Gradient Descent with JAX gradient computation for RIDGE

lemda	**Learning rate**	**RMSE**	**MAE**	**Time taken**
0.1	0.1	0.9217603663526538	0.7318958933259078	1.4805946350097656
0.1	0.01	1.4911491795013396	1.1983844786078811	1.4336094856262207
0.1	0.001	3.3140010602445624	2.6813248702587756	1.8594343662261963
1	0.001	2.5656668146126793	2.0545816450054144	1.5079424381256104
1	0.01	1.3474734515029483	1.0862527237692201	1.4075217247009277
1	0.1	0.9218650458900396	0.7310851441595964	1.4911489486694336
10	0.001	3.665810434571774	2.8935092155163455	1.4533715248107791
10	0.01	0.9848861915651099	0.7672203913183792	1.6426382064819336
10	0.1	0.9315949822843226	0.7921750572796936	1.8775434494018555

We have found the best RMSE 0.9217603663526538 and time taken 1.4805946350097656 on using lambda 0.1 and learning rate 0.1.

Batch Gradient Descent with JAX gradient computation for regularized objective RIDGE

Batch size	RMSE	MAE	Time taken
10	1.8793437389973198	1.5279358225786834	1.698305368423462
15	2.9734395509741893	2.3692876298847336	1.0771324634552002
20	1.8433701720957683	1.4642168226074135	0.954808235168457

SGD Momentum with JAX gradient computation for regularized objective RIDGE with momentum

Momentum	RMSE	MAE:	Time taken	Batch size
0.1	1.4699483873969783	1.1594492947854911	1.5565354824066162	9
0.5	0.9549173761688867	0.7579015413881073	1.4115982055664062	9
0.9	0.9186546626429495	0.7252929003267249	1.4447081089019775	9

Batch size	Gradient type	Regularization type	RMSE	MAE	Time taken
9	manual gradient	unregularized	1.7853290067513778	1.4408848546404541	0.2731807231903076
9	manual gradient	Ridge regularization	1.0155040049359525	0.8044188589803151	0.2226202487945566
9	JAX gradient	unregularized	1.4106056254032833	1.1513182572326441	1.3176164627075195
9	JAX gradient	regularized objective LASSO	1.5156732475575057	1.1717037554127965	2.2428302764892578