Task 1

N	# of Validation Errors
5	107
50	40
100	27
200	17
400	9
800	12

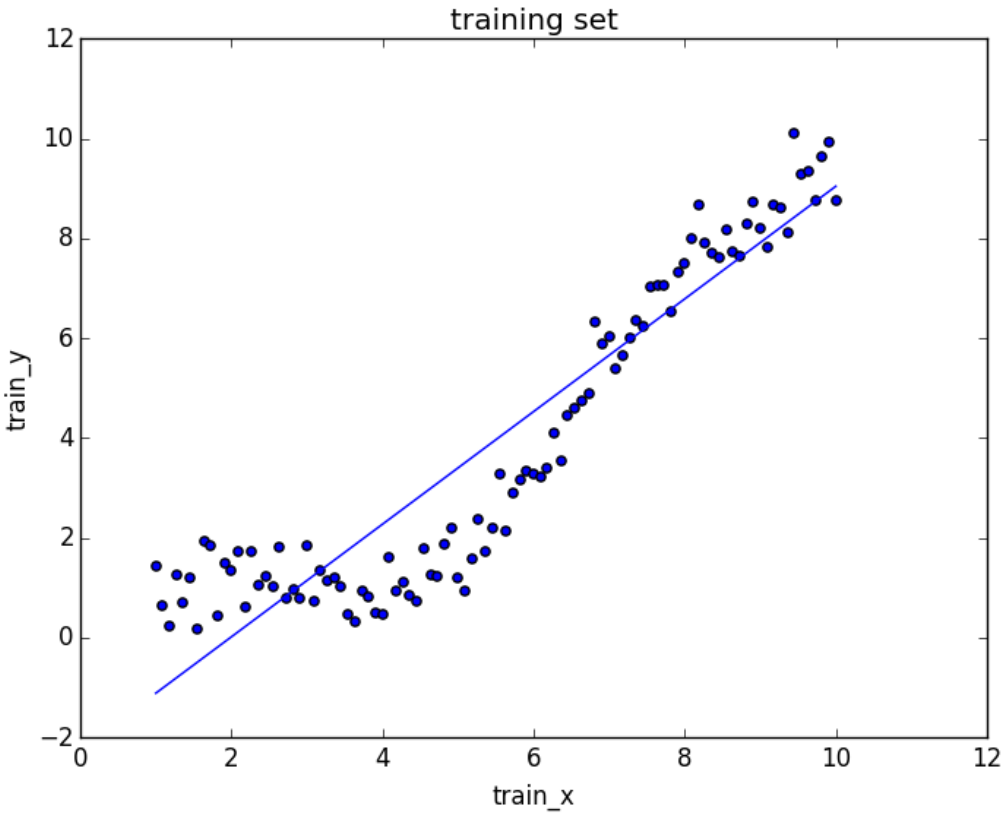
Generally a higher N value resulted in a lower number of validation errors, thus a higher N is best for performance.

Task 2

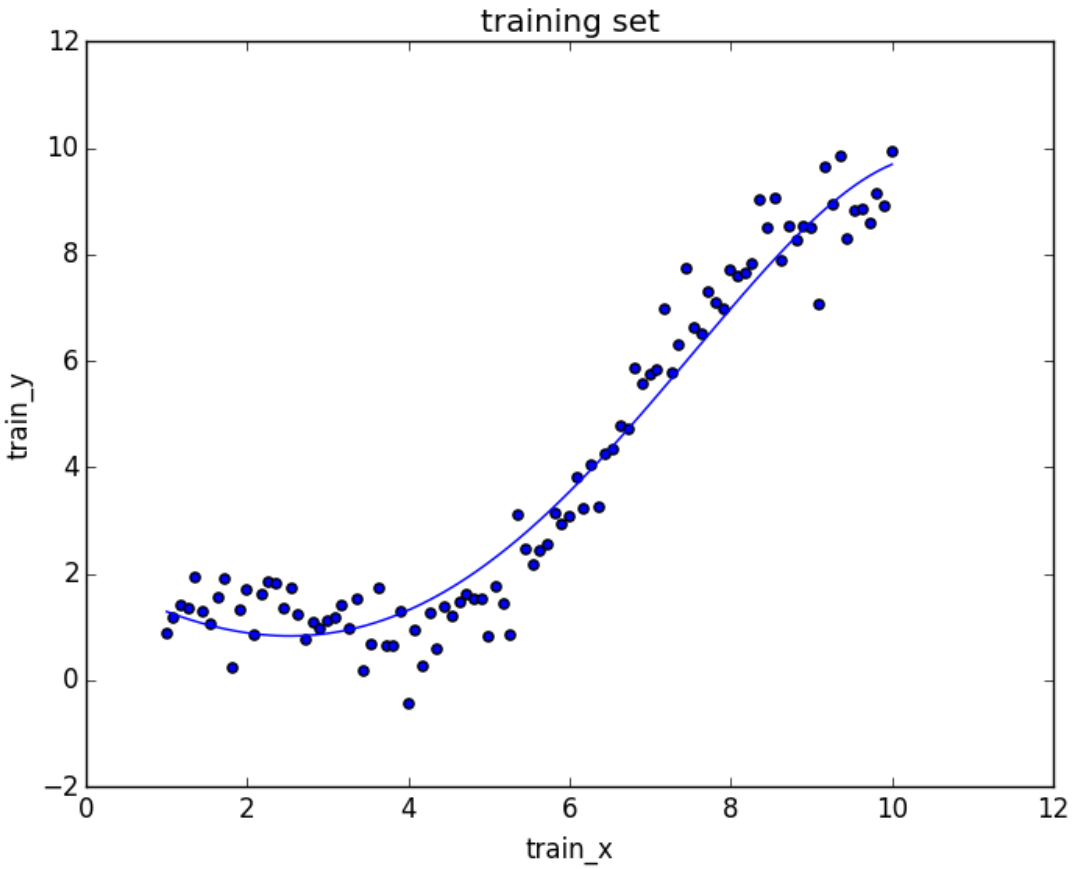
K	# of Validation Errors
1	12
3	8
5	10
7	9
21	11
101	24
401	52

Generally a smaller K value performed better.

Task 3



Task 4



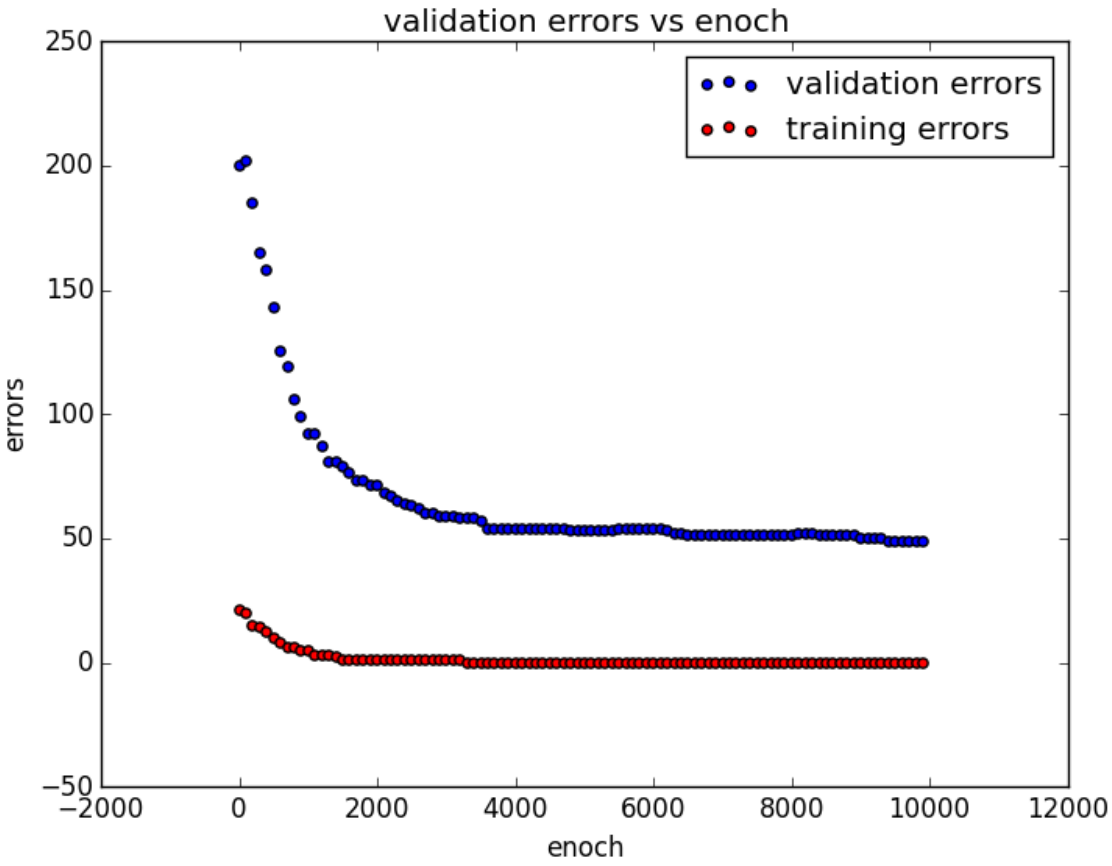
The effect of nonlinearity allows the curve to match the data a lot better than the line and hence have a lower cost.

Task 5

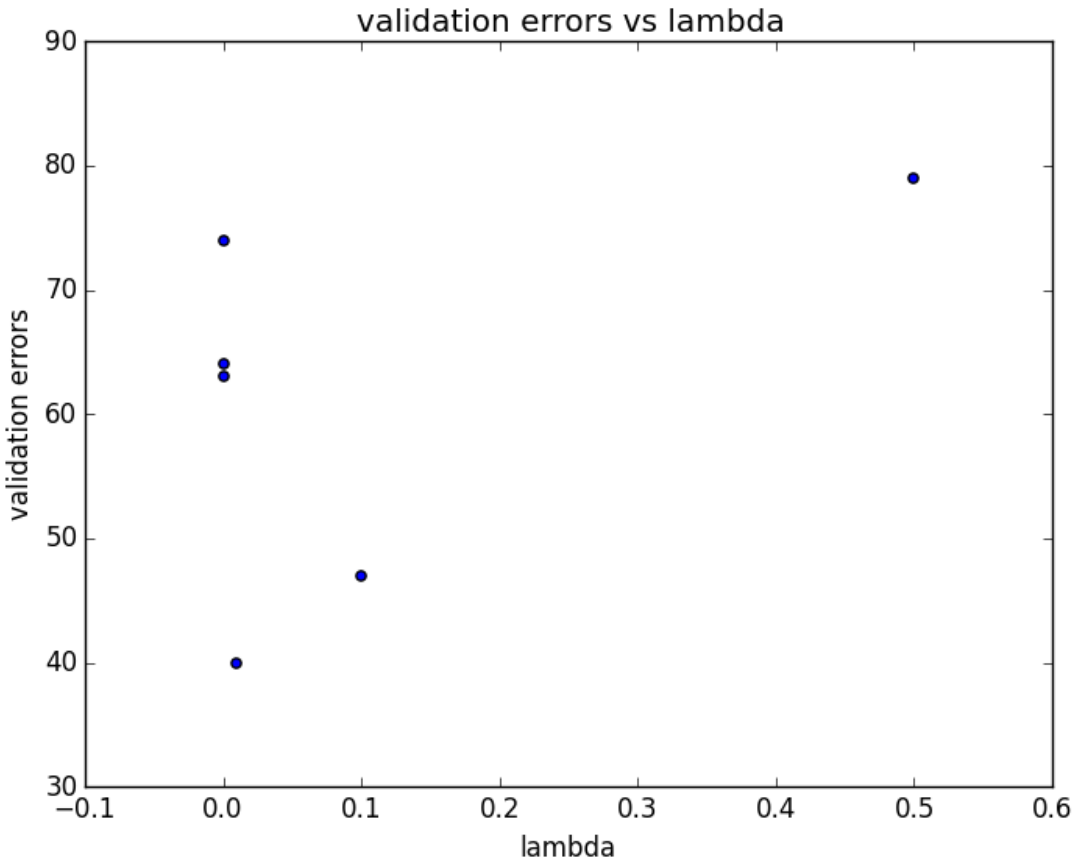
N	# of validation errors
100	72
200	54
400	37
800	22

The number of validation errors were seen to decrease as N increased, suggesting that a large N is best.

Task 6


validation errors vs enoch
validation errors
training errors
errors
enoch
250
200
150
100
50
0
−50
−2000
0
2000
4000
6000
8000
10000
12000

Task 7



The weight decay parameter seemed to decrease the number of validation errors in the middle range, and an optimal value of 0.01 was found for lambda.