PARUL UNIVERSITY
FACULTY OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF APPLIED SCIENCE AND HUMANITIES
(4th SEMESTER)B.TECH PROGRAMME
PROBABILITY, STATISTICS AND NUMERICAL METHODS
(203191251)
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Tutorial 2: Curve Fitting

1.	If P is the pull required to lift a load W by means of a pulley block, find a linear law of the form P = m W+ c

P	12	15	21	25
W	50	70	100	120

Where P and W are taken in kg-wt. compute P when W=150 kg.

2.	In some determinations of the value v of carbon dioxide dissolved in a given volume of water at different temperatures θ, the following pairs of values were obtained:

θ	0	5	10	15
v	1.8	1.45	1.18	1.00

Obtain by the method of least squares, a relation of the form $v= a+b\theta$ which best fits to these observations.

3	Fit a second degree polynomial to the following data:

x	0	1	2	3	4
y	1	1.8	1.3	2.5	6.3

4	Fit a second degree parabola to the following data:

x	1.0	1.5	2.0	2.5	3.0	3.5	4.0
y	1.1	1.3	1.6	2.0	2.7	3.4	4.1

(Hint: To reduce calculations take $X=2x-5$.

5	Fit the exponential curve $y=a\,e^{bx}$ to the following data:

x	2	4	6	8
y	25	38	56	84

6.	The voltage v across a capacitor at time t seconds is given by the following table:

t	0	2	4	6	8
v	150	63	28	12	5.6

Use the method of least squares to fit a curve of the form $v=a\,e^{bt}$

7	Growth of bacteria (N) in a culture after t hours, is given in the following table:

t:	0	1	2	3	4	5	6
N:	31	47	65	92	132	190	275

Fit a curve of the form $N=a\,b^{t}$ and estimate N when t=7.