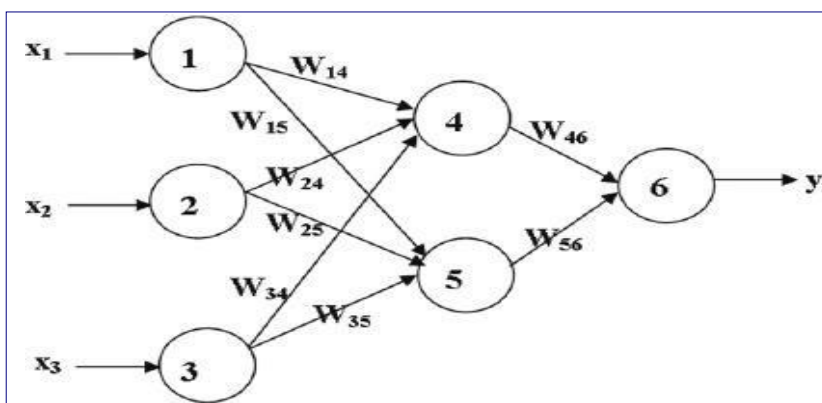# Assignment 2

Set 1

1. The support vector machine is a highly accurate classification method. Justify.
2. Based on the following data determine the gender of a person having height 6 ft.,
   weight 130 lbs. and foot size 8 in. (use Naive Bayes algorithm).

person	height (feet)	weight (lbs)	foot size (inches)
male	6.00	180	10
male	6.00	180	10
male	5.50	170	8
male	6.00	170	10
female	5.00	130	8
female	5.50	150	6
female	5.00	130	6
female	6.00	150	8

Set 2

1. Explain how C4.5 differs from ID3 algorithm?
2. The following figure shows a multilayer feed-forward neural network. Let the
   learning rate be 0.9. The initial weight and bias values of the network is given in the
   table below.The activation function used is the sigmoid function.

X₁	X₂	X₃	W₁₄	W₁₅	W₂₄	W₂₅	W₃₄	W₃₅	W₄₆	W₅₆	θ_4	θ_5	θ_6
1	0	1	0.2	-0.3	0.4	0.1	-0.5	0.2	-0.3	-0.2	-0.4	0.2	0.1

Show weight and bias updation with the first training sample (1,0,1) with class label
1, using backpropagation algorithm

Set 3

1. Give the importance of tree pruning in decision tree classification.
2. Consider the collection of training samples (S) in the table given below. Loan_risk is the target attribute which describes the risk associated with loan for each customer. Find the value of the following.
   i) Gain(S, Sex) ii) Gain (S,Credit_rating)

Cust_ID	Age	Sex	Income	Credit_rating	Loan_risk
1000	Young	F	High	Normal	Safe
1001	Young	F	High	High	Safe
1002	Middle Age	F	High	Normal	Risky
1003	Senior	F	Normal	Normal	Risky
1004	Senior	M	Low	Normal	Risky
1005	Senior	M	Low	High	Safe
1006	Middle Age	M	Low	High	Risky
1007	Young	F	Normal	Normal	Safe
1008	Young	M	Low	Normal	Risky
1009	Senior	M	Normal	Normal	Risky
1010	Young	M	Normal	High	Risky
1011	Middle Age	F	Normal	High	Risky
1012	Middle Age	M	High	Normal	Risky
1013	Senior	F	Normal	High	Safe