University of Science and Technology of Hanoi
Course: Numerical Methods

CURVE FITTING PROBLEMS

Exercise 1.

The table below gives the weight and the **JHI** number (**Jonash Health Indicator**) of each student in a class. Use it to predict the **JHI** number of Van Lam whose weight is 72kg.

Student	**Weight (kg)**	**JHI**
Lan Anh	40	1450
Van Toan	63	3817
Quang Hai	62	3708
Xuan Truong	68	4300
Cong Phuong	64	3950
Huyen My	45	1896
My Linh	50	2339
Duc Chinh	66	4200
Phan Van Duc	67	4312

1. Use function “fit()” in matlab. Plot results
2. Use function “polyfit()” in matlab. Plot results
3. Use function “lsqcurvefit()” in matlab. Plot results
4. Give some comments for the differences among these 3 methods.
5.

Exercise 2.

Given the decaying equation of a **Kagawa**’s particle:
y = exp(-t.x)+0.8 and a recorded table of observation:

x	**y**
0.1	1.6781
0.2	1.5711
0.3	1.4771
0.4	1.3945
0.5	1.3220
0.6	1.2584
0.7	1.2025
0.8	1.1535
0.9	1.1104
1.0	1.0725

a. Find the decaying rate **t** by function “lsqnonlin()” in matlab. Plot results.
b. Try to use lb, ub, options in: x = lsqnonlin(fun,x0,lb,ub,options)

Exercise 3.

Given a table of observation:

x	f(x)
0.00000	0.00000
0.78540	0.70711
1.57080	1.00000
2.35619	0.70711
3.14159	0.00000
3.92699	-0.70711
4.71239	-1.00000
5.49779	-0.70711
6.28319	0.00000

a. Calculate f(3.00000) and f(4.50000) by function “interp1()” in matlab. Plot results.
b. Try to use another method (‘nearest', 'cubic', or 'spline'.) with vq = interp1(x,v,xq,method)

Excercise 4.

Given x runs from -3 to 3 with step of 1 and so does y.
1. Draw a grid of coordinates of (x,y) (hint: meshgrid)
2. Build a random function z having many local extremes that takes only 2 arguments x and y. (hint: peaks)
3. Compute **z(1.2, 2.8**) and z**(2.5, 2.5)** by function “interp2()”