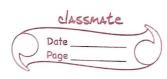


DNIT-4 SOFTWARE METRICS And the Continuous application of measurement band technique to the software during ment process and its products to supply meaningful and timel management information, together with the use of those technique to improve that process cand its products. Categories of Metrics 1 Product metrics: describe the characteristics of the

- 1 Product metrics: describe the characteristics of the product such as size, compliaity, design features, performance, effecting, ruliability, portability etc.
- 2 procus metrics: discribes the effectiveness and quality of the procusus that produce the software product.

 Examples are t
 - · effort required in the process.
 - · reflectioners of defect removal clearing development · number of defects found during testing · maturity of the process.

number of software decelopers · Staffing pattern own the life cycle of the softwar Some motrice lulong to multiple Certigories like quality metric may belong to all three categorius. It fourses on the quality aspects of the product proces and the project. Some important metrices are discussed in subsequent sections of the chaptur. & what are the Areas of Application? Anst The most established area of software metrices is cost and size estimation techniques. There are many propraetary packages in the executes to whomite spicional troub trafferm system size, cost to delulop a system, and the duration of the development or enhancement of the project These packages are based on estimation models like COCOMOSI, COCOMO-TI developed by Berry Bochm [BOEH 81]



=	
	Metrices for Source Code - Loc
	assistant to contain a second contain of the second
	Halstead Metrics
	Halstead Metrics
	Malstrad Letrics Complexity measures are Software milities introduced by Maurice Mal stead In 1977.
	Software milities introduced by Mauria Hal stead
	m1927.
	halstead made the observation that metrices of the
	Software should reflect the implementation of
	expression of algorithms in different (anguages, but
	be independent of their execution on a specific platform
	These metrices are therefore computed statically
	from the Code !!
	or broad: His goal is to identify measurable
	properties of software and relations between
1	then, a some a regard but a real of the
	This is similar to the identification of me aswable
	properties of mother (like the volume, mars and
	Sturior of a gas) and the relationships between then
	Canalogica of the are a senting
1	thus his mothicy are a actually not just complexity
-	mitrion.
1	
1	

72 = The number of distinct operands NI = The total number of operators N2 = The total number of operands From the numbers, seural measures Can be Tim Program Vocabulary: n = ny + no Program length: N= N, +N2 Ne mos · Calculated Estimated program lingth: N = 1/2 log 1/2 log 1/2 · Volume: V=N X log n · Difficulty: D = 1/1 N2 · Effort: E=DXV

_	
	Oding time using the following relation
-	Coding time using the following relation.
	thought to be delight of the state of the st
	The difficulty measures is related to the
_	The difficulty measures is related to the difficulty of the program to write orunderstand and when doing cook medical
	so when doing cook medica
-	The effort measure translater into actual coding time using the following relation.
	time using the following relation.
	The Marie Dans I) the
6	Time required to program: T= E seconds
	18
	Halstead's delivered bugs (B) is an estimate for the number of words in the influentation.
	for the number of words in the implementations
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	Dun Number of delivered 15 ugs: B= E'S or
	2000
	Num Number of delivered Bugs: B= E ^{2/3} or 3000 more recently B=V is excepted 3.000
	3,00
	The dustract opening () and = a, b, a dustract about about a dustract about a dustract
	the state of the s
\parallel	$PI = PI_2PI_2 = PI_2PI_2$
#	- A - A
#	

T	Classmate
	Date Page
Exum	ple :- in waldowed areas as to
	Consider the following Chrogram!
	est se unature d'annier de la
	main ()
	f.
	into be and;
	int a, b, c avg; Scenf ("1./.d :/.d", ka, kb, bc);
	0,0, = (a +4+++) /2:
-	avg = (a+5+c)/3; prints ("avg = 1.d", avg);
	Purity Constant of the mount was
	7
	travolue house top have a law that the material
	tion to love at his stand to destinate and one
	The distinct operators (M) are = main, 1), E).
	, int, scant, b, =, +, / prints , 9, 1
	Scart / Scart
	3000
	The Island I have I have a company
	The distinct of wremas (72) are = a, b, c, arg, care
	1.0 7.07.0", 3, "avg = 7.0
	1. n. 12 n = 7
	$ \cdot _{1} = 12$, $ n_{2} = 7$
1	n = n + h2
	2
	n= 12+7=19
	N12 27 N2=15
	N = 42

Calculated Estimated Program Ingth's N=12 xlog 12 +7 x log 7 Volume 1 V2 MX logg V= 42 × log 19 V= 178.4 Difficulty: D= My N2 D= 12 15 = 12.85 Effort: E = 12.85×178-4 = 2292.99 Time reguired to fragren : T= E T= 127.357 seonds Number of delivered bugs: B=V 3000 B - 2292.4443 = 0:05 3000

V.D