Homework 2 – due M 02/22/06
Submit important plots, etc., for grading

1. [50 points]
a) create a matlab function m file, ternsig.m, for the ternary valued function

$$f(u) = \begin{cases} \tanh(u-1) \text{ for } 1 < u \\ 0 \text{ for } -1 \le u \le 1 \\ -\tanh(u+1) \text{ for } u < -1 \end{cases}$$

For the derivative of f(u) at the transition points, at u=-1 and at u=1, use 0.
b) use this for the activation functions of the first two layers (of two neurons each) of a newff network with third output layer which has two purelin neurons and created to work with 2-vector input data P={P1; -P1} of the first problem of Homework 1 with output 2-vector data T={T1; T2} with T1 formed from the f(x) of Homework 1 and T2 from f(-x).
c) Submit the code for ternsig.m, the matlab calls, and plots of input and output data.

2. [50 points]
a) By hand calculations carry out backpropagation of two passes of the network of the above problem 1 for P=[-3;3], T= [2; -4] assuming that the initial weights and biases are all +1. Submit the weights, the n's, the a's, and the sensitivity vectors for each if the two passes. Assume that α=0.2.