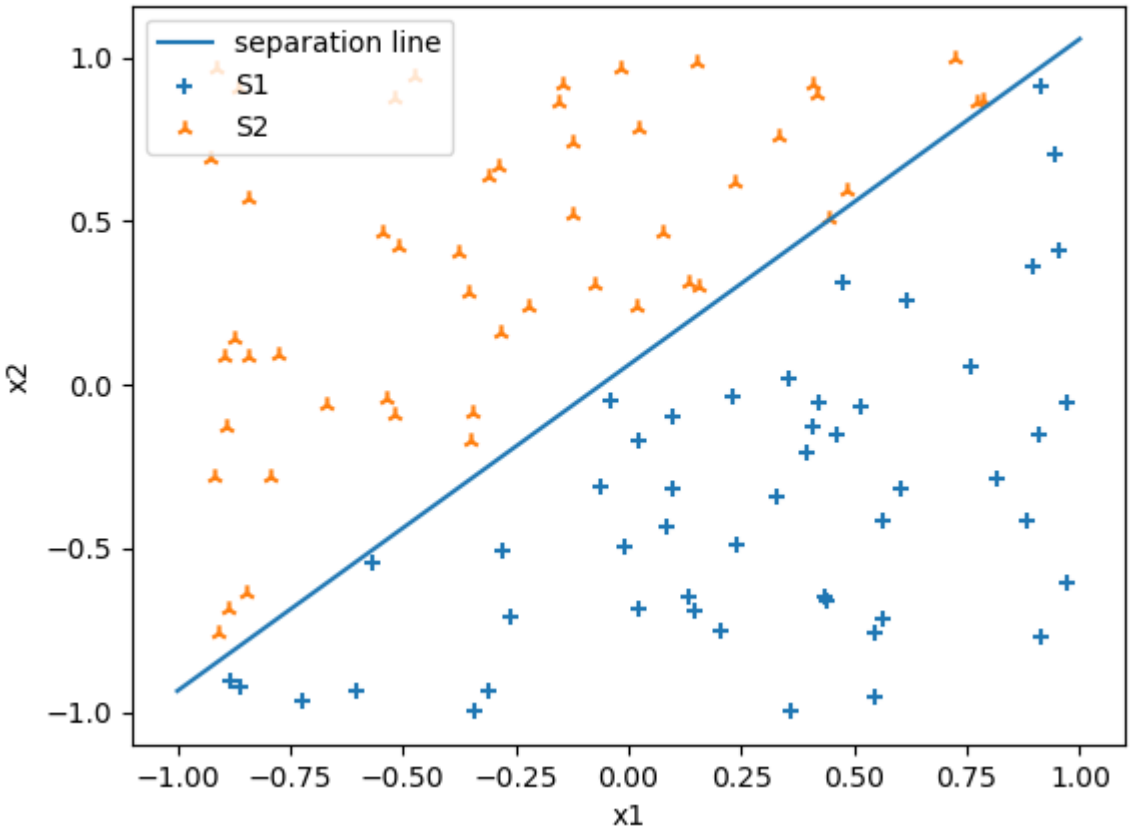
HOMEWORK 1

1.g)



1.h)

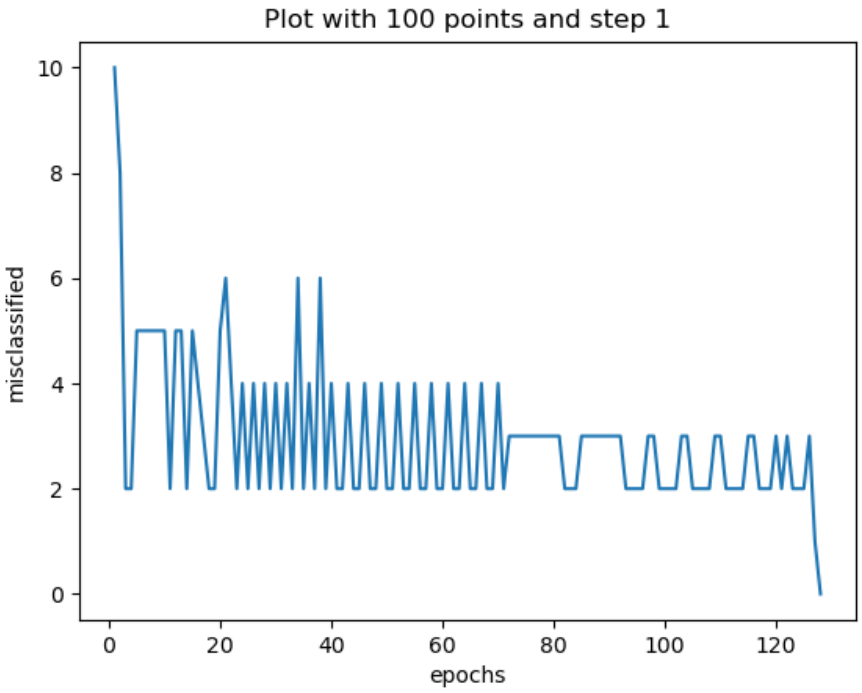
initial weights[0.02539895 0.41629565 -0.41819052]

final weights[0.96799745 13.4675414 -14.55090378]

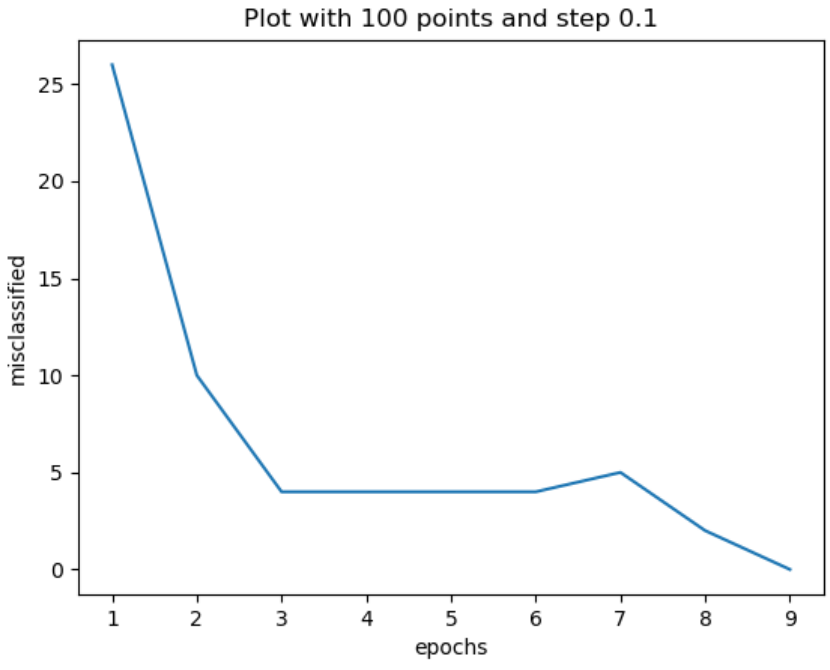
The final and true weights have different values but same sign

Number of misclassification for the first epoch is 10

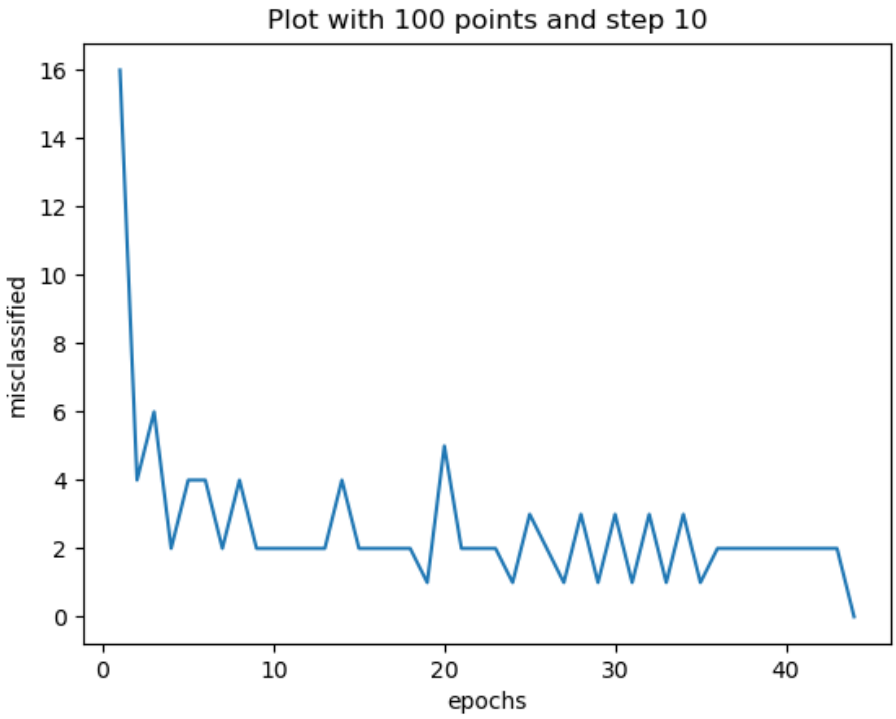
i)


Plot with 100 points and step 1
misclassified
epochs
0
2
4
6
8
10
0
20
40
60
80
100
120

j)


Plot with 100 points and step 0.1
misclassified
epochs
0
5
10
15
20
25
1
2
3
4
5
6
7
8
9

K)




```
l) #as is possible to see from the plots, the right step is the one of 0.1, in
which the number of epochs to reach
#convergence is 9, while with a step equal to 1 the number of epochs needed are
more than 120 and with step equal 10 is about 45.
# Is possible to see that in the case of step = 1 we have a lot of oscillations
in the number of misclassifications
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m)

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 point m
# With weights proportional to the previous ones we would have the same kind of
results depending on the step parameter
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n)

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# also in this case, increasing the number of points the behaviour is similare
to the one of 100 points, with the difference that to reach convergence,
# the number of epochs increases due to the growth on the number of points to be
classified
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