



Assignment On Software Matrices

Course Code: CSE3204

Assignment-1

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Code Size Measure

Definition: The "source code" of a computer program is composed of lines of code, and depending on the programming language, one line may produce one or more instructions. Almost all compilers display the overall number of lines of code without indicating how many blank lines, comment lines, data declaration lines, or heads there are.

Measuring Techniques:

- **LOC** = Counting number of physical lines (including blank lines, comment lines).
So,
LOC = 3152
Type = Programmatic
- **CLOC** = Counting the commented lines of code. Comment can be single line comment (//) and multi-line comment (/**/).
So,
CLOC = 102
Type = Programmatic
- **NCLOC** = Counting all lines excluding blank lines and commented lines of code. Called effective lines of code.
So,
NCLOC = 3050
Type = Programmatic
- **Total size, LOC = NCLOC + CLOC**
Here,
NLOC= Non commented line = 3050
CLOC= Comment lines of program text = 102
LOC = 3152
Type = **Manual**
- **Density of program, DoP = CLOC / LOC**
Here,
CLOC= Comment lines of program text =102
LOC = Total size = 3152
DoP=102/3152=0.03

Type = Programmatic

- **Halstead Approach.** Volume of Program, $V = N \times \log_2 \mu$
Here,
 $N = N_1 + N_2$ & $\mu = \mu_1 + \mu_2$
 μ_1 = Number of unique operators = 7
 μ_2 = Number of unique operands = 146
 N_1 = Total occurrences of operators = 588
 N_2 = Total occurrences of operands = 724
So, $V = N \times \log_2 \mu = (588 + 724) \times \log_2 (7 + 146) = 2866.315$
Type = Manual

- **Byte of code = 101844 Byte**

Type = Programmatic

- **Number of characters = 66485**

Type = Programmatic

- **Number of words = 31807**

Type = Programmatic

- **Average number of characters per line = 21**

Type = Programmatic

- **Average number of words per line = 10**

Type = Programmatic

- **Average number of words per file = 1621**

Type = Programmatic

- **Average number of characters per file = 1621**

Type = Programmatic

- **Average number of lines per file =76**

Type = Programmatic

Design Size Measure

Definition: Design size measure size in terms of packages, design patterns, classes, interfaces, abstract classes, operations, and methods in a software project.

- **Number of sub-packages** = Counting the number of sub packages under a package.

Number of sub-packages = 11

Type = Manual

- **Number of classes** = Counting the number of classes used

Number of classes = 41

Type = programmatic

- **Number of Interfaces** = Counting the number of interfaces used

Number of Interfaces = 6

Type = Manual

- **Number of design patterns** = Number of design pattern used in the design.

Number of design patterns = 2 (Strategy, Factory)

Type = Manual

- **Number of public methods** = Counting number of public methods used

Number of public methods = 164

Type = Manual

- **Number of overloaded methods** = Counting the overloaded methods.

Number of overloaded methods = 25

Type = Manual

- **Average method per class** = Calculating the average number of methods in a class.

Average method per class = 4

Type = Manual

- **Weighted method per class** = Calculate the weight of a method using cyclomatic complexity and finding out the weight of method for a class.

Weighted method per class = 3

Type = Manual