Introduction to Machine Learning Final Exam
No :
Name :

1. dataset

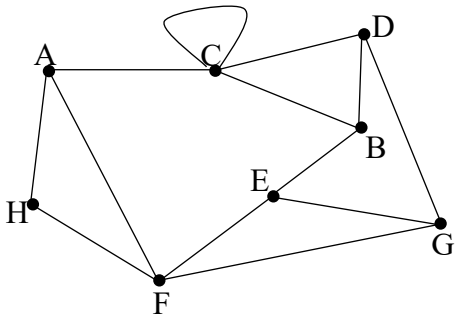
X_1	X_2	D
2	-1	0
1	3	0
0	-2	1
-1	-1	1

2. dataset

X_1	X_2	D
1	2	1
3	4	1
0	3	2
-3	-2	2

3. dataset

X_1	X_2	X_3
4	2	1
1	1	-1
-1	-2	2
-4	0	0



1. According to the given graph, a robot try to find the exit which is represented by A. When this robot use Q learning, show the first four updates in trainig procedure by starting H node. Note: we can use the learning parameter (γ) as 0.8, and the four random action as A, H, F,A, and F.
2. For the first dataset, show the first iteration of training process of a MLP network which has one hidden layers with 2 neurons. Each neuron uses hyperbolic tangent activation function and the weights and parameters are w_{11}=0, w_{22}=0, w_{21}=0, w_{12}=0, a_1=1, a_2=1,η=0.5
3. For the second dataset, design a LVQ network and show its training process for only one iteration. (Note: each class has only one centroid, distance measure is Euclidean, learning rate λ=0.5 and at the beginning, the centroid positions are (9, 3) for the class 1 and (0, 8) for the class 2.
4. Using PCA method, reduce the dimension of the third dataset.