Combined Report

1. In Task 1, we minimized the error given by the Error equation. For this we perform differentiation and got values of all w coefficients.

   In Task 2, we added an extra term for Regularization. This technique is often used to control the over-fitting phenomenon. Regularization involves adding a penalty term to the error function in order to discourage the coefficients from reaching large values.

   In Task 3, we used probability distribution. we assumed a Gaussian distribution with a mean equal to the value y(x,w) in original equations. We used maximum likelihood to determine the precision parameter beta of the Gaussian conditional distribution.

   In Task 4, we considered a zero-mean isotropic Gaussian governed by a single precision parameter alpha. Here we took ground truth value of beta as 11.1 as calculated. By putting various values of alpha, we got lambda for task 2. Maximization of this posterior distribution with respect to w is equivalent to the minimization of the sum-of-squares error function with the addition of a quadratic regularization term.