CS725 Jan-Apr, 2015
Quiz 1, 11-Feb-2015 **Roll No**: _____

Consider a ternary classification problem with classes 'positive', 'negative' and 'in-between'. For example, a kid trying to classify a bucket of water into hot (positive), cold (negative), and luke-warm (in-between). **The important point here is that the 'in-between' class has a relation with both the other classes in the sense that it is indeed between them**. Now, mimic the way we dealt with the problem of binary classification and think about adapting/extending i) nearest neighbour ii) decision tree and iii) maximum-margin linear classifier methodologies. In each case, clearly write/illustrate/identify the following: i) model and its parameters (if any) ii) Training algorithm iii) Inference/prediction algorithm. In case you pose ii) and/or iii) as an optimization problem, then presenting the formal optimization problem is enough. While $\mathcal{X}, \mathcal{Y} = \{-1, 0, 1\}$ denote the input, output spaces respectively; $\phi_1, \ldots, \phi_n$ denote the input features and $\mathcal{D} = \{(x_1, y_1), \ldots, (x_m, y_m)\}$ denotes the training set.

1. (*1 point*) Nearest Neighbour

2. (*1 point*) Decision Tree

3. (*1 point*) Maximum-Margin Linear Classifier

THIS SIDE IS ONLY FOR ROUGH WORK. ANYTHING WRITTEN HERE WILL NOT BE EVALUATED.