PROGRAMMING ASSIGNMENT – III

1. The Hilbert matrix, known to be severely ill-conditioned, is defined as

$$H = \begin{bmatrix} 1 & 1/2 & .. & 1/N \\ 1/2 & 1/3 & .. & 1/(N+1) \\ 1/3 & .. & .. & 1/(N+2) \\ 1/N & .. & .. & 1/(2N-1) \end{bmatrix}$$

   Determine the condition number of the matrix as a function of *N* (till CN exceeds 10^6).

2. Fit a saturation profile through the following data and determine the curve fitting parameters by a linear regression technique. Specify the correlation coefficient obtained.

x	0.1	0.2	0.5	0.7	1	2	5	7	10
y	10.57	19.03	36.61	44.43	52.92	68.16	82.65	86.30	89.46