**1: 10 hidden layer perceptron, learning rate = 0.0001, batch size = 250, without normalization of the data**

Updates in Epoch 20 / 400:

The total error is: 22722321179130.43

Train accuracy = 0.05998

Test accuracy = 0.0628

Updates in Epoch 40 / 400:

The total error is: 24606227183565.766

Train accuracy = 0.06024

Test accuracy = 0.0629

Updates in Epoch 60 / 400:

The total error is: 27300832842491.06

Train accuracy = 0.06016

Test accuracy = 0.0623

Updates in Epoch 80 / 400:

The total error is: 30845064292104.945

Train accuracy = 0.06014

Test accuracy = 0.0627

Updates in Epoch 100 / 400:

The total error is: 35260264531878.02

Train accuracy = 0.06008

Test accuracy = 0.0629

Updates in Epoch 120 / 400:

The total error is: 40547089301285.18

Train accuracy = 0.05988

Test accuracy = 0.0636

Updates in Epoch 140 / 400:

The total error is: 46694646298573.17

Train accuracy = 0.05974

Test accuracy = 0.0628

Updates in Epoch 160 / 400:

The total error is: 53689206178501.84

Train accuracy = 0.05962

Test accuracy = 0.0621

Updates in Epoch 180 / 400:

The total error is: 61505925844947.66

Train accuracy = 0.05984

Test accuracy = 0.062

Updates in Epoch 200 / 400:

The total error is: 70124385714035.65

Train accuracy = 0.06004

Test accuracy = 0.0616

Updates in Epoch 220 / 400:

The total error is: 79519655920546.94

Train accuracy = 0.06002

Test accuracy = 0.0616

Updates in Epoch 240 / 400:

The total error is: 89662782056202.8

Train accuracy = 0.0601

Test accuracy = 0.0618

Updates in Epoch 260 / 400:

The total error is: 100529532662361.34

Train accuracy = 0.0603

Test accuracy = 0.0619

Updates in Epoch 280 / 400:

The total error is: 112094418929527.27

Train accuracy = 0.06018

Test accuracy = 0.0626

Updates in Epoch 300 / 400:

The total error is: 124330199696744.38

Train accuracy = 0.06024

Test accuracy = 0.063

Updates in Epoch 320 / 400:

The total error is: 137228226485161.6

Train accuracy = 0.06034

Test accuracy = 0.0629

Updates in Epoch 340 / 400:

The total error is: 150839203930609.16

Train accuracy = 0.06056

Test accuracy = 0.0626

Updates in Epoch 360 / 400:

The total error is: 165219065958896.75

Train accuracy = 0.06108

Test accuracy = 0.0627

Updates in Epoch 380 / 400:

The total error is: 180377486438322.75

Train accuracy = 0.06122

Test accuracy = 0.0624

Updates in Epoch 400 / 400:

The total error is: 196299889717726.75

Train accuracy = 0.06184

Test accuracy = 0.063

**2: 10 hidden layer perceptron, learning rate = 0.0001, batch size = 250, normalization of the data**

Updates in Epoch 20 / 400:

The total error is: 87730529819739.97

Train accuracy = 0.11884

Test accuracy = 0.1159

Updates in Epoch 40 / 400:

The total error is: 96702269696968.92

Train accuracy = 0.1201

Test accuracy = 0.1171

Updates in Epoch 60 / 400:

The total error is: 106528248160168.84

Train accuracy = 0.12098

Test accuracy = 0.1185

Updates in Epoch 80 / 400:

The total error is: 117239552850887.4

Train accuracy = 0.12156

Test accuracy = 0.1171

Updates in Epoch 100 / 400:

The total error is: 128864099991759.3

Train accuracy = 0.12202

Test accuracy = 0.1184

Updates in Epoch 120 / 400:

The total error is: 141426886672998.94

Train accuracy = 0.12262

Test accuracy = 0.1182

Updates in Epoch 140 / 400:

The total error is: 154950532046638.75

Train accuracy = 0.12332

Test accuracy = 0.1195

Updates in Epoch 160 / 400:

The total error is: 169455077373526.28

Train accuracy = 0.1239

Test accuracy = 0.1199

Updates in Epoch 180 / 400:

The total error is: 184958439425447.5

Train accuracy = 0.12434

Test accuracy = 0.1198

Updates in Epoch 200 / 400:

The total error is: 201476874866320.7

Train accuracy = 0.1251

Test accuracy = 0.1202

Updates in Epoch 220 / 400:

The total error is: 219024830186647.4

Train accuracy = 0.12508

Test accuracy = 0.12

Updates in Epoch 240 / 400:

The total error is: 237615388267366.38

Train accuracy = 0.1264

Test accuracy = 0.1194

Updates in Epoch 260 / 400:

The total error is: 257259736135247.4

Train accuracy = 0.12652

Test accuracy = 0.1194

Updates in Epoch 280 / 400:

The total error is: 277967946953237.22

Train accuracy = 0.127

Test accuracy = 0.1192

Updates in Epoch 300 / 400:

The total error is: 299748868971059.9

Train accuracy = 0.12708

Test accuracy = 0.1198

Updates in Epoch 320 / 400:

The total error is: 322610959286829.7

Train accuracy = 0.12788

Test accuracy = 0.1203

Updates in Epoch 340 / 400:

The total error is: 346560870623097.9

Train accuracy = 0.12816

Test accuracy = 0.1217

Updates in Epoch 360 / 400:

The total error is: 371604870056512.3

Train accuracy = 0.12818

Test accuracy = 0.1217

Updates in Epoch 380 / 400:

The total error is: 397749050170972.5

Train accuracy = 0.12812

Test accuracy = 0.1216

Updates in Epoch 400 / 400:

The total error is: 424999698461647.56

Train accuracy = 0.1283

Test accuracy = 0.1218

**3: 10 hidden layer perceptron, learning rate = 0.001, batch size = 250, normalization of the data, normalization of the delta**

Updates in Epoch 20 / 400:

The total error is: 15720633893322.875

Train accuracy = 0.0851

Test accuracy = 0.0853

Updates in Epoch 40 / 400:

The total error is: 7407865563656.52

Train accuracy = 0.09836

Test accuracy = 0.0966

Updates in Epoch 60 / 400:

The total error is: 6844035755604.229

Train accuracy = 0.09874

Test accuracy = 0.0984

Updates in Epoch 80 / 400:

The total error is: 6784708303074.269

Train accuracy = 0.09882

Test accuracy = 0.0983

Updates in Epoch 100 / 400:

The total error is: 6729739728477.029

Train accuracy = 0.09898

Test accuracy = 0.0988

Updates in Epoch 120 / 400:

The total error is: 6677472606522.244

Train accuracy = 0.09896

Test accuracy = 0.099

Updates in Epoch 140 / 400:

The total error is: 6626897595945.603

Train accuracy = 0.09916

Test accuracy = 0.0988

Updates in Epoch 160 / 400:

The total error is: 6577200570676.124

Train accuracy = 0.09924

Test accuracy = 0.0986

Updates in Epoch 180 / 400:

The total error is: 6527029277184.321

Train accuracy = 0.09926

Test accuracy = 0.099

Updates in Epoch 200 / 400:

The total error is: 6477223998554.496

Train accuracy = 0.09936

Test accuracy = 0.0989

Updates in Epoch 220 / 400:

The total error is: 6426003728684.409

Train accuracy = 0.09944

Test accuracy = 0.099

Updates in Epoch 240 / 400:

The total error is: 6374307692993.842

Train accuracy = 0.09952

Test accuracy = 0.0987

Updates in Epoch 260 / 400:

The total error is: 6322118017033.917

Train accuracy = 0.0996

Test accuracy = 0.0987

Updates in Epoch 280 / 400:

The total error is: 6269057662812.844

Train accuracy = 0.09992

Test accuracy = 0.0987

Updates in Epoch 300 / 400:

The total error is: 6213986000782.671

Train accuracy = 0.09996

Test accuracy = 0.0992

Updates in Epoch 320 / 400:

The total error is: 6155378472780.135

Train accuracy = 0.10026

Test accuracy = 0.0998

Updates in Epoch 340 / 400:

The total error is: 6093847123972.979

Train accuracy = 0.10032

Test accuracy = 0.1003

Updates in Epoch 360 / 400:

The total error is: 6029060932101.677

Train accuracy = 0.1006

Test accuracy = 0.1004

Updates in Epoch 380 / 400:

The total error is: 5960426686671.741

Train accuracy = 0.1008

Test accuracy = 0.1002

Updates in Epoch 400 / 400:

The total error is: 5888850334303.485

Train accuracy = 0.10088

Test accuracy = 0.1001

**4: 10 hidden layer perceptron, learning rate = 0.01, batch size = 250, normalization of the data, normalization of the delta**

Updates in Epoch 20 / 400:

The total error is: 6993265297595.038

Train accuracy = 0.09562

Test accuracy = 0.0981

Updates in Epoch 40 / 400:

The total error is: 7861854518532.728

Train accuracy = 0.08974

Test accuracy = 0.0904

Updates in Epoch 60 / 400:

The total error is: 9267219099833.014

Train accuracy = 0.0854

Test accuracy = 0.0863

Updates in Epoch 80 / 400:

The total error is: 11039295169666.502

Train accuracy = 0.08182

Test accuracy = 0.0831

**Πρόωρη διακοπή, τα έρορς αυξάνονται και τα αακιούραση μειώνονται**

**5: 10 hidden layer perceptron, learning rate = 0.01, batch size = 250, normalization of the data, normalization of the delta, softmax**

Updates in Epoch 20 / 400:

The total error is: 43604.35487707281

Train accuracy = 0.12784

Test accuracy = 0.1278

Updates in Epoch 40 / 400:

The total error is: 43741.36256207428

Train accuracy = 0.1249

Test accuracy = 0.1206

Updates in Epoch 60 / 400:

The total error is: 44306.77843778518

Train accuracy = 0.11348

Test accuracy = 0.1118

Updates in Epoch 80 / 400:

The total error is: 44963.036357651334

Train accuracy = 0.1002

Test accuracy = 0.1019

Updates in Epoch 100 / 400:

The total error is: 45807.65423316641

Train accuracy = 0.08336

Test accuracy = 0.0848

Updates in Epoch 120 / 400:

The total error is: 45830.381762066834

Train accuracy = 0.08286

Test accuracy = 0.0839

Updates in Epoch 140 / 400:

The total error is: 45862.68131099102

Train accuracy = 0.0823

Test accuracy = 0.0833

Updates in Epoch 160 / 400:

The total error is: 45888.10650282377

Train accuracy = 0.08184

Test accuracy = 0.0829

Updates in Epoch 180 / 400:

The total error is: 45906.163087630186

Train accuracy = 0.08138

Test accuracy = 0.0823

Updates in Epoch 200 / 400:

The total error is: 45937.21262748516

Train accuracy = 0.0809

Test accuracy = 0.0811

Updates in Epoch 220 / 400:

The total error is: 45965.618850774496

Train accuracy = 0.08016

Test accuracy = 0.0802

**Προωρη διακοπη παλι για τους ιδιους λογους**

**5: 10 hidden layer perceptron, learning rate = 0.01, batch size = 250, normalization of the data, normalization of the delta, softmax**

Updates in Epoch 20 / 400:

The total error is: 45243.81348654133

Train accuracy = 0.09506

Test accuracy = 0.095

Updates in Epoch 40 / 400:

The total error is: 45171.93768741593

Train accuracy = 0.0965

Test accuracy = 0.0951

Updates in Epoch 60 / 400:

The total error is: 45141.556617991606

Train accuracy = 0.09712

Test accuracy = 0.0957

Updates in Epoch 80 / 400:

The total error is: 45085.44480929695

Train accuracy = 0.09824

Test accuracy = 0.0975

Updates in Epoch 100 / 400:

The total error is: 44999.15018117501

Train accuracy = 0.09994

Test accuracy = 0.0997

Updates in Epoch 120 / 400:

The total error is: 44903.70616517587

Train accuracy = 0.10184

Test accuracy = 0.1025

Updates in Epoch 140 / 400:

The total error is: 44786.23560855927

Train accuracy = 0.1042

Test accuracy = 0.1033

Updates in Epoch 160 / 400:

The total error is: 44658.184845595904

Train accuracy = 0.10672

Test accuracy = 0.1061

Updates in Epoch 180 / 400:

The total error is: 44512.669316059095

Train accuracy = 0.10964

Test accuracy = 0.1099

Updates in Epoch 200 / 400:

The total error is: 44360.7498733402

Train accuracy = 0.11268

Test accuracy = 0.1138

Updates in Epoch 220 / 400:

The total error is: 44208.96958482272

Train accuracy = 0.11568

Test accuracy = 0.1163

Updates in Epoch 240 / 400:

The total error is: 44074.95723611596

Train accuracy = 0.11838

Test accuracy = 0.1202

Updates in Epoch 260 / 400:

The total error is: 43926.965737923165

Train accuracy = 0.12128

Test accuracy = 0.1258

Updates in Epoch 280 / 400:

The total error is: 43745.90364970811

Train accuracy = 0.1249

Test accuracy = 0.1301

Updates in Epoch 300 / 400:

The total error is: 43578.385520406984

Train accuracy = 0.1282

Test accuracy = 0.1335

Updates in Epoch 320 / 400:

The total error is: 43459.08153285584

Train accuracy = 0.1305

Test accuracy = 0.136

Updates in Epoch 340 / 400:

The total error is: 43303.43539621431

Train accuracy = 0.13368

Test accuracy = 0.1391

Updates in Epoch 360 / 400:

The total error is: 43181.29287591236

Train accuracy = 0.13602

Test accuracy = 0.1405

Updates in Epoch 380 / 400:

The total error is: 43088.550424286426

Train accuracy = 0.13774

Test accuracy = 0.1434

Updates in Epoch 400 / 400:

The total error is: 43012.54807469031

Train accuracy = 0.13904

Test accuracy = 0.1461