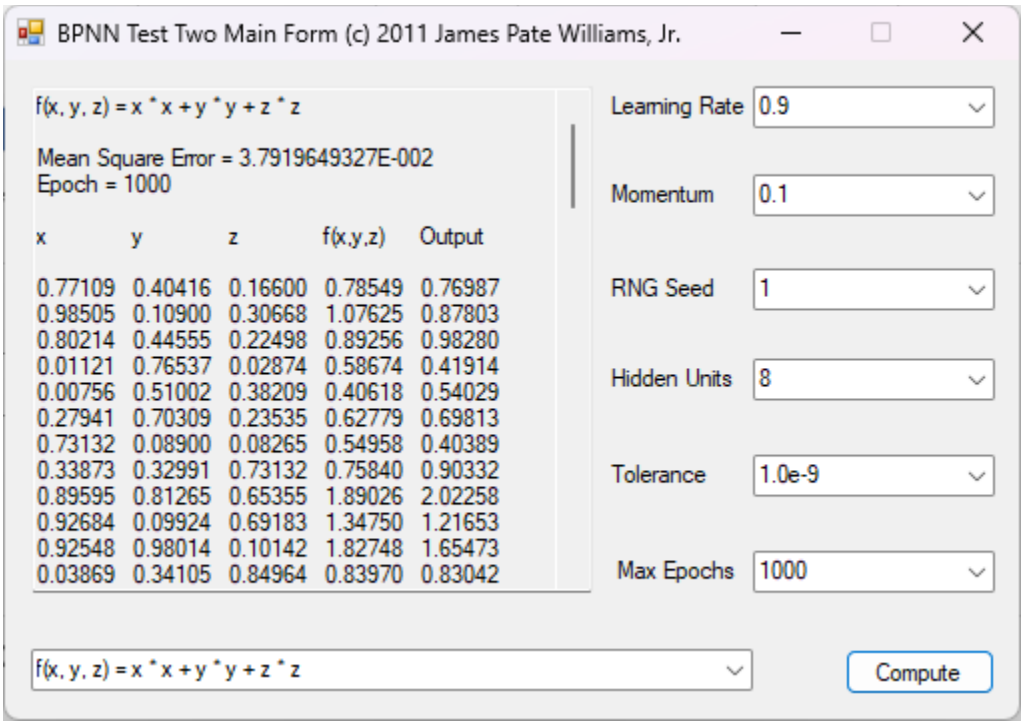
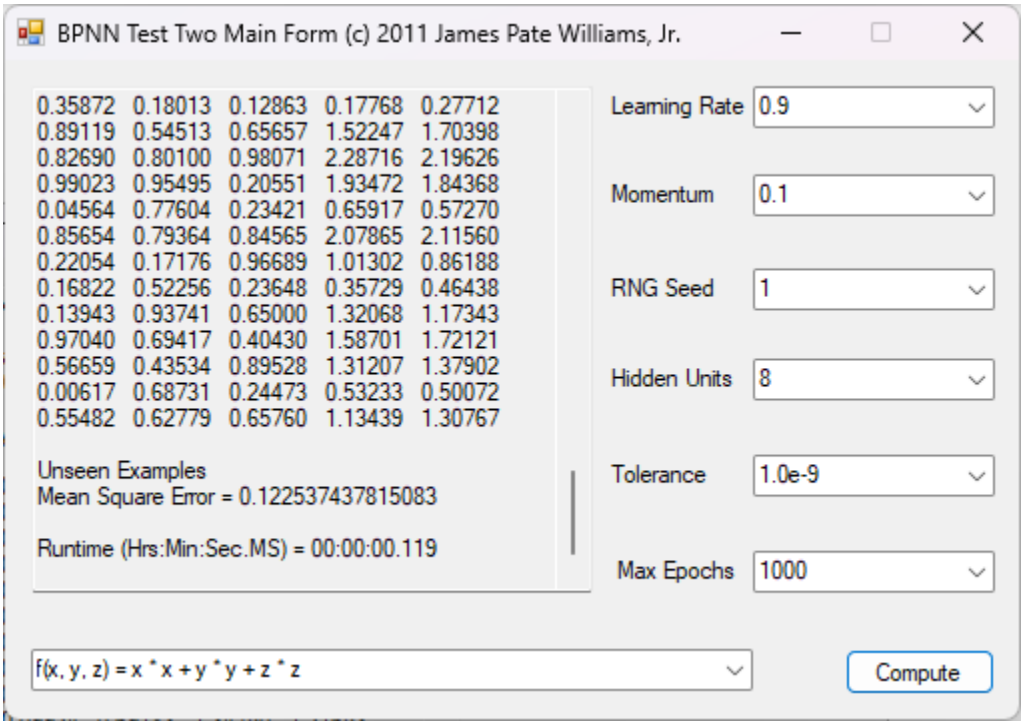
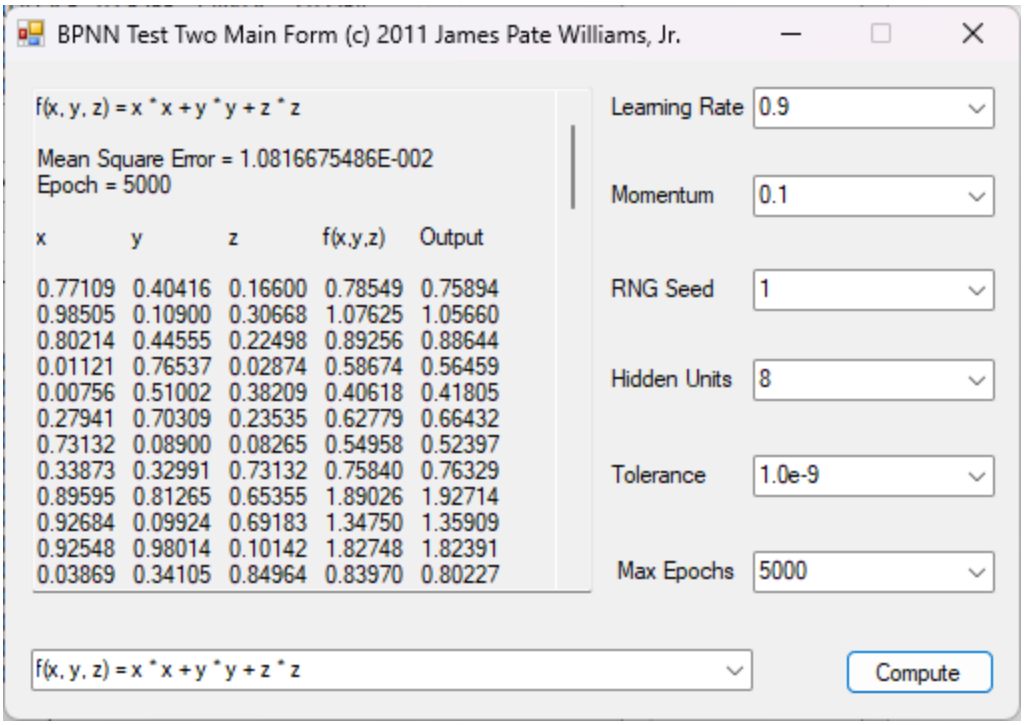
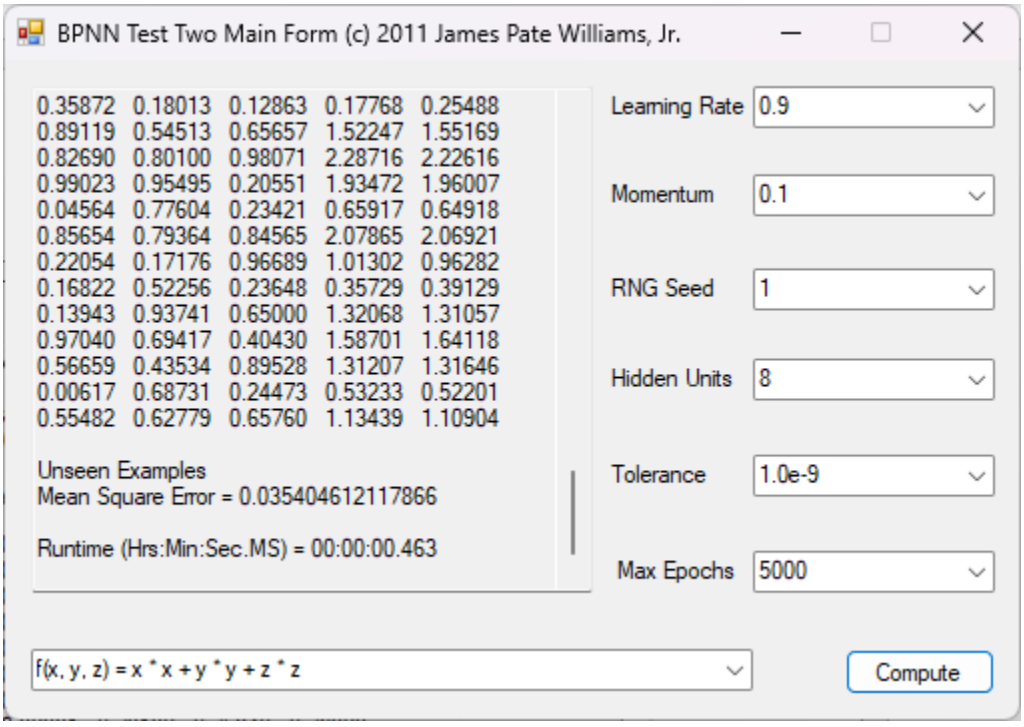
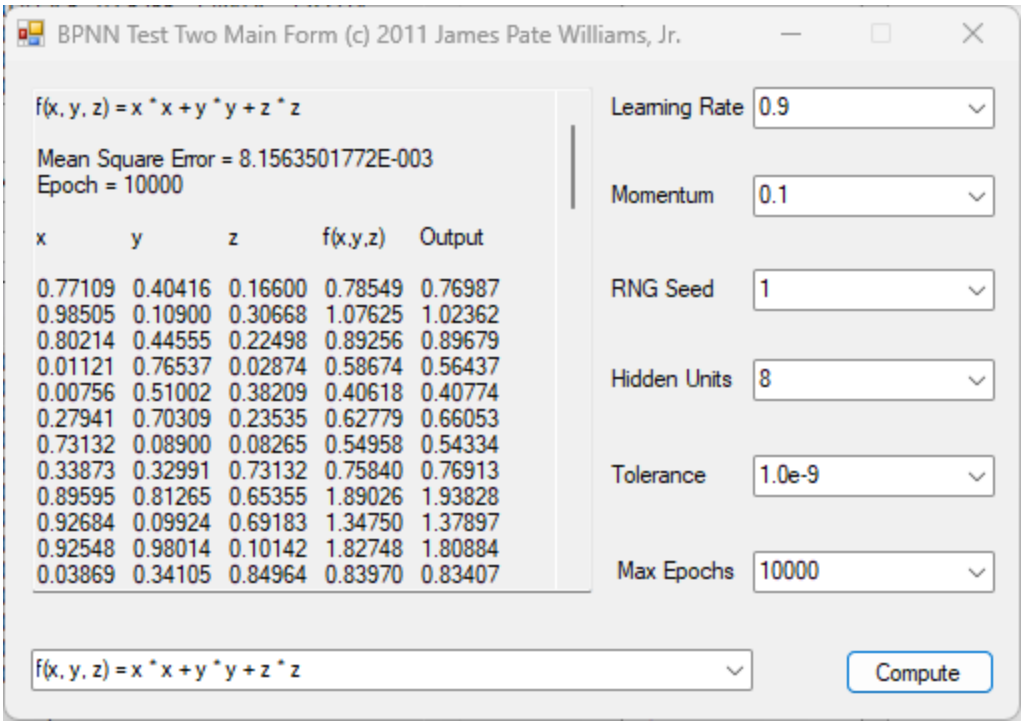
Blog Entry © Tuesday, September 2, 2025, by James Pate Williams, Jr. Testing of a Backpropagation Neural Network Function Approximator

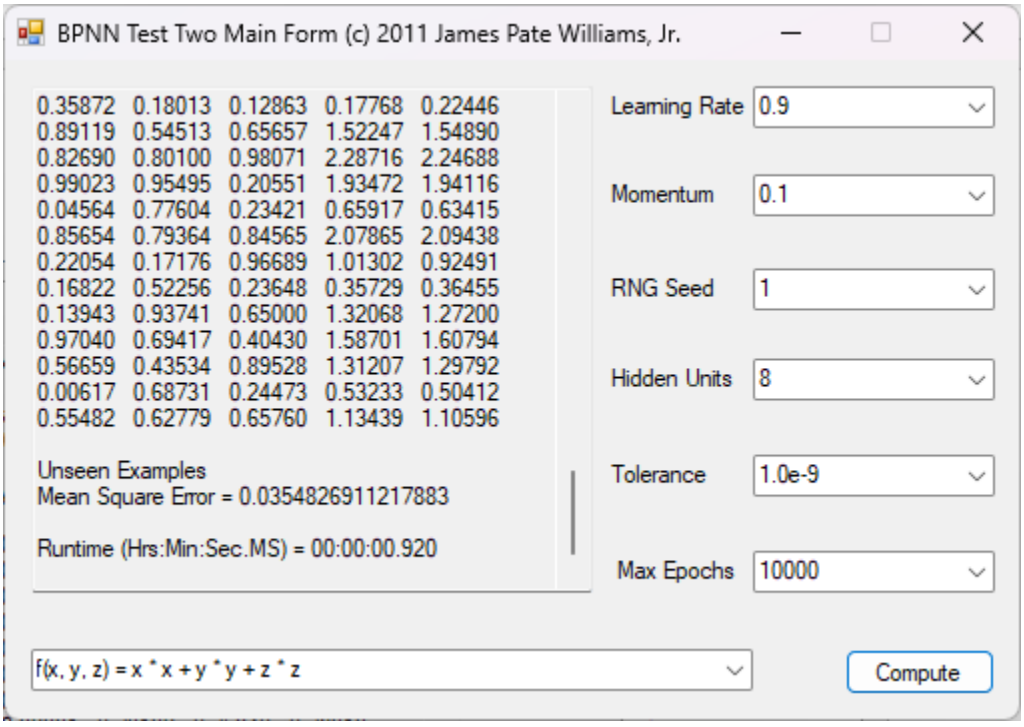


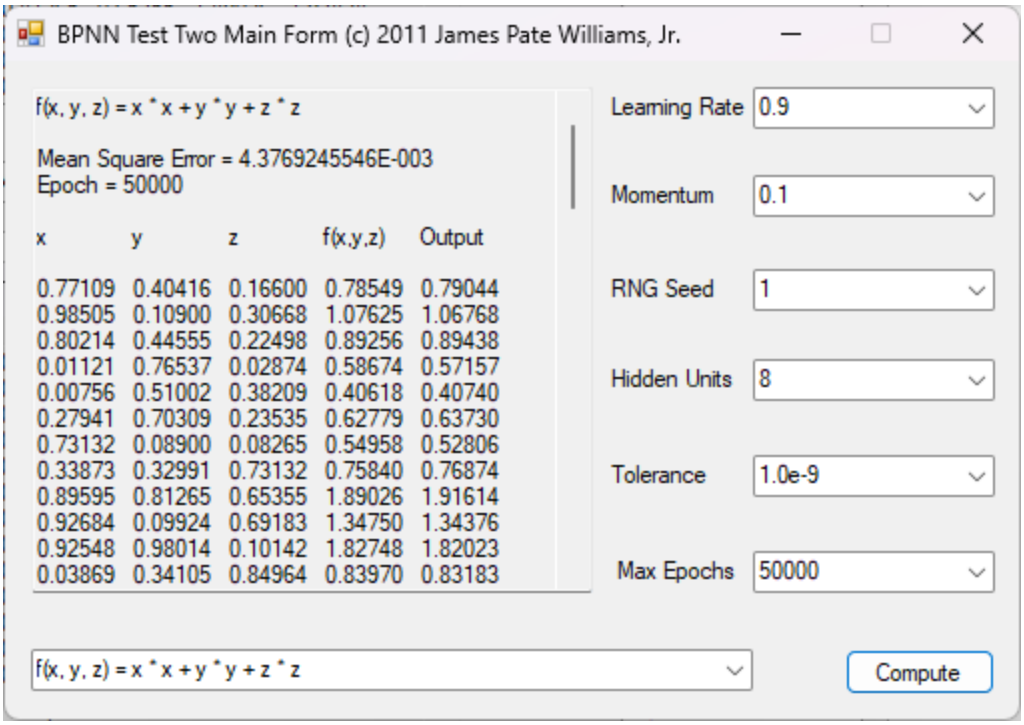


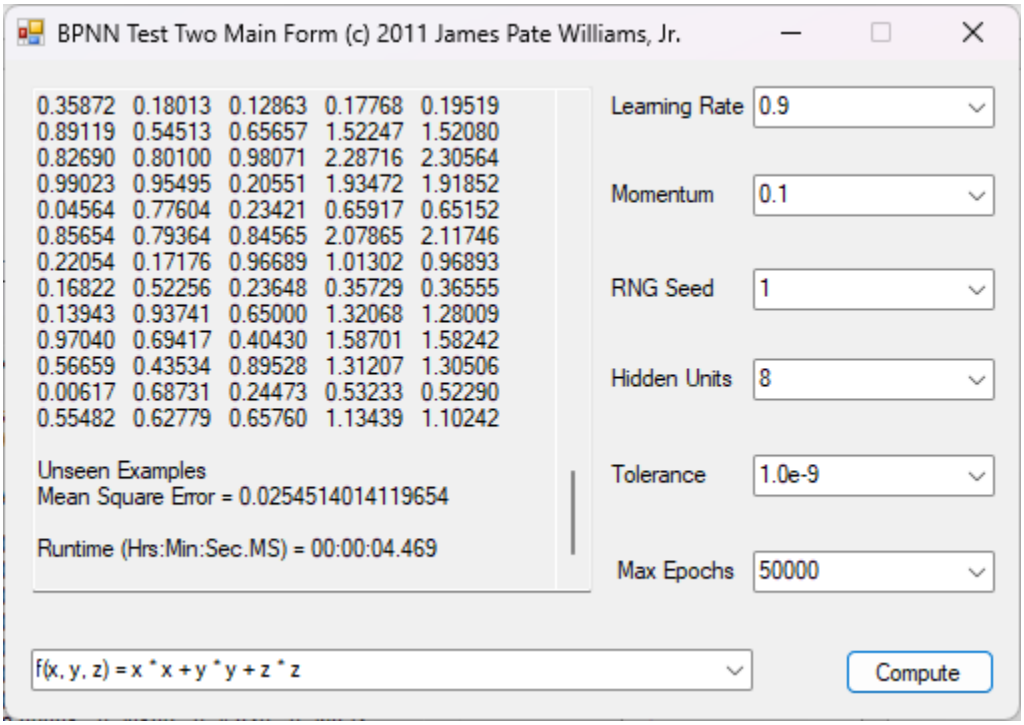

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x * x + y * y + z * z
Mean Square Error = 1.0816675486E-002
Epoch = 5000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.75894
0.98505 0.10900 0.30668 1.07625 1.05660
0.80214 0.44555 0.22498 0.89256 0.88644
0.01121 0.76537 0.02874 0.58674 0.56459
0.00756 0.51002 0.38209 0.40618 0.41805
0.27941 0.70309 0.23535 0.62779 0.66432
0.73132 0.08900 0.08265 0.54958 0.52397
0.33873 0.32991 0.73132 0.75840 0.76329
0.89595 0.81265 0.65355 1.89026 1.92714
0.92684 0.09924 0.69183 1.34750 1.35909
0.92548 0.98014 0.10142 1.82748 1.82391
0.03869 0.34105 0.84964 0.83970 0.80227
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 5000
f(x, y, z) = x * x + y * y + z * z
Compute

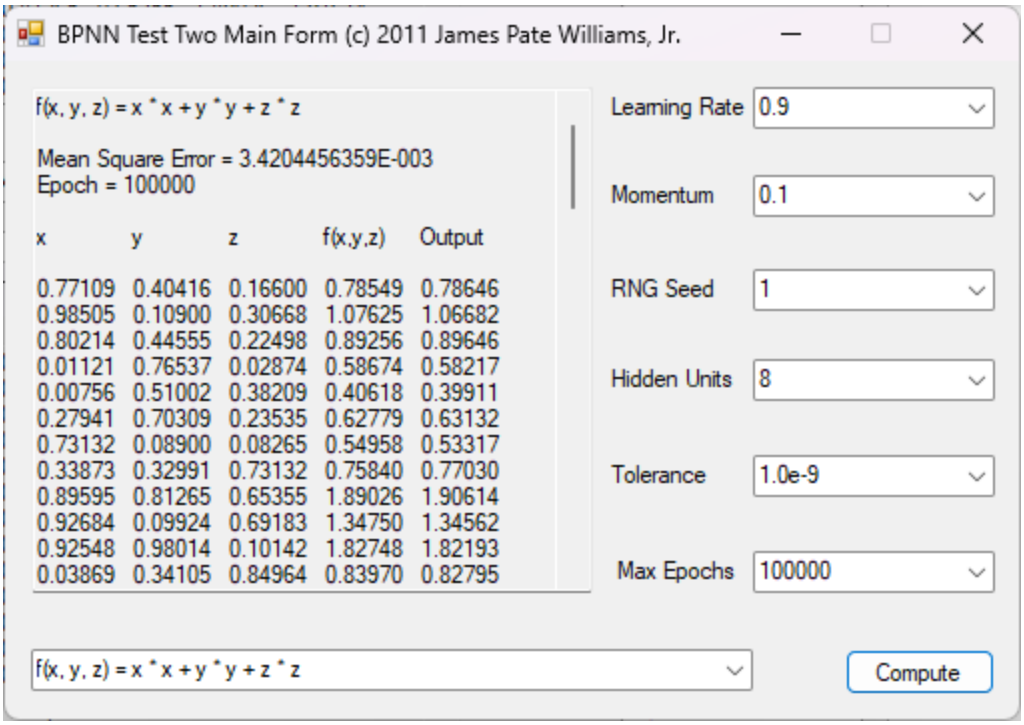

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.25488
0.89119 0.54513 0.65657 1.52247 1.55169
0.82690 0.80100 0.98071 2.28716 2.22616
0.99023 0.95495 0.20551 1.93472 1.96007
0.04564 0.77604 0.23421 0.65917 0.64918
0.85654 0.79364 0.84565 2.07865 2.06921
0.22054 0.17176 0.96689 1.01302 0.96282
0.16822 0.52256 0.23648 0.35729 0.39129
0.13943 0.93741 0.65000 1.32068 1.31057
0.97040 0.69417 0.40430 1.58701 1.64118
0.56659 0.43534 0.89528 1.31207 1.31646
0.00617 0.68731 0.24473 0.53233 0.52201
0.55482 0.62779 0.65760 1.13439 1.10904
Unseen Examples
Mean Square Error = 0.035404612117866
Runtime (Hrs:Min:Sec.MS) = 00:00:00.463
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 5000
f(x, y, z) = x * x + y * y + z * z
Compute

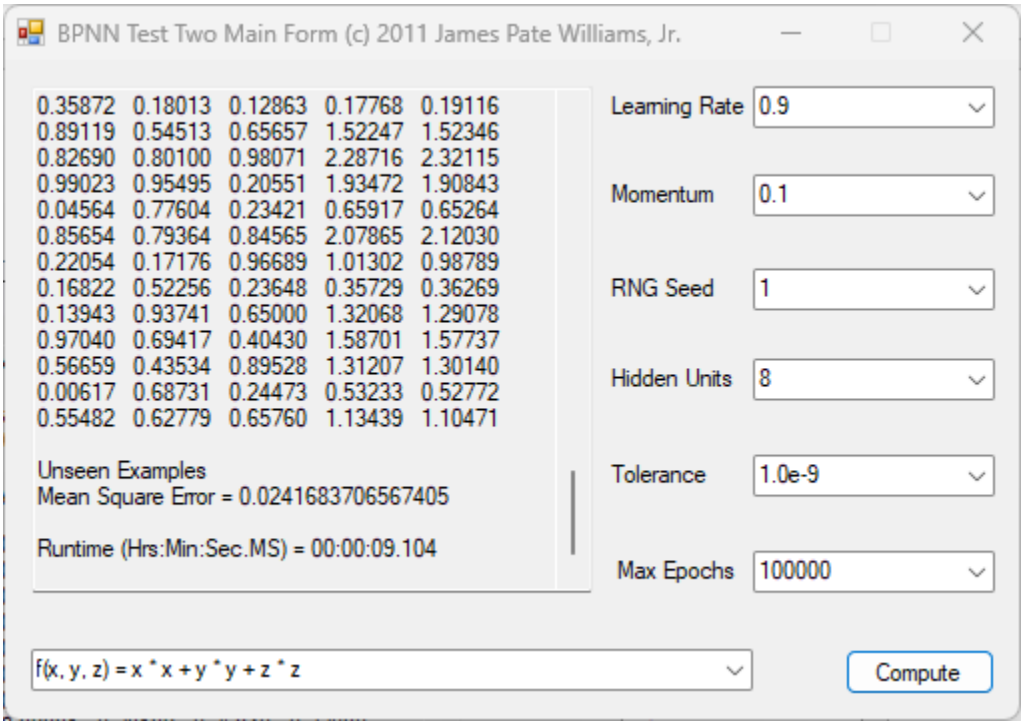

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x * x + y * y + z * z
Mean Square Error = 8.1563501772E-003
Epoch = 10000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.76987
0.98505 0.10900 0.30668 1.07625 1.02362
0.80214 0.44555 0.22498 0.89256 0.89679
0.01121 0.76537 0.02874 0.58674 0.56437
0.00756 0.51002 0.38209 0.40618 0.40774
0.27941 0.70309 0.23535 0.62779 0.66053
0.73132 0.08900 0.08265 0.54958 0.54334
0.33873 0.32991 0.73132 0.75840 0.76913
0.89595 0.81265 0.65355 1.89026 1.93828
0.92684 0.09924 0.69183 1.34750 1.37897
0.92548 0.98014 0.10142 1.82748 1.80884
0.03869 0.34105 0.84964 0.83970 0.83407
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 10000
f(x, y, z) = x * x + y * y + z * z
Compute

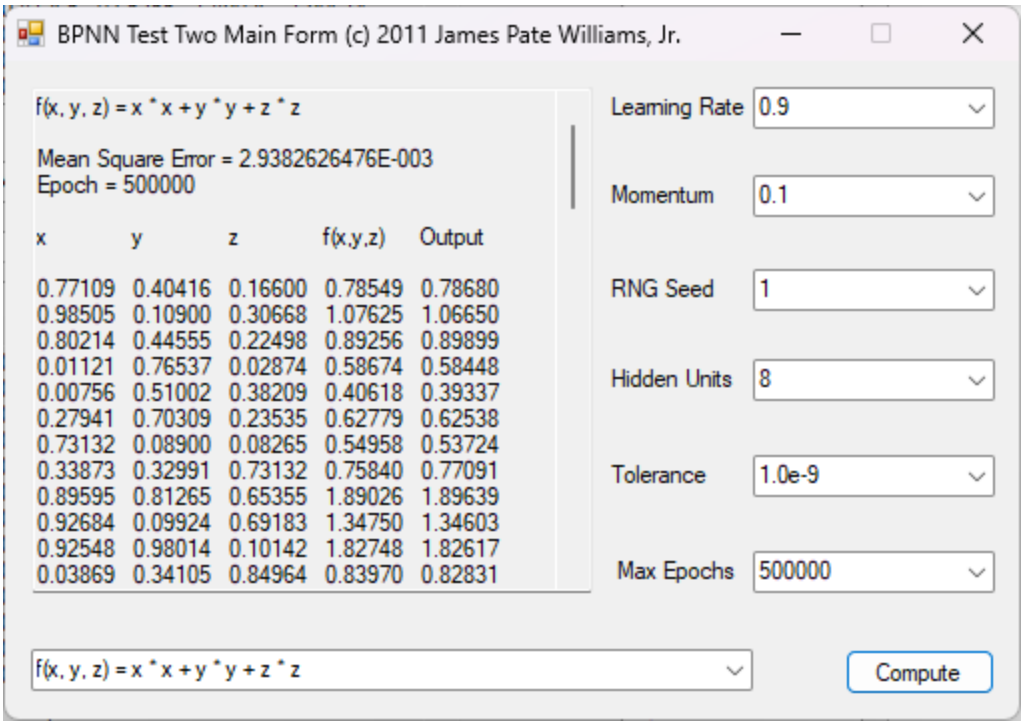

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.22446
0.89119 0.54513 0.65657 1.52247 1.54890
0.82690 0.80100 0.98071 2.28716 2.24688
0.99023 0.95495 0.20551 1.93472 1.94116
0.04564 0.77604 0.23421 0.65917 0.63415
0.85654 0.79364 0.84565 2.07865 2.09438
0.22054 0.17176 0.96689 1.01302 0.92491
0.16822 0.52256 0.23648 0.35729 0.36455
0.13943 0.93741 0.65000 1.32068 1.27200
0.97040 0.69417 0.40430 1.58701 1.60794
0.56659 0.43534 0.89528 1.31207 1.29792
0.00617 0.68731 0.24473 0.53233 0.50412
0.55482 0.62779 0.65760 1.13439 1.10596
Unseen Examples
Mean Square Error = 0.0354826911217883
Runtime (Hrs:Min:Sec.MS) = 00:00:00.920
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 10000
f(x, y, z) = x * x + y * y + z * z
Compute

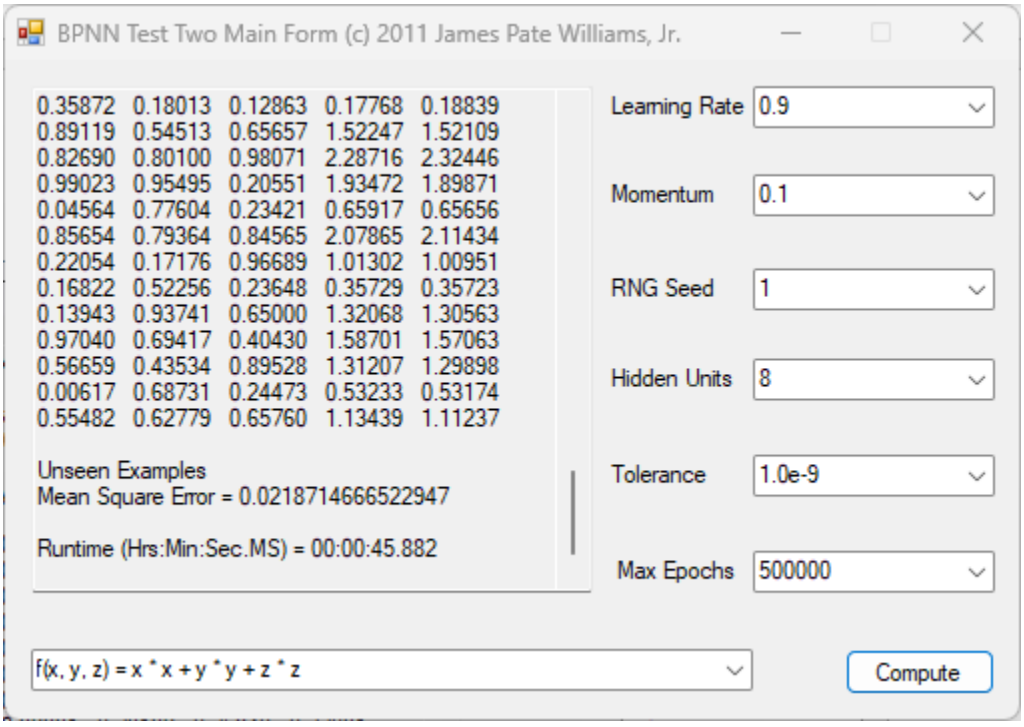

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x * x + y * y + z * z
Mean Square Error = 4.3769245546E-003
Epoch = 50000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.79044
0.98505 0.10900 0.30668 1.07625 1.06768
0.80214 0.44555 0.22498 0.89256 0.89438
0.01121 0.76537 0.02874 0.58674 0.57157
0.00756 0.51002 0.38209 0.40618 0.40740
0.27941 0.70309 0.23535 0.62779 0.63730
0.73132 0.08900 0.08265 0.54958 0.52806
0.33873 0.32991 0.73132 0.75840 0.76874
0.89595 0.81265 0.65355 1.89026 1.91614
0.92684 0.09924 0.69183 1.34750 1.34376
0.92548 0.98014 0.10142 1.82748 1.82023
0.03869 0.34105 0.84964 0.83970 0.83183
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 50000
f(x, y, z) = x * x + y * y + z * z
Compute

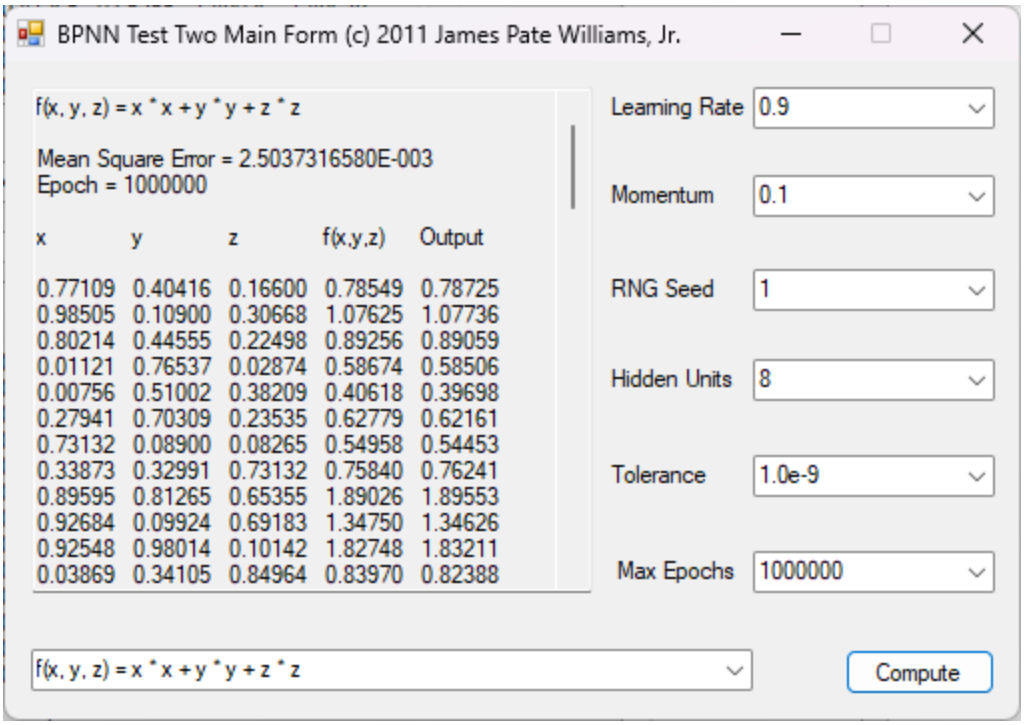

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.19519
0.89119 0.54513 0.65657 1.52247 1.52080
0.82690 0.80100 0.98071 2.28716 2.30564
0.99023 0.95495 0.20551 1.93472 1.91852
0.04564 0.77604 0.23421 0.65917 0.65152
0.85654 0.79364 0.84565 2.07865 2.11746
0.22054 0.17176 0.96689 1.01302 0.96893
0.16822 0.52256 0.23648 0.35729 0.36555
0.13943 0.93741 0.65000 1.32068 1.28009
0.97040 0.69417 0.40430 1.58701 1.58242
0.56659 0.43534 0.89528 1.31207 1.30506
0.00617 0.68731 0.24473 0.53233 0.52290
0.55482 0.62779 0.65760 1.13439 1.10242
Unseen Examples
Mean Square Error = 0.0254514014119654
Runtime (Hrs:Min:Sec.MS) = 00:00:04.469
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 50000
f(x, y, z) = x * x + y * y + z * z
Compute

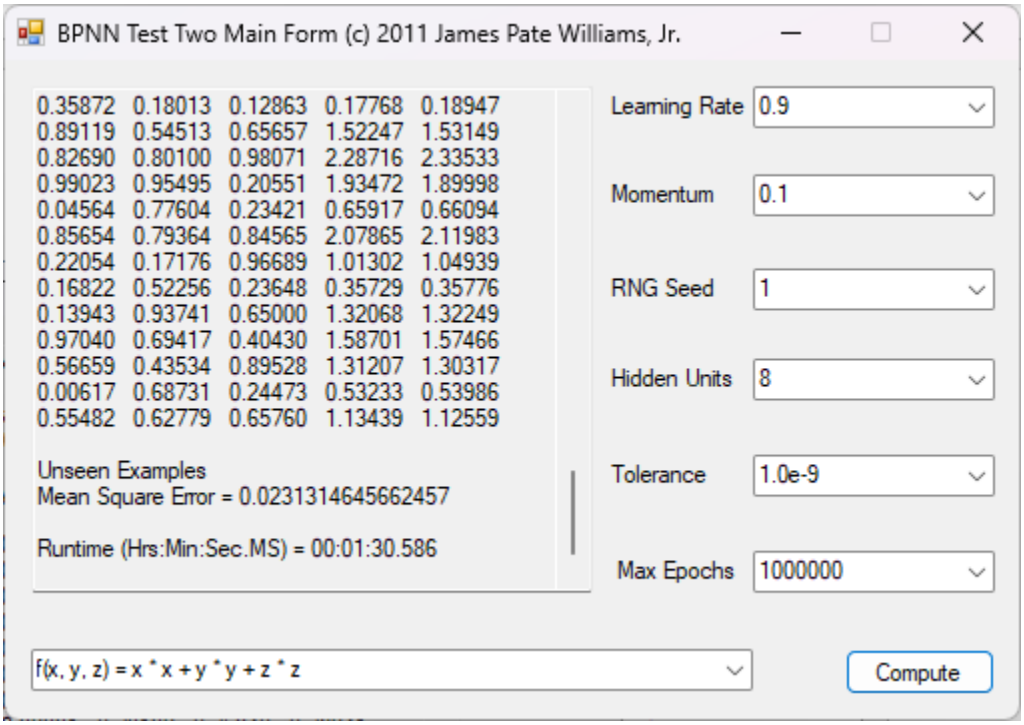

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x * x + y * y + z * z
Mean Square Error = 3.4204456359E-003
Epoch = 100000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.78646
0.98505 0.10900 0.30668 1.07625 1.06682
0.80214 0.44555 0.22498 0.89256 0.89646
0.01121 0.76537 0.02874 0.58674 0.58217
0.00756 0.51002 0.38209 0.40618 0.39911
0.27941 0.70309 0.23535 0.62779 0.63132
0.73132 0.08900 0.08265 0.54958 0.53317
0.33873 0.32991 0.73132 0.75840 0.77030
0.89595 0.81265 0.65355 1.89026 1.90614
0.92684 0.09924 0.69183 1.34750 1.34562
0.92548 0.98014 0.10142 1.82748 1.82193
0.03869 0.34105 0.84964 0.83970 0.82795
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 100000
f(x, y, z) = x * x + y * y + z * z
Compute

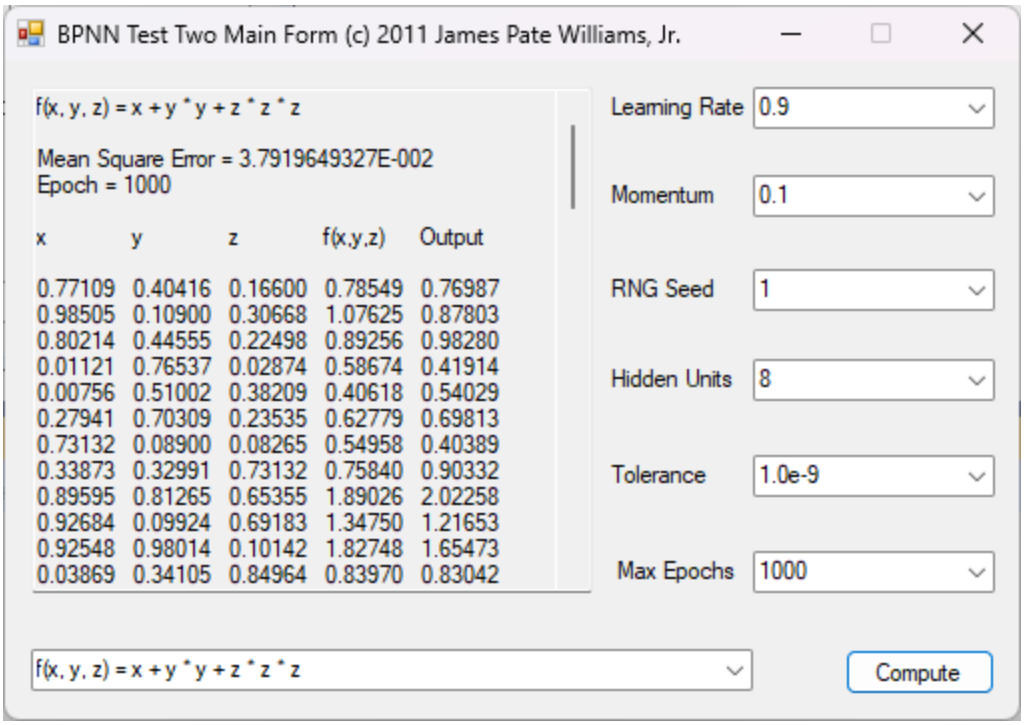

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.19116
0.89119 0.54513 0.65657 1.52247 1.52346
0.82690 0.80100 0.98071 2.28716 2.32115
0.99023 0.95495 0.20551 1.93472 1.90843
0.04564 0.77604 0.23421 0.65917 0.65264
0.85654 0.79364 0.84565 2.07865 2.12030
0.22054 0.17176 0.96689 1.01302 0.98789
0.16822 0.52256 0.23648 0.35729 0.36269
0.13943 0.93741 0.65000 1.32068 1.29078
0.97040 0.69417 0.40430 1.58701 1.57737
0.56659 0.43534 0.89528 1.31207 1.30140
0.00617 0.68731 0.24473 0.53233 0.52772
0.55482 0.62779 0.65760 1.13439 1.10471
Unseen Examples
Mean Square Error = 0.0241683706567405
Runtime (Hrs:Min:Sec.MS) = 00:00:09.104
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 100000
f(x, y, z) = x * x + y * y + z * z
Compute

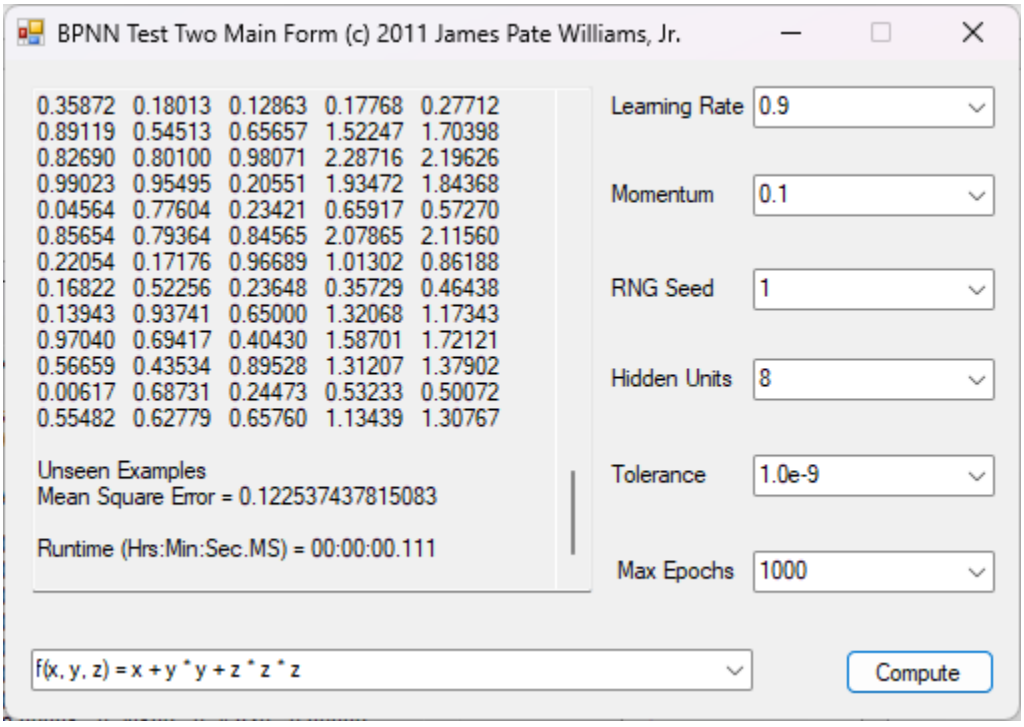

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x * x + y * y + z * z
Mean Square Error = 2.9382626476E-003
Epoch = 500000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.78680
0.98505 0.10900 0.30668 1.07625 1.06650
0.80214 0.44555 0.22498 0.89256 0.89899
0.01121 0.76537 0.02874 0.58674 0.58448
0.00756 0.51002 0.38209 0.40618 0.39337
0.27941 0.70309 0.23535 0.62779 0.62538
0.73132 0.08900 0.08265 0.54958 0.53724
0.33873 0.32991 0.73132 0.75840 0.77091
0.89595 0.81265 0.65355 1.89026 1.89639
0.92684 0.09924 0.69183 1.34750 1.34603
0.92548 0.98014 0.10142 1.82748 1.82617
0.03869 0.34105 0.84964 0.83970 0.82831
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 500000
f(x, y, z) = x * x + y * y + z * z
Compute

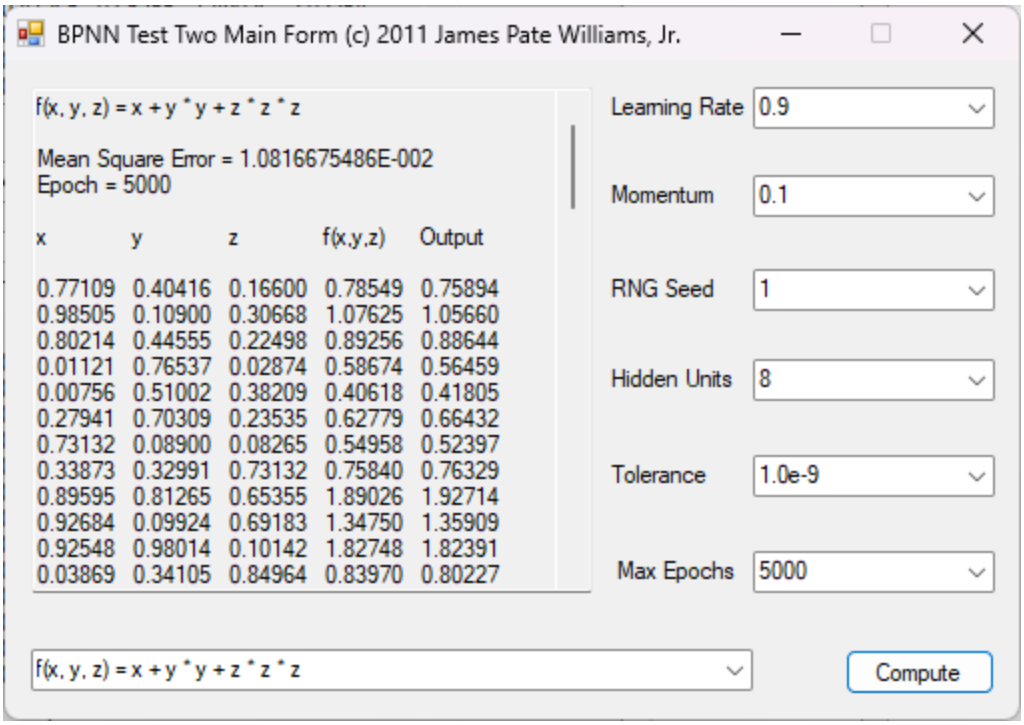

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.18839
0.89119 0.54513 0.65657 1.52247 1.52109
0.82690 0.80100 0.98071 2.28716 2.32446
0.99023 0.95495 0.20551 1.93472 1.89871
0.04564 0.77604 0.23421 0.65917 0.65656
0.85654 0.79364 0.84565 2.07865 2.11434
0.22054 0.17176 0.96689 1.01302 1.00951
0.16822 0.52256 0.23648 0.35729 0.35723
0.13943 0.93741 0.65000 1.32068 1.30563
0.97040 0.69417 0.40430 1.58701 1.57063
0.56659 0.43534 0.89528 1.31207 1.29898
0.00617 0.68731 0.24473 0.53233 0.53174
0.55482 0.62779 0.65760 1.13439 1.11237
Unseen Examples
Mean Square Error = 0.0218714666522947
Runtime (Hrs:Min:Sec.MS) = 00:00:45.882
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 500000
f(x, y, z) = x * x + y * y + z * z
Compute

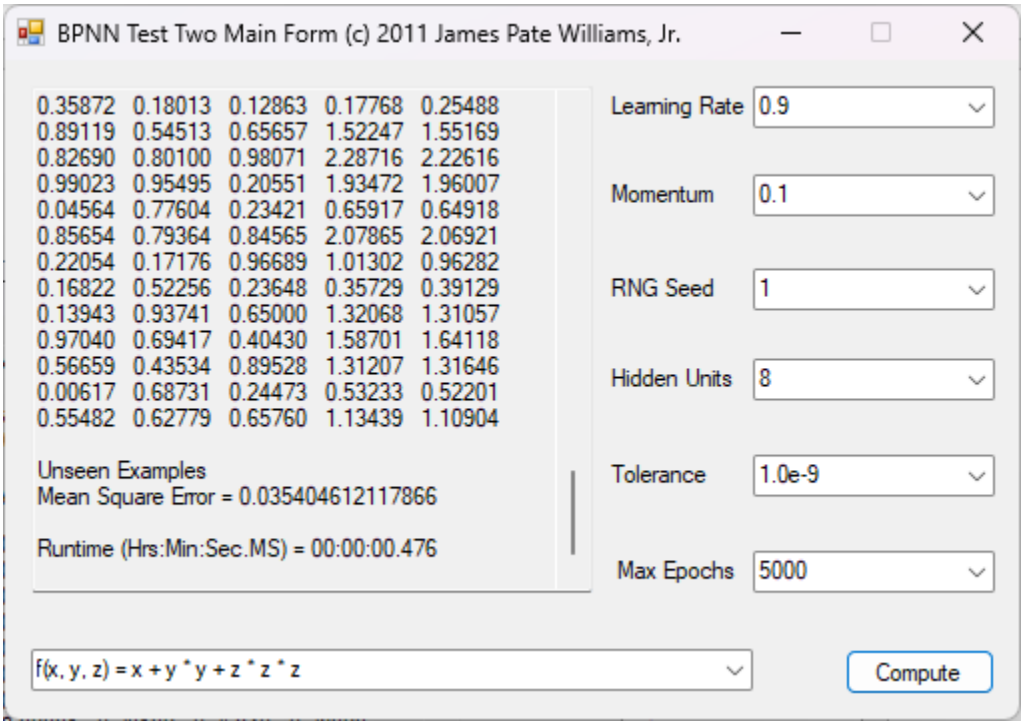

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x * x + y * y + z * z
Mean Square Error = 2.5037316580E-003
Epoch = 1000000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.78725
0.98505 0.10900 0.30668 1.07625 1.07736
0.80214 0.44555 0.22498 0.89256 0.89059
0.01121 0.76537 0.02874 0.58674 0.58506
0.00756 0.51002 0.38209 0.40618 0.39698
0.27941 0.70309 0.23535 0.62779 0.62161
0.73132 0.08900 0.08265 0.54958 0.54453
0.33873 0.32991 0.73132 0.75840 0.76241
0.89595 0.81265 0.65355 1.89026 1.89553
0.92684 0.09924 0.69183 1.34750 1.34626
0.92548 0.98014 0.10142 1.82748 1.83211
0.03869 0.34105 0.84964 0.83970 0.82388
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 1000000
f(x, y, z) = x * x + y * y + z * z
Compute

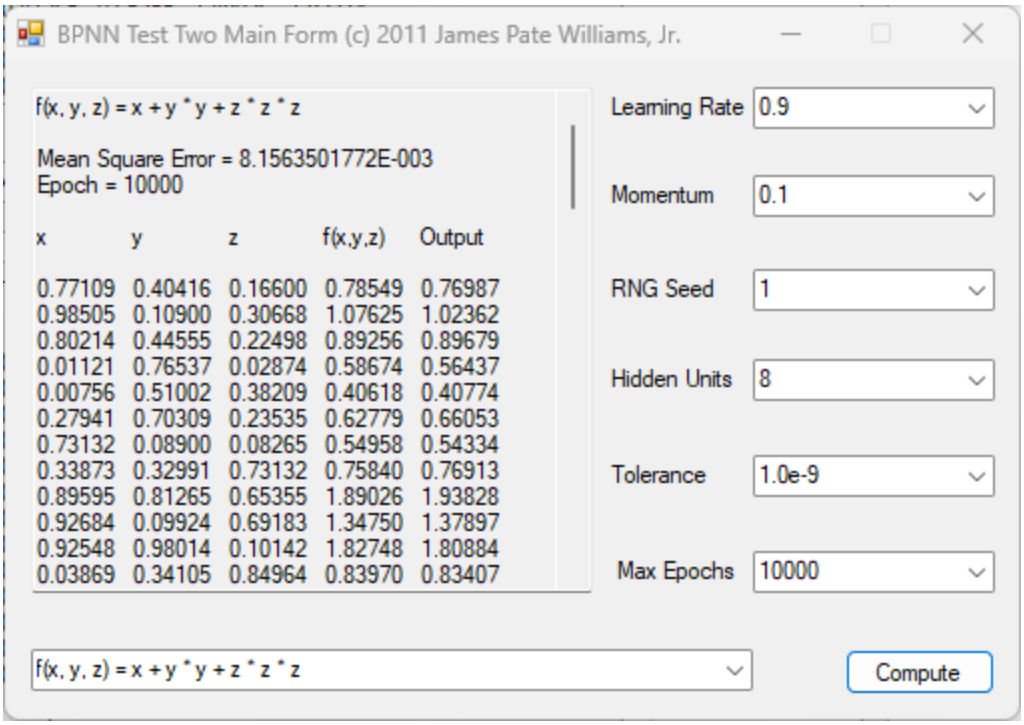

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.18947
0.89119 0.54513 0.65657 1.52247 1.53149
0.82690 0.80100 0.98071 2.28716 2.33533
0.99023 0.95495 0.20551 1.93472 1.89998
0.04564 0.77604 0.23421 0.65917 0.66094
0.85654 0.79364 0.84565 2.07865 2.11983
0.22054 0.17176 0.96689 1.01302 1.04939
0.16822 0.52256 0.23648 0.35729 0.35776
0.13943 0.93741 0.65000 1.32068 1.32249
0.97040 0.69417 0.40430 1.58701 1.57466
0.56659 0.43534 0.89528 1.31207 1.30317
0.00617 0.68731 0.24473 0.53233 0.53986
0.55482 0.62779 0.65760 1.13439 1.12559
Unseen Examples
Mean Square Error = 0.0231314645662457
Runtime (Hrs:Min:Sec.MS) = 00:01:30.586
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 1000000
f(x, y, z) = x * x + y * y + z * z
Compute

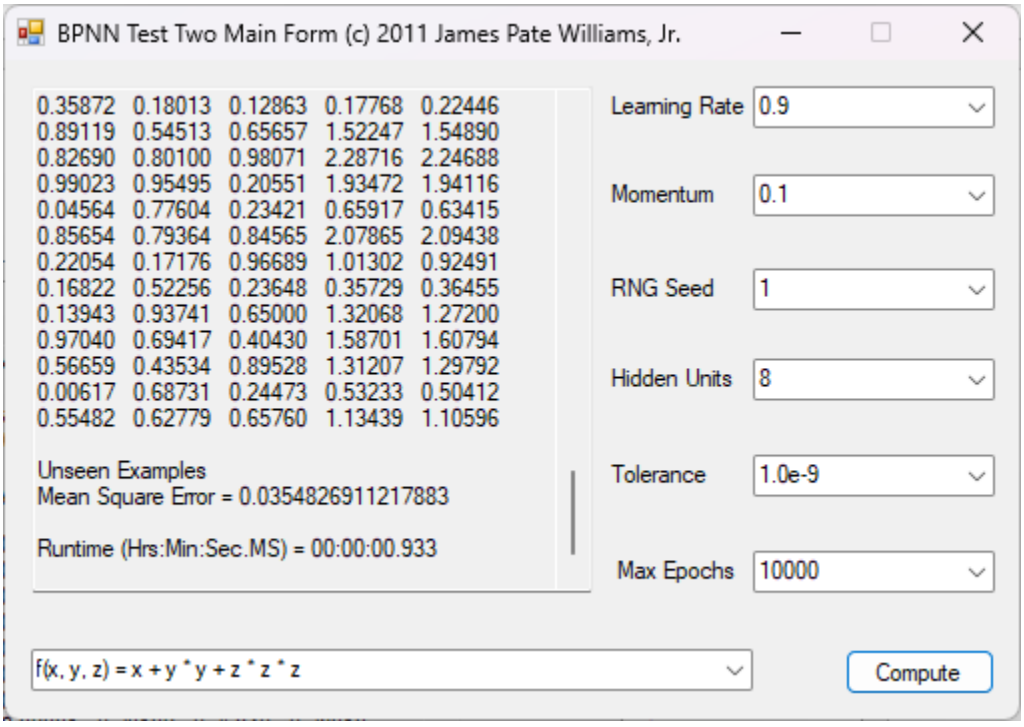

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x + y * y + z * z * z
Mean Square Error = 3.7919649327E-002
Epoch = 1000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.76987
0.98505 0.10900 0.30668 1.07625 0.87803
0.80214 0.44555 0.22498 0.89256 0.98280
0.01121 0.76537 0.02874 0.58674 0.41914
0.00756 0.51002 0.38209 0.40618 0.54029
0.27941 0.70309 0.23535 0.62779 0.69813
0.73132 0.08900 0.08265 0.54958 0.40389
0.33873 0.32991 0.73132 0.75840 0.90332
0.89595 0.81265 0.65355 1.89026 2.02258
0.92684 0.09924 0.69183 1.34750 1.21653
0.92548 0.98014 0.10142 1.82748 1.65473
0.03869 0.34105 0.84964 0.83970 0.83042
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 1000
f(x, y, z) = x + y * y + z * z * z
Compute

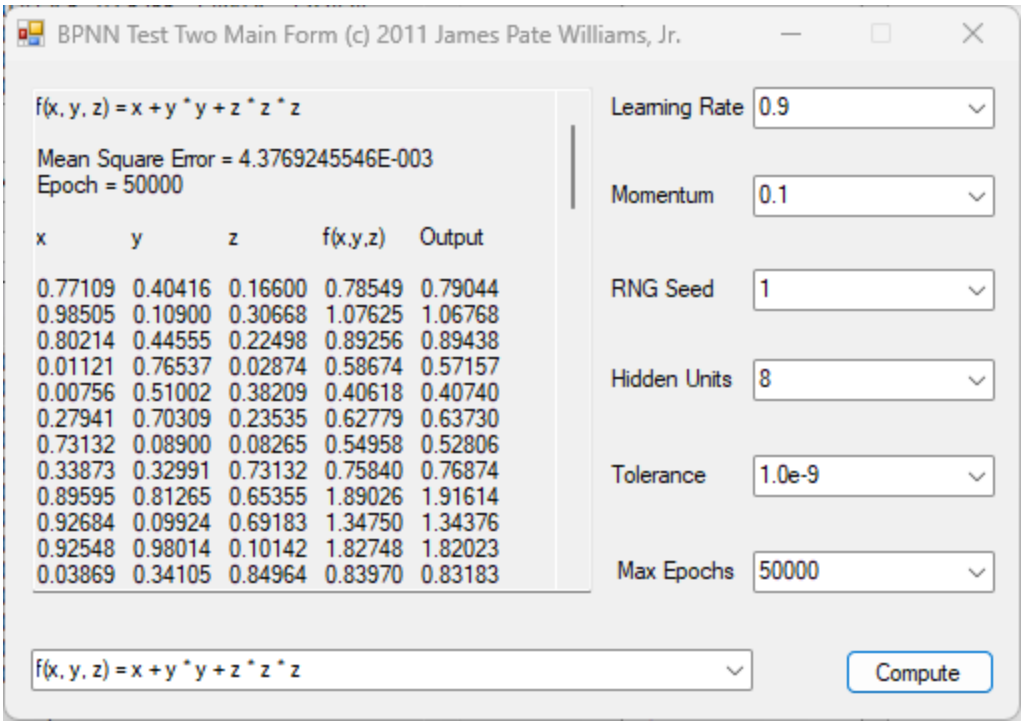

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.27712
0.89119 0.54513 0.65657 1.52247 1.70398
0.82690 0.80100 0.98071 2.28716 2.19626
0.99023 0.95495 0.20551 1.93472 1.84368
0.04564 0.77604 0.23421 0.65917 0.57270
0.85654 0.79364 0.84565 2.07865 2.11560
0.22054 0.17176 0.96689 1.01302 0.86188
0.16822 0.52256 0.23648 0.35729 0.46438
0.13943 0.93741 0.65000 1.32068 1.17343
0.97040 0.69417 0.40430 1.58701 1.72121
0.56659 0.43534 0.89528 1.31207 1.37902
0.00617 0.68731 0.24473 0.53233 0.50072
0.55482 0.62779 0.65760 1.13439 1.30767
Unseen Examples
Mean Square Error = 0.122537437815083
Runtime (Hrs:Min:Sec.MS) = 00:00:00.111
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 1000
f(x, y, z) = x + y * y + z * z * z
Compute

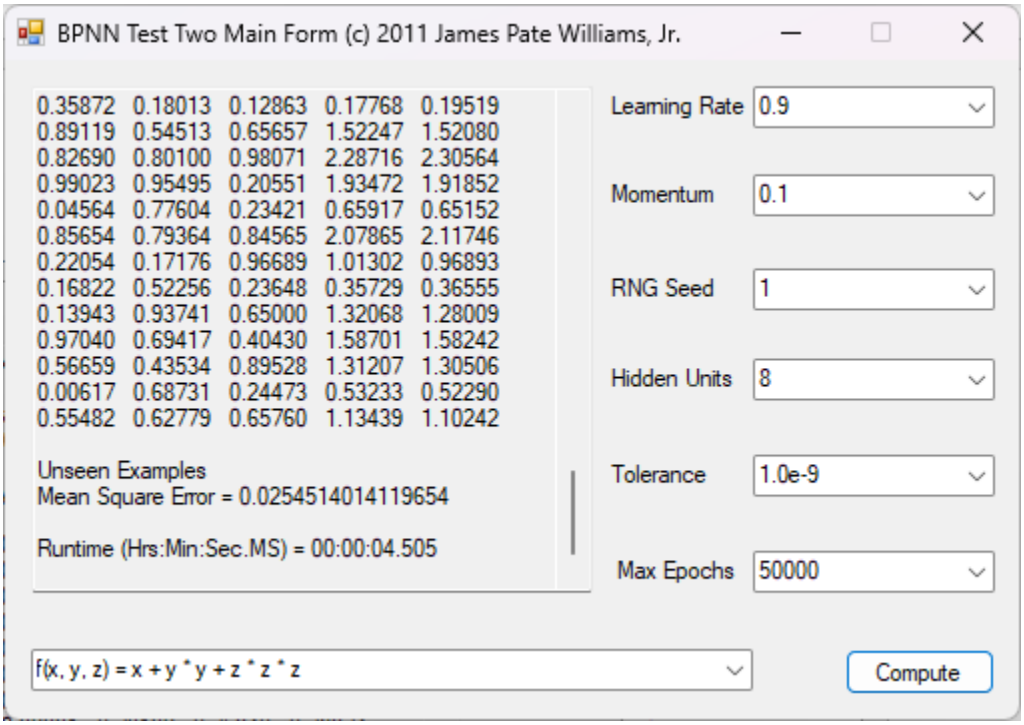

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x + y * y + z * z * z
Mean Square Error = 1.0816675486E-002
Epoch = 5000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.75894
0.98505 0.10900 0.30668 1.07625 1.05660
0.80214 0.44555 0.22498 0.89256 0.88644
0.01121 0.76537 0.02874 0.58674 0.56459
0.00756 0.51002 0.38209 0.40618 0.41805
0.27941 0.70309 0.23535 0.62779 0.66432
0.73132 0.08900 0.08265 0.54958 0.52397
0.33873 0.32991 0.73132 0.75840 0.76329
0.89595 0.81265 0.65355 1.89026 1.92714
0.92684 0.09924 0.69183 1.34750 1.35909
0.92548 0.98014 0.10142 1.82748 1.82391
0.03869 0.34105 0.84964 0.83970 0.80227
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 5000
f(x, y, z) = x + y * y + z * z * z
Compute

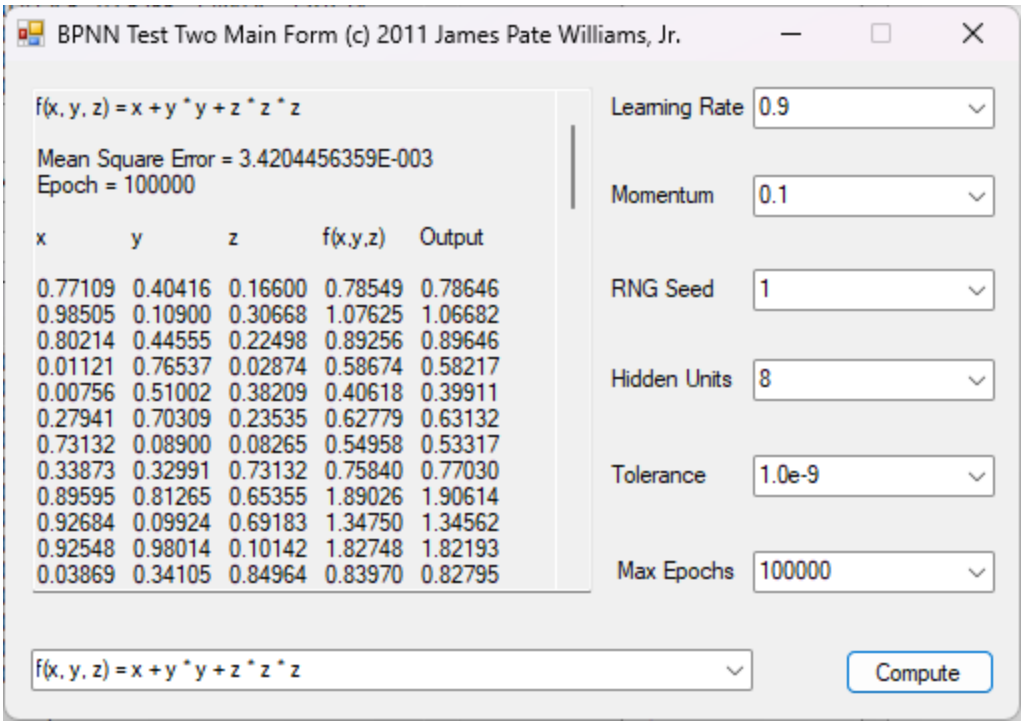

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.25488
0.89119 0.54513 0.65657 1.52247 1.55169
0.82690 0.80100 0.98071 2.28716 2.22616
0.99023 0.95495 0.20551 1.93472 1.96007
0.04564 0.77604 0.23421 0.65917 0.64918
0.85654 0.79364 0.84565 2.07865 2.06921
0.22054 0.17176 0.96689 1.01302 0.96282
0.16822 0.52256 0.23648 0.35729 0.39129
0.13943 0.93741 0.65000 1.32068 1.31057
0.97040 0.69417 0.40430 1.58701 1.64118
0.56659 0.43534 0.89528 1.31207 1.31646
0.00617 0.68731 0.24473 0.53233 0.52201
0.55482 0.62779 0.65760 1.13439 1.10904
Unseen Examples
Mean Square Error = 0.035404612117866
Runtime (Hrs:Min:Sec.MS) = 00:00:00.476
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 5000
f(x, y, z) = x + y * y + z * z * z
Compute

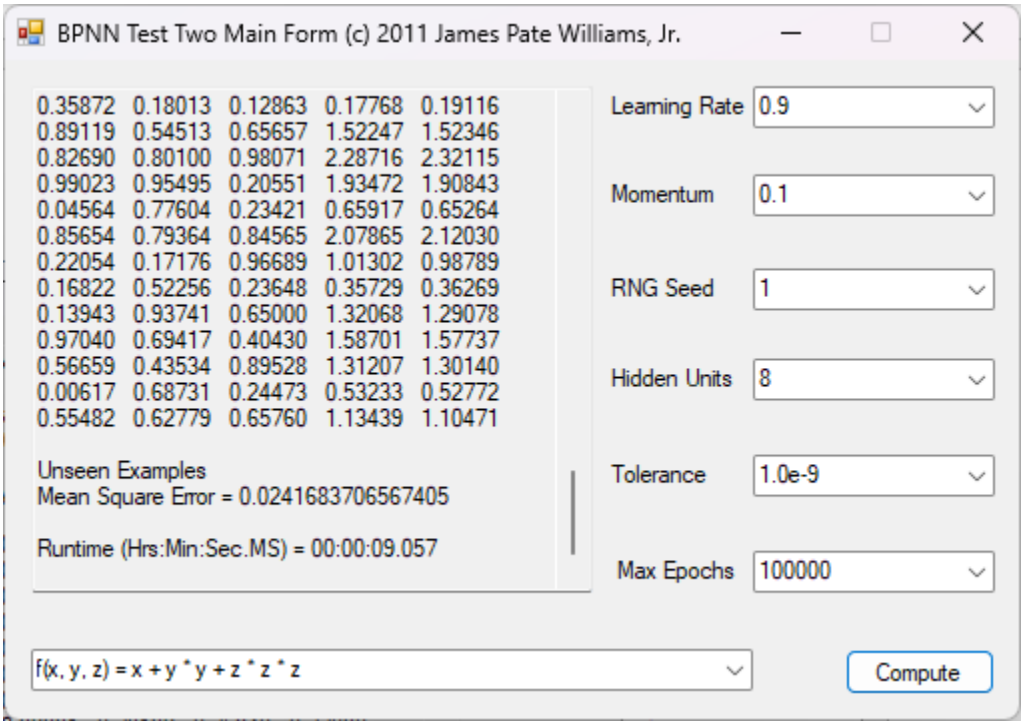

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x + y * y + z * z * z
Mean Square Error = 8.1563501772E-003
Epoch = 10000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.76987
0.98505 0.10900 0.30668 1.07625 1.02362
0.80214 0.44555 0.22498 0.89256 0.89679
0.01121 0.76537 0.02874 0.58674 0.56437
0.00756 0.51002 0.38209 0.40618 0.40774
0.27941 0.70309 0.23535 0.62779 0.66053
0.73132 0.08900 0.08265 0.54958 0.54334
0.33873 0.32991 0.73132 0.75840 0.76913
0.89595 0.81265 0.65355 1.89026 1.93828
0.92684 0.09924 0.69183 1.34750 1.37897
0.92548 0.98014 0.10142 1.82748 1.80884
0.03869 0.34105 0.84964 0.83970 0.83407
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 10000
f(x, y, z) = x + y * y + z * z * z
Compute

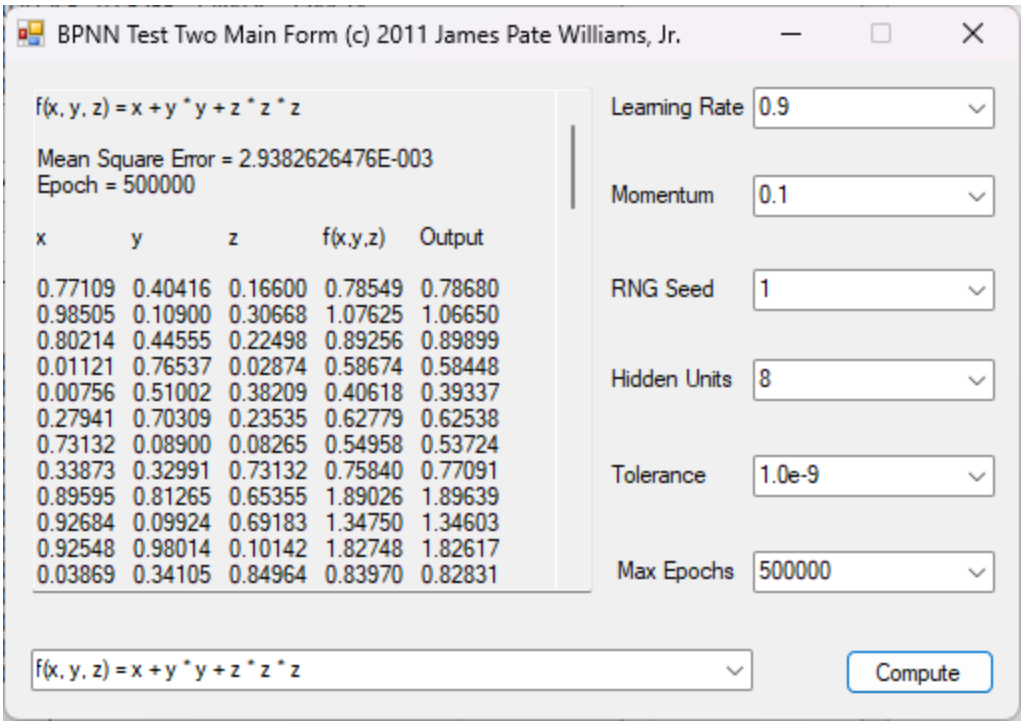

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.22446
0.89119 0.54513 0.65657 1.52247 1.54890
0.82690 0.80100 0.98071 2.28716 2.24688
0.99023 0.95495 0.20551 1.93472 1.94116
0.04564 0.77604 0.23421 0.65917 0.63415
0.85654 0.79364 0.84565 2.07865 2.09438
0.22054 0.17176 0.96689 1.01302 0.92491
0.16822 0.52256 0.23648 0.35729 0.36455
0.13943 0.93741 0.65000 1.32068 1.27200
0.97040 0.69417 0.40430 1.58701 1.60794
0.56659 0.43534 0.89528 1.31207 1.29792
0.00617 0.68731 0.24473 0.53233 0.50412
0.55482 0.62779 0.65760 1.13439 1.10596
Unseen Examples
Mean Square Error = 0.0354826911217883
Runtime (Hrs:Min:Sec.MS) = 00:00:00.933
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 10000
f(x, y, z) = x + y * y + z * z * z
Compute

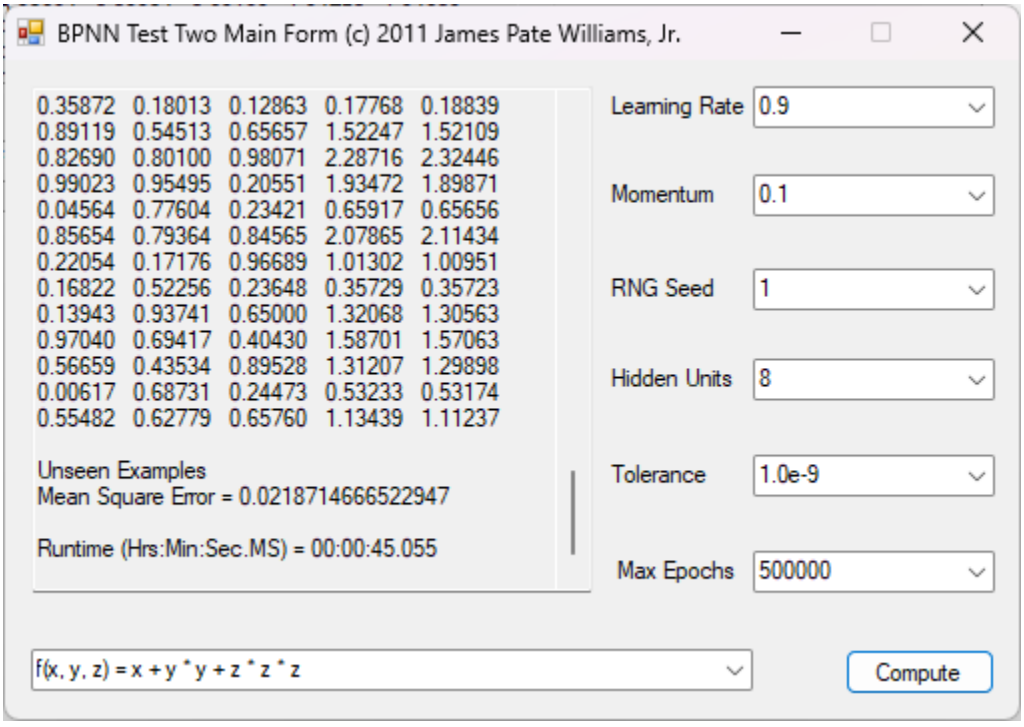

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x + y * y + z * z * z
Mean Square Error = 4.3769245546E-003
Epoch = 50000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.79044
0.98505 0.10900 0.30668 1.07625 1.06768
0.80214 0.44555 0.22498 0.89256 0.89438
0.01121 0.76537 0.02874 0.58674 0.57157
0.00756 0.51002 0.38209 0.40618 0.40740
0.27941 0.70309 0.23535 0.62779 0.63730
0.73132 0.08900 0.08265 0.54958 0.52806
0.33873 0.32991 0.73132 0.75840 0.76874
0.89595 0.81265 0.65355 1.89026 1.91614
0.92684 0.09924 0.69183 1.34750 1.34376
0.92548 0.98014 0.10142 1.82748 1.82023
0.03869 0.34105 0.84964 0.83970 0.83183
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 50000
f(x, y, z) = x + y * y + z * z * z
Compute

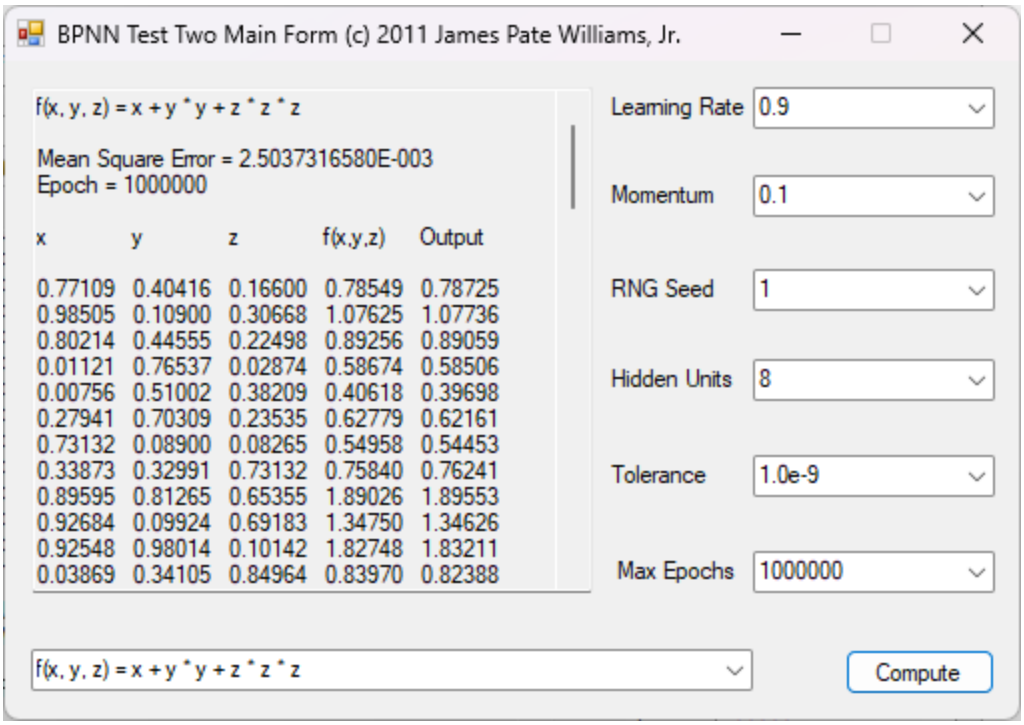

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.19519
0.89119 0.54513 0.65657 1.52247 1.52080
0.82690 0.80100 0.98071 2.28716 2.30564
0.99023 0.95495 0.20551 1.93472 1.91852
0.04564 0.77604 0.23421 0.65917 0.65152
0.85654 0.79364 0.84565 2.07865 2.11746
0.22054 0.17176 0.96689 1.01302 0.96893
0.16822 0.52256 0.23648 0.35729 0.36555
0.13943 0.93741 0.65000 1.32068 1.28009
0.97040 0.69417 0.40430 1.58701 1.58242
0.56659 0.43534 0.89528 1.31207 1.30506
0.00617 0.68731 0.24473 0.53233 0.52290
0.55482 0.62779 0.65760 1.13439 1.10242
Unseen Examples
Mean Square Error = 0.0254514014119654
Runtime (Hrs:Min:Sec.MS) = 00:00:04.505
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 50000
f(x, y, z) = x + y * y + z * z * z
Compute

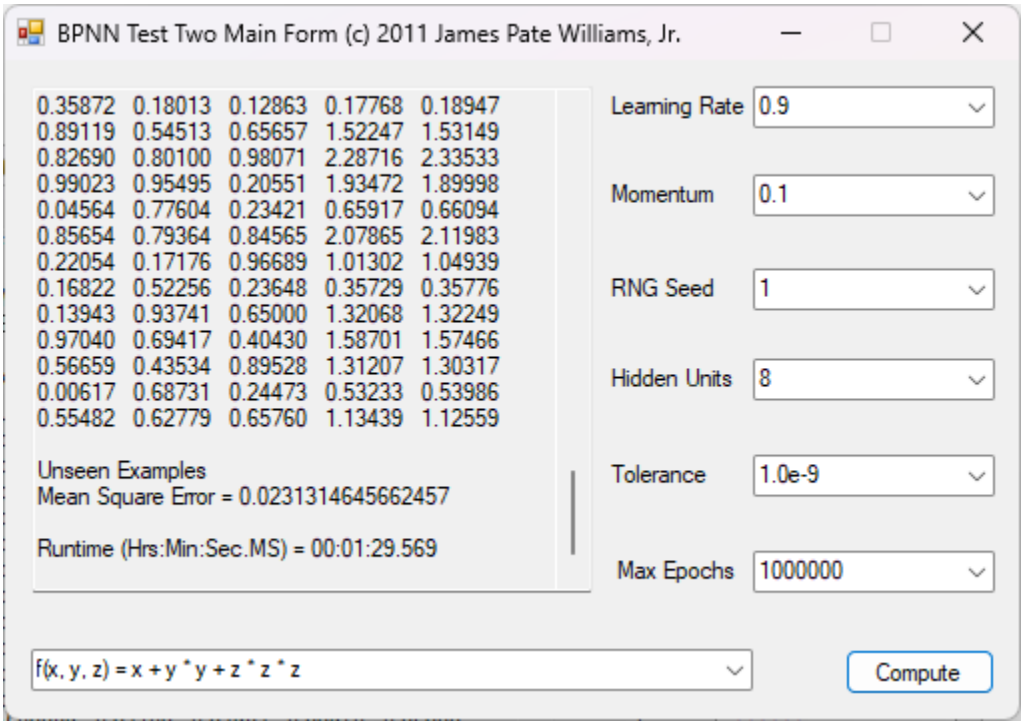

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x + y * y + z * z * z
Mean Square Error = 3.4204456359E-003
Epoch = 100000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.78646
0.98505 0.10900 0.30668 1.07625 1.06682
0.80214 0.44555 0.22498 0.89256 0.89646
0.01121 0.76537 0.02874 0.58674 0.58217
0.00756 0.51002 0.38209 0.40618 0.39911
0.27941 0.70309 0.23535 0.62779 0.63132
0.73132 0.08900 0.08265 0.54958 0.53317
0.33873 0.32991 0.73132 0.75840 0.77030
0.89595 0.81265 0.65355 1.89026 1.90614
0.92684 0.09924 0.69183 1.34750 1.34562
0.92548 0.98014 0.10142 1.82748 1.82193
0.03869 0.34105 0.84964 0.83970 0.82795
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 100000
f(x, y, z) = x + y * y + z * z * z
Compute

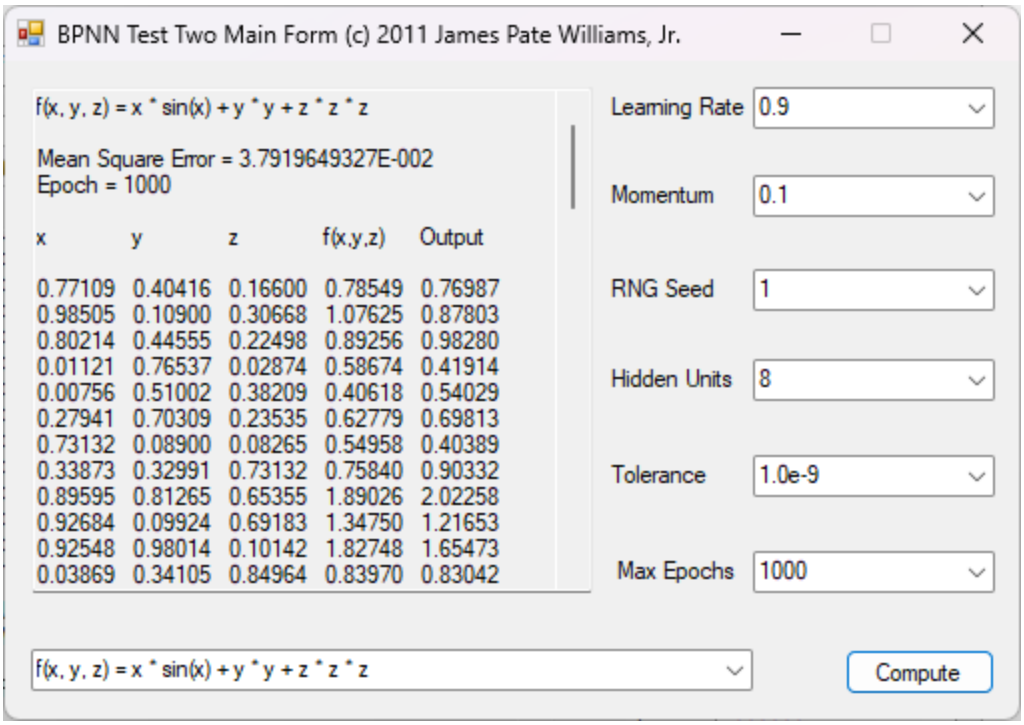

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.19116
0.89119 0.54513 0.65657 1.52247 1.52346
0.82690 0.80100 0.98071 2.28716 2.32115
0.99023 0.95495 0.20551 1.93472 1.90843
0.04564 0.77604 0.23421 0.65917 0.65264
0.85654 0.79364 0.84565 2.07865 2.12030
0.22054 0.17176 0.96689 1.01302 0.98789
0.16822 0.52256 0.23648 0.35729 0.36269
0.13943 0.93741 0.65000 1.32068 1.29078
0.97040 0.69417 0.40430 1.58701 1.57737
0.56659 0.43534 0.89528 1.31207 1.30140
0.00617 0.68731 0.24473 0.53233 0.52772
0.55482 0.62779 0.65760 1.13439 1.10471
Unseen Examples
Mean Square Error = 0.0241683706567405
Runtime (Hrs:Min:Sec.MS) = 00:00:09.057
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 100000
f(x, y, z) = x + y * y + z * z * z
Compute

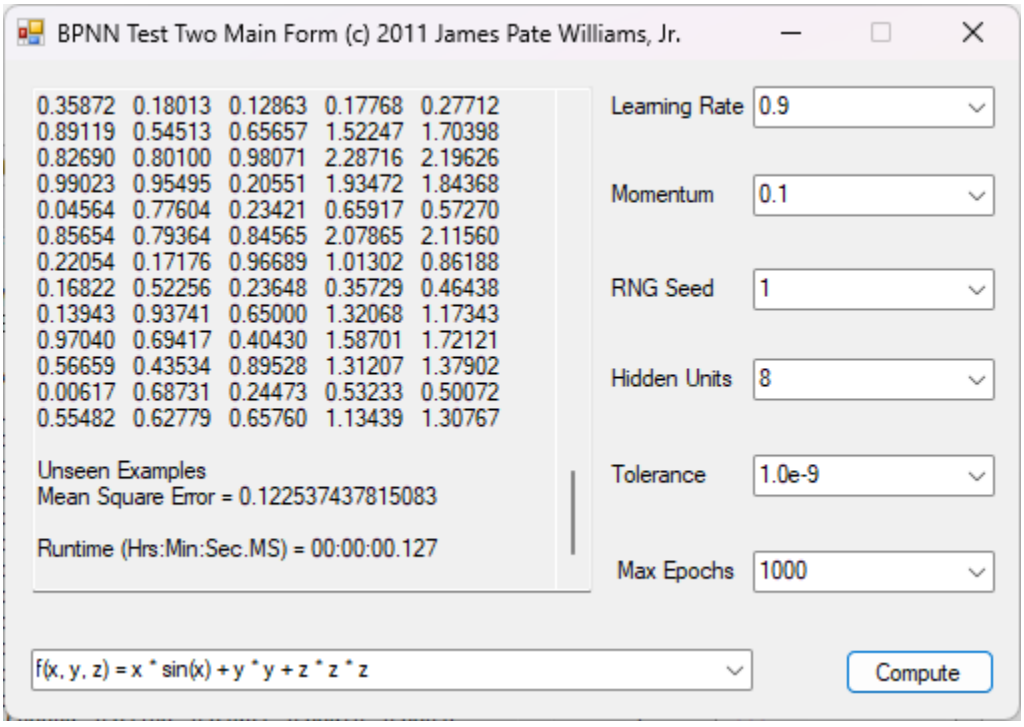

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x + y * y + z * z * z
Mean Square Error = 2.9382626476E-003
Epoch = 500000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.78680
0.98505 0.10900 0.30668 1.07625 1.06650
0.80214 0.44555 0.22498 0.89256 0.89899
0.01121 0.76537 0.02874 0.58674 0.58448
0.00756 0.51002 0.38209 0.40618 0.39337
0.27941 0.70309 0.23535 0.62779 0.62538
0.73132 0.08900 0.08265 0.54958 0.53724
0.33873 0.32991 0.73132 0.75840 0.77091
0.89595 0.81265 0.65355 1.89026 1.89639
0.92684 0.09924 0.69183 1.34750 1.34603
0.92548 0.98014 0.10142 1.82748 1.82617
0.03869 0.34105 0.84964 0.83970 0.82831
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 500000
f(x, y, z) = x + y * y + z * z * z
Compute

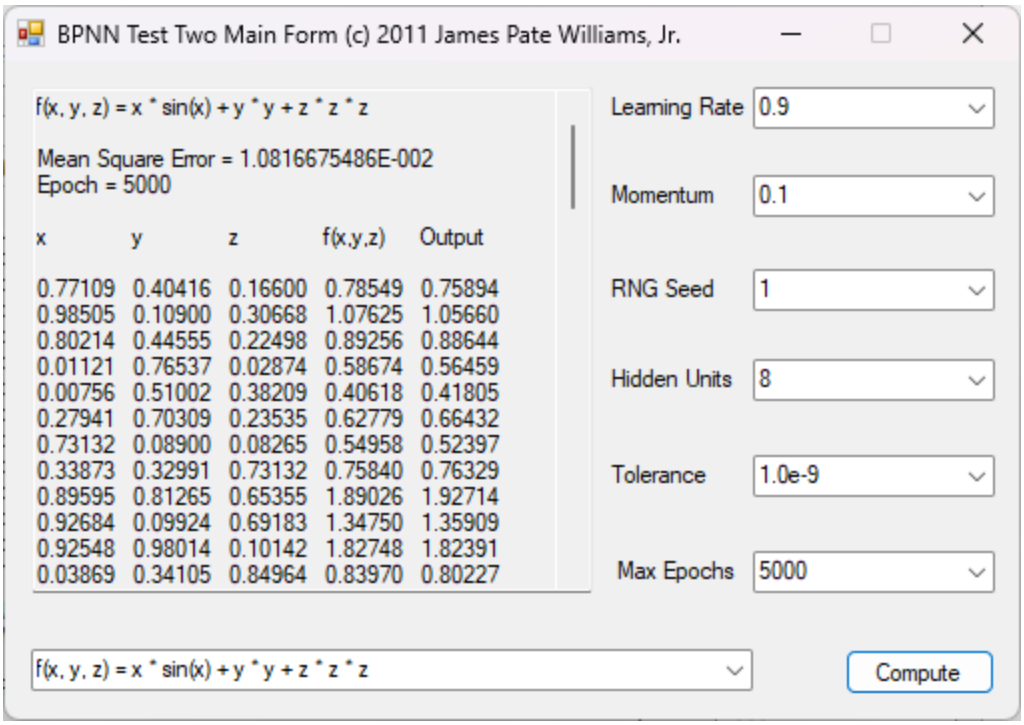

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.18839
0.89119 0.54513 0.65657 1.52247 1.52109
0.82690 0.80100 0.98071 2.28716 2.32446
0.99023 0.95495 0.20551 1.93472 1.89871
0.04564 0.77604 0.23421 0.65917 0.65656
0.85654 0.79364 0.84565 2.07865 2.11434
0.22054 0.17176 0.96689 1.01302 1.00951
0.16822 0.52256 0.23648 0.35729 0.35723
0.13943 0.93741 0.65000 1.32068 1.30563
0.97040 0.69417 0.40430 1.58701 1.57063
0.56659 0.43534 0.89528 1.31207 1.29898
0.00617 0.68731 0.24473 0.53233 0.53174
0.55482 0.62779 0.65760 1.13439 1.11237
Unseen Examples
Mean Square Error = 0.0218714666522947
Runtime (Hrs:Min:Sec.MS) = 00:00:45.055
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 500000
f(x, y, z) = x + y * y + z * z * z
Compute

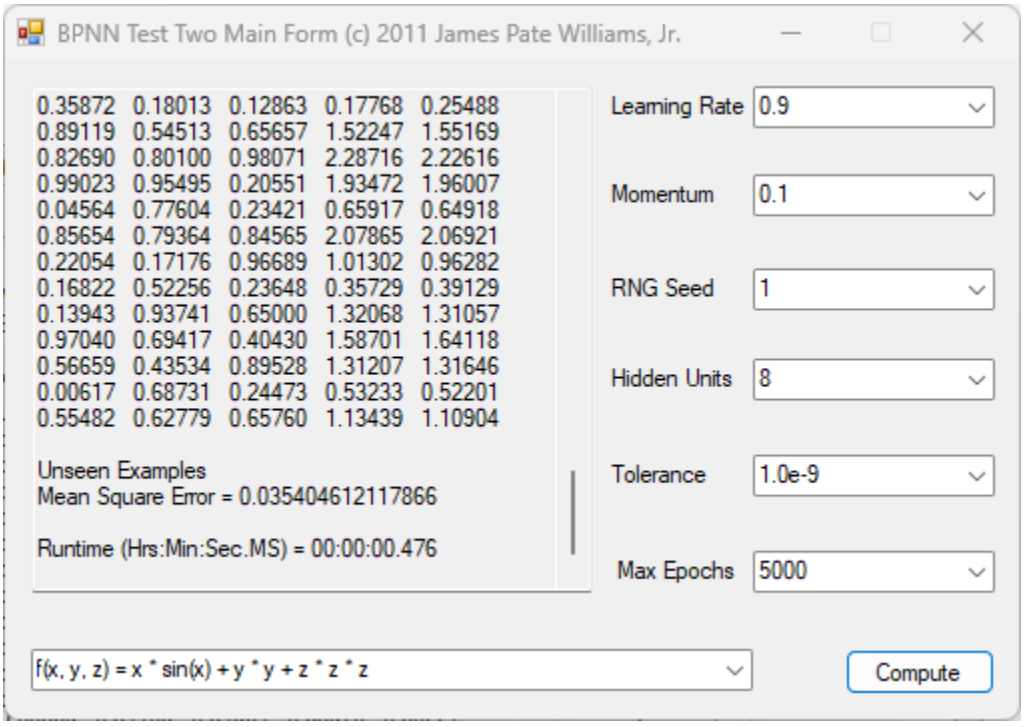

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x + y * y + z * z * z
Mean Square Error = 2.5037316580E-003
Epoch = 1000000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.78725
0.98505 0.10900 0.30668 1.07625 1.07736
0.80214 0.44555 0.22498 0.89256 0.89059
0.01121 0.76537 0.02874 0.58674 0.58506
0.00756 0.51002 0.38209 0.40618 0.39698
0.27941 0.70309 0.23535 0.62779 0.62161
0.73132 0.08900 0.08265 0.54958 0.54453
0.33873 0.32991 0.73132 0.75840 0.76241
0.89595 0.81265 0.65355 1.89026 1.89553
0.92684 0.09924 0.69183 1.34750 1.34626
0.92548 0.98014 0.10142 1.82748 1.83211
0.03869 0.34105 0.84964 0.83970 0.82388
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 1000000
f(x, y, z) = x + y * y + z * z * z
Compute

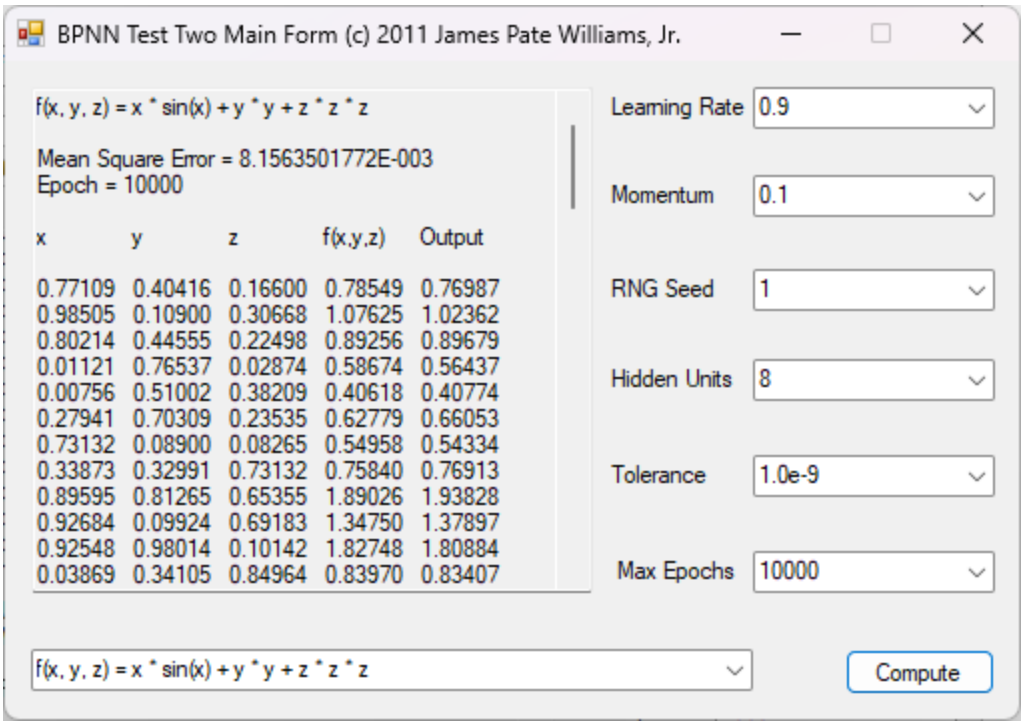

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.18947
0.89119 0.54513 0.65657 1.52247 1.53149
0.82690 0.80100 0.98071 2.28716 2.33533
0.99023 0.95495 0.20551 1.93472 1.89998
0.04564 0.77604 0.23421 0.65917 0.66094
0.85654 0.79364 0.84565 2.07865 2.11983
0.22054 0.17176 0.96689 1.01302 1.04939
0.16822 0.52256 0.23648 0.35729 0.35776
0.13943 0.93741 0.65000 1.32068 1.32249
0.97040 0.69417 0.40430 1.58701 1.57466
0.56659 0.43534 0.89528 1.31207 1.30317
0.00617 0.68731 0.24473 0.53233 0.53986
0.55482 0.62779 0.65760 1.13439 1.12559
Unseen Examples
Mean Square Error = 0.0231314645662457
Runtime (Hrs:Min:Sec.MS) = 00:01:29.569
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 1000000
f(x, y, z) = x + y * y + z * z * z
Compute

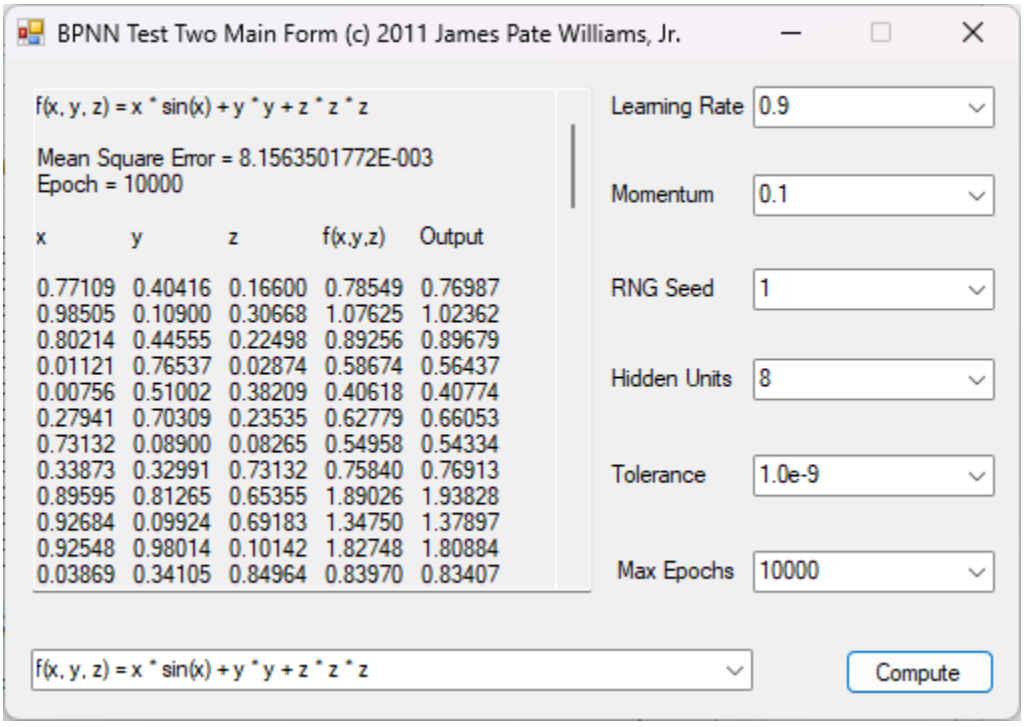

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x * sin(x) + y * y + z * z * z
Mean Square Error = 3.7919649327E-002
Epoch = 1000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.76987
0.98505 0.10900 0.30668 1.07625 0.87803
0.80214 0.44555 0.22498 0.89256 0.98280
0.01121 0.76537 0.02874 0.58674 0.41914
0.00756 0.51002 0.38209 0.40618 0.54029
0.27941 0.70309 0.23535 0.62779 0.69813
0.73132 0.08900 0.08265 0.54958 0.40389
0.33873 0.32991 0.73132 0.75840 0.90332
0.89595 0.81265 0.65355 1.89026 2.02258
0.92684 0.09924 0.69183 1.34750 1.21653
0.92548 0.98014 0.10142 1.82748 1.65473
0.03869 0.34105 0.84964 0.83970 0.83042
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 1000
f(x, y, z) = x * sin(x) + y * y + z * z * z
Compute

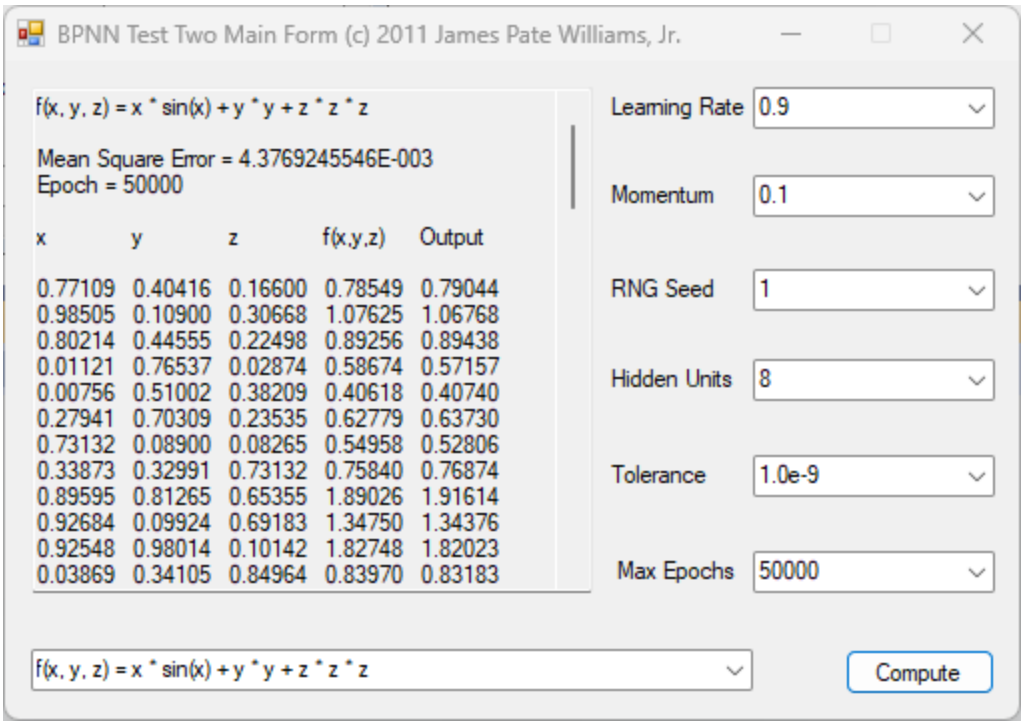

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.27712
0.89119 0.54513 0.65657 1.52247 1.70398
0.82690 0.80100 0.98071 2.28716 2.19626
0.99023 0.95495 0.20551 1.93472 1.84368
0.04564 0.77604 0.23421 0.65917 0.57270
0.85654 0.79364 0.84565 2.07865 2.11560
0.22054 0.17176 0.96689 1.01302 0.86188
0.16822 0.52256 0.23648 0.35729 0.46438
0.13943 0.93741 0.65000 1.32068 1.17343
0.97040 0.69417 0.40430 1.58701 1.72121
0.56659 0.43534 0.89528 1.31207 1.37902
0.00617 0.68731 0.24473 0.53233 0.50072
0.55482 0.62779 0.65760 1.13439 1.30767
Unseen Examples
Mean Square Error = 0.122537437815083
Runtime (Hrs:Min:Sec.MS) = 00:00:00.127
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 1000
f(x, y, z) = x * sin(x) + y * y + z * z * z
Compute

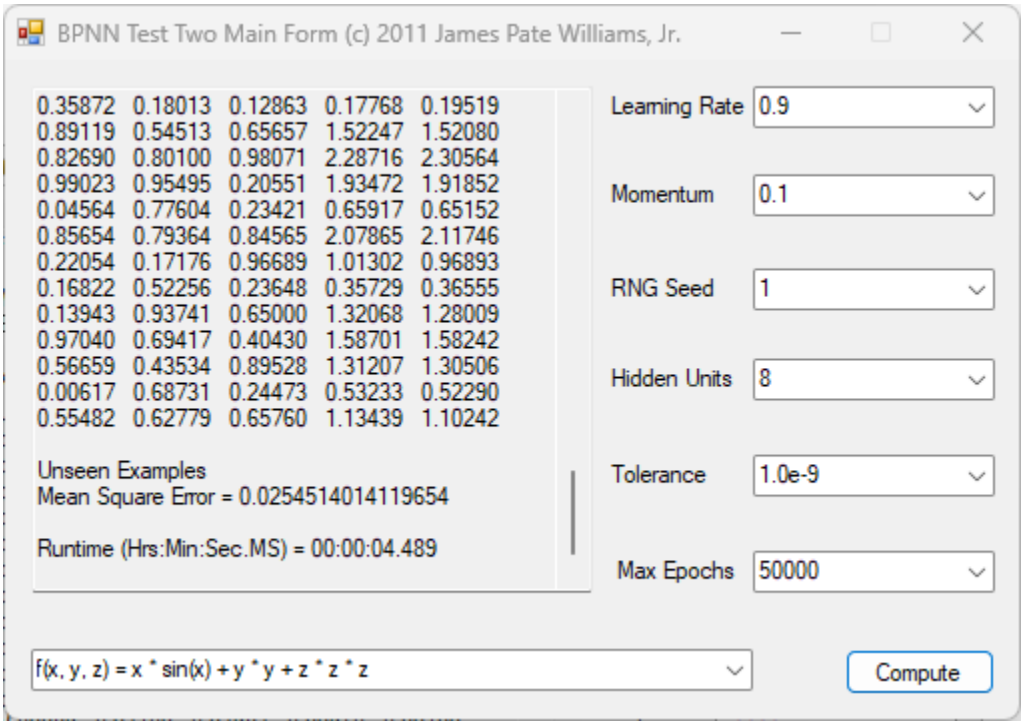

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x * sin(x) + y * y + z * z * z
Mean Square Error = 1.0816675486E-002
Epoch = 5000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.75894
0.98505 0.10900 0.30668 1.07625 1.05660
0.80214 0.44555 0.22498 0.89256 0.88644
0.01121 0.76537 0.02874 0.58674 0.56459
0.00756 0.51002 0.38209 0.40618 0.41805
0.27941 0.70309 0.23535 0.62779 0.66432
0.73132 0.08900 0.08265 0.54958 0.52397
0.33873 0.32991 0.73132 0.75840 0.76329
0.89595 0.81265 0.65355 1.89026 1.92714
0.92684 0.09924 0.69183 1.34750 1.35909
0.92548 0.98014 0.10142 1.82748 1.82391
0.03869 0.34105 0.84964 0.83970 0.80227
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 5000
f(x, y, z) = x * sin(x) + y * y + z * z * z
Compute

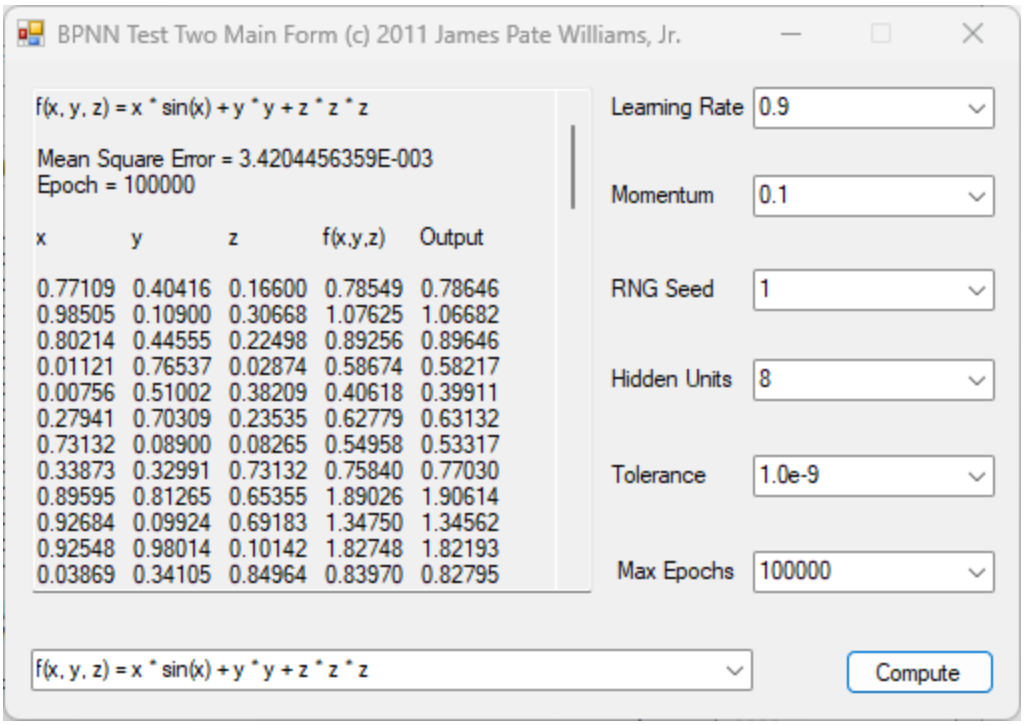

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.25488
0.89119 0.54513 0.65657 1.52247 1.55169
0.82690 0.80100 0.98071 2.28716 2.22616
0.99023 0.95495 0.20551 1.93472 1.96007
0.04564 0.77604 0.23421 0.65917 0.64918
0.85654 0.79364 0.84565 2.07865 2.06921
0.22054 0.17176 0.96689 1.01302 0.96282
0.16822 0.52256 0.23648 0.35729 0.39129
0.13943 0.93741 0.65000 1.32068 1.31057
0.97040 0.69417 0.40430 1.58701 1.64118
0.56659 0.43534 0.89528 1.31207 1.31646
0.00617 0.68731 0.24473 0.53233 0.52201
0.55482 0.62779 0.65760 1.13439 1.10904
Unseen Examples
Mean Square Error = 0.035404612117866
Runtime (Hrs:Min:Sec.MS) = 00:00:00.476
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 5000
f(x, y, z) = x * sin(x) + y * y + z * z * z
Compute

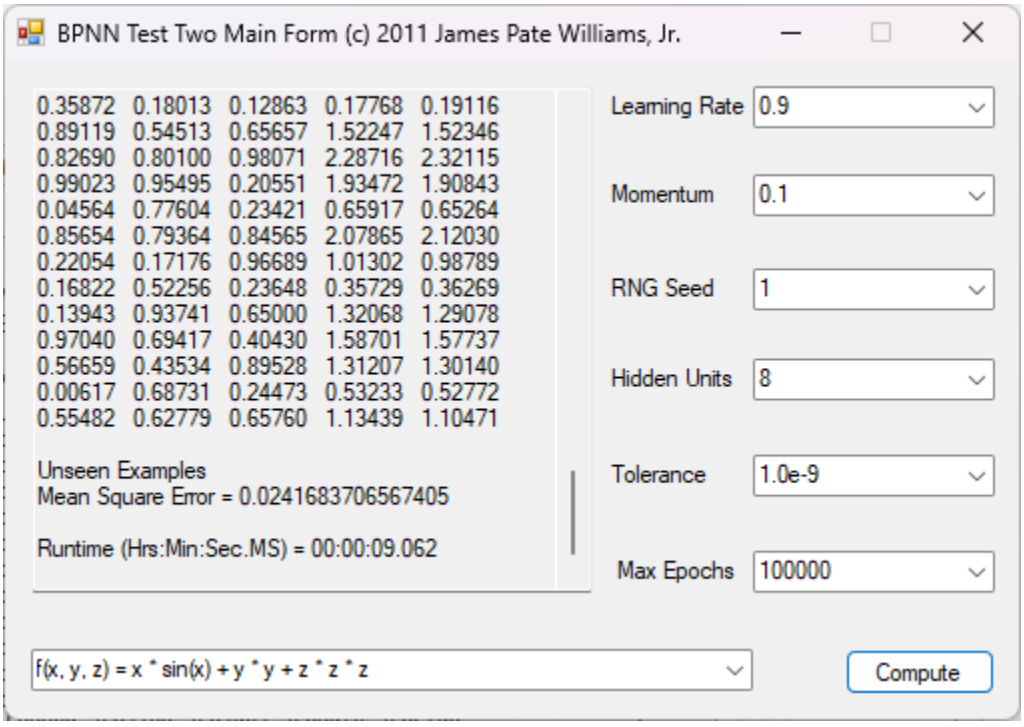

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x * sin(x) + y * y + z * z * z
Mean Square Error = 8.1563501772E-003
Epoch = 10000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.76987
0.98505 0.10900 0.30668 1.07625 1.02362
0.80214 0.44555 0.22498 0.89256 0.89679
0.01121 0.76537 0.02874 0.58674 0.56437
0.00756 0.51002 0.38209 0.40618 0.40774
0.27941 0.70309 0.23535 0.62779 0.66053
0.73132 0.08900 0.08265 0.54958 0.54334
0.33873 0.32991 0.73132 0.75840 0.76913
0.89595 0.81265 0.65355 1.89026 1.93828
0.92684 0.09924 0.69183 1.34750 1.37897
0.92548 0.98014 0.10142 1.82748 1.80884
0.03869 0.34105 0.84964 0.83970 0.83407
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 10000
f(x, y, z) = x * sin(x) + y * y + z * z * z
Compute

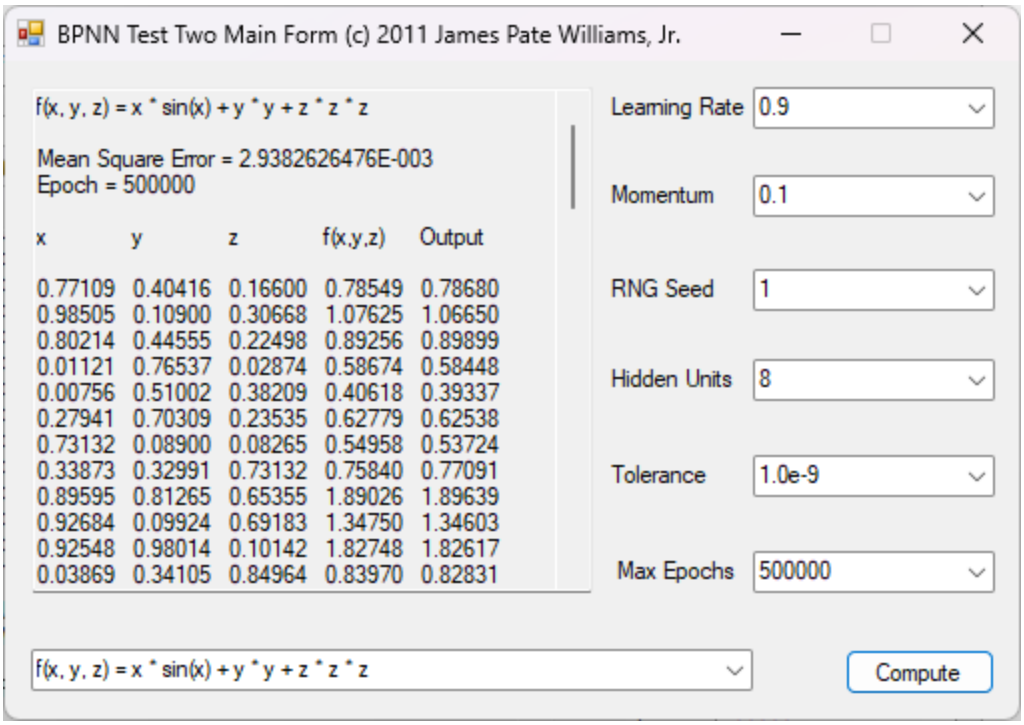

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x * sin(x) + y * y + z * z * z
Mean Square Error = 8.1563501772E-003
Epoch = 10000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.76987
0.98505 0.10900 0.30668 1.07625 1.02362
0.80214 0.44555 0.22498 0.89256 0.89679
0.01121 0.76537 0.02874 0.58674 0.56437
0.00756 0.51002 0.38209 0.40618 0.40774
0.27941 0.70309 0.23535 0.62779 0.66053
0.73132 0.08900 0.08265 0.54958 0.54334
0.33873 0.32991 0.73132 0.75840 0.76913
0.89595 0.81265 0.65355 1.89026 1.93828
0.92684 0.09924 0.69183 1.34750 1.37897
0.92548 0.98014 0.10142 1.82748 1.80884
0.03869 0.34105 0.84964 0.83970 0.83407
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 10000
f(x, y, z) = x * sin(x) + y * y + z * z * z
Compute

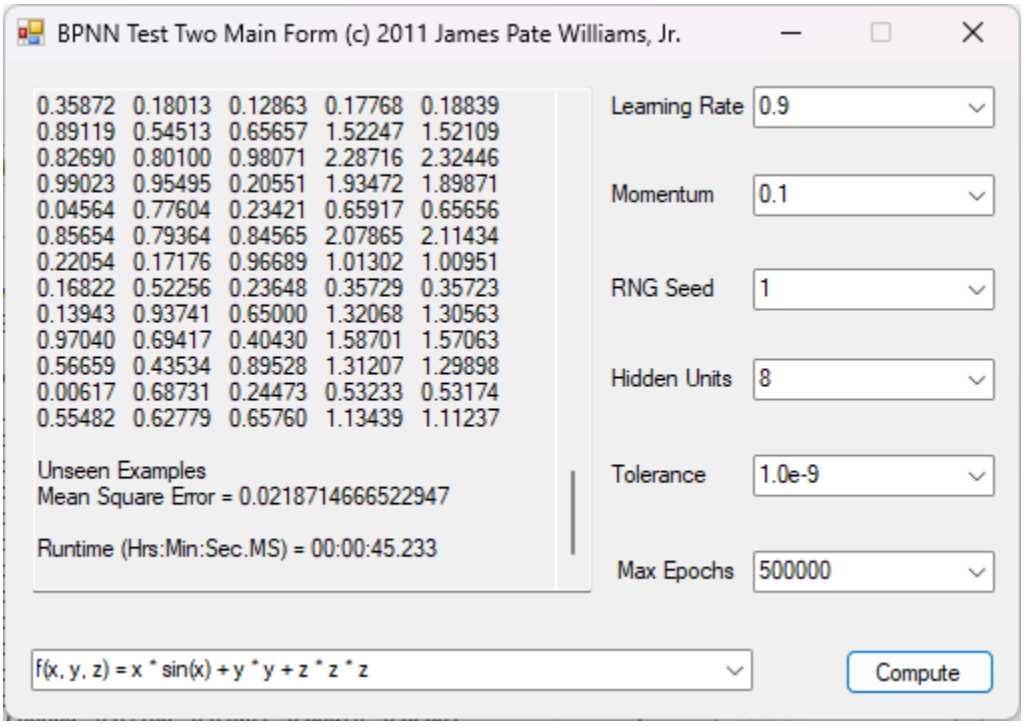

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x * sin(x) + y * y + z * z * z
Mean Square Error = 4.3769245546E-003
Epoch = 50000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.79044
0.98505 0.10900 0.30668 1.07625 1.06768
0.80214 0.44555 0.22498 0.89256 0.89438
0.01121 0.76537 0.02874 0.58674 0.57157
0.00756 0.51002 0.38209 0.40618 0.40740
0.27941 0.70309 0.23535 0.62779 0.63730
0.73132 0.08900 0.08265 0.54958 0.52806
0.33873 0.32991 0.73132 0.75840 0.76874
0.89595 0.81265 0.65355 1.89026 1.91614
0.92684 0.09924 0.69183 1.34750 1.34376
0.92548 0.98014 0.10142 1.82748 1.82023
0.03869 0.34105 0.84964 0.83970 0.83183
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 50000
f(x, y, z) = x * sin(x) + y * y + z * z * z
Compute

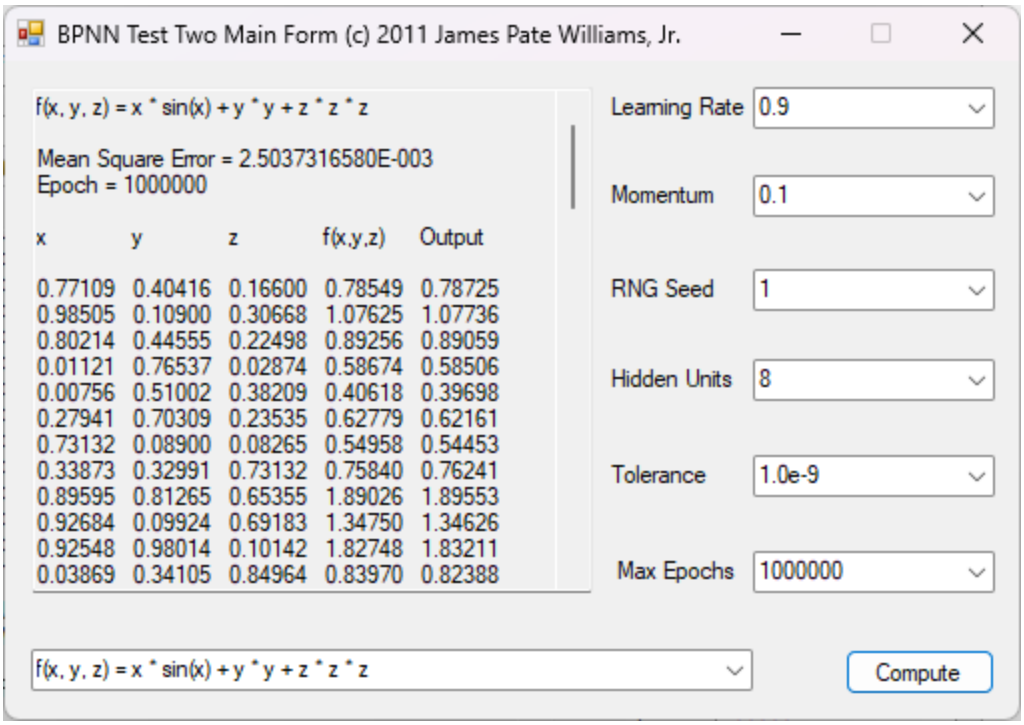

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.19519
0.89119 0.54513 0.65657 1.52247 1.52080
0.82690 0.80100 0.98071 2.28716 2.30564
0.99023 0.95495 0.20551 1.93472 1.91852
0.04564 0.77604 0.23421 0.65917 0.65152
0.85654 0.79364 0.84565 2.07865 2.11746
0.22054 0.17176 0.96689 1.01302 0.96893
0.16822 0.52256 0.23648 0.35729 0.36555
0.13943 0.93741 0.65000 1.32068 1.28009
0.97040 0.69417 0.40430 1.58701 1.58242
0.56659 0.43534 0.89528 1.31207 1.30506
0.00617 0.68731 0.24473 0.53233 0.52290
0.55482 0.62779 0.65760 1.13439 1.10242
Unseen Examples
Mean Square Error = 0.0254514014119654
Runtime (Hrs:Min:Sec.MS) = 00:00:04.489
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 50000
f(x, y, z) = x * sin(x) + y * y + z * z * z
Compute

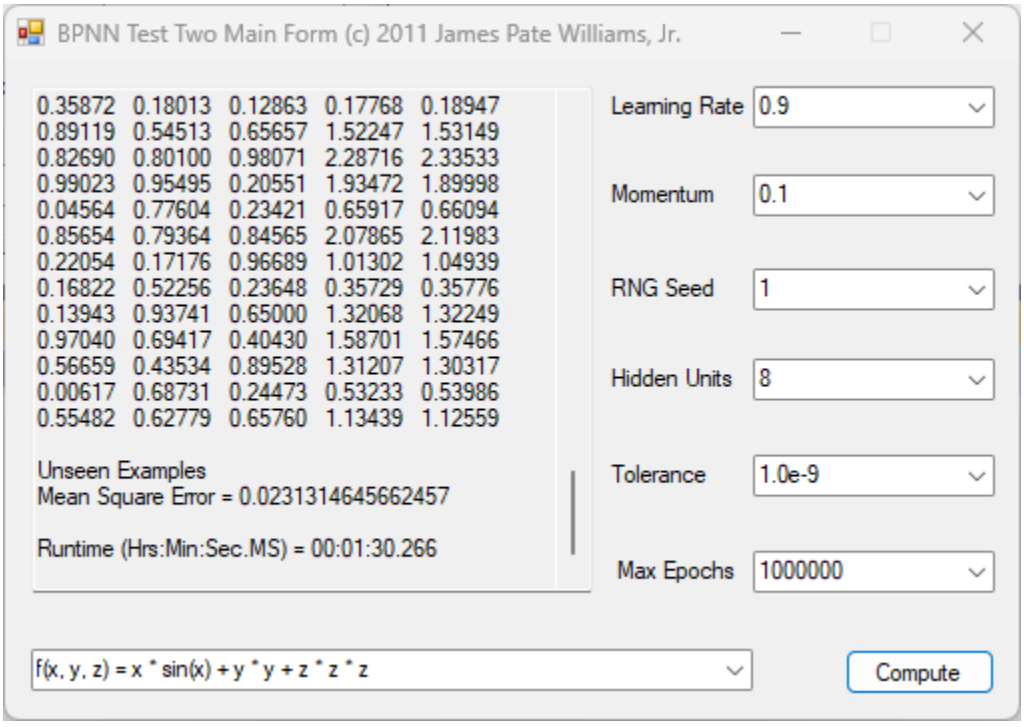

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x * sin(x) + y * y + z * z * z
Mean Square Error = 3.4204456359E-003
Epoch = 100000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.78646
0.98505 0.10900 0.30668 1.07625 1.06682
0.80214 0.44555 0.22498 0.89256 0.89646
0.01121 0.76537 0.02874 0.58674 0.58217
0.00756 0.51002 0.38209 0.40618 0.39911
0.27941 0.70309 0.23535 0.62779 0.63132
0.73132 0.08900 0.08265 0.54958 0.53317
0.33873 0.32991 0.73132 0.75840 0.77030
0.89595 0.81265 0.65355 1.89026 1.90614
0.92684 0.09924 0.69183 1.34750 1.34562
0.92548 0.98014 0.10142 1.82748 1.82193
0.03869 0.34105 0.84964 0.83970 0.82795
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 100000
f(x, y, z) = x * sin(x) + y * y + z * z * z
Compute

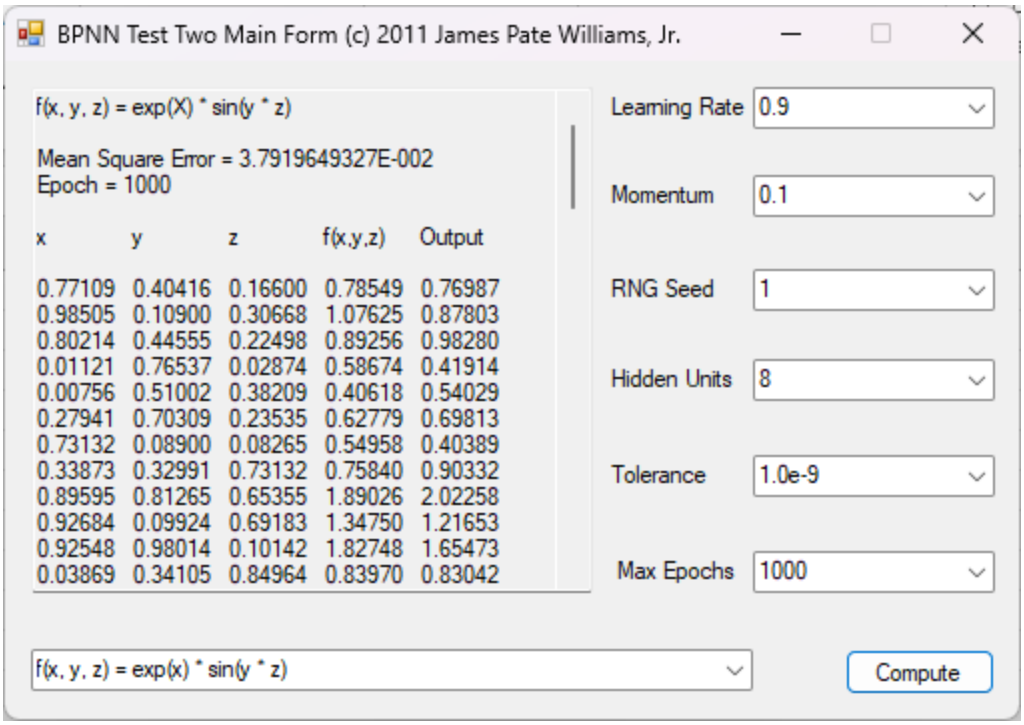

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.19116
0.89119 0.54513 0.65657 1.52247 1.52346
0.82690 0.80100 0.98071 2.28716 2.32115
0.99023 0.95495 0.20551 1.93472 1.90843
0.04564 0.77604 0.23421 0.65917 0.65264
0.85654 0.79364 0.84565 2.07865 2.12030
0.22054 0.17176 0.96689 1.01302 0.98789
0.16822 0.52256 0.23648 0.35729 0.36269
0.13943 0.93741 0.65000 1.32068 1.29078
0.97040 0.69417 0.40430 1.58701 1.57737
0.56659 0.43534 0.89528 1.31207 1.30140
0.00617 0.68731 0.24473 0.53233 0.52772
0.55482 0.62779 0.65760 1.13439 1.10471
Unseen Examples
Mean Square Error = 0.0241683706567405
Runtime (Hrs:Min:Sec.MS) = 00:00:09.062
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 100000
f(x, y, z) = x * sin(x) + y * y + z * z * z
Compute

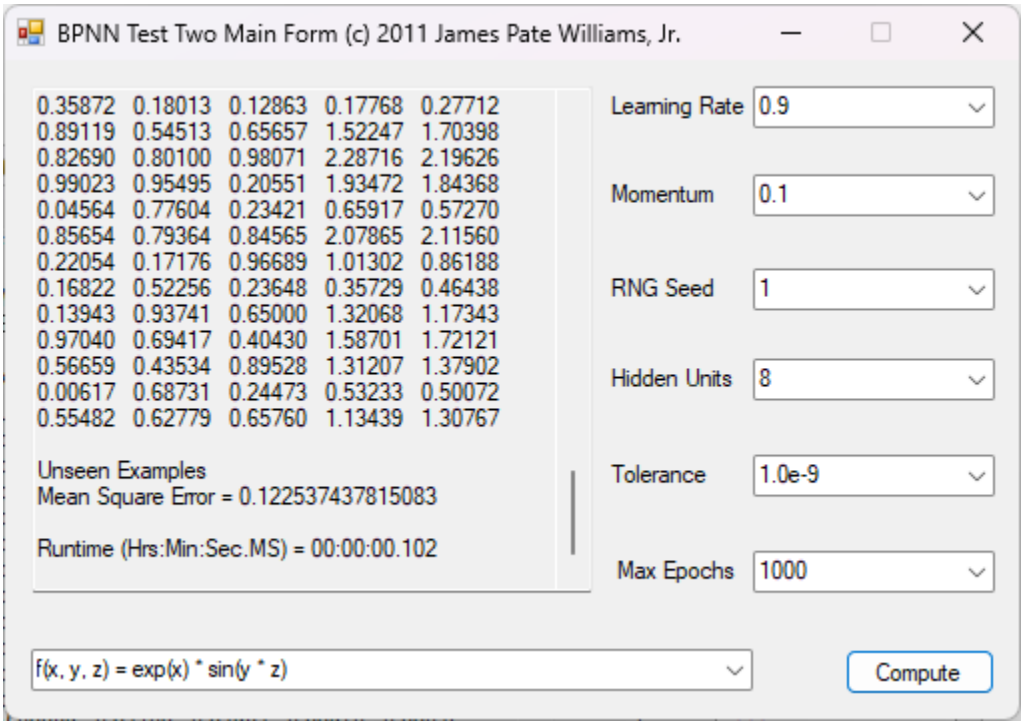

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x * sin(x) + y * y + z * z * z
Mean Square Error = 2.9382626476E-003
Epoch = 500000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.78680
0.98505 0.10900 0.30668 1.07625 1.06650
0.80214 0.44555 0.22498 0.89256 0.89899
0.01121 0.76537 0.02874 0.58674 0.58448
0.00756 0.51002 0.38209 0.40618 0.39337
0.27941 0.70309 0.23535 0.62779 0.62538
0.73132 0.08900 0.08265 0.54958 0.53724
0.33873 0.32991 0.73132 0.75840 0.77091
0.89595 0.81265 0.65355 1.89026 1.89639
0.92684 0.09924 0.69183 1.34750 1.34603
0.92548 0.98014 0.10142 1.82748 1.82617
0.03869 0.34105 0.84964 0.83970 0.82831
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 500000
f(x, y, z) = x * sin(x) + y * y + z * z * z
Compute

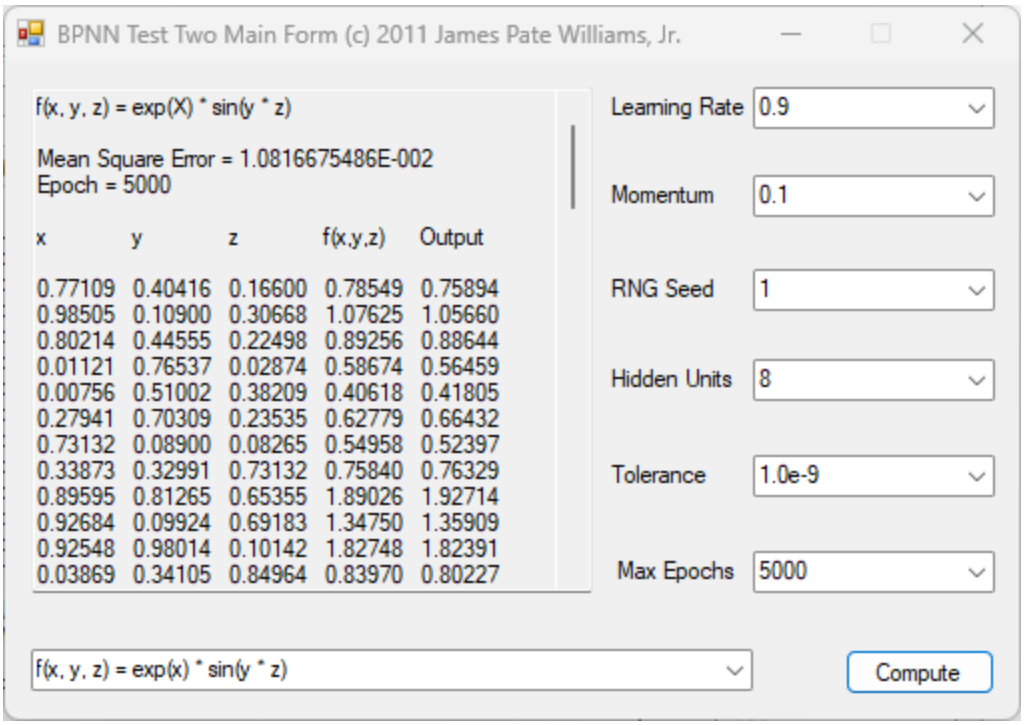

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.18839
0.89119 0.54513 0.65657 1.52247 1.52109
0.82690 0.80100 0.98071 2.28716 2.32446
0.99023 0.95495 0.20551 1.93472 1.89871
0.04564 0.77604 0.23421 0.65917 0.65656
0.85654 0.79364 0.84565 2.07865 2.11434
0.22054 0.17176 0.96689 1.01302 1.00951
0.16822 0.52256 0.23648 0.35729 0.35723
0.13943 0.93741 0.65000 1.32068 1.30563
0.97040 0.69417 0.40430 1.58701 1.57063
0.56659 0.43534 0.89528 1.31207 1.29898
0.00617 0.68731 0.24473 0.53233 0.53174
0.55482 0.62779 0.65760 1.13439 1.11237
Unseen Examples
Mean Square Error = 0.0218714666522947
Runtime (Hrs:Min:Sec.MS) = 00:00:45.233
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 500000
f(x, y, z) = x * sin(x) + y * y + z * z * z
Compute

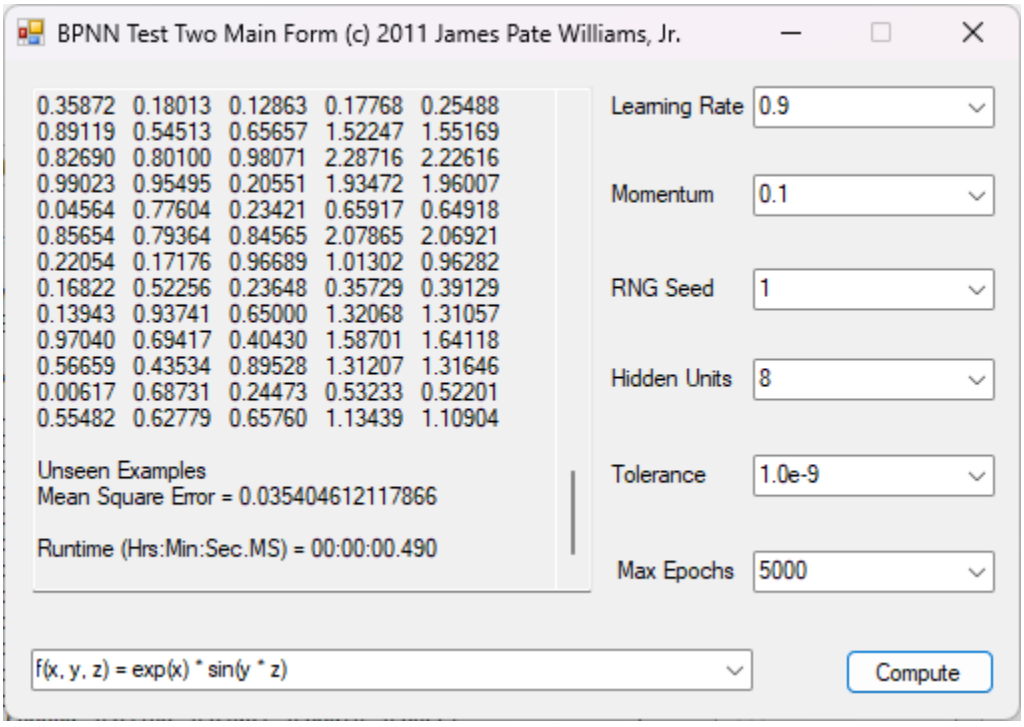

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = x * sin(x) + y * y + z * z * z
Mean Square Error = 2.5037316580E-003
Epoch = 1000000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.78725
0.98505 0.10900 0.30668 1.07625 1.07736
0.80214 0.44555 0.22498 0.89256 0.89059
0.01121 0.76537 0.02874 0.58674 0.58506
0.00756 0.51002 0.38209 0.40618 0.39698
0.27941 0.70309 0.23535 0.62779 0.62161
0.73132 0.08900 0.08265 0.54958 0.54453
0.33873 0.32991 0.73132 0.75840 0.76241
0.89595 0.81265 0.65355 1.89026 1.89553
0.92684 0.09924 0.69183 1.34750 1.34626
0.92548 0.98014 0.10142 1.82748 1.83211
0.03869 0.34105 0.84964 0.83970 0.82388
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 1000000
f(x, y, z) = x * sin(x) + y * y + z * z * z
Compute

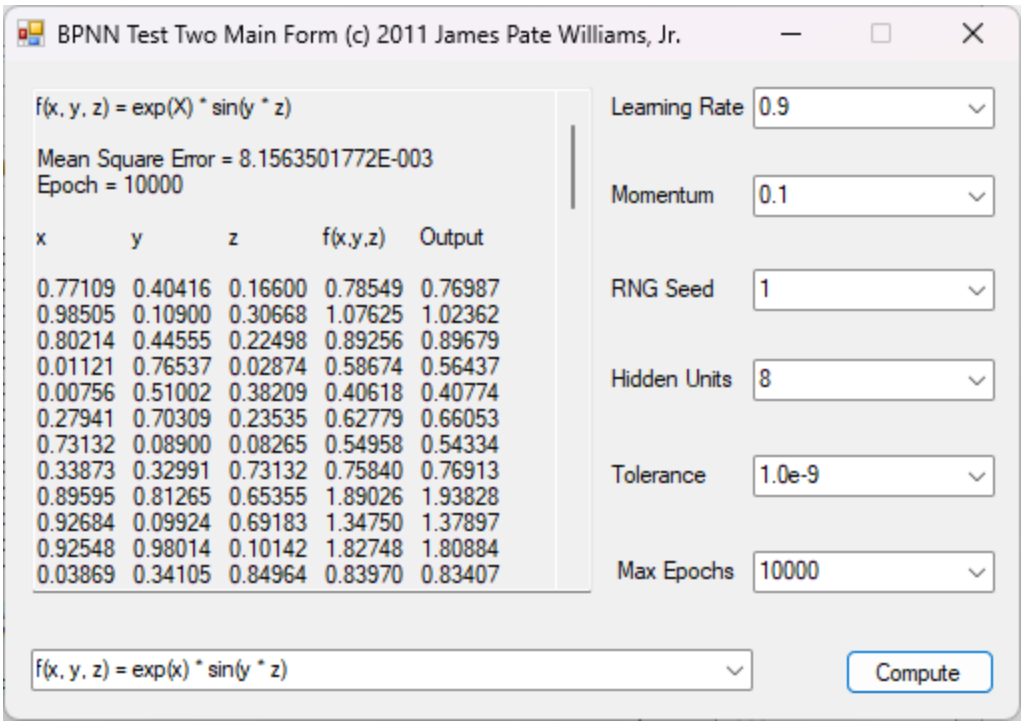

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.18947
0.89119 0.54513 0.65657 1.52247 1.53149
0.82690 0.80100 0.98071 2.28716 2.33533
0.99023 0.95495 0.20551 1.93472 1.89998
0.04564 0.77604 0.23421 0.65917 0.66094
0.85654 0.79364 0.84565 2.07865 2.11983
0.22054 0.17176 0.96689 1.01302 1.04939
0.16822 0.52256 0.23648 0.35729 0.35776
0.13943 0.93741 0.65000 1.32068 1.32249
0.97040 0.69417 0.40430 1.58701 1.57466
0.56659 0.43534 0.89528 1.31207 1.30317
0.00617 0.68731 0.24473 0.53233 0.53986
0.55482 0.62779 0.65760 1.13439 1.12559
Unseen Examples
Mean Square Error = 0.0231314645662457
Runtime (Hrs:Min:Sec.MS) = 00:01:30.266
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 1000000
f(x, y, z) = x * sin(x) + y * y + z * z * z
Compute

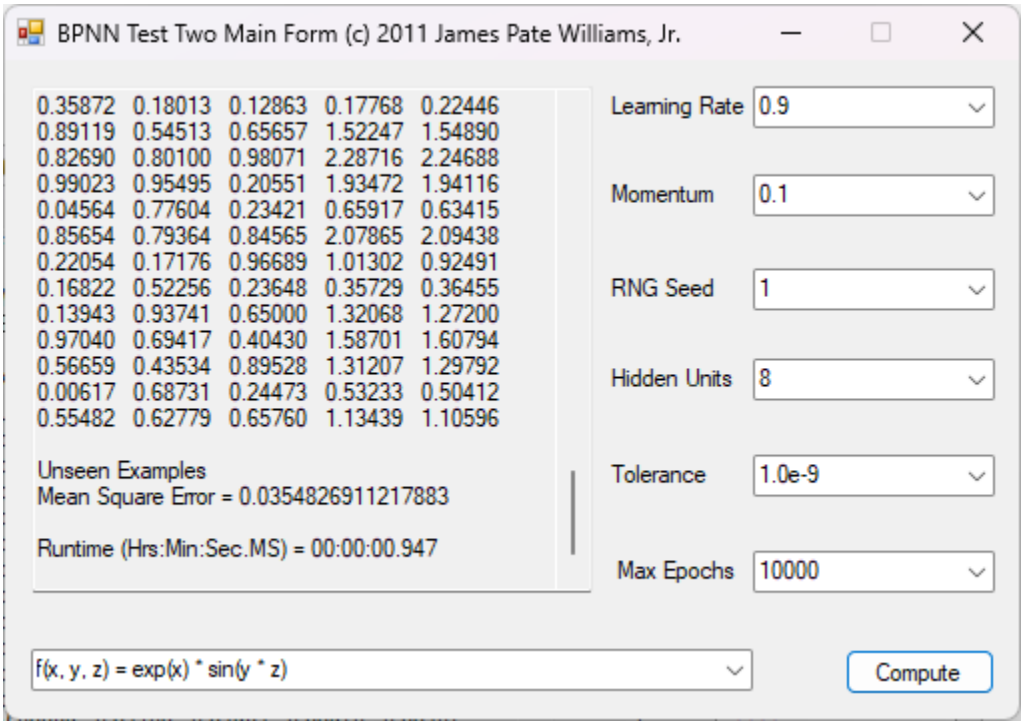

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = exp(X) * sin(y * z)
Mean Square Error = 3.7919649327E-002
Epoch = 1000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.76987
0.98505 0.10900 0.30668 1.07625 0.87803
0.80214 0.44555 0.22498 0.89256 0.98280
0.01121 0.76537 0.02874 0.58674 0.41914
0.00756 0.51002 0.38209 0.40618 0.54029
0.27941 0.70309 0.23535 0.62779 0.69813
0.73132 0.08900 0.08265 0.54958 0.40389
0.33873 0.32991 0.73132 0.75840 0.90332
0.89595 0.81265 0.65355 1.89026 2.02258
0.92684 0.09924 0.69183 1.34750 1.21653
0.92548 0.98014 0.10142 1.82748 1.65473
0.03869 0.34105 0.84964 0.83970 0.83042
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 1000
f(x, y, z) = exp(x) * sin(y * z)
Compute

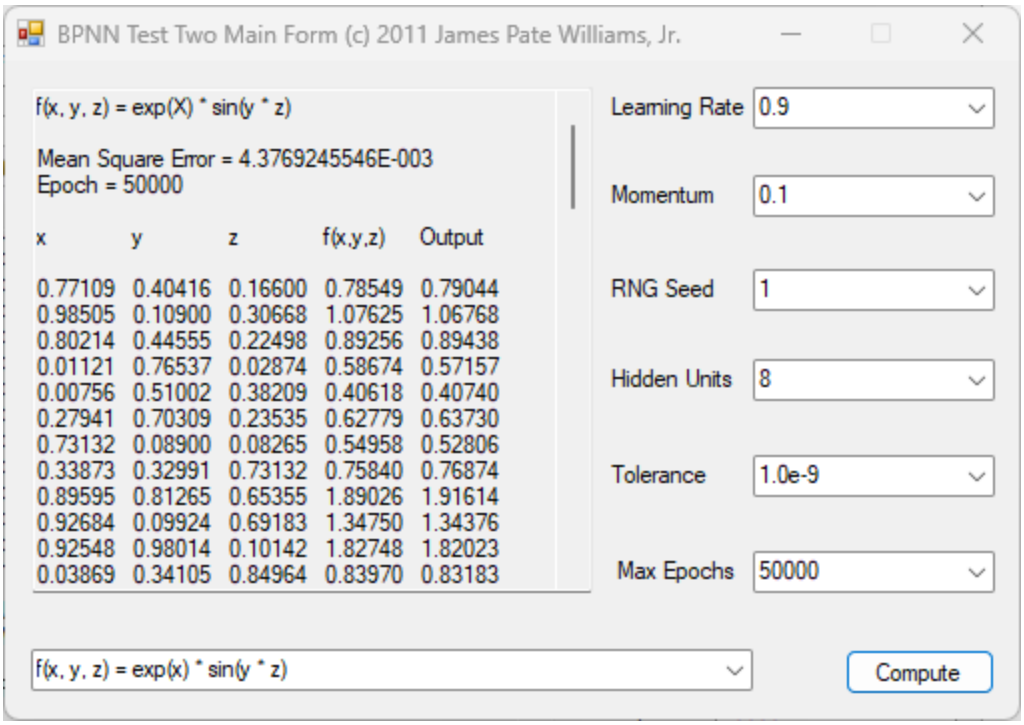

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.27712
0.89119 0.54513 0.65657 1.52247 1.70398
0.82690 0.80100 0.98071 2.28716 2.19626
0.99023 0.95495 0.20551 1.93472 1.84368
0.04564 0.77604 0.23421 0.65917 0.57270
0.85654 0.79364 0.84565 2.07865 2.11560
0.22054 0.17176 0.96689 1.01302 0.86188
0.16822 0.52256 0.23648 0.35729 0.46438
0.13943 0.93741 0.65000 1.32068 1.17343
0.97040 0.69417 0.40430 1.58701 1.72121
0.56659 0.43534 0.89528 1.31207 1.37902
0.00617 0.68731 0.24473 0.53233 0.50072
0.55482 0.62779 0.65760 1.13439 1.30767
Unseen Examples
Mean Square Error = 0.122537437815083
Runtime (Hrs:Min:Sec.MS) = 00:00:00.102
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 1000
f(x, y, z) = exp(x) * sin(y * z)
Compute

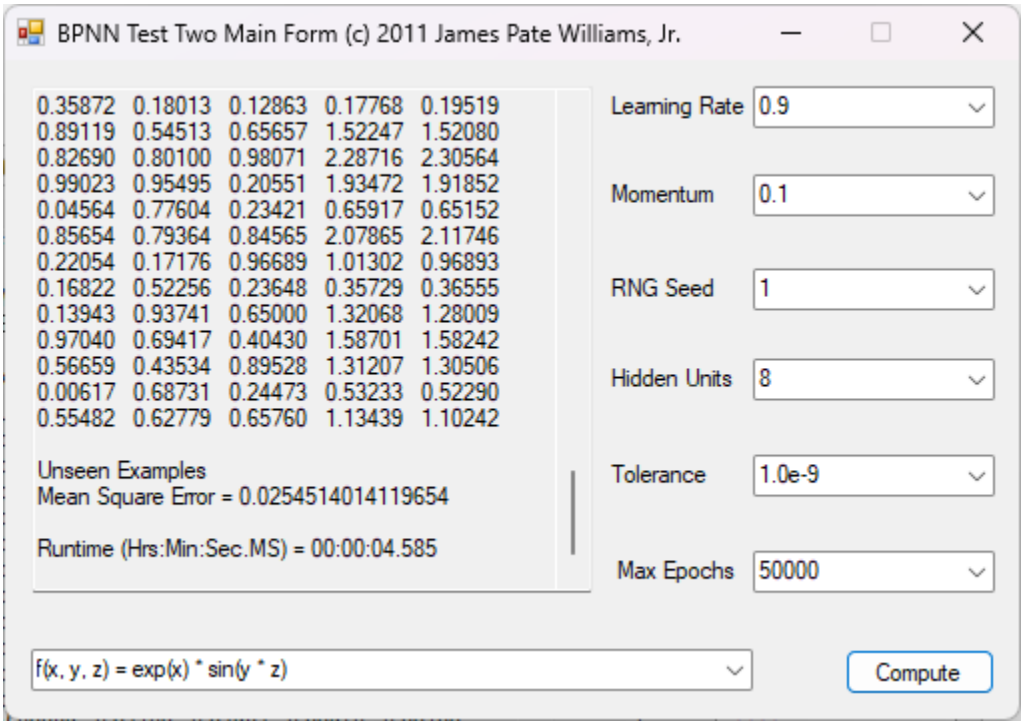

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = exp(X) * sin(y * z)
Mean Square Error = 1.0816675486E-002
Epoch = 5000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.75894
0.98505 0.10900 0.30668 1.07625 1.05660
0.80214 0.44555 0.22498 0.89256 0.88644
0.01121 0.76537 0.02874 0.58674 0.56459
0.00756 0.51002 0.38209 0.40618 0.41805
0.27941 0.70309 0.23535 0.62779 0.66432
0.73132 0.08900 0.08265 0.54958 0.52397
0.33873 0.32991 0.73132 0.75840 0.76329
0.89595 0.81265 0.65355 1.89026 1.92714
0.92684 0.09924 0.69183 1.34750 1.35909
0.92548 0.98014 0.10142 1.82748 1.82391
0.03869 0.34105 0.84964 0.83970 0.80227
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 5000
f(x, y, z) = exp(x) * sin(y * z)
Compute

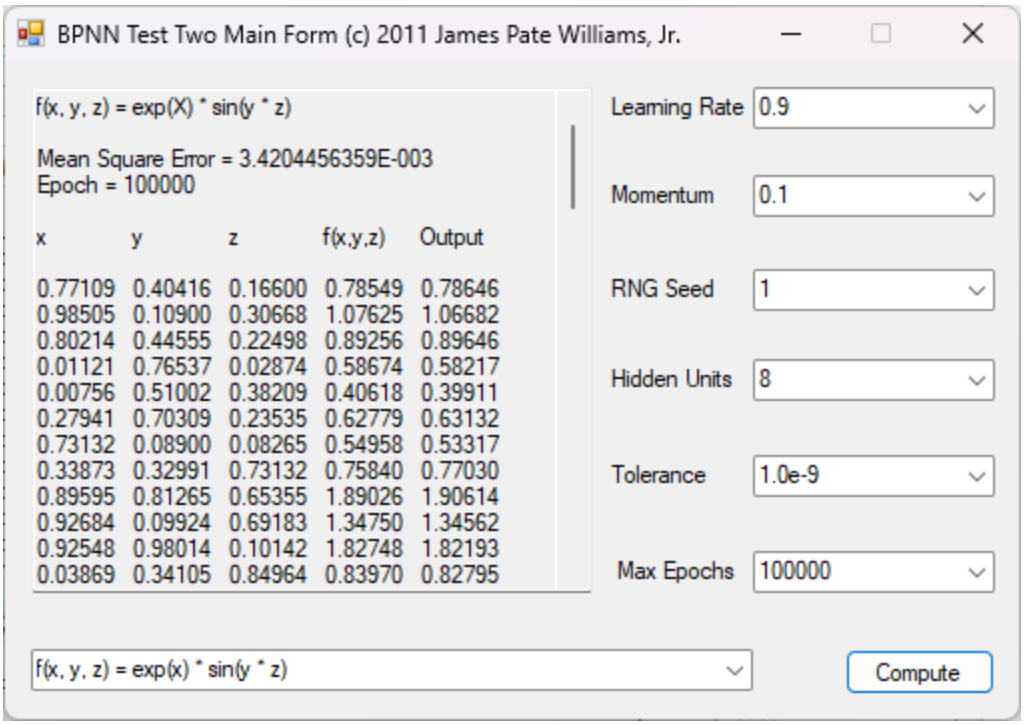

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.25488
0.89119 0.54513 0.65657 1.52247 1.55169
0.82690 0.80100 0.98071 2.28716 2.22616
0.99023 0.95495 0.20551 1.93472 1.96007
0.04564 0.77604 0.23421 0.65917 0.64918
0.85654 0.79364 0.84565 2.07865 2.06921
0.22054 0.17176 0.96689 1.01302 0.96282
0.16822 0.52256 0.23648 0.35729 0.39129
0.13943 0.93741 0.65000 1.32068 1.31057
0.97040 0.69417 0.40430 1.58701 1.64118
0.56659 0.43534 0.89528 1.31207 1.31646
0.00617 0.68731 0.24473 0.53233 0.52201
0.55482 0.62779 0.65760 1.13439 1.10904
Unseen Examples
Mean Square Error = 0.035404612117866
Runtime (Hrs:Min:Sec.MS) = 00:00:00.490
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 5000
f(x, y, z) = exp(x) * sin(y * z)
Compute

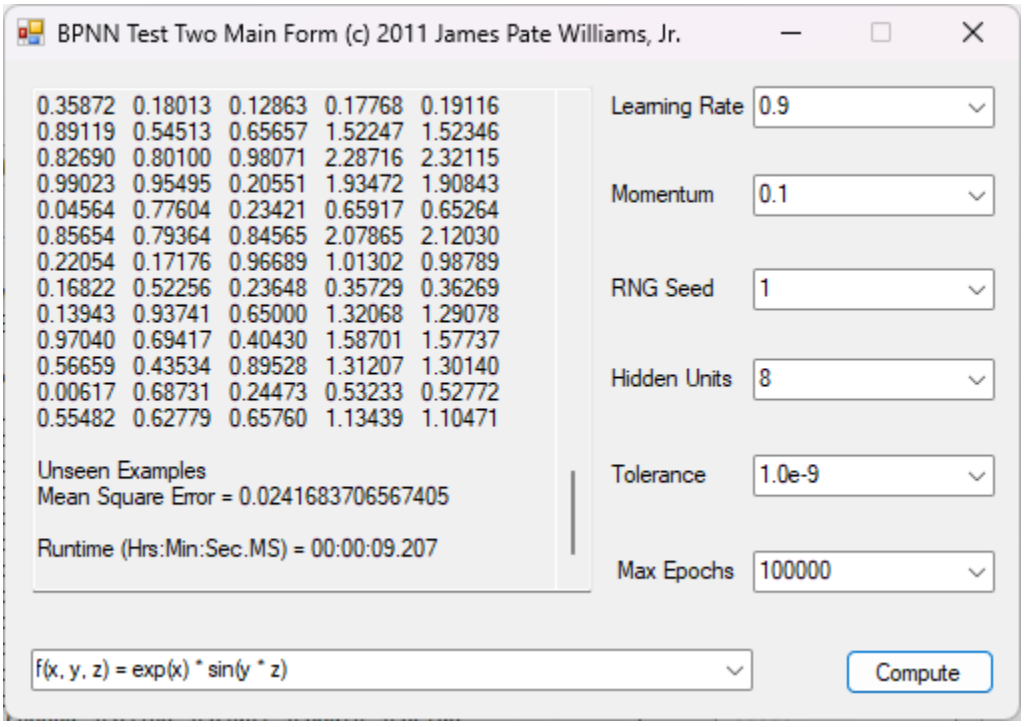

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = exp(X) * sin(y * z)
Mean Square Error = 8.1563501772E-003
Epoch = 10000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.76987
0.98505 0.10900 0.30668 1.07625 1.02362
0.80214 0.44555 0.22498 0.89256 0.89679
0.01121 0.76537 0.02874 0.58674 0.56437
0.00756 0.51002 0.38209 0.40618 0.40774
0.27941 0.70309 0.23535 0.62779 0.66053
0.73132 0.08900 0.08265 0.54958 0.54334
0.33873 0.32991 0.73132 0.75840 0.76913
0.89595 0.81265 0.65355 1.89026 1.93828
0.92684 0.09924 0.69183 1.34750 1.37897
0.92548 0.98014 0.10142 1.82748 1.80884
0.03869 0.34105 0.84964 0.83970 0.83407
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 10000
f(x, y, z) = exp(x) * sin(y * z)
Compute

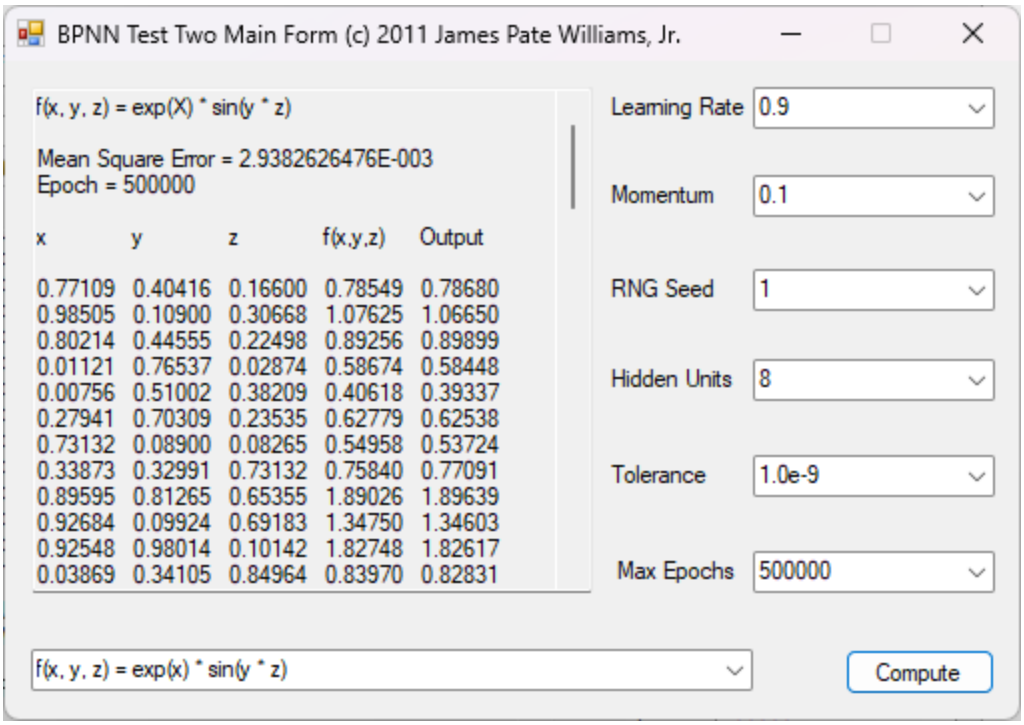

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.22446
0.89119 0.54513 0.65657 1.52247 1.54890
0.82690 0.80100 0.98071 2.28716 2.24688
0.99023 0.95495 0.20551 1.93472 1.94116
0.04564 0.77604 0.23421 0.65917 0.63415
0.85654 0.79364 0.84565 2.07865 2.09438
0.22054 0.17176 0.96689 1.01302 0.92491
0.16822 0.52256 0.23648 0.35729 0.36455
0.13943 0.93741 0.65000 1.32068 1.27200
0.97040 0.69417 0.40430 1.58701 1.60794
0.56659 0.43534 0.89528 1.31207 1.29792
0.00617 0.68731 0.24473 0.53233 0.50412
0.55482 0.62779 0.65760 1.13439 1.10596
Unseen Examples
Mean Square Error = 0.0354826911217883
Runtime (Hrs:Min:Sec.MS) = 00:00:00.947
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 10000
f(x, y, z) = exp(x) * sin(y * z)
Compute

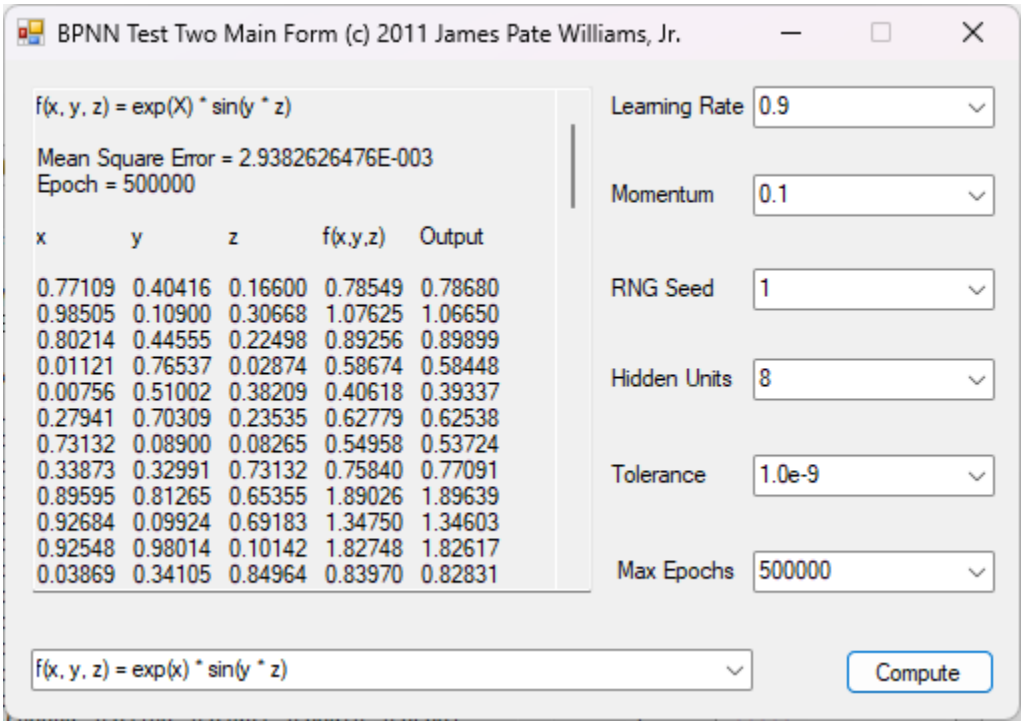

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = exp(X) * sin(y * z)
Mean Square Error = 4.3769245546E-003
Epoch = 50000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.79044
0.98505 0.10900 0.30668 1.07625 1.06768
0.80214 0.44555 0.22498 0.89256 0.89438
0.01121 0.76537 0.02874 0.58674 0.57157
0.00756 0.51002 0.38209 0.40618 0.40740
0.27941 0.70309 0.23535 0.62779 0.63730
0.73132 0.08900 0.08265 0.54958 0.52806
0.33873 0.32991 0.73132 0.75840 0.76874
0.89595 0.81265 0.65355 1.89026 1.91614
0.92684 0.09924 0.69183 1.34750 1.34376
0.92548 0.98014 0.10142 1.82748 1.82023
0.03869 0.34105 0.84964 0.83970 0.83183
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 50000
f(x, y, z) = exp(x) * sin(y * z)
Compute

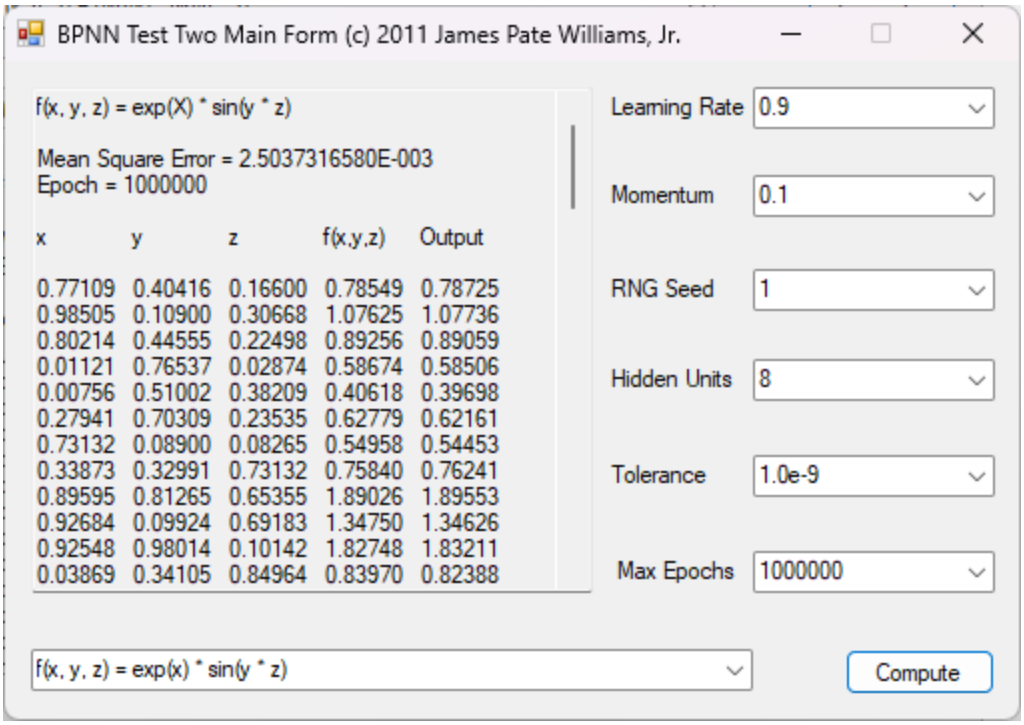

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.19519
0.89119 0.54513 0.65657 1.52247 1.52080
0.82690 0.80100 0.98071 2.28716 2.30564
0.99023 0.95495 0.20551 1.93472 1.91852
0.04564 0.77604 0.23421 0.65917 0.65152
0.85654 0.79364 0.84565 2.07865 2.11746
0.22054 0.17176 0.96689 1.01302 0.96893
0.16822 0.52256 0.23648 0.35729 0.36555
0.13943 0.93741 0.65000 1.32068 1.28009
0.97040 0.69417 0.40430 1.58701 1.58242
0.56659 0.43534 0.89528 1.31207 1.30506
0.00617 0.68731 0.24473 0.53233 0.52290
0.55482 0.62779 0.65760 1.13439 1.10242
Unseen Examples
Mean Square Error = 0.0254514014119654
Runtime (Hrs:Min:Sec.MS) = 00:00:04.585
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 50000
f(x, y, z) = exp(x) * sin(y * z)
Compute

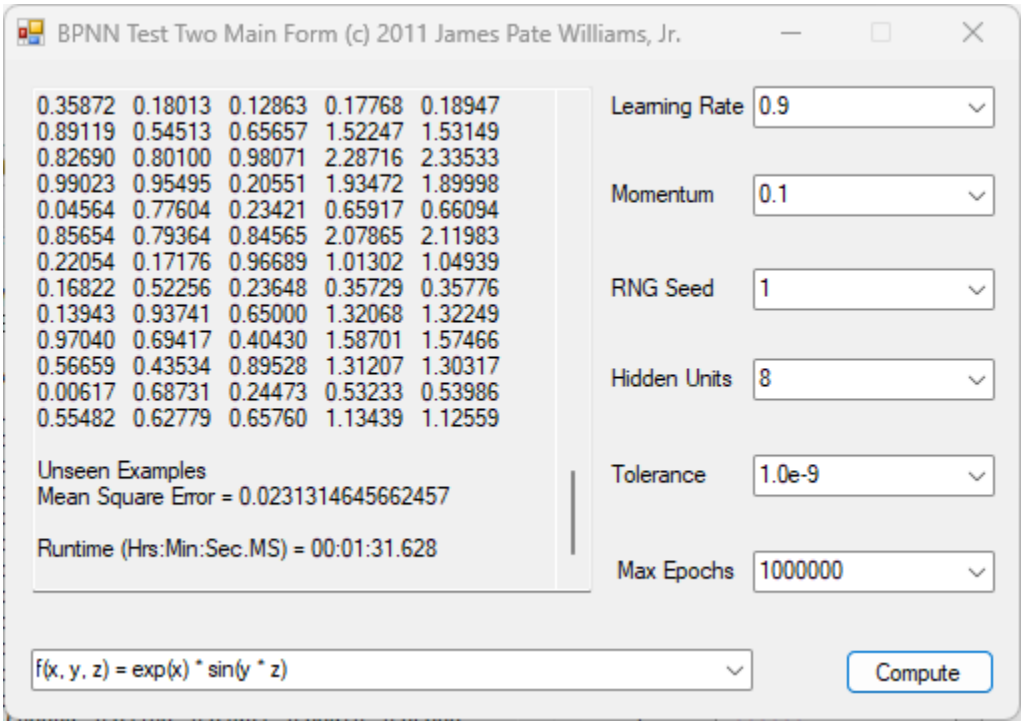

BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = exp(X) * sin(y * z)
Mean Square Error = 3.4204456359E-003
Epoch = 100000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.78646
0.98505 0.10900 0.30668 1.07625 1.06682
0.80214 0.44555 0.22498 0.89256 0.89646
0.01121 0.76537 0.02874 0.58674 0.58217
0.00756 0.51002 0.38209 0.40618 0.39911
0.27941 0.70309 0.23535 0.62779 0.63132
0.73132 0.08900 0.08265 0.54958 0.53317
0.33873 0.32991 0.73132 0.75840 0.77030
0.89595 0.81265 0.65355 1.89026 1.90614
0.92684 0.09924 0.69183 1.34750 1.34562
0.92548 0.98014 0.10142 1.82748 1.82193
0.03869 0.34105 0.84964 0.83970 0.82795
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 100000
f(x, y, z) = exp(x) * sin(y * z)
Compute


BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.19116
0.89119 0.54513 0.65657 1.52247 1.52346
0.82690 0.80100 0.98071 2.28716 2.32115
0.99023 0.95495 0.20551 1.93472 1.90843
0.04564 0.77604 0.23421 0.65917 0.65264
0.85654 0.79364 0.84565 2.07865 2.12030
0.22054 0.17176 0.96689 1.01302 0.98789
0.16822 0.52256 0.23648 0.35729 0.36269
0.13943 0.93741 0.65000 1.32068 1.29078
0.97040 0.69417 0.40430 1.58701 1.57737
0.56659 0.43534 0.89528 1.31207 1.30140
0.00617 0.68731 0.24473 0.53233 0.52772
0.55482 0.62779 0.65760 1.13439 1.10471
Unseen Examples
Mean Square Error = 0.0241683706567405
Runtime (Hrs:Min:Sec.MS) = 00:00:09.207
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 100000
f(x, y, z) = exp(x) * sin(y * z)
Compute


BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = exp(X) * sin(y * z)
Mean Square Error = 2.9382626476E-003
Epoch = 500000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.78680
0.98505 0.10900 0.30668 1.07625 1.06650
0.80214 0.44555 0.22498 0.89256 0.89899
0.01121 0.76537 0.02874 0.58674 0.58448
0.00756 0.51002 0.38209 0.40618 0.39337
0.27941 0.70309 0.23535 0.62779 0.62538
0.73132 0.08900 0.08265 0.54958 0.53724
0.33873 0.32991 0.73132 0.75840 0.77091
0.89595 0.81265 0.65355 1.89026 1.89639
0.92684 0.09924 0.69183 1.34750 1.34603
0.92548 0.98014 0.10142 1.82748 1.82617
0.03869 0.34105 0.84964 0.83970 0.82831
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 500000
f(x, y, z) = exp(x) * sin(y * z)
Compute


BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = exp(X) * sin(y * z)
Mean Square Error = 2.9382626476E-003
Epoch = 500000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.78680
0.98505 0.10900 0.30668 1.07625 1.06650
0.80214 0.44555 0.22498 0.89256 0.89899
0.01121 0.76537 0.02874 0.58674 0.58448
0.00756 0.51002 0.38209 0.40618 0.39337
0.27941 0.70309 0.23535 0.62779 0.62538
0.73132 0.08900 0.08265 0.54958 0.53724
0.33873 0.32991 0.73132 0.75840 0.77091
0.89595 0.81265 0.65355 1.89026 1.89639
0.92684 0.09924 0.69183 1.34750 1.34603
0.92548 0.98014 0.10142 1.82748 1.82617
0.03869 0.34105 0.84964 0.83970 0.82831
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 500000
f(x, y, z) = exp(x) * sin(y * z)
Compute


BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
f(x, y, z) = exp(X) * sin(y * z)
Mean Square Error = 2.5037316580E-003
Epoch = 1000000
x y z f(x,y,z) Output
0.77109 0.40416 0.16600 0.78549 0.78725
0.98505 0.10900 0.30668 1.07625 1.07736
0.80214 0.44555 0.22498 0.89256 0.89059
0.01121 0.76537 0.02874 0.58674 0.58506
0.00756 0.51002 0.38209 0.40618 0.39698
0.27941 0.70309 0.23535 0.62779 0.62161
0.73132 0.08900 0.08265 0.54958 0.54453
0.33873 0.32991 0.73132 0.75840 0.76241
0.89595 0.81265 0.65355 1.89026 1.89553
0.92684 0.09924 0.69183 1.34750 1.34626
0.92548 0.98014 0.10142 1.82748 1.83211
0.03869 0.34105 0.84964 0.83970 0.82388
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 1000000
f(x, y, z) = exp(x) * sin(y * z)
Compute


BPNN Test Two Main Form (c) 2011 James Pate Williams, Jr.
0.35872 0.18013 0.12863 0.17768 0.18947
0.89119 0.54513 0.65657 1.52247 1.53149
0.82690 0.80100 0.98071 2.28716 2.33533
0.99023 0.95495 0.20551 1.93472 1.89998
0.04564 0.77604 0.23421 0.65917 0.66094
0.85654 0.79364 0.84565 2.07865 2.11983
0.22054 0.17176 0.96689 1.01302 1.04939
0.16822 0.52256 0.23648 0.35729 0.35776
0.13943 0.93741 0.65000 1.32068 1.32249
0.97040 0.69417 0.40430 1.58701 1.57466
0.56659 0.43534 0.89528 1.31207 1.30317
0.00617 0.68731 0.24473 0.53233 0.53986
0.55482 0.62779 0.65760 1.13439 1.12559
Unseen Examples
Mean Square Error = 0.0231314645662457
Runtime (Hrs:Min:Sec.MS) = 00:01:31.628
Learning Rate 0.9
Momentum 0.1
RNG Seed 1
Hidden Units 8
Tolerance 1.0e-9
Max Epochs 1000000
f(x, y, z) = exp(x) * sin(y * z)
Compute