NM Lab Sheet
II Year / II Part
Faculty: Computer/Electrical

Labsheet#2

Objectives:

1. Generate following **table** for the functions $f(a) = a^3 - 4a - 9$ & $g(b) = 3b^2 - 4$, where a runs from 0 to 2.5 on an increment of 0.25 & b runs from 0.5 to 5 on an increment of 0.5.

SN	a	b	f(a)	g(b)
1	0.00	0.50	-9.000000	-3.250000
2	0.25	1.00	-9.984375	-1.000000
3	0.50	1.50	-10.875000	2.750000
4	0.75	2.00	-11.578125	8.000000
5	1.00	2.50	-12.000000	14.750000
6	1.25	3.00	-12.046875	23.000000
7	1.50	3.50	-11.625000	32.750000
8	1.75	4.00	-10.640625	44.000000
9	2.00	4.50	-9.000000	56.750000
10	2.25	5.00	-6.609375	71.000000

2. Generate **divided difference table** for the following data:

x	5	7	11	13	17
y	150	392	1452	2366	5202

Divided Difference Table

x	y	I DD	II DD	III DD	IV DD
5	150				
		$\frac{392-150}{7-5} = 121$			
7	392		$\frac{265-121}{11-5} = 24$		
		$\frac{1452-392}{11-7} = 265$		$\frac{32-24}{13-5} = 1$	
11	1452		$\frac{457-265}{13-7} = 32$		$\frac{1-1}{17-5} = 0$
		$\frac{2366-1452}{13-11} = 457$		$\frac{42-32}{17-7} = 1$	
13	2366		$\frac{709-457}{17-11} = 42$		
		$\frac{5202-2366}{17-13} = 709$			
17	5202				

3. Generate **forward difference table** for the following data:

θ	10	20	30	40	50
sinθ	0.1736	0.342	0.5	0.6428	0.766

Forward Difference Table

θ	**sinθ**	**1st Simple Difference**	**2nd Simple Difference**	**3rd Simple Difference**	**4th Simple Difference**
10	0.1736				
		0.342-0.1736 = 0.1684			
20	0.3420		-0.0104		
		0.5-0.342 = 0.158		-0.0048	
30	0.5000		-0.0152		0.0004
		0.6428-0.5 = 0.1428		-0.0044	
40	0.6428		-0.0196		
		0.766-0.6428 = 0.1232			
50	0.7660				

4. Generate **backward difference table** for the following data:

x	7.47	7.48	7.49	7.5	7.51	7.52	7.53
f(x)	0.193	0.195	0.198	0.201	0.203	0.206	0.208

5. Generate following **table** for the data:

x	0	1	2	3
y	1.05	2.10	3.85	8.30

	x	**y**	**ln(y)**	**x*x**	**x*ln(y)**
	0	1.05	0.04879	0	0.00000
	1	2.10	0.74194	1	0.74194
	2	3.85	1.34807	4	2.69615
	3	8.30	2.11626	9	6.34877
$\sum$	**6**	**15.30**	**4.25506**	**14**	**9.78685**

Lab Assignment#2

1. Construct the divided difference table from the following data set:
   (x0,y0), (x1,y1), (x2,y2), (x3,y3) & (x4,y4).
2. Generate divided difference table for the following data:

x	3	4	5	6	7	8	9
y	4.8	8.4	14.5	23.6	36.2	52.8	73.9

3. Generate forward difference table for the following data:

x	2	4	6	8	10	12
y	5.1	4.2	3.1	3.5	6.2	7.3

4. Generate divided difference table for the following data:

x	1.0	1.5	2.0	2.5	3.0	3.5	4.0
y	8.2	5.2	3.1	2.5	1.7	1.6	1.4

5. Generate simple difference table for the following data:

x	10	30	50	70	90
y	34	56	45	23	36