Problem 1 (20%). Describe an (arbitrary) decision tree that correctly classifies 6 of the 8 records in the training set. Furthermore, based on your decision tree, what is the predicted class for a record with \( A = 1, B = 0, C = 0 \)?

Problem 2 (40%). Suppose that we apply Bayesian classification with the following \emph{conditional independence} assumption: conditioned on a value of \( C \) and a value of \( D \), attributes \( A \) and \( B \) are independent. What is the predicted class for a record with \( A = 1, B = 1, C = 1 \)？ You must show the details of your reasoning.
Problem 3 (40%). The following figure shows a training set of 5 points. Use the Perceptron algorithm to find a plane that (i) crosses the origin, and (ii) separates the black points from the white ones. Recall that this algorithm starts with a vector $\vec{c} = \vec{0}$ and iteratively adjusts it using a point from the training set. You need to show the value of $\vec{c}$ after every adjustment.