

SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107



AN AUTONOMOUS INSTITUTION

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

	Newbork interpolation formula for unequal interval.
	Let y of (N) take values of (No), of (M) of (Nn)
-	Corresponding to the arguments xo, x,
	$f(x,x_0) = f(x_0) + (x-x_0) f(x,x_0) - 0$
	1/1 f(w) x0, x1) = f(x, x8) = f(x0,x1)
	Using this value of formorin O, we have
	B(x) = f(x0)+(x-x0)f(x0,x1)+(x-x0)(x-x1)f(x1,2)x1)
	Again f(x1x0, x1, x2) = f(x1, x0, x1) - f(x0, x1, x2)
	Using this value in es, we get
	\$(m) = f(m.) + (x-x0) f(x0,x1) + xx-x0)(x-x1)f(m0,x1,x1)
-	Continuing in this manner, we get
	f(n) = (x0) (x-x1) (x-x2) (x-x1) f(x0,x1, 2)
	+ (x-x0) (x-x1) (x-x7) (x-x0) (x,x0,1,-x)



SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107



AN AUTONOMOUS INSTITUTION

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

24 4W) ir a v	polynowia	d ook	Oleon	
4600 4CW.X	0,71,	20 -0	S ONE	19 cm]	
- D becom	. ٨ــــ				
7(N) =	f(No)+ (n.	-x0) -f(x0	,V,)+(H-	(,x-Yn-1)	f(40,4,7,
Fgr. (2) 12	called	Neutoni		1	
divided det	ference	interpol	ation	formula	e for
unequal inte	ivali.				
Problem:		diameter and			
Using Newto	ni divideo	l differ	ence -	menda	Lind
Using Newton the values	of fier.	LC2) 8	4(15)	given the	7.
following table	b.	0	0	20,11	
2 : H		10	11	13	
fun: 48					
Solu.	Pivided di	Henento A	ralala	2018	
	A \$(70)				
H H8	100-48 = 52 5-4	Q17-12			
	_97	7-4 =15			
7 294	202	-21	- 1		
10 900		_ 27	1		
11 1210	- 310 _	33	37 24		
13 2028	- A07				



SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107



AN AUTONOMOUS INSTITUTION

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

f(n) = f(no) + (x-xo) f(xo, x, 7) + (x-xo)(x-x, 7) f(xo, x, xo) + Cliver No=4, X,=5, xo=4, Xo=10, Xu=11 & Yo=13 & f(no)=18, f(xo, x, 7)=52, f(xo, x, xo)=15, f(xo, x, xo, xo)= Hence Using these values in (D), We howe f(n) = 18 + (x-1)52 + (x-1)(x-5) 15 + (x-1)(x-5)(x-7)? f(2) = 148 + (n-1)52 + (n) (3) 15 + 11 (3) (1) (1) = 145 f(15) = 148 + (n) 52 + (n) (3) 15 + 11 (3) (1) (1) = 145 f(15) = 18 + 11 (10) 15 + 11 (10) (10) = 145 f(15) = 18 + 11 (10) 15 + 11 (10) (10) = 145 From the following table find f(x) and hence f(b) Luing Newtoni interpolation formulo x: 1 2 7 8 f(x): 1 5 5 1 8 oliv: Evidently, intervals are not equal. We form the olivided difference table helow x f(x) Af(x) Af(x) Af(x) y (x) Af(x) Af(x) Af(x) 7 5 1/8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	By Newto	ni divided diff interpolation formula,	
8 f (40)=18, f (x0, x,7=52, f (x0, x1, x2)=15, f (x0, x1, x3, x3)= Hence Using these values in (10, we have f(x1)=48+ (x-4)52+ (x-4) (x-5) 15+ (x-4) (x-5) (x-7)? f(2)=48-64+90-30=24 f(8)=48+14x52+(42) (3) 15+4 (3) (1) (1)=148 f(15)=48+14x52+14x10x15+11x10x8=3150 From the following table find f(x) and hence f (8) Lying Newtoni interpolation formulo x: 1 2 7 8 golu: Evidently, intervals are not equal. We firm the clivided difference table below X f(x2) Af(x2) Af(x2) Af(x3) 7 5 - 18 1 1 2 5 - 19 1 1 1 4 - 23 7 5 - 18 3y Newton's divided difference formula. - (x0)=-1(x0)+(x-x0)-f(x4, x6) +(x-x6) (x-x1)-f(x0, x1, x6) - (x0)=-1(x0)+(x-x0)-f(x4, x6) +(x-x6) (x-x1)-f(x0, x1, x6)	fcas =	f(x0)+(x-x0) f(x0,x1)+(x-x0)(x-x1) f(x0,	7,7/2)+ 15=13
\$(n) = 48 + (n-4)52 + (n-4) (n-5) 15 + (n-4)(n-5)(x7)? \$(2) = 48 - 64 + 90 - 30 = 24 \$(8) = 48 + (14) 52 + (12) (3) 15 + 4 (3) (1) (1) = 145 \$(15) = 48 + 11x52 + 11x10x15 + 11x10x8 = 3150 From the following table find \$(x)\$ and hence \$f(8) Lying Newtoni interpolation formulo \$\frac{1}{2} \frac{7}{3} \frac{8}{4} \$\frac{1}{2} \frac{7}{3} \frac{8}{4} \$\frac{1}{2} \frac{7}{3} \frac{1}{4} \$\frac{1}{2} \frac{7}{3} \frac{1}{4} \$\frac{1}{2} \frac{1}{3} \frac{1}{4} \$\frac{1}{2} \frac{1}{3} \frac{1}{4} \$\frac{1}{2} \frac{1}{3} \frac{1}{4} \$\frac{1}{3} \fr	840	る)=18, も(xo,x,)=52, も(xo,x,,x,)=15, もい	= (و×, و×, ۱۴, ٥
f(8) = 48 + (4) 52 + (4) (3) 15 + 4 (3) (1) (1) = 145 f(15) = 48 + 11x52 + 11x10x15 + 11x10x8 = 3150 From the following table find f(x) and hence f (6) Lying Newtoni interpolation formulo X: 1 2 7 8 Solu: Evidently, intervals are not equal. We from the Olivided difference table below X f(x) Af(x) Af(x) Af(x) Af(x) -2/3 1 1 2 3 14 3y Newton's divided difference formula -4(x) = 4(x0) + (x-x0) f(x0, x0) + (x-x0) (x-x) f(x0, x0, x0)	& (M) =	48+ (x-4)52+(x-4) (x-5) 15+(x-4)(x-5)(x	יכד
From the following table find f(x) and hence f(s) Lying Newtoni interpolation formulo X: 1 2 7 8 f(x): 1 5 5 4 Bolis: Evidently, intervals are not equal. we firm the divided difference table below X f(x) Af(x) Af(x) Af(x) 1 1 2 5 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	- Y		
Lying Newtoni interpolation formula X: 1 2 7 8 f(x): 1 5 5 4 Bolu: Evidently, rentervous are not equal. We form the Olivided difference table below X f(x) Af(x) Af(x) Af(x) 1 1 4 -2/3 7 5 -1/8 By Newton's divided difference formula, J(x) = f(x0) + (x-x0) f(x0, x0) + (x-x0) (x-x1) f(x0, x1, x0)	f(12)	= 48+11x52+11x10x15+11x16x8 = 3150	0
Solu: Evidently, intervals are not equal. We from the Olivided difference table below 2 f(x) Af(x) Af(x) Af(x) 2 5 - 0 - 43 7 5 - 18 By Newton's divided difference formula, f(x) = f(x0) + (x-x0) f(x0, x0) + (x-x0) (x-x) f(x0, x, x0)	Lying Ne	tollowing table find f(x) and hen autoni interpolation formula	(a \$16)
80/w: Evidently, intervals are not equal. we from the clivided difference table below X of (x) Afix? Afix? 1 1 4 -2/3 7 5 - 1/8 By Newton's divided difference formula. I(x) = I(x0) + (x-x0) f(xy, x0) + (x-x0) (x-x) f(x0, x, x)		. 0	
2 5 0 -43 14 2 5 0 14 2	80/m: E	vidently, intervals are not equal. We	from the
2 5 0 -43 7 5 -18 14 8 4 By Newlon's divided difference formula.			
By Newton's divided difference formula. - f(x) = f(x0) + (x-x0) f(x0, x0) + (x-x0) (x-x1) f(x0, x1, x2)	- 1	1-2/3	
1(m)=+(no)+(x-x)+(nx, x, +(x-x)+(nx)+(x)+(x)+	7	5 -18	
1(m)=+(no)+(x-x)+(nx, x, +(x-x)+(nx)+(x)+(x)+	8	14	
+(x-x0)(x-x1) (x-x0) f(x0, x1, 22,25)	3y New	ions divided difference formula.	
00 0) 11, 103/	-1 (M) = -	+(x-x0) (x-x1) +(x-x0) (x-x1)	x, 15,0x)
	1	0 0) 11 10 3)	
			(2) (2)
= 1+(x-1)4+(x-1)(x-2)(-2)+(x-1)(x-2)(x-7)(3	411	= 13x-58x+31x-24)	
$= 1 + (x-1) + 2 + (x-1) (x-2) (-\frac{2}{5}) + (x-1)(x-2) (x-7) (\frac{1}{5})$ $= \frac{1}{12} [3x^2 + 3ix - 224]$ $= \frac{1}{12} [3x^2 + 36x5 + 1926 - 224]$	100	6.23809524	

SNSCE/ S&H/ UNIT 2 Page 3/3