Assignment 3

(1) The input to this problem is the times for every hour between 5:00 AM and 1:00 PM inclusive. The output is temperature predicted for that particular time.

(2) The activation function used is a supervised learning method using least mean squared gradient descent. This algorithm was chosen because the trend in the training data set is linear and a least mean squared gradient descent approach made the most sense.

(3)
Training Error

Output(Desired)	Output(Actual)	Absolute Error
60.0	57.427	2.573
63.0	62.081	0.918
70.0	66.735	3.265
73.0	71.389	1.610
78.0	76.044	1.956
81.5	80.698	0.802
85.1	85.352	0.252
87.0	90.006	3.006
90.0	94.660	4.660
60.5	57.427	3.073
62.0	62.081	0.081
69.7	66.735	2.965
73.1	71.390	1.710
77.5	76.044	1.456
81.0	80.698	0.302
84.8	85.352	0.552
86.2	90.006	3.806

92.0	94.661	2.661
59.0	57.427	1.573
63.2	62.081	1.119
69.0	66.735	2.265
74.15	71.390	2.760
79.1	76.044	3.056
82.6	80.698	1.902
86.2	85.352	0.848
88.1	90.006	1.906
91.1	94.661	3.561

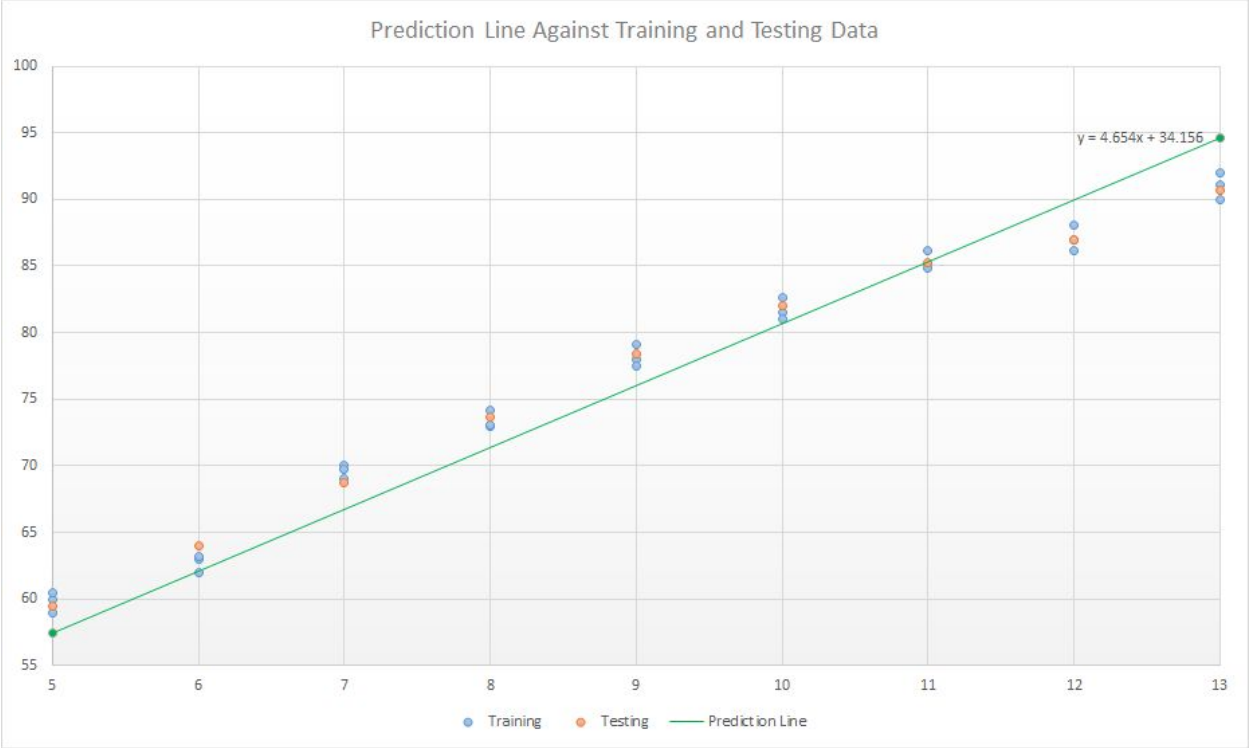
(4)
Testing Error

Output (desired)	Output (actual)	Absolute Error
59.5	57.427	2.073
64.0	62.081	1.919
68.7	66.735	1.965
73.65	71.390	2.260
78.43	76.044	2.386
82.0	80.698	1.302
85.2	85.352	0.152
87.0	90.006	3.006
90.67	94.661	3.991

(5)
Iterations: 500
Learning rate: 0.00062
Data preprocessing: none

(6) Yes, with more iterations the weights converge to values that more accurately predict the fourth day's temperatures.

(7) Yes, because the neural network can analyze the problem with more levels of abstraction than a single decision unit.



Weights:
W0 = 34.156
W1 = 4.654