Page: Numerical Date: analysis

Duny measure errors to determine The accuracy of results
algorithms
Absolute error (Et)
The difference between The exact value in a calculation and The
approximate value found using numerical method
$E_t = exact - Approximate$
14 CX-V) - V - V - V - V - V - V - V - V - V
Relative Absolute error (Et)
The ratio between The absolute error and exact value
Et = Absolute Error exact volue
Approximate error (Ed)
The difference between Present approximate and Previous
approximate.
A CONTRACTOR OF COMMENTS SERVICES AND A SERVICES
Ea=Present approximate - Previous approximate
Relative Approximate error
The vatio between The approximate error and present approximate
Eq = Present Approximate
* Source of numerical error > (Round off - truncation)
-Round off: Caused by representing anumber approximately
- truncation: caused by truncation or approximating amount procedure

	Page: Date:
	ASTRICT Ide AFT
Ktaylor series 1	L X-a
3.30 103	4, 113
$F(x+h) = F(x) + h F(x) + \frac{h^2}{2!}$	- C''(x) +
* Maclauren series (X=0)	Novik .
	The Water State of the State of
$f(x+h) := f(0) + hf'(0) + \frac{h}{2}$	- C"(0) + -
F(X+n) := F(0) + MF(0) + 2	Ab , and a
* Absolute error Rn = CX	-h/x P cc) Ce[x, x+h]
	Cn+1)!
Gauss elemination	
1 Forward elemination 2 Ba	CREOSabstitution Islain
3 no. of Steps of Forwar	
* Pi+ folis Forgauss eliminar	tion :
	large round all errors
ODivision by Zero	101 ye round or orre
* Steps of Gauss elemina	
(1) Column (1) 19px] Tougus!	121 × (P=2 [1 -1 /12]
KIPKN	K=1 = 3
	[3 1 1 /4] nxn
@ Swap R2 wiTh R, Rixa	$R_{21} - R_2 \rightarrow R_2$
a _{II}	-6 -1 37
Ri xq	31-R3->R3 0 56 -5 -5
* det(A) =) - a11 14	
	10 (-3)-21-3)
(3) Column 2 -> 19px 1 -> 932	ا كبرفيدة <
	66 1 -1 3
9 SWAP R3 WITH R2 >	R2 × a32 - R3 → R3 O -32 -1 -12
$X_1 = 9$, X25? X35? (OO) 13 3

	Date:
* Jacobi steps	
	20132
$\bigcirc X = Z$	S XO
$+(x)^{\prime\prime}\gamma$	+ (x) 7 + (x) 7 (113 x) 7
2) start by xo=1, yo=1, zo=1	
given given	4 0) 1 25-0 1 10 m 1 -
3) Then > use The x, y, z results	2. 1 2. 50% 2 5 - 611.
+ (0) Nature	A final factor of the state of
1) E = xnew_ x old xnew x loo = - %.	11111111
x new 100 7 (N-X)	= MA AL YOUR STURYLL
8 may 6 1(1410)	
Dillax. C	Foots elemination
VC 111 0+0C	
Gauss seidel steps	70 minutes []
	7 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
$0 \times 3 = 3 = 3 \times 3 = 3 \times 3 \times 3 = 3 \times 3 \times 3$	
nation i	31-31
2) Stort by > X=0, 450,	250 (given)
	Landon will and the control of the c
3) Then - use X in y and	nselar geninezalo, saspe
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n x 9 2	Partition Carried and Carried
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1 atrz	x nan yna JI sisius
20 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	1 - Carlotal
Decree State of the second	

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* Bisection Method		•		book	11	15.533 2 8
	$2) X_{m} = -$	Xc 7	F X4		n	
1 given 1 1+X		-iX /		JA.	X Xu	x, & 8
③ F(X1). F(Xm) <0 → X1 F(X1). F(Xm) >0 → X1			1:			
$F(X_i) \cdot F(X_m) = 0 \rightarrow Alg$				and -	= Xm	
9 voot = Last Xm x Es=					7, 641	
9) 100 (3) Last Am 3,25	<u> 45 (C)</u>	,	į			
* Newton Raphson						
-	1-16			. No	3-1-1-5	Lister C
(Xo + siven))	1	Xn		1 Eal	
782	7. 512-39 4-1			1	Ligno	Visnid
$(2) X_{i+1} = X_i - F(X_i)$	(120 bai	2	j-	00	(1-1-012.	and it
(A)		-	\	l		
3 Yout = last Xn		and the second second	<u> </u>	Anto	<u>retecp</u>	2005/15/2
	CLARA DANIES PROPERTY AND	W. F 5-140-FM	the same win backer than	S. B. S.		
* Bisection method		710	1010	931		Quadvat
Advantages	T	-	aw			
DAlways Convergent						<u> </u>
2) The root bracket getsholved	-					sses is Close
with each iteration - guranteed	to There	oot,	The			ce is slower
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				verbalco	Mineral Intrec
* Newton Raphson	N. Ast.					
Advantages	1					
1) Converges fast (quadratic Cor	vergence) (90	iverg	genc	e at ir	flection Points
(2) Require only one guess		U	11/15	ion	by zero	2
		3) [Root	Ju	mping	() Modyagi
1607-1804 4 6xx2=xd-4			1.00		-V ^A -	
1474-1414					200	
TOWN TO THE WORLD	1					1937, 372, 938

Shell				Date:
* Secant Metho	nd		7/0/1/	Bisection
$D X_{i+1} = X_i - \frac{FCX}{FCX}$	i) (Xi - Xi-i) (i) - F(Xi-i)	2 E a =		- x 1000 = 1 x
3) N X ₁₋₁ X ₁	Xi+I E	Xi - 1 · · · · · · · · · · · · · · · · · ·	$=\frac{1}{\sqrt{m^2}}$ $=\frac{1}{\sqrt{m^2}}$ Teration	7 (9'ven) (9'ven) بتغیر ال فی کل
* Interpolation	-	SOB	Pack	Newton
A PITTER POTALION		(xo + given)		1.20
THE REPORT OF THE PERSON OF TH				
Setup (n+1) (D) Linear Interpol	ation: FCX) =	ao + a, x .	Cloy I	a ₁ → given
D Linear Interpol	erpolation, FC	x)= a0 + a1x + a2x2	Jao, a	Gar Jaiven
2) Linear Interpole 3) Quadratic Inte	erpolation, FC	x)= 90 + 91X + 92x ²	lasja otnov	gar sgiven
D Linear Interpole 3 Quadratic Interpole 270 Cubic Interpole	expolation x FC adward plation: FCX)=	$ x = a_0 + a_1 x + a_2 x^2$ $ x = a_0 + a_1 x + a_2 x^2 + a_3 x$	100,0 ot mov	gar Sgiven
2) Linear Interpole 3) Quadratic Interpole 270 3) Cubic Interpole	erpolation v FC adward plation : Fcx) =	ao+a, x+a2x2+a3x	100, a ot nov 3 ao, a	Gar Jaiven
D Linear Interpole 3 Quadratic Interpole 270 Cubic Interpole	erpolation v FC adwar() plation: FCX)= ded differen	ao + a1 X + a2 X ² ao + a1 X + a2 X ² ao + a1 X + a2 X ² + a3 X ce Method	100, a 27 MAV 3 a0, a	Jaz Jgiven JA vazaz → given
Dinear Interpolation Quadratic Interpolation Quadratic Interpolation Quadratic Interpolation Quadratic Interpolation Newton's Divi	erpolation x FC plation: FCX)= ded differen	ao + a1 X + a2 X ² ao + a1 X + a2 X ² ao + a1 X + a2 X ² + a3 X ce Method	100,0 2 00,0	Mar Sgiven
Dinear Interpolation	expolation x FCX)= clation: FCX)= clad different	290 290 200 200 200 200 200 200	100,0 2 00,0	Mar Sgiven
Dinear Interpolation Quadratic Interpolation Newton's Divinear interpolation (x) = boff by (x=	erpolation x FCX)= ded different (xo) erpolation v	$(X-X_1)$ bo= $F(X_0)$	1 α ο, α 23 α ο, α 1 b)	Mar Sgiven

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Polation	* Quadratic Inter
3 Cubic Interpolation	- c
(e) V(t) + (t) V(t) + (e) V(t) = ==	V(t) = E by V(t) =
F3(X) = F(X0) + F(X1, X0) (X-X0) + F(X2, X1, X0) ((-xo) (x-xi) +
(X3, X2, X1, X0) (X-X0) (X-X1) (X-X2)	T = [i]
	Company Company AND Company
bo	(+) <u>/</u>
Xo E(X ₀)	b2
F(X1, X0)	K b3
X_1 $F(X_2,X_1)$	
Y2 (+) V (+) of F(X2) X2 (+ (+) V (+)) + X+F(X3) X2	F(X3, X2, X1, X6)
X_2 (\pm)	0=1 0=1
$f(x_3)$	The same and the same of the s
	Flatte Western
Lagrangian Interpolation	0-6
	-X;
$F_n(x) = \sum_{l=0}^{\infty} l_l(x) F(x_l)$ $l_l(x) = \prod_{l=0}^{\infty} \frac{x_l}{x_l}$	-X) = -= -= += (+) J
j=0 j±1	401-101-2
$P_{1}(x) = \frac{x - x_{1}}{x_{0} - x_{1}} y_{0} + \frac{x - x_{0}}{x_{1} - x_{0}} y_{1} = \frac{(x_{1} - x_{1}) y_{0} + (x - x_{1})}{x_{1} - x_{0}}$	19(0)
$ Y_1(X) = X_0 - X_1 - X_0 - X_1 - X_0 $	24-A
$P_{2}(x) = \frac{(x-x_{1})(x-x_{2})}{(x_{0}-x_{1})(x_{0}-x_{2})} y_{0} + \frac{(x-x_{0})(x-x_{2})}{(x_{1}-x_{0})(x_{1}-x_{2})} y_{1} +$	(X-X,) (X-X,)
$(X_0 - X_1)(X_0 - X_2) = (X_1 - X_0)(X_1 - X_2)$	(X2-X0)(X2-X1) 52
linear Interpolation	23.
linear Interpolation North Constitution	
$I(t) = \sum_{i=0}^{\infty} L_i(t) \ V(t_i) = L_0(t) \ V(t_0) + L_1(t) \ V(t_0)$	V(t) V(t)
$o(t) = \int_{J=0}^{1} \frac{t - t_j}{t_0 - t_j} = \frac{t - t_i}{t_0 - t_i} = \frac{t}{t_0} \int_{J=0}^{1} \frac{t}{t_0} dt$	-t) = t-To
j≠0 j≠0 j≠1	y the solitory

* Quadratic Interpolation li(t) V(ti) = Lo(t) V(t) + Li(t) V(ti) + L2(t) V(t2) * Cubic Interpolation (X) li(t) v(t) = 10(t) v(to)+4(t) v(to)+12(t) v(to) + 12(t) v(to) * AFter Quadratic Interpolation: X100 = -After Cubic InterPolation: Cubic - Quadratic X100 = -