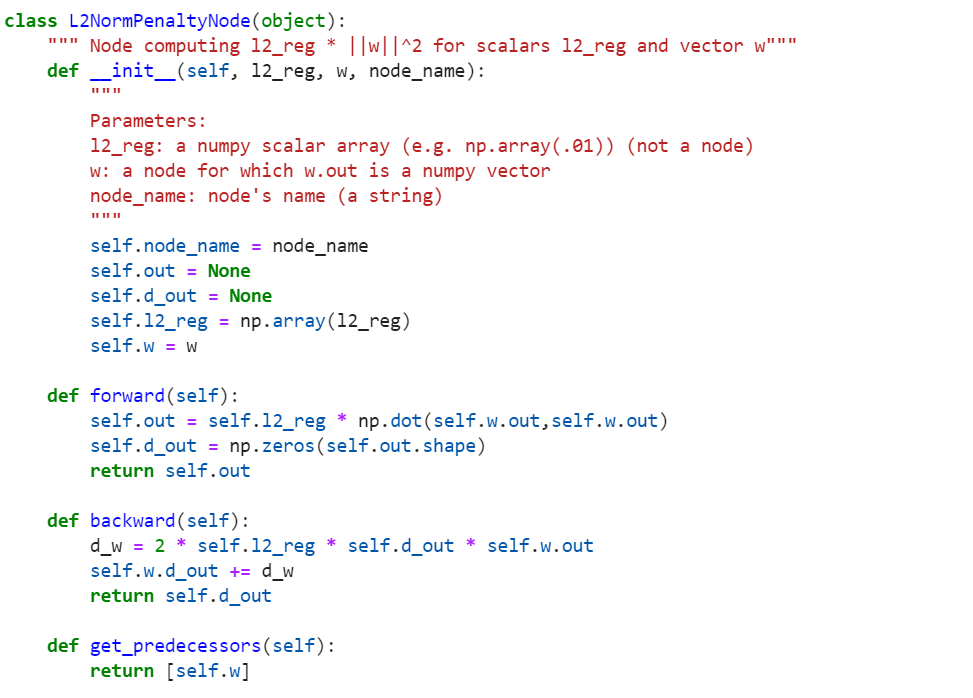
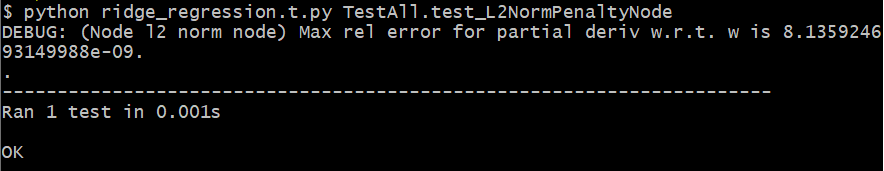
**Problem 1**

Codes:

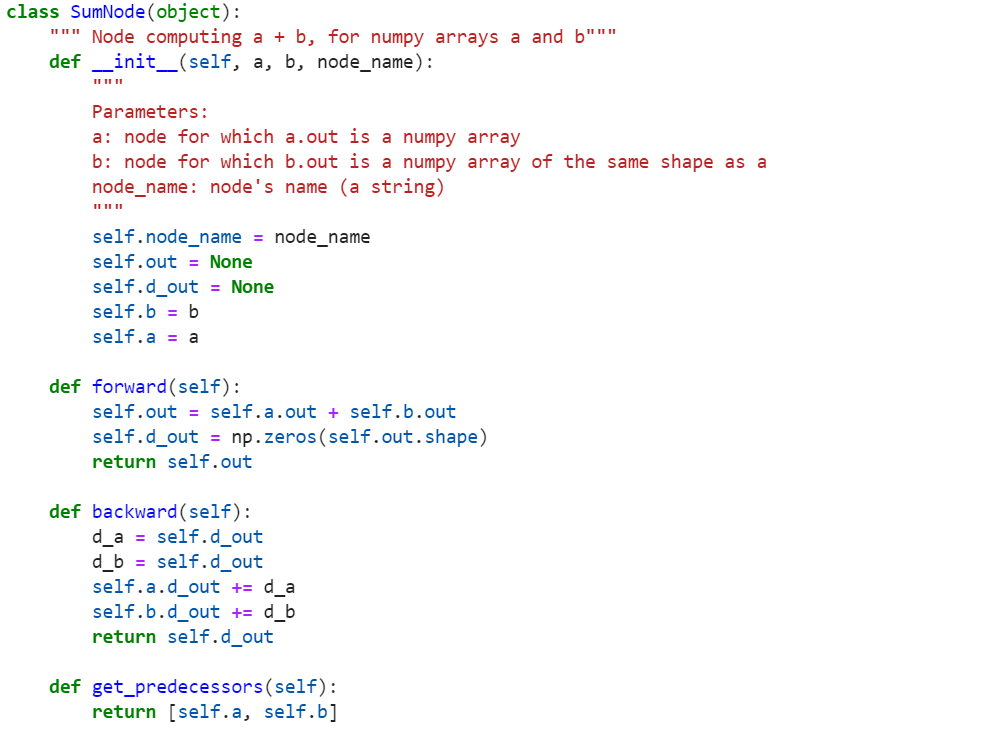


Test Results:

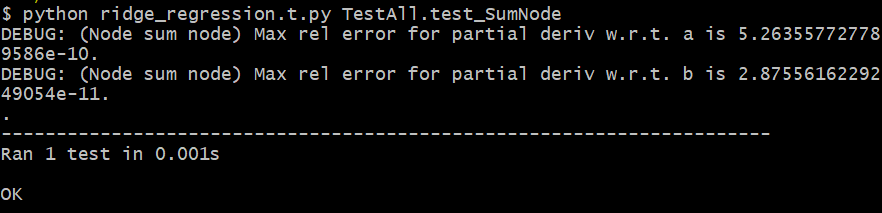


**Problem 2**

Codes:

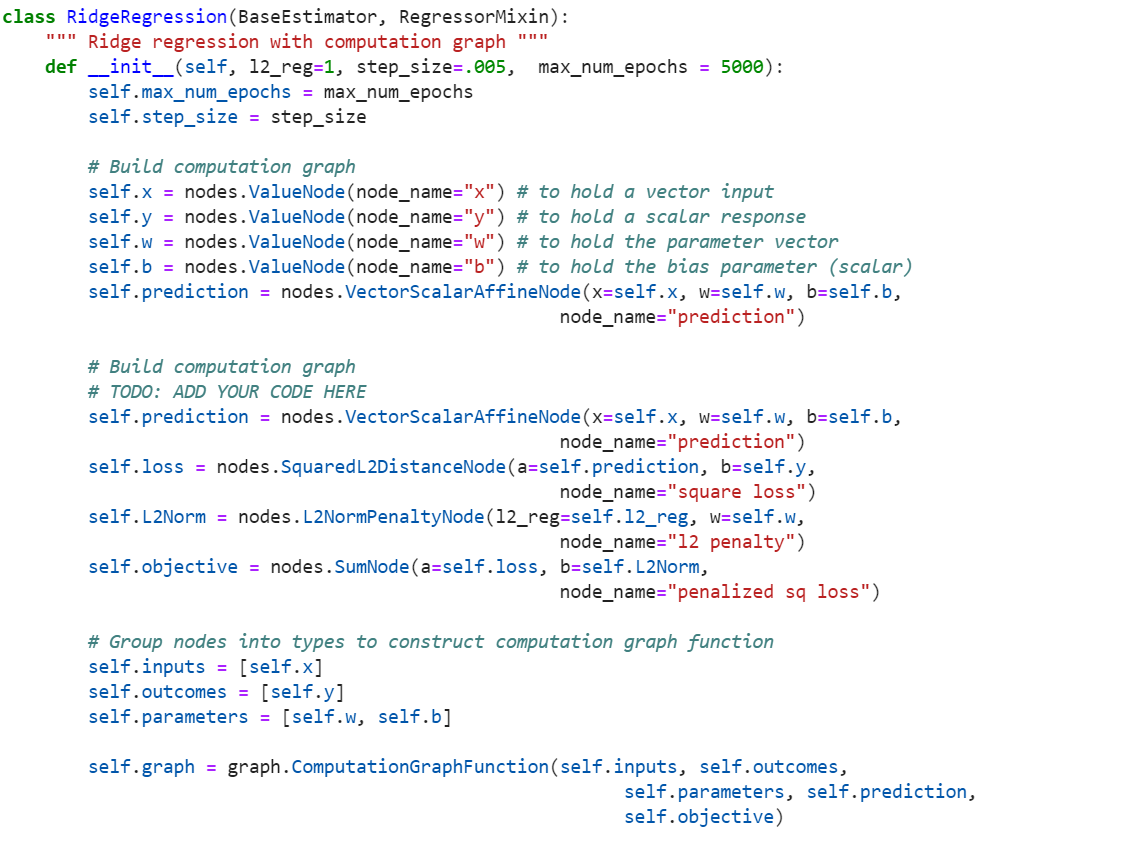


Test Results:



**Problem 3**

Codes:



Test Results:

Setting 1: l2reg = 1, step\_size=0.00005, max\_num\_epochs=2000

Average Square Error = **0.20121047965190475**

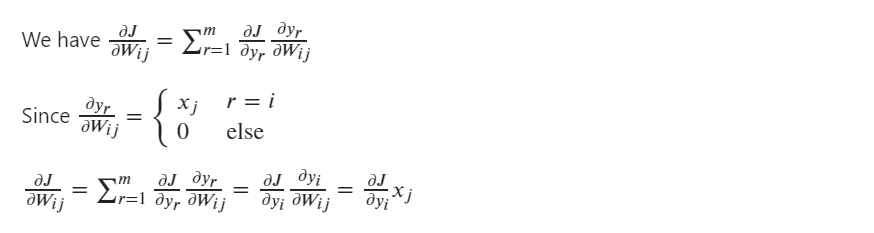
Setting 2: l2reg = 1, step\_size=0.00005, max\_num\_epochs=500

Average Square Error = **0. 0443814303794584**

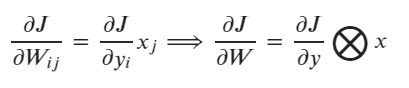
Chart, scatter chart

Description automatically generated

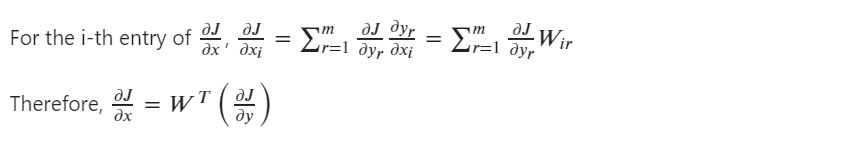
**Problem 4**



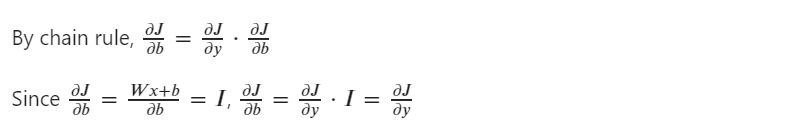
**Problem 5**



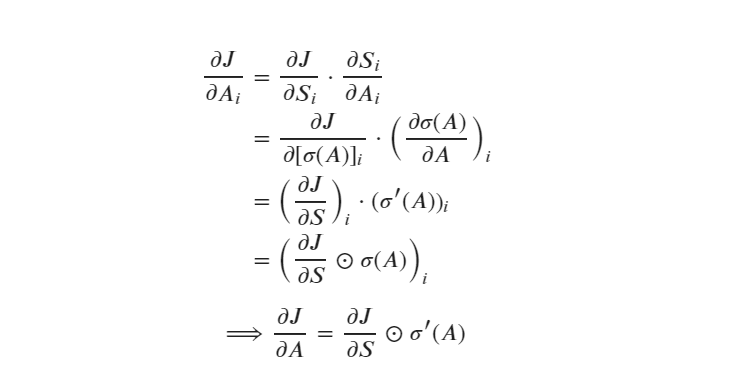
**Problem 6**



**Problem 7**

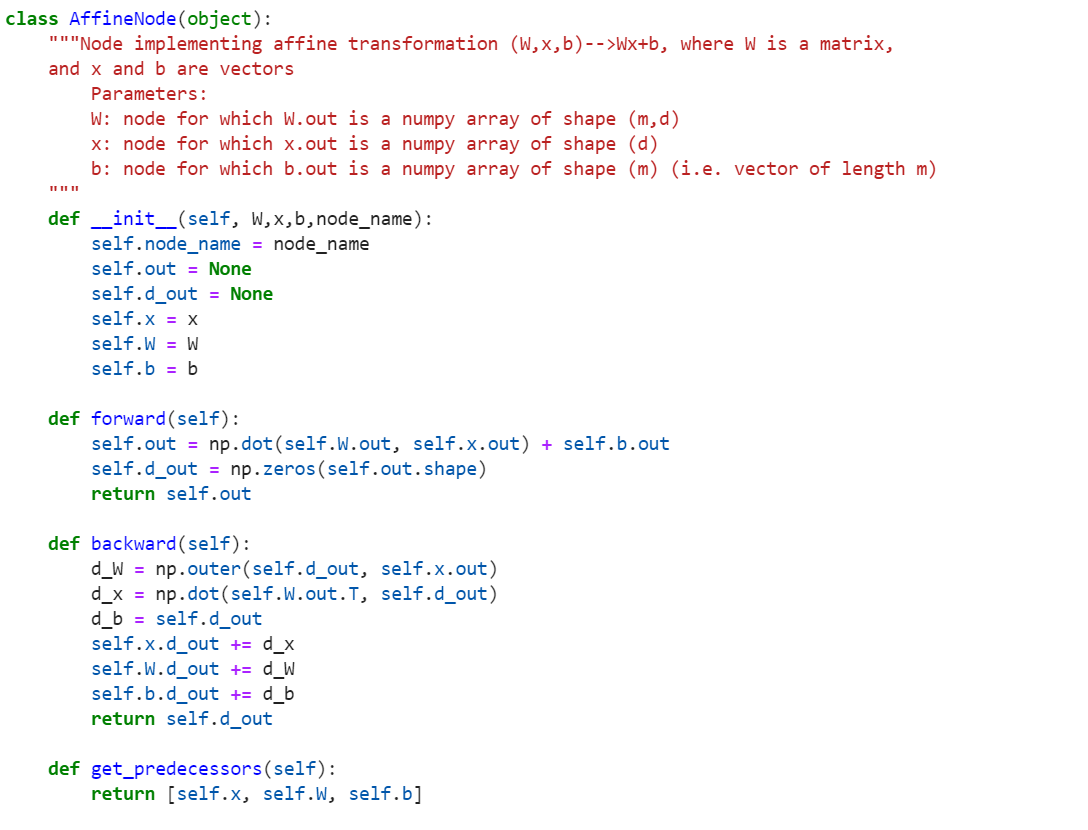


**Problem 8**

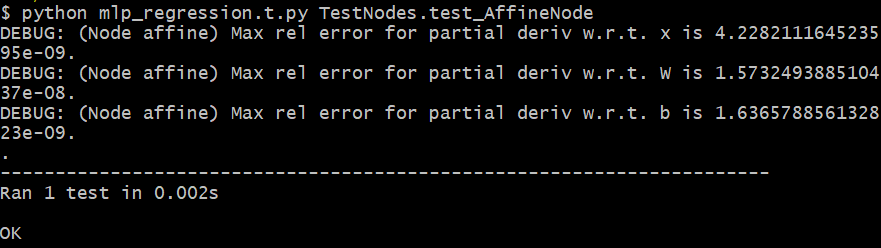


**Problem 9**

Code:

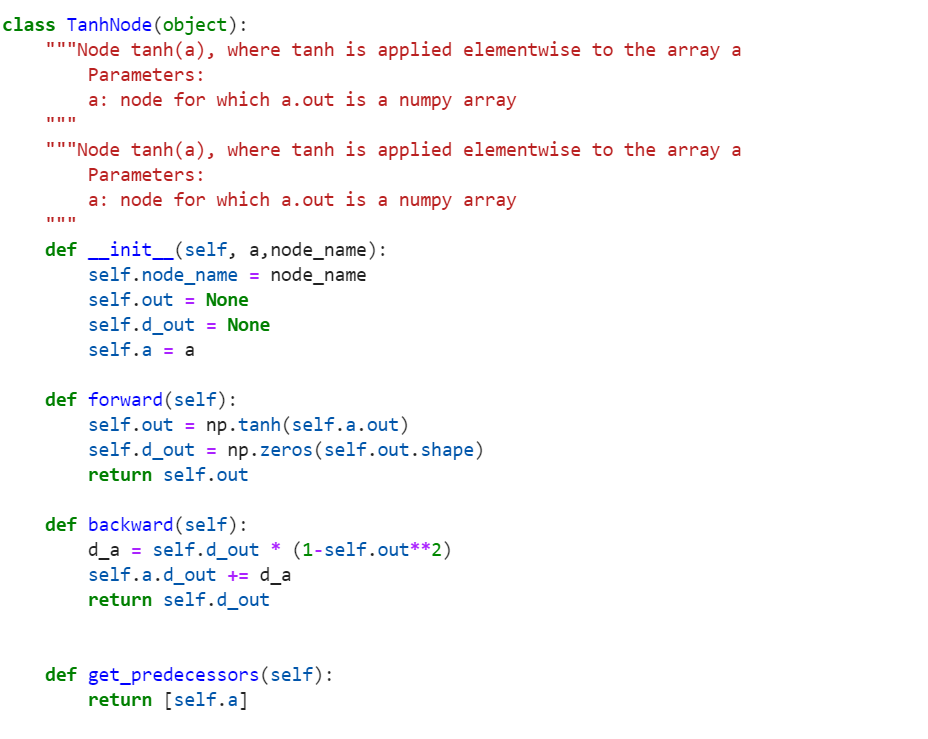


Test Results:

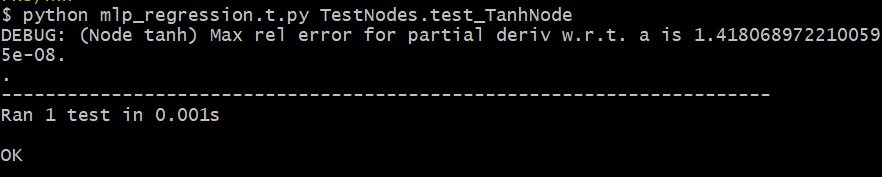


**Problem 10**

Codes:

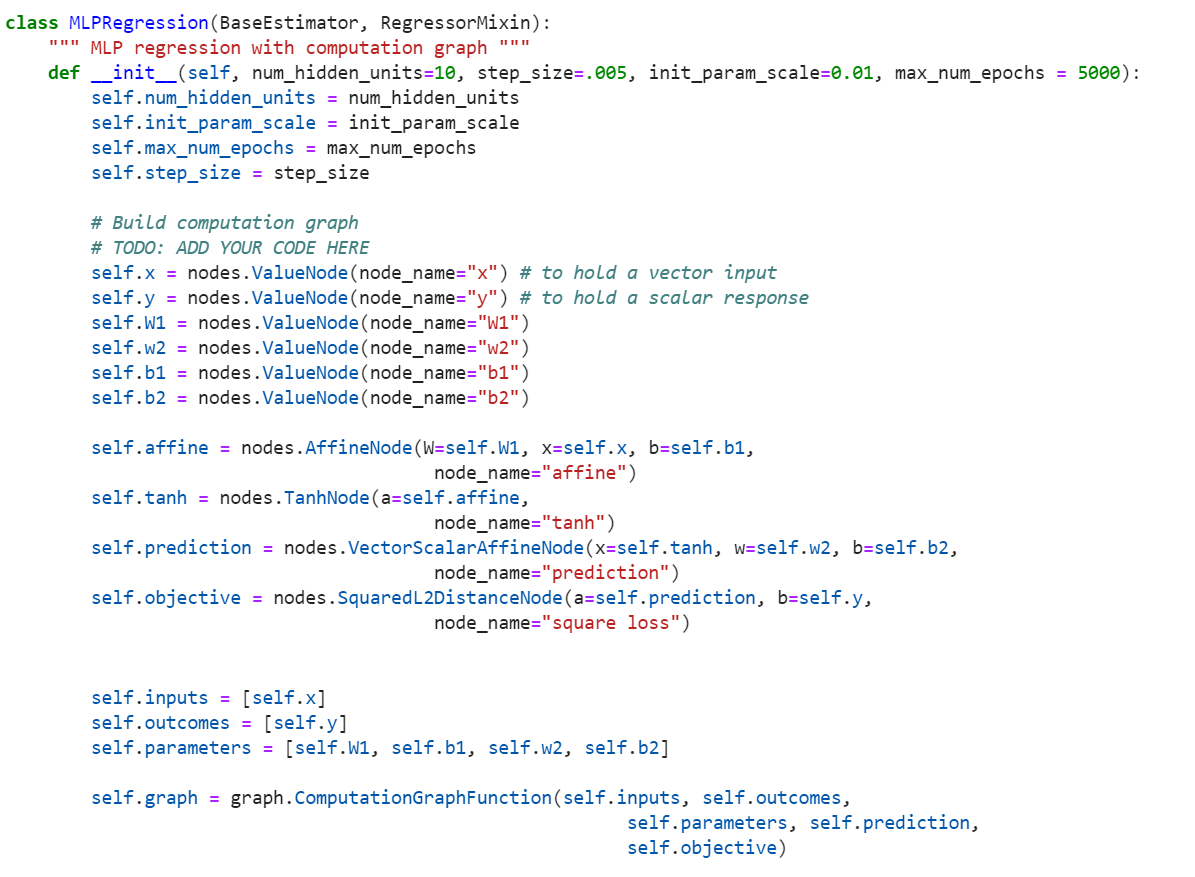


Test Results:



**Problem 11**

Codes:



Test Results:

Setting 1: step\_size=0.001, init\_param\_scale=.0005, max\_num\_epochs=5000

Average Square Error = **0.26107056770910664**

Setting 2: step\_size=0.0005, init\_param\_scale=.01, max\_num\_epochs=500

Average Square Error = **0.0429245017966997**

Chart, scatter chart

Description automatically generated