Competitive learning

Data files:

data1.txt, data2.txt, data3.txt	– 2 inputs
data3d1.txt, data3d2.txt, data3d3.txt	– 3 inputs
captain_i.txt	– 3 inputs
diabet_i.txt	– 8 inputs
glass_i.txt	– 9 inputs

Example program for data with 2 inputs:

```
load data1.txt
inp = data1';
net = newc(minmax(inp), 4);              craete the network with 4 neurons
w = net.IW{1}                            display initial weights of the network
plot(inp(1,:),inp(2,:),'b+', w(:,1),w(:,2),'go')   plot data (+) and points corresponding
hold on                                  to network weights (o)

net.trainParam.epochs = 50;              set the maximum number of learning epochs
net = train(net, inp);                   learn the network

w = net.IW{1}                            display weights of the network after learning
plot(inp(1,:),inp(2,:),'b+', w(:,1),w(:,2),'ro')   plot data (+) and points corresponding
hold off                                 to network weights (o)

vec2ind( sim(net, [0.1; 0.1]) )          exemplary classification of point (0.1, 0.1) –
                                         returns the number of the class (neuron) to
                                         which the sample is classified
```

Example program for data with 3 inputs:

```
load data3d3.txt
inp = data3d3';

net = newc(minmax(inp),3);

w = net.IW{1}
plot3(inp(1,:),inp(2,:),inp(3,:),'b+',w(:,1),w(:,2),w(:,3),'go'); hold on;

for i=1:20
    net.trainParam.epochs = 1;
    net = train(net,inp);
    w = net.IW{1};
    plot3(w(:,1),w(:,2),w(:,3),'go');
end

w = net.IW{1}
plot3(w(:,1),w(:,2),w(:,3),'ro'); hold off

vec2ind(sim(net, [0.1; 0.1; 0.1]))
```

Tasks to do:

1. For chosen data files:
   a. look at the data,
   b. choose the number of neurons and find centers of data clusters using competitive learning.

2. Create the function realising competitive learning. Learning data and given number of clusters should be arguments of the function. The purpose of the function should be finding of centers of data clusters.

In the report: description of realised experiments and creared program.