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1 /usr/local/bin/python3.12 /Users/lorispalmarin/Library/Application Support/JetBrains/
  PyCharm2023.2/scratches/scratch_7.py
2 First rows of the dataset:
3      x1      x2      x3      x4 ...      x8      x9      x10 y
4 0  1.205492  5.823226  98.837539 -1.075852 ... -1.720267 -0.346191 -54.708330 -1
5 1  1.391530  3.611581  98.857197 -5.020318 ...  4.253865  2.041603 -54.317291  1
6 2  1.692571 -0.887019 100.901276 -0.595548 ...  0.907834  3.126815 -56.397484 -1
7 3  4.289320  1.416843 100.784735 -2.897154 ...  1.336237  2.183829 -56.197728  1
8 4  0.542420 -1.010095 100.015580 -3.070705 ... -0.284683 -2.104145 -55.794045  1
9
10 [5 rows x 11 columns]
11
12 Statistical summary:
13      x1      x2 ...      x10      y
14 count 10000.000000 10000.000000 ... 10000.000000 10000.000000
15 mean  1.591298    0.515879 ... -55.447678 -0.001600
16 std   1.321185    2.054488 ...  0.710082  1.000049
17 min   0.002443   -7.524934 ... -56.773931 -1.000000
18 25%   0.524758   -0.883862 ... -56.137679 -1.000000
19 50%   1.276243    0.492813 ... -55.397208 -1.000000
20 75%   2.352106    1.902003 ... -54.758351  1.000000
21 max   9.384223    8.302375 ... -54.208890  1.000000
22
23 [8 rows x 11 columns]
24 Final dataset shape: (9733, 11)
25
26 Statistical summary of training set after standardisation:
27      0      1 ...      6      7
28 count 7.786000e+03 7.786000e+03 ... 7.786000e+03 7.786000e+03
29 mean -1.108797e-15 -2.628260e-16 ... -9.226287e-16 -2.920289e-17
30 std  1.000064e+00 1.000064e+00 ... 1.000064e+00 1.000064e+00
31 min -1.210816e+00 -2.728141e+00 ... -2.793592e+00 -2.760765e+00
32 25% -8.115617e-01 -6.980145e-01 ... -6.936736e-01 -6.787072e-01
33 50% -2.333511e-01 -1.176852e-02 ... -9.258075e-03 -1.798967e-02
34 75%  5.805372e-01  6.981031e-01 ...  6.718357e-01  6.861826e-01
35 max  5.958668e+00  2.810010e+00 ...  2.756846e+00  2.753401e+00
36
37 [8 rows x 8 columns]
38 Running Kernelised Perceptron with gaussian kernel:
39 Training with parameters: max_epochs: 1000, kernel: <function gaussian_kernel at
  0x13aabc9a0>
40 Convergence reached at epoch 5
41 Converged after 5 epochs in 23.34 seconds
42 Accuracy on training set: 1.0000
43 Training with parameters: max_epochs: 1000, kernel: <function gaussian_kernel at
  0x13aabc9a0>
44 Convergence reached at epoch 5
45 Converged after 5 epochs in 23.92 seconds
46 Accuracy on training set: 1.0000
47 Training with parameters: max_epochs: 1000, kernel: <function gaussian_kernel at
  0x13aabc9a0>
48 Convergence reached at epoch 6
49 Converged after 6 epochs in 23.47 seconds
50 Accuracy on training set: 1.0000
51 Training with parameters: max_epochs: 1000, kernel: <function gaussian_kernel at
  0x13aabc9a0>
52 Convergence reached at epoch 5
53 Converged after 5 epochs in 23.31 seconds
54 Accuracy on training set: 1.0000

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55 Training with parameters: max_epochs: 1000, kernel: <function gaussian_kernel at
    0x13aabc9a0>
56 Convergence reached at epoch 5
57 Converged after 5 epochs in 23.80 seconds
58 Accuracy on training set: 1.0000
59 Training with parameters: max_epochs: 1000, kernel: <function gaussian_kernel at
    0x13aabc9a0>
60 Convergence reached at epoch 5
61 Converged after 5 epochs in 23.67 seconds
62 Accuracy on training set: 1.0000
63 Training with parameters: max_epochs: 1000, kernel: <function gaussian_kernel at
    0x13aabc9a0>
64 Convergence reached at epoch 5
65 Converged after 5 epochs in 23.84 seconds
66 Accuracy on training set: 1.0000
67 Training with parameters: max_epochs: 1000, kernel: <function gaussian_kernel at
    0x13aabc9a0>
68 Convergence reached at epoch 6
69 Converged after 6 epochs in 23.57 seconds
70 Accuracy on training set: 1.0000
71 Training with parameters: max_epochs: 1000, kernel: <function gaussian_kernel at
    0x13aabc9a0>
72 Convergence reached at epoch 5
73 Converged after 5 epochs in 23.28 seconds
74 Accuracy on training set: 1.0000
75 Training with parameters: max_epochs: 1000, kernel: <function gaussian_kernel at
    0x13aabc9a0>
76 Convergence reached at epoch 5
77 Converged after 5 epochs in 23.34 seconds
78 Accuracy on training set: 1.0000
79 Training with parameters: max_epochs: 1000, kernel: <function gaussian_kernel at
    0x13aabc9a0>
80 Convergence reached at epoch 5
81 Converged after 5 epochs in 23.27 seconds
82 Accuracy on training set: 1.0000
83 Training with parameters: max_epochs: 1000, kernel: <function gaussian_kernel at
    0x13aabc9a0>
84 Convergence reached at epoch 5
85 Converged after 5 epochs in 24.13 seconds
86 Accuracy on training set: 1.0000
87 Training with parameters: max_epochs: 1000, kernel: <function gaussian_kernel at
    0x13aabc9a0>
88 Convergence reached at epoch 6
89 Converged after 6 epochs in 23.55 seconds
90 Accuracy on training set: 1.0000
91 Training with parameters: max_epochs: 1000, kernel: <function gaussian_kernel at
    0x13aabc9a0>
92 Convergence reached at epoch 5
93 Converged after 5 epochs in 23.26 seconds
94 Accuracy on training set: 1.0000
95 Training with parameters: max_epochs: 1000, kernel: <function gaussian_kernel at
    0x13aabc9a0>
96 Convergence reached at epoch 5
97 Converged after 5 epochs in 23.38 seconds
98 Accuracy on training set: 1.0000
99 Best Parameters for Perceptron (gaussian kernel): {'gamma': 0.01, 'max_epochs': 1000
    }
100 Best Cross-Validation Accuracy for <functions.KernelPerceptron object at 0x13fa004a0
    >: 0.82
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101 Training with parameters: max_epochs: 1000, kernel: <function gaussian_kernel at
    0x13aabc9a0>
102 Convergence reached at epoch 5
103 Converged after 5 epochs in 35.07 seconds
104 Accuracy on training set: 1.0000
105 Running Kernelised Perceptron with polynomial kernel:
106 Training with parameters: max_epochs: 1000, kernel: <function polynomial_kernel at
    0x13aabca40>
107
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