

CS 3320 – Numerical Software
Module 10 Homework

1. (10 pt) Use least-squares regression to fit a straight line to the data below.

x	0	2	4	6	9	11	12	15	17	19
y	5	6	7	6	9	8	8	10	12	12

Along with the slope and intercept, compute the coefficient of determination, R^2 .

2. (10 pt) On average the surface area, A , of a human is related to weight, W , and height, H . Measurements for several individuals of height 180 cm and different weights (kg), give values of area (m^2) in the following table.

W (kg)	70	75	77	80	82	84	87	90
A (m^2)	2.10	2.12	2.15	2.20	2.22	2.23	2.26	2.30

Show that a power law, $A = aW^b$, fits these data reasonably well. Present plots of data along with the model line. Predict what the surface area is for a 95-kg person.

3. (10 pt) Fit an exponential model to

x	0.4	0.8	1.2	1.6	2	2.3
y	800	985	1490	1950	2850	3600

4. (10 pt) Find a 3rd order polynomial to fit the following data. Plot the data with your model curve. Tabulate the residual of the predict y-value.

x	3	4	5	7	8	9	11	12
y	1.6	3.6	4.4	3.4	2.2	2.8	3.8	4.6