Experimental results of low dimension discreted regression data with multiple models

Abstract

This is a note which records some complementary experiments in OR-DPE paper. As this paper mentioned, SVOR and RedSVM don't perform as well as expected in high dimension data. Therefore, we test these model on low dimension data which download from a research website [1] to make further investigates. We download some of these datasets and split 4/5 of them as train datasets and the left as test datasets. The evaluation metrics we apply here are MAE as well as MSE and the experimental results are shown below. From the Table1, we could see that in most cases such as in Datasets abalone, housing as well as machine, SVOR and RedSVM considering ordering information perform much better than those models which doesn't take ordering information into account including SVC, SVR and LR in both MAE and MSE especially in MSE. Surprisingly, form this table, we find our model SVMOPnew achieves much pretty performance not only in high dimension data bust also in low dimension and even outperforms all the above models as we mentioned.

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[1]http://www.gatsby.ucl.ac.uk/ chuwei/ordinalregression

Dataset	#Ins	#Att	SVC	SVR	LR	SVOR	RedSVM	SVMOP*new*
MAE								
abalone-5	83540	11	0.7977	0.7119	0.6997	0.6828	0.6750	**0.6475**
housing-5	10120	14	0.5165	0.4542	0.4354	0.3979	0.4033	**0.3657**
machine-5	4180	7	0.6059	0.5497	0.4514	0.3904	0.4239	**0.3688**
pyrim-5	1480	27	**0.0542**	0.2847	0.0576	0.2372	0.2711	0.0745
abalone-10	83540	11	1.9587	1.4513	1.5565	1.43461	1.4337	**1.3914**
housing-10	10120	14	1.5126	0.9624	0.9990	0.8591	0.8482	**0.7567**
machine-10	4180	7	1.4251	1.1509	0.9856	0.9353	0.9269	**0.8407**
pyrim-10	1480	27	0.2338	0.8203	0.1152	0.7288	0.6440	**0.0542**
MSE								
abalone-5	83540	11	1.4502	0.9920	1.2441	1.0421	0.9914	**0.9623**
housing-5	10120	14	0.6648	0.5452	0.6124	0.4938	0.5239	**0.4458**
machine-5	4180	7	0.9940	0.6335	0.6479	0.4694	0.5053	**0.4287**
pyrim-5	1480	27	**0.0745**	0.3322	0.0779	0.2847	0.2983	**0.0745**
abalone-10	83540	11	7.2215	3.7030	5.0906	3.5859	3.7826	**3.6354**
housing-10	10120	14	4.5635	1.8581	2.5600	1.6935	1.6421	**1.4527**
machine-10	4180	7	3.9976	2.4874	2.2766	1.7856	1.7197	**1.5473**
pyrim-10	1480	27	0.5457	1.1864	0.3254	1.0406	0.9491	**0.0813**

Table 1: The performance with SVC, SVR, LR, SVOR, RedSVM and SVMOP model. Evaluation metrics are MAE, MSE. The best method in each setting is in **bold**