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**Introduction To Machine Learning – EX 4**

1. Directory: " /specific/a/home/cc/students/csguests/roeiherzig/ML/EX4"See main function in file "q5.py".

We implemented Ada boost algorithm:  
The algorithm run with T=?? and the training dataset supplied with the EX.  
Algorithm:

* D 🡨uniform distribution
* For t=0..T:
  + Find best hypothesis relative to distribution D  
    Best hypothesis include the following params:
    - pixel index
    - theta
    - type – the value of prediction in case bigger than the threshold
    - accuracy relative to D

best\_hypo 🡨 FindBestHypo(training\_data\_set, D)

* + SaveBestHypoParams(t, best\_hypo)  
    including calculate alpha
  + UpdateDistribution(D, training\_data\_set, labels, best\_hypo)

**A:**Directory: " /specific/a/home/cc/students/csguests/roeiherzig/ML/EX4"See function "part\_a" in file "q5.py"  
Create Image “q5\_part\_a.png” – training and test accuracy vs T

We calculated the accuracy in the training data set and test data as a function of T. **I**n the image we can that the training accuracy increases exponentially as proved in class.  
In addition the test accuracy continue to improves after the training accuracy is 1 due to the fact that we are using additional information extracted from data to differentiate in increase the margin.

**B:**

Directory: " /specific/a/home/cc/students/csguests/roeiherzig/ML/EX4"See function "part\_b" in file "q5.py"  
Create Image “q5\_part\_b.png” – training and test loss vs T

We calculated the loss in the training data set and test data as a function of T.