

B. Tech. IT 5th SEM

SoS(E & T), GGU, Bilaspur C G

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ELECTIVE-I SOFTWARE ENGINEERING(ITo5TPE11)
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Unit-4 Content



- Coding- Top Down & Bottom UP approach
- Structured Programming
- Information Hiding
- Programming Style
- Internal Documentation
- Verification
- Metrics
- Monitoring & Control(Covered in Unit-2)

Coding



- Translate the design into given programming language.
- Affects both testing & maintenance phase.
- Programming Practice-
- Simple
- Easy to test
- Easy to understand & modify
- Simplicity & clarity

Top Down (TD)



- TD- Implementation starts from top of the hierarchy...
- STUBS have to be written..
- When building a prototype TD approach is used.....

Bottom Up(BU)



- Implementation starts from bottom of the hierarchy....
- DRIVER modules are needed...
- For many complex system like OS, Networking etc.....

Information Hiding(IH)



- Only access function can access the data structure...
- IH can reduce coupling....
- Effective tool for managing the complexity of developing software.....

Programming Style



- Name
- Control construct
- Gotos
- Information Hiding
- User Defined Types
- Nesting
- Module Size

Programming Style



- Module Interface
- Program layout
- Side Effects
- Robustness

Internal Documentation



- Comments===Prologue
- Prologue- Providing comments for modules
- Structure of Prologue-
 - Module Functionality
 - Parameters & their purpose
 - Assumptions
 - Global Variables

Verification



- Verification in 2 Categories—Dynamic & Static.
- Methods-
 - Code Reading
 - Static Analysis
 - Symbolic Execution
 - Proving Correctness
 - Code Inspection/Reviews
 - Unit Testing

Metrics



- Size Measures
- Complexity Metrics(will be covered in Unit 5)

Size Measures



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Size Metrics (Volume)

proposed metrics for length & volume of a pgm based on the no. of operators & operands.

n_1 = no. of distinct operators

n_2 = no. of operands

$f_{1,j}$ = no. of occurrences of the j^{th} most frequent operator.

$f_{2,j}$ = ———— operand.

The vocabulary n of a pgm is defined as

$n = n_1 + n_2$

New Parameters -

$N_1 = \sum f_{1,j}$ $N_2 = \sum f_{2,j}$

Size Measures



from the length & vocabulary the volume V of the pgm is defined as

$$V = N \log_2(n)$$

V = volume of pgm represents the min no. of bits necessary to represent the pgm.

$\log_2(n)$ = no. of bits needed to represent every element in the pgm uniquely.

N = total occurrence of different element.

Thank You



- Any Doubt in Unit-4 Coding?????