

**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:

$\theta$	10	20	30	40	50
$\sin\theta$	0.1736	0.342	0.5	0.6428	0.766

Forward Difference Table

$\theta$	$\sin\theta$	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
$\Sigma$	6	15.30	4.25506	14	9.78685

## Lab Assignment#2

- Construct the divided difference table from the following data set:  
( $x_0, y_0$ ), ( $x_1, y_1$ ), ( $x_2, y_2$ ), ( $x_3, y_3$ ) & ( $x_4, y_4$ ).
- 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

- 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:

<b>x</b>	1.0	1.5	2.0	2.5	3.0	3.5	4.0
<b>y</b>	8.2	5.2	3.1	2.5	1.7	1.6	1.4

5. Generate simple difference table for the following data:

<b>x</b>	10	30	50	70	90
<b>y</b>	34	56	45	23	36