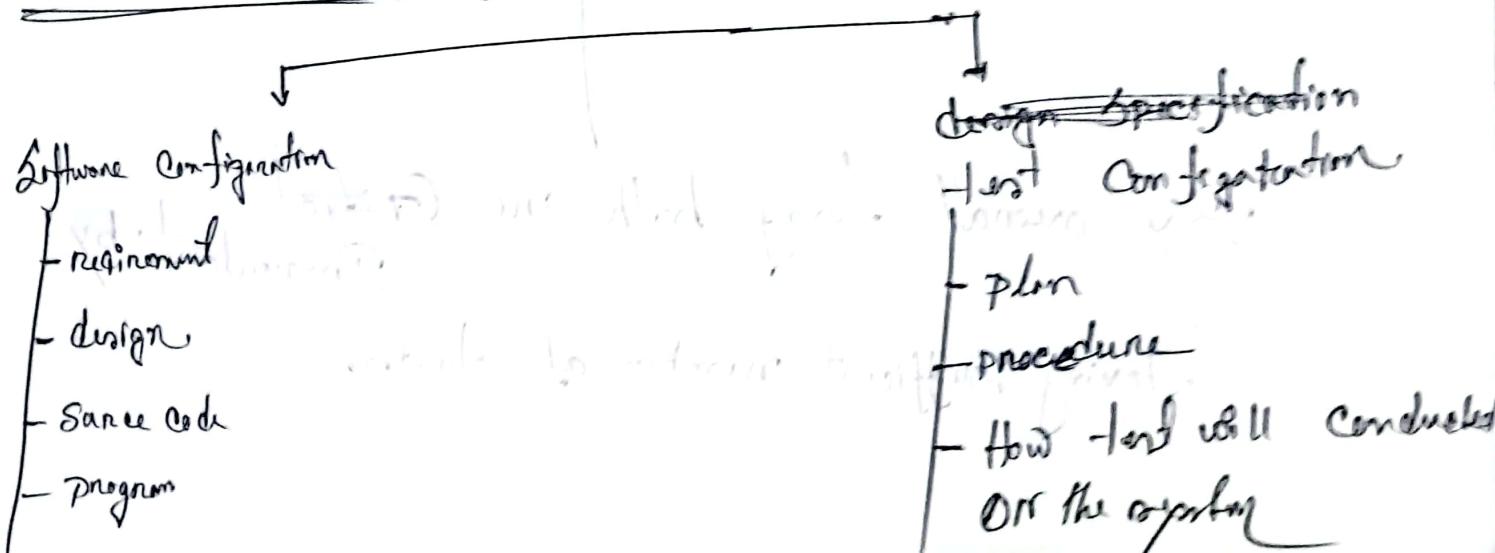
- It is a way to know about quality and testability.
- It is basically a process to detect errors in the software product.

Error can be occur when due to wrong analysis, wrong decision, and system fault etc.

Objective of testing

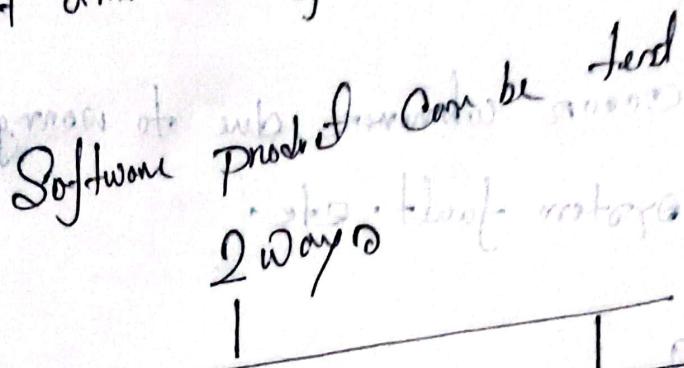
- First of all objective of testing is clear [to find error]
- It can executing a program to find errors.
- To performed testing test case are designed.
- A Guard test case can find undiscovered errors.

Test info flow : for testing 2 type Input and



Test case Design

It is a ~~important~~ part of testing. Expectation from the test is that it should be able to find most errors in the least amount of time and effort.



Black box testing

- functional product is tested. inputs are given. output checked. doesn't check internal function.

white box testing

- Internal function are tested
- procedure tested by its accuracy (loops)
- More intensive than black box.

By overall testing both are ~~critical~~ Important by

having sufficient number of tests.

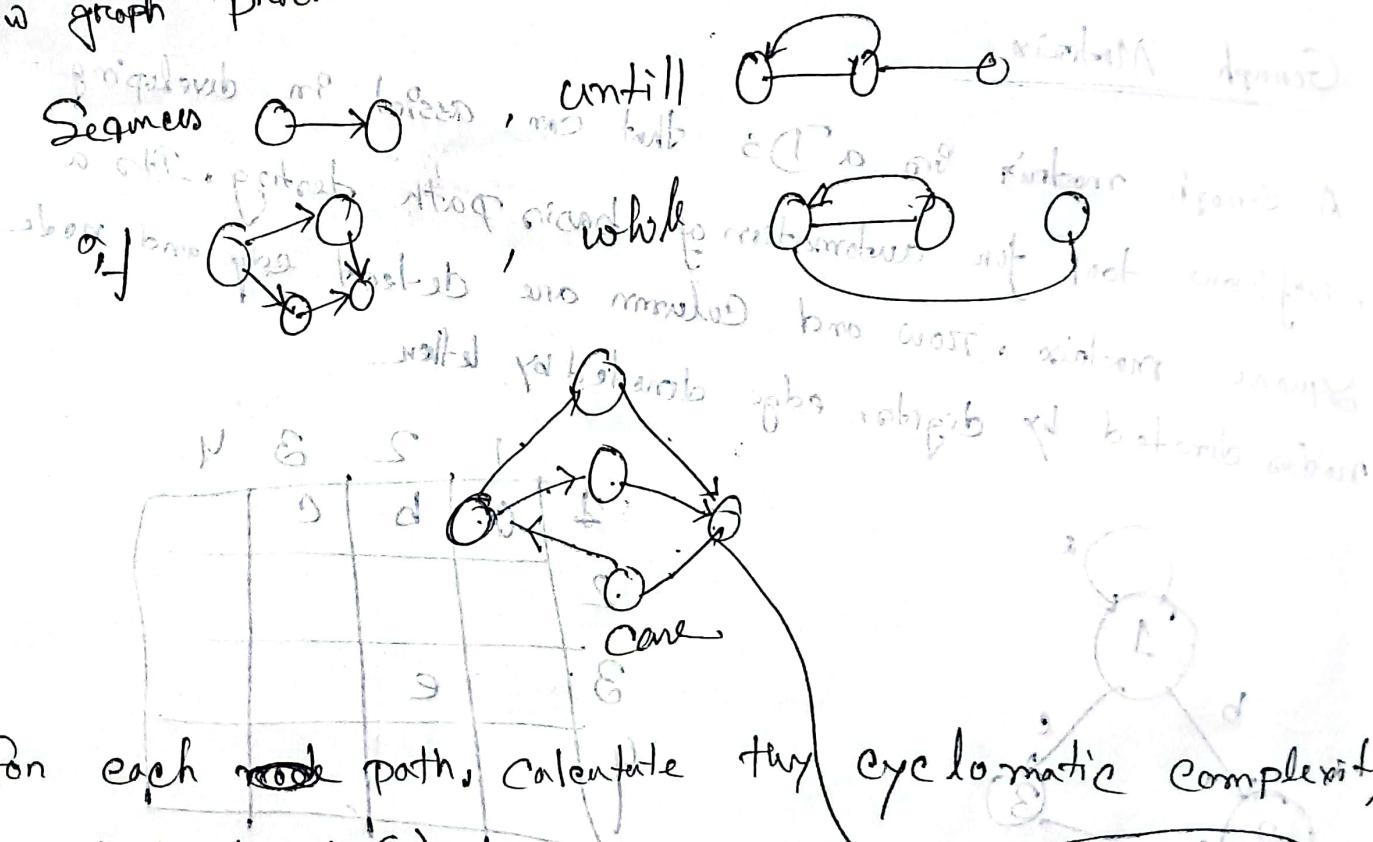
White box → performed unit testing • 3 way ()
Boundary Path testing (Bonie) (This does not end here. Rest follows.)

The tester guarantees to execute every statement in the program at least one time during testing.

(All execution path of a procedure)

Basic path is depend on the flow graph of step by step.

flow graph procedure.



For each node path, calculate their cyclomatic complexity denoted by $V(G)$

$$V(G) = \underset{\text{Edge}}{E} - \underset{\text{Node}}{N} + 2$$

$$= 6 - 5 + 2 = 3$$

A simple line drawing of a person with a large, circular head containing a smaller circle with a dot. The person has a small body and arms. To the left of the drawing, the words "cyclomatic comple" are written in a cursive, handwritten style.

Driving test case for Basis path testing

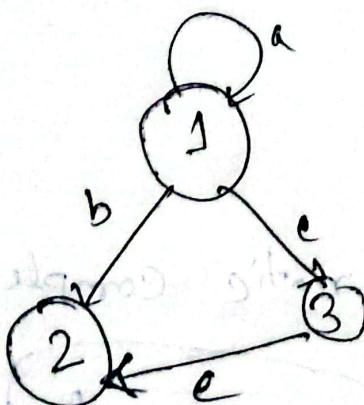
From design, Source code, flow graph.

Determine the $V(G)$.

- Prepare the test case that will force execution of each path in the basis set.
- each test executed and give expected results

Graph Matrix

A Graph matrix is a DS that can assist in developing software tool for automation of basis path testing. It's a square matrix. Row and column are defined edge and node numbers denoted by digits, edge denoted by letter.



flow graph?

	1	2	3	4
1	a	b	c	
2				
3		e		

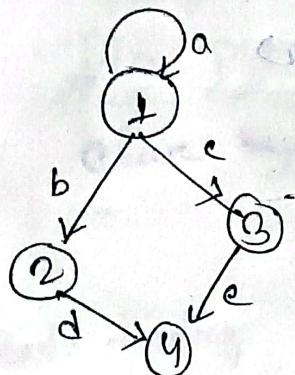
Graph matrix

$$\text{Value} \rightarrow S + C - 3 \rightarrow$$

Connection matrix:

→ It is defined with edges weight, when connection exists between 2 nodes of graph then edge weight is $\neq 1$, otherwise 0 .

(In connection to the 1 node $\neq 0$) applies not



comes to apply principle of 3 lowest priority				
1	1	1	1	0
2	0	0	0	1
3	0	0	0	1
4	0	0	0	0

$$\begin{aligned}
 & 3-1=2 && \text{odd value} \\
 & 2-0=2 && \text{even value} \\
 & 4-1=3 && \text{odd value} \\
 & \text{ignore} && \text{sum} \\
 & 2+0+0+0=2 && \text{sum} \\
 & 2+1=3 && \text{sum}
 \end{aligned}$$

To find Cyclomatic complexity of control graph

System [250 1 source row will consist of ① every thin ② ③ ④]

→ 1. 1st row to calculate CTC 1 (215)

→ 2. 2nd row to calculate CTC 2 (215)

→ 3. 3rd row to calculate CTC 3 (215)

→ 4. 4th row to calculate CTC 4 (215)

Black Box Testing

It is testing to check the overall functional requirements of product. Input given and put & verified if it's conducted.

Latter stages testing. It is more meticulous work.

Black box testing reveal following types of errors

• Incorrect

or missing function.

• Interface errors.

• External Database access.

• Performance errors. and Initialization error

• Program testing

to determine whether built software satisfies

Validation Testing

Validation successful when Software works in a way.

that can be expected by customer

(Customer can't know what is)

• It is the final series of software test.

• Validation achieved through a series of black box test

• It will be used in an attempt to uncover errors.

in the adjust with requirements.

Alpha testing

British market

- It's a type of acceptance test.
- Identify all possible issue/bugs before releasing the product.
- It's carried out in lab environment.
- Completed by internal employees.
- The procedure clarifies beta shooting intervals in terms of time and bugs.

Beta testing

- | Alpha Testing | Beta Testing |
|--|---|
| Performed by real users in real environment. | Performed by real users in real environment. |
| External Acceptance testing. | External Acceptance testing. |
| Direct feedback are major advantage. | Direct feedback are major advantage. |
| Test by internal employees. | Test by owner only. |
| Performed at developer site. | Performed at client location. |
| use white and black box. | use black box test. |
| require lab environment. | require real time environment. |
| Issue are fix if developer can find. | if owner get feedback such as issue are solved on this basis. |

Recovery testing

recovery test is a system that testing for where software fails or stops working and how well it can recover and resume normal operations after recovering from unexpected issues. It ensures that software can handle errors and bugs such as crashes, errors and undefined behavior.

Stress testing is a testing that checks how well a system can handle volume under pressure on high load. It ensures if the system behaves well under stress and handle heavy usage without crashing. It determines if the system fails to function correctly when subjected to an inaccurate mathematical model. To confirm its input, generate data and check if it matches with no errors in output.

Security testing :

Security testing is like putting on a strong wall.
for computer system. It checking of a Software or
website has strong defenses against hackers.

- * Security testing goal is to find any weak spots.
or and fix it.
 - * Make sure digital space are safe and secure
- (Test an attack the system to break down any defense, if he find any weak spots that can be fix.)

Ans.