Preliminary Report for Homework 2

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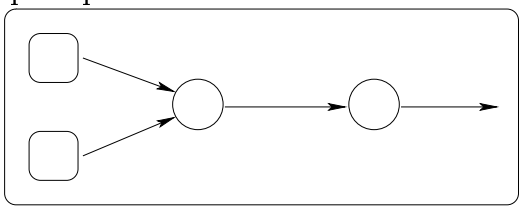
For this assignment I had to implement a neural network. For the assignment I had to update the weights using gradient descent. All confidence intervals are a 95% confidence intervals.

Here are the results I got. For the first expirement I used a simple 2 layer network with only 1 neuron in each layer. As you can see this is just simple the perceptron network.



I varied the learning rate and here are the results:

For data set 1 I got the following values

	.1	.3	.7
class1	.08%	.02%	0%
class2	14.7%	17.2%	13.5%
total	4.48%	5.18%	4.06%
interval	[.039, .0505]	[.0456, .0579]	[.0351, .046]

For data set 1 I got the following times:

	.1	.3	.7
total	.04 sec	.04 sec	.04 sec

For data set 2 I got the following values

	.1	.3	.7
class1	0%	0%	0%
class2	38.2%	42.1%	45.1%
total	7.64%	8.42%	9.02%
interval	[.069, .083]	[.077, .091]	[.082, .098]

For data set 2 I got the following times:

	.1	.3	.7
total	.03 sec	.03 sec	.03 sec

For data set 3 I got the following values

	.1	.3	.7
class1	11.3%	31.6%	31.6%
class2	.96%	.44%	.44%
total	6.14%	16.04%	16.02%
interval	[.055, .068]	[.150, .171]	[.150, .170]

For data set 3 I got the following times:

	.1	.3	.7
total	.03 sec	.11 sec	.06 sec

For data set 4 I got the following values

	.1	.3	.7
class1	39.7%	24.8%	23.3%
class2	7.55%	11.9%	.75%
total	26.86%	19.6%	14.3%
interval	[.256, .281]	[.185, .207]	[.133, .152]

For data set 4 I got the following times:

	.1	.3	.7
total	.04 sec	.04 sec	.03 sec

For data set 5 I got the following values

	.1	.3	.7
class1	34.1%	51.8%	50%
class2	42.9%	58.7%	37.9%
total	37.6%	54.6%	45.2%
interval	[.362, .389]	[.532, .560]	[.437, .465]

For data set 5 I got the following times:

	.1	.3	.7
total	.06 sec	.16 sec	4.87 sec

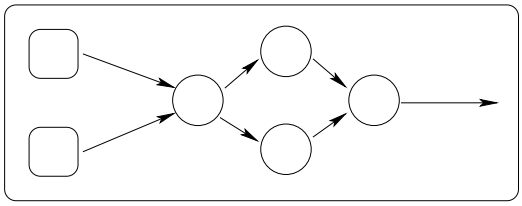
For data set 6, I constructed two classifiers and used each of those two classifiers to predict my final output.
For data set 6 I got the following values

	.1	.3	.7
class1	0%	0%	0%
class2	100%	100%	100%
class3	100%	100%	100%
class4	100%	100%	100%
total	58%	58%	58%
interval	[.566, .593]	[.566, .593]	[.566, .593]

For data set 6 I got the following times:

	.1	.3	.7
total	.07 sec	.07 sec	.08 sec

Now I constructed a network with 3 layers, one of them being a hidden layer. The hidden layer has two neurons.



I varied the learning rate and here are the results:

For data set 1 I got the following values

	.1	.3	.7
class1	.03%	.03%	.03%
class2	6.67%	5.33%	5.4%
total	4.64%	3.46%	3.62%
interval	[.041, .0522]	[.0295, .0397]	[.031, .0413]

For data set 1 I got the following times:

	.1	.3	.7
total	.05 sec	.05 sec	.05 sec

For data set 2 I got the following values

	.1	.3	.7
class1	0%	0%	0%
class2	35%	35.1%	35.1%
total	7%	7.02%	7.02%
interval	[.0629, .077]	[.063, .077]	[.063, .077]

For data set 2 I got the following times:

	.1	.3	.7
total	.05 sec	.04 sec	.04 sec

For data set 3 I got the following values

	.1	.3	.7
class1	14.68%	7.52%	9.72%
class2	.76%	1.36%	1.04%
total	7.72%	4.44%	5.38%
interval	[.070, .085]	[.039, .050]	[.048, .060]

For data set 3 I got the following times:

	.1	.3	.7
total	.04 sec	.04 sec	.05 sec

For data set 4 I got the following values

	.1	.3	.7
class1	48.7%	.167%	46.8%
class2	.55%	.6%	.55%
total	29.4%	.34%	30.04%
interval	[.281, .307]	[.002, .005]	[.288, .313]

For data set 4 I got the following times:

	.1	.3	.7
total	.12 sec	.1 sec	.06 sec

For data set 5 I got the following values

	.1	.3	.7
class1	21.8%	50.7%	49.9%
class2	44.8%	58.2%	58%
total	30.98%	53.72%	53.14%
interval	[.297, .322]	[.523, .551]	[.517, .545]

For data set 5 I got the following times:

	.1	.3	.7
total	.17 sec	.31 sec	.16 sec

For data set 6, I constructed two classifiers and used each of those two classifiers to predict my final output.
For data set 6 I got the following values

	.1	.3	.7
class1	0%	0%	0%
class2	100%	100%	100%
class3	100%	100%	100%
class4	100%	100%	100%
total	58%	58%	58%
interval	[.566, .593]	[.566, .593]	[.566, .593]

For data set 6 I got the following times:

	.1	.3	.7
total	.08 sec	.08 sec	.08 sec