| Name of run, name of algorithm | Parameters of algorithm | Value | Test/Training Split | Precision/Class | Value | | Confusion Ma | ıtrix | | | |
|--|-----------------------------------|----------|----------------------|-------------------------|-------|----------|---------------|---------------------------------------|--------------|--------|--|
| Neural Network Default Values | Hidden Nodes | 100 | 10-fold X-validation | Precision for Class "1" | | 0.773417 | | | | | |
| Multi Class Neural Network | Learning Rate | 0.1 | | Precision for Class "2" | | 0.924275 | | 9 1 | 10 | 22 153 | |
| Main Glass Nearan Network | Learning Iterations | 100 | | Precision for Class "3" | | 0.626667 | | 9 1 | | 44 5 | |
| Excercise: 4)a) "Parameters" | Initial learning weights diameter | 0.1 | | Precision for Class "4" | | 0.815274 | | | | 44 5 | |
| Exercises. I)a) I didilictore | Momentum | 0.1 | | Precision for Class "5" | | 0.732143 | 8- | | 1 7 101 | | |
| | Normalization | Min-Max | | Precision for Class "6" | | 0.920841 | 7- 3 | 3 1 | 2 4 221 6 | | |
| | Shuffle examples | FALSE | | Precision for Class "7" | | 0.925369 | s 6- 3 | 9 | 308 14 | | |
| | Random Number Seed | 42 | | Precision for Class "8" | | 0.923503 | - è | 3 2 | 45 1 1 | 5 | |
| | | | | Precision for Class "9" | | 0.92 | e | 16 | 71 | | |
| | | | | Precision for Class "10 | | 0.657024 | | | | | |
| | | | | meanPrecision | | 0.821851 | 3- 20 | 0 3 2 | | | |
| | | | | stdPrecision | | 0.112 | 2 13 | 3 531 | 1 10 6 14 | | |
| | | | | | | | 1 - 28 | 37 12 2 | 20 11 4 8 | 2 32 | |
| | | | | | | | | | | | |
| | | | | | | |) | 2 | 3 14 5 6 1 8 | 9 70 | |
| | | | | | | | | | | | |
| | | | | | | | | | Class | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| Neural Network Tuned Values | Hidden Nodes | 125 | 10-fold X-validation | Precision for Class "1" | | 0.789396 | _ | | | | |
| Multi Class Neural Network | Learning Rate | 0.054096 | 3 | Precision for Class "2" | | 0.914486 | 10 - 22 | 2 1 | 8 1 | 9 161 | |
| | Learning Iterations | 363 | | Precision for Class "3" | | 0.720476 | 10- | | | | |
| Excercise: 4)a) "Parameters" | Initial learning weights diameter | 0.1 | | Precision for Class "4" | | 0.84619 | 9_ | | 1 | 56 7 | |
| | Momentum | 0.5 | | Precision for Class "5" | | 0.746389 | | | 1 7 100 | | |
| | Normalization | Min-Max | | Precision for Class "6" | | 0.895452 | 7 - 3 | 1 1 | 2 4 218 7 | | |
| | Shuffle examples | FALSE | | Precision for Class "7" | | 0.92034 | 6- 2 | 16 | 304 15 | | |
| | Random Number Seed | 42 | | Precision for Class "8" | | 0.911355 | g Tape | 5 5 | 48 1 | 1 5 | |
| | | | | Precision for Class "9" | | 0.835354 | 900S 4- | 9 | 67 1 | | |
| | | | | Precision for Class "10 |)" | 0.816687 | 3 - 12 | 2 2 | 24 1 | | |
| | | | | meanPrecision | | 0.839613 | | | 2 14 3 18 | | |
| | | | | stdPrecision | | 0.068104 | | | | | |
| | | | | | | | 1 - 324 | 24 11 2 | 23 11 4 9 | 2 22 | |
| | | | | | | | | 1 2 | 3 1 5 6 1 8 | 9 10 | |
| | | | | | | | | | | | |
| | | | | | | | | | Class | | |
| | | | | | | | | | | | |
| News Network Ded Values 4 | | | | | | | | | | | |
| Neural Network Bad Values 1 | Hidden Nodes | | 10-fold X-validation | Precision for Class "1" | | 0.650047 | | | | | |
| Multi Class Neural Network | Learning Rate | 0.1 | | Precision for Class "2" | | 0.900285 | 10 - | 41 1 | 17 | 56 123 | |
| bad parameter value: hidden nodes too low | Learning Iterations | 100 | | Precision for Class "3" | | 0 | 9 | | | 2 | |
| > even lower than amount of output classes | Initial learning weights diameter | 0.1 | | Precision for Class "4" | | 0.761825 | | | | 06 | |
| | Momentum | 0 | | Precision for Class "5" | | 0.584762 | | | 3 9 | 96 1 | |
| Excercise: 4)a) "Parameters" | Normalization | Min-Max | | Precision for Class "6" | | 0.93741 | | 7 2 | 1 8 230 | 10 | |
| | Shuffle examples | FALSE | | Precision for Class "7" | | 0.888398 | <u>u</u> e | 2 8 | 1 300 7 | 1 | |
| | Random Number Seed | 42 | | Precision for Class "8" | | 0.885119 | d Lak | | | | |
| | | | | Precision for Class "9" | | 0.2 | - S | 2 4 | | | |
| | | | | Precision for Class "10 |)" | 0.5589 | | 17 | 58 1 3 | | |
| | | | | meanPrecision | | 0.636675 | 2 | 13 531 | 3 22 8 13 | | |
| | | | | stdPrecision | | 0.30094 | | | | 0 70 | |
| | | | | | | | 1- | 318 12 | 47 25 4 4 | 9 72 | |
| | | | | | | | | \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | 3 4 5 6 1 | 8 0 0 | |
| | | | | | | | | | , . , | 2 7 10 | |

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|---|-------------------------------------|-----------|----------------------|---|----------------------|-------|------|--------|-----|-----|-------|-------|-------|-----|-----|-----|-----|---|
| | | | | | | _ | | | | | | | | | | | | |
| Neural Network Bad Values 2 | Hidden Nodes | 100 | 10-fold X-validation | Precision for Class "1" | 0.738954 | | | | , | | | | | | | | | |
| Multi Class Neural Network | Learning Rate | 0.9999999 | | Precision for Class "2" | 0.736934 | | 10 - | 55 4 | | 17 | | 2 | 26 | 147 | | | | |
| | | | | Precision for Class "3" | | | 9_ | 2 | | | | | 39 | 5 | | | | |
| bad parameter value: learning rate too high | Learning Iterations | 100 | | Precision for Class 3 Precision for Class "4" | 0.469087 | | | | | | | | | | | | | |
| > local minima problem | Initial learning weights diameter | 0.1 | | | 0.808669 | | 8 - | | | | 1 | 8 96 | | | | | | |
| Evenueina (A) a) IIDamamatana II | Momentum | 0 | | Precision for Class "5" | 0.675 | | 7 - | 4 1 | 1 | 1 | 13 2 | 19 10 | | 2 | | | | |
| Excercise: 4)a) "Parameters" | Normalization | Min-Max | | Precision for Class "6" | 0.896238 | | 6- | 4 16 | 1 | 2 | 294 | 11 1 | - | | | | | |
| | Shuffle examples Random Number Seed | FALSE 42 | | Precision for Class "7" Precision for Class "8" | 0.868689 0.917383 | abels | | | | | | | | _ | | | | |
| | Random Number Seed | 42 | | Precision for Class '9" | | | 5 - | 9 2 | | 27 | 1 | | | 5 | | | | |
| | | | | | 0.858929 | Sco | 4 - | 15 | 6 | 6 | | | | | | | | - |
| | | | | Precision for Class "10" | 0.594051 | | 3- | 16 2 | 21 | | | 2 | | 1 | | | | |
| | | | | meanPrecision | 0.772341 | | | | | | | | - | | | | | |
| | | | | stdPrecision | 0.142906 | | 2 - | 15 526 | 2 1 | 5 8 | 20 | | | 1 | | | | |
| | | | | | | | 1- 2 | 278 9 | 26 | 17 | 3 | 9 | 3 | 34 | | | | |
| | | | | | | | | | | | | | | | | | | - |
| | | | | | | | | 3 2 | 3 | N 5 | 6 | 1 8 | 9 | 10 | | | | - |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | Cla | iss | | | | | | | - |
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| Noural Natwork Red Values 2 | | | 40.6.1.134 | B | | | | | | | | | | | | | | |
| Neural Network Bad Values 3 | Hidden Nodes | | 10-fold X-validation | Precision for Class "1" | 0.712124 | | | | | | | | | | | | | - |
| Multi Class Neural Network | Learning Rate | 0.1 | | Precision for Class "2" | 0.614628 | | | | | | | | | _ | | | | |
| oad parameter value: learning iterations too lo | | 3 | | Precision for Class "3" | 0 | | 10 – | 95 | 9 | | | 30 | 1 | | 57 | 16 | 2 | |
| > hardly any improvement | Initial learning weights diameter | 0.1 | | Precision for Class "4" | 0 | | | | | | | | | | | | | |
| | Momentum | 0 | | Precision for Class "5" | 0 | | 8 – | | | | | | 4 | 8 | 4 | | | |
| Excercise: 4)a) "Parameters" | Normalization | Min-Max | | Precision for Class "6" | 0.810714 | | 7_ | 6 | 2 | | | | 58 19 | 5 2 | 2 | | | |
| | Shuffle examples | FALSE | | Precision for Class "7" | 0.688626 | sels | | | | | | | | | | | | |
| | Random Number Seed | 42 | | Precision for Class "8" | 0.946389 | d Lak | 6 – | | 13 | | 8 | 2 1 | 96 3 | 1 1 | | | | |
| | | | | Precision for Class "9" | 0 | Core | | | | | | | | | | | | |
| | | | | Precision for Class "10" | 0.473928 | Ň | 2 – | 115 | 536 | 35 | 73 | 34 | 76 8 | • | | 4 | | |
| | | | | meanPrecision | 0.424641 | | 1 | 167 | 15 | 16 | | 6 | 2 1 | 2 | 11 | 29 | , | |
| | | | | stdPrecision | 0.365159 | | 1- | 107 | | 10 | | | | | | | | |
| | | | | | | | - | | | | - | J | | 4 | | | | |
| | | | | | | | | 7 | 2 | 3 | De | 5 | 6 | 1 | 8 0 |) 1 | | |
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| | | | | | | | | | | | | Class | | | | | | |
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| | _ | | | | | | | | | | | | | | | | | |
| Neural Network Bad Values 4 | Hidden Nodes | | 10-fold X-validation | Precision for Class "1" | 0.537006 | | | | | | | | | | | | | |
| Multi Class Neural Network | Learning Rate | 0.8 | | Precision for Class "2" | 0.773863 | | 10 - | 120 | 13 | 2 | | 26 | | 4 | | 65 | 154 | |
| a bad combination of the three factors above | Learning Iterations | 3 | | Precision for Class "3" | 0 | | | | | | | | | | | | | |
| -> result even worse | Initial learning weights diameter | 0.1 | | Precision for Class "4" | 0 | | 8 - | | | | | | | | 5 | | | |
| | Momentum | 0 | | Precision for Class "5" | 0 | | | | | | | | | | | | | |
| Excercise: 4)a) "Parameters" | Normalization | Min-Max | | Precision for Class "6" | 0.90676 | S | 7 – | 9 | 5 | 1 | | | 72 | 212 | 101 | | 1 | |
| | Shuffle examples | FALSE | | Precision for Class "7" | 0.531135 | abe | | | 10 | | 9 | 1 | 206 | 12 | 1 | | | |
| | Random Number Seed | 42 | | Precision for Class "8" | 0.1 | l pa | 6 – | 1 | 19 | | 9 | 1 | 206 | 12 | 1 | | | |
| | | | | Precision for Class "9" | 0 | Scor | _ | 10 | 478 | 4 | 72 | 7 | 47 | | | | 1 | |
| | | | | Precision for Class "10" | 0.398968 | | 2 - | 10 | 7,0 | | | | ", | | | | | |
| | | | | meanPrecision | 0.324773 | | | 243 | 60 | 44 | | 38 | 7 | 23 | | 3 | 39 | |
| | | | | | | | 1 - | 243 | 00 | | | 30 | | | | | | |

| | | | | | | | | 2 | 3 | Ds. | 5 | 6 | ٦ | 8 | 9 00 | | |
|-----------------------------|-----------------------------------|-------|----------------------|--------------------------|----------|--------|-----|-----|-----|-----|----------------|-----|-----|-----|------|----|-----|
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| | | | | | | | | | | | Class | S | | | | | |
| leural Network Bad Values 5 | Hidden Nodes | 100 | 10-fold X-validation | Precision for Class "1" | 0.01564 | | 7 | | | | | | | | | | |
| lulti Class Neural Network | Learning Rate | 0.1 | | Precision for Class "2" | 0.244369 | | | | | | | | | | | | |
| o normalization used | Learning Iterations | 100 | | Precision for Class "3" | 0 | | | | | | | | | | | | |
| | Initial learning weights diameter | 0.1 | | Precision for Class "4" | 0 | | 2 - | 350 | 517 | 45 | 70 | 65 | 296 | 234 | 97 | 63 | 167 |
| xcercise: 4)a) "Parameters" | Momentum | 0 | | Precision for Class "5" | 0 | S | | | | | | | | | | | |
| | Normalization | None | | Precision for Class "6" | 0 | Labels | | | | | | | | | | | |
| | Shuffle examples | FALSE | | Precision for Class "7" | 0 | ed L | 1 | 33 | 58 | 6 | 11 | 7 | 36 | 17 | 10 | 5 | 28 |
| | Random Number Seed | 42 | | Precision for Class "8" | 0 | COL | 1- | | | | | | | | | | |
| | | | | Precision for Class "9" | 0 | | | | | | | | | | | | |
| | | | | Precision for Class "10" | 0 | | | | | | | | | | | | |
| | | | | meanPrecision | 0.026001 | | + | \ | 2 | 3 | D _k | 5 | 6 | 1 | - 8 | 9 | 10 |
| | | | | stdPrecision | 0.072938 | | | | | | | | | | | | 7- |
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