0.1 Plots of single attributes

0.1.1 residual sugar

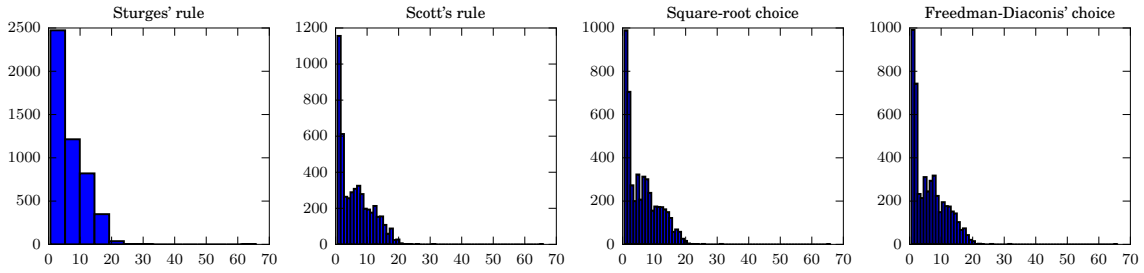

Figure 1: Histograms of attribute *residual sugar* using different binning methods

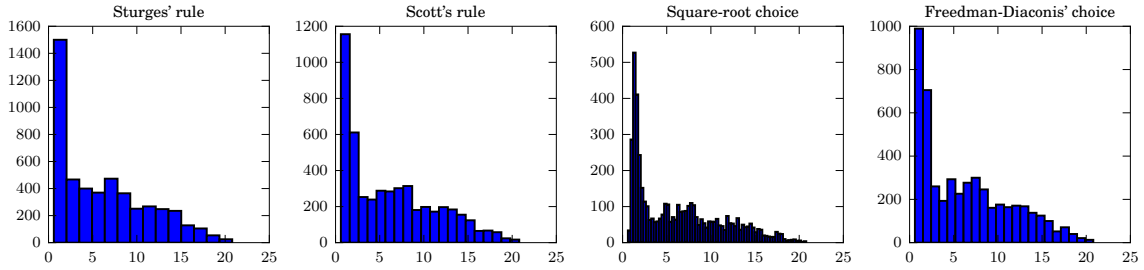

Figure 2: Histograms of attribute *residual sugar* with outliers further than 3 standard deviations from the mean filtered

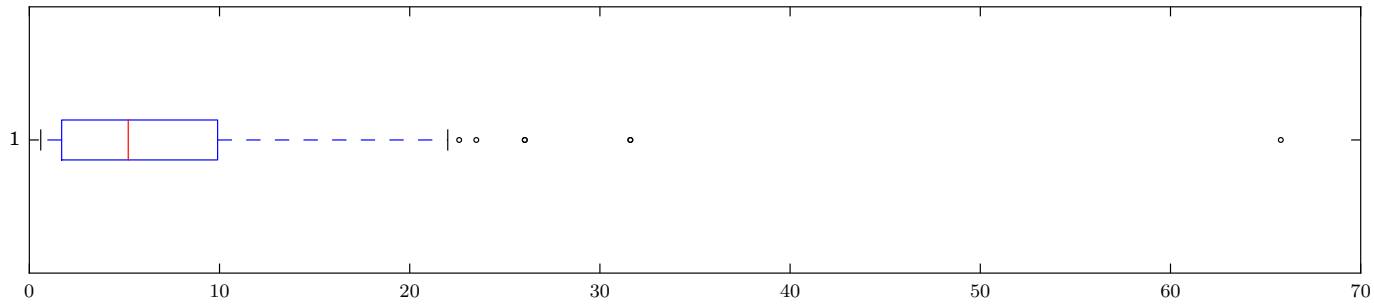

Figure 3: Boxplot of attribute *residual sugar*

0.1.2 fixed acidity

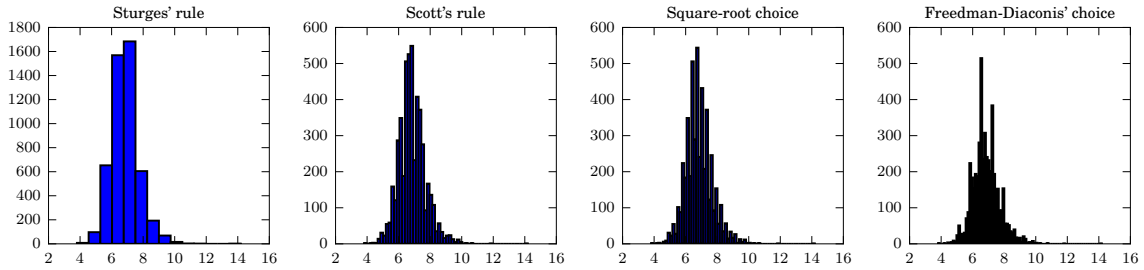

Figure 4: Histograms of attribute *fixed acidity* using different binning methods

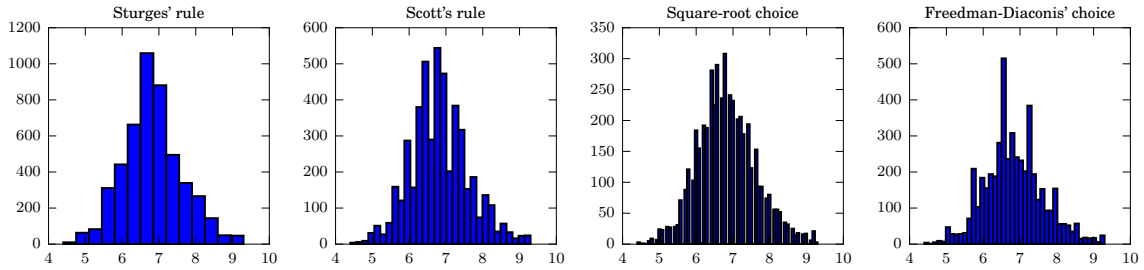

Figure 5: Histograms of attribute *fixed acidity* with outliers further than 3 standard deviations from the mean filtered

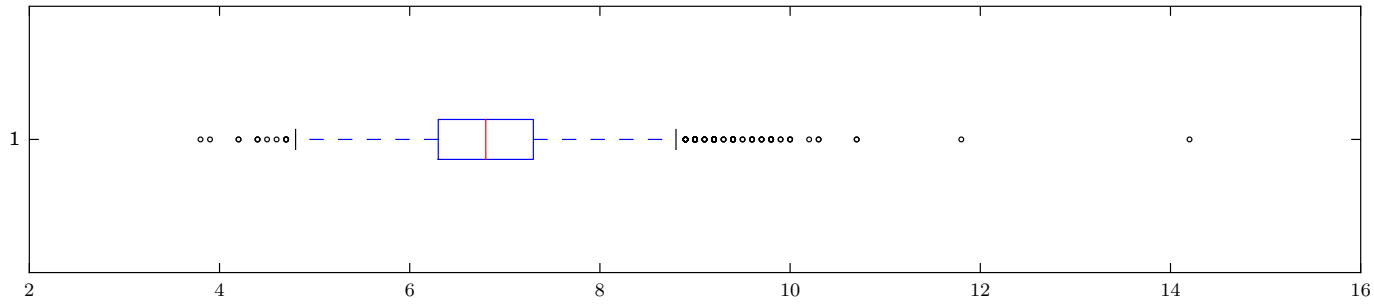

Figure 6: Boxplot of attribute *fixed acidity*

0.1.3 density

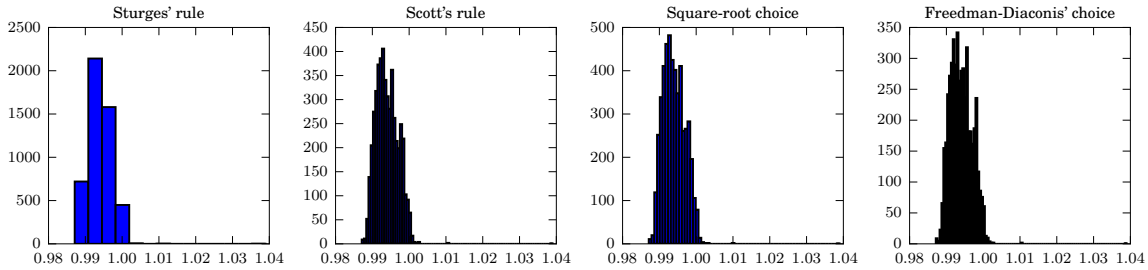

Figure 7: Histograms of attribute *density* using different binning methods

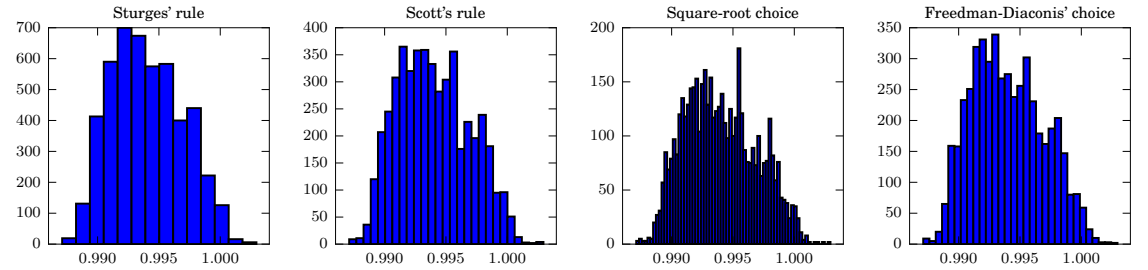

Figure 8: Histograms of attribute *density* with outliers further than 3 standard deviations from the mean filtered

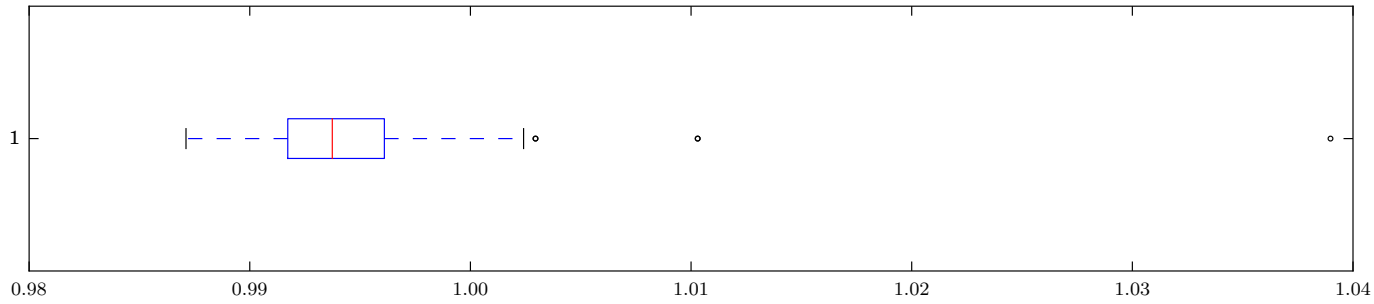

Figure 9: Boxplot of attribute *density*

0.1.4 volatile acidity

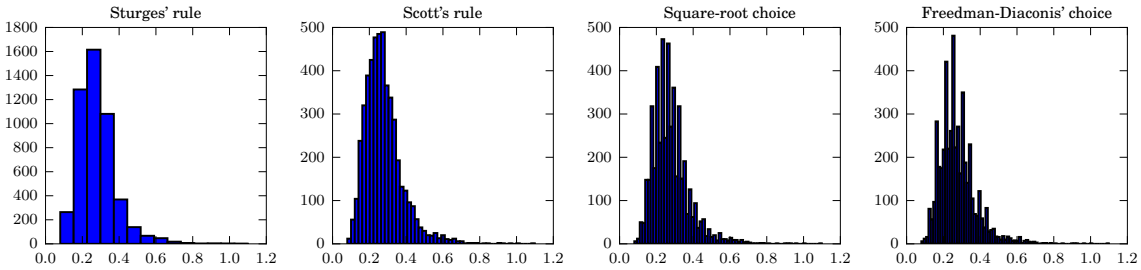

Figure 10: Histograms of attribute *volatile acidity* using different binning methods

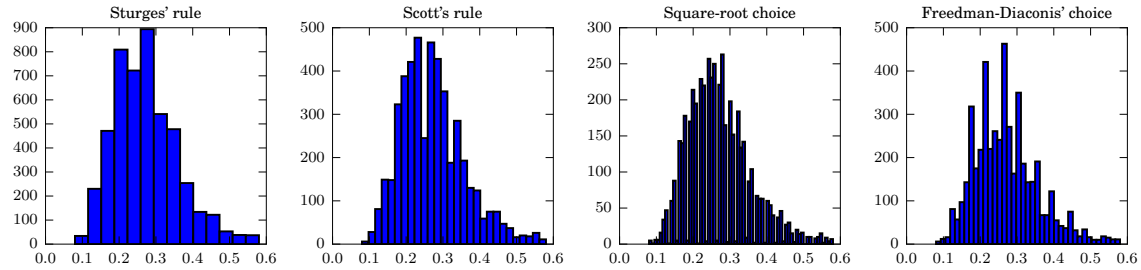

Figure 11: Histograms of attribute *volatile acidity* with outliers further than 3 standard deviations from the mean filtered

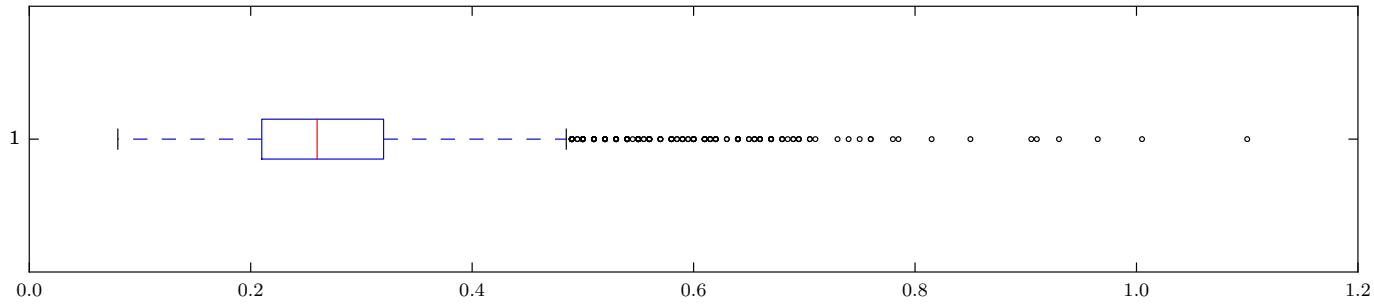

Figure 12: Boxplot of attribute *volatile acidity*

0.1.5 total sulfur dioxide

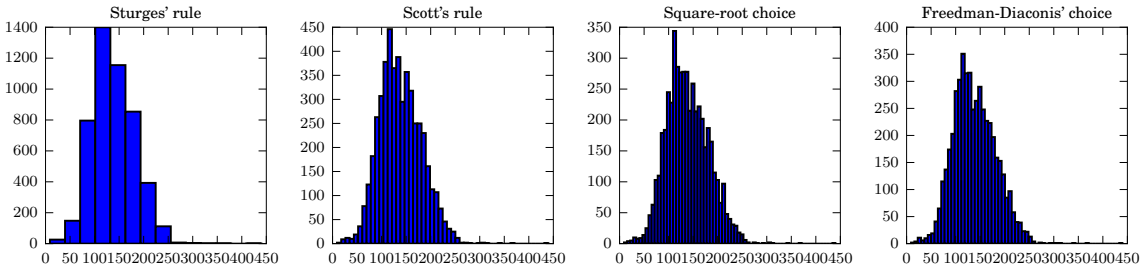

Figure 13: Histograms of attribute *total sulfur dioxide* using different binning methods

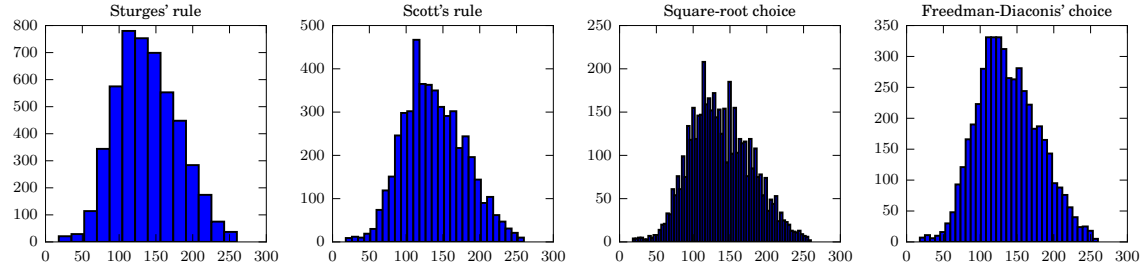

Figure 14: Histograms of attribute *total sulfur dioxide* with outliers further than 3 standard deviations from the mean filtered

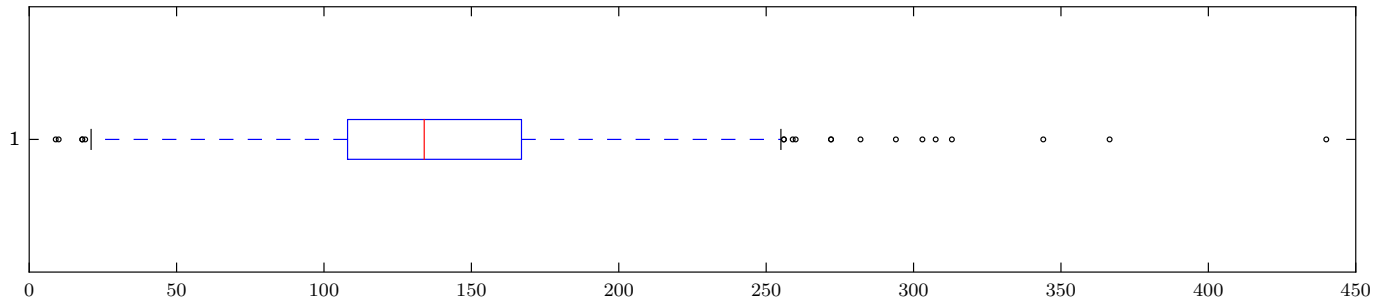

Figure 15: Boxplot of attribute *total sulfur dioxide*

0.1.6 alcohol

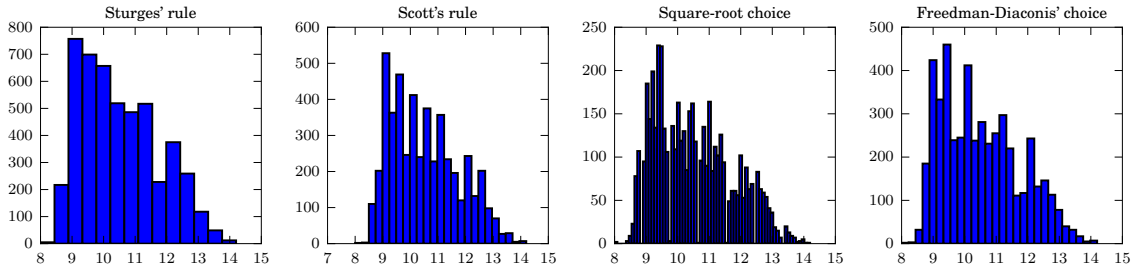

Figure 16: Histograms of attribute *alcohol* using different binning methods

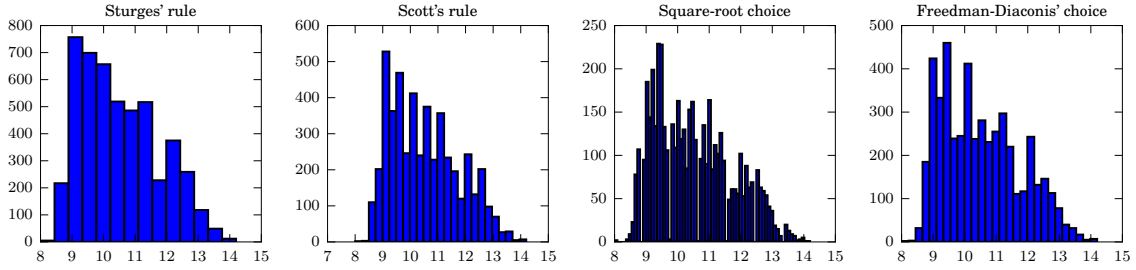

Figure 17: Histograms of attribute *alcohol* with outliers further than 3 standard deviations from the mean filtered

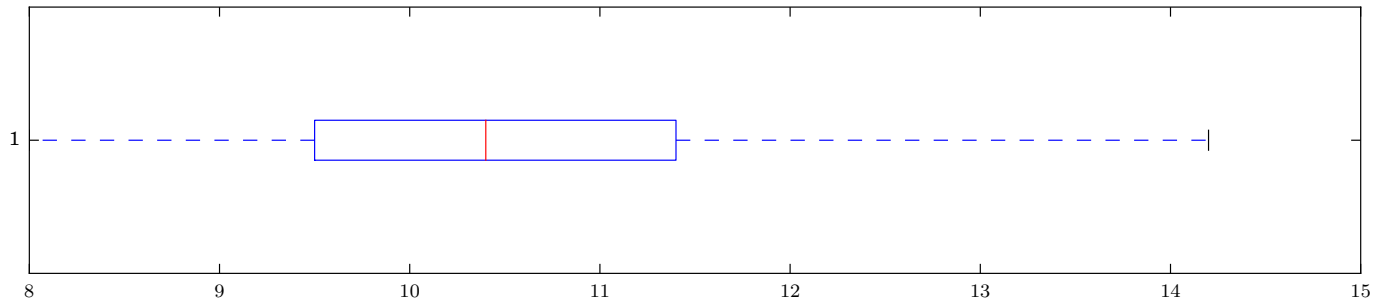

Figure 18: Boxplot of attribute *alcohol*

0.1.7 quality

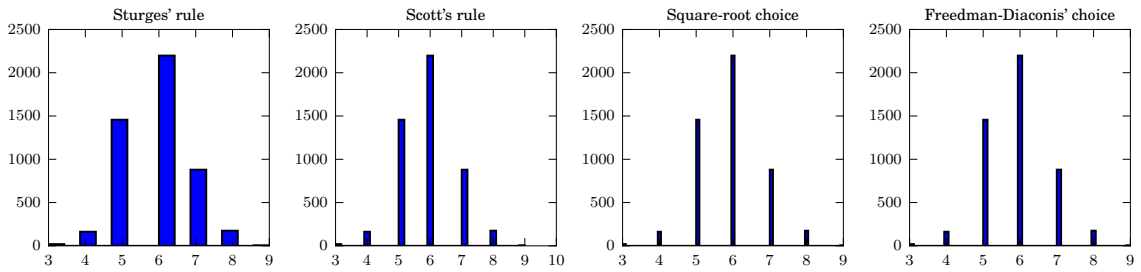

Figure 19: Histograms of attribute *quality* using different binning methods

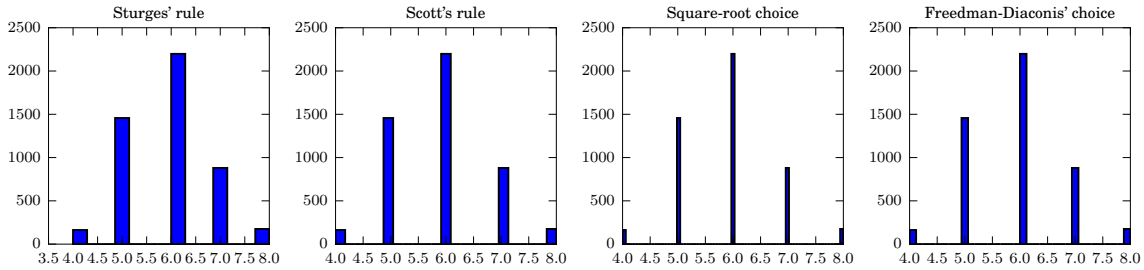

Figure 20: Histograms of attribute *quality* with outliers further than 3 standard deviations from the mean filtered

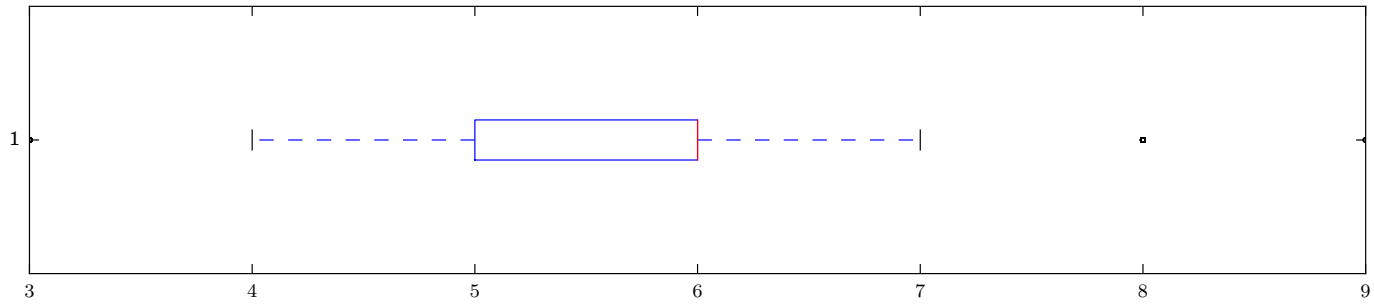

Figure 21: Boxplot of attribute *quality*

0.1.8 sulphates

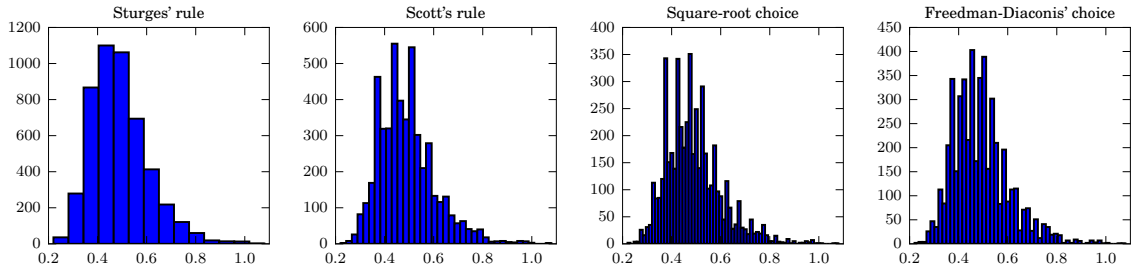

Figure 22: Histograms of attribute *sulphates* using different binning methods

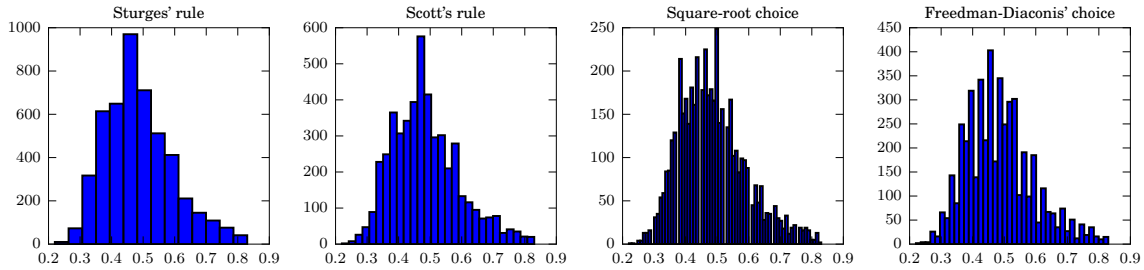

Figure 23: Histograms of attribute *sulphates* with outliers further than 3 standard deviations from the mean filtered

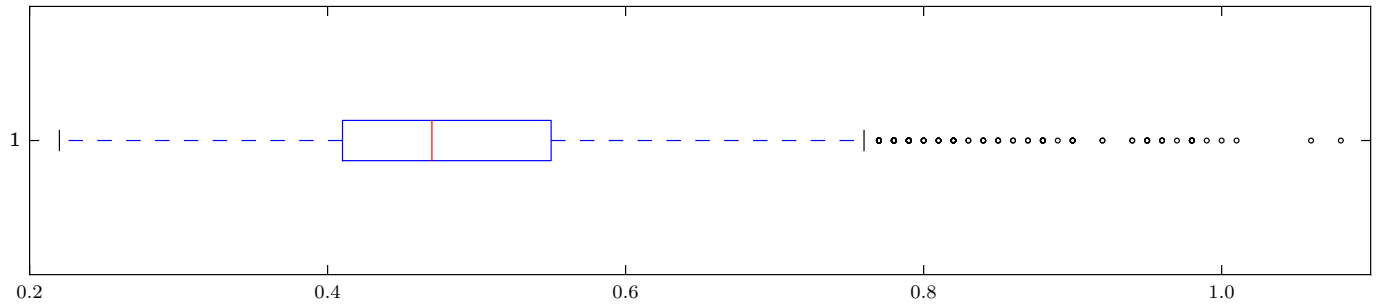

Figure 24: Boxplot of attribute *sulphates*

0.1.9 free sulfur dioxide

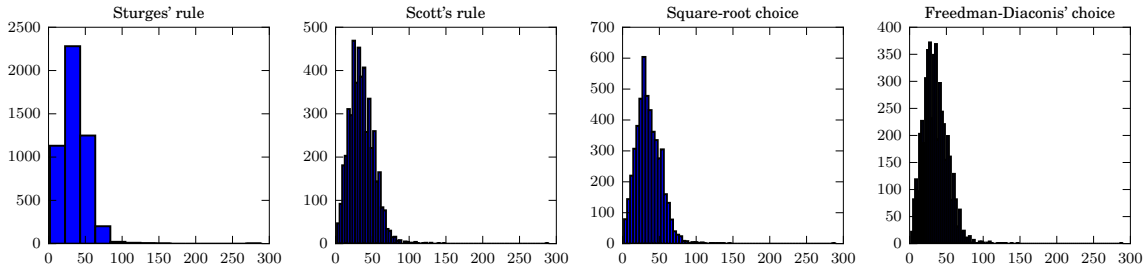

Figure 25: Histograms of attribute *free sulfur dioxide* using different binning methods

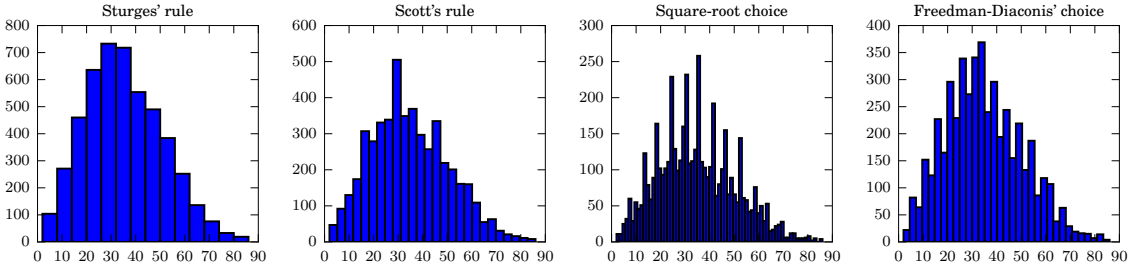

Figure 26: Histograms of attribute *free sulfur dioxide* with outliers further than 3 standard deviations from the mean filtered

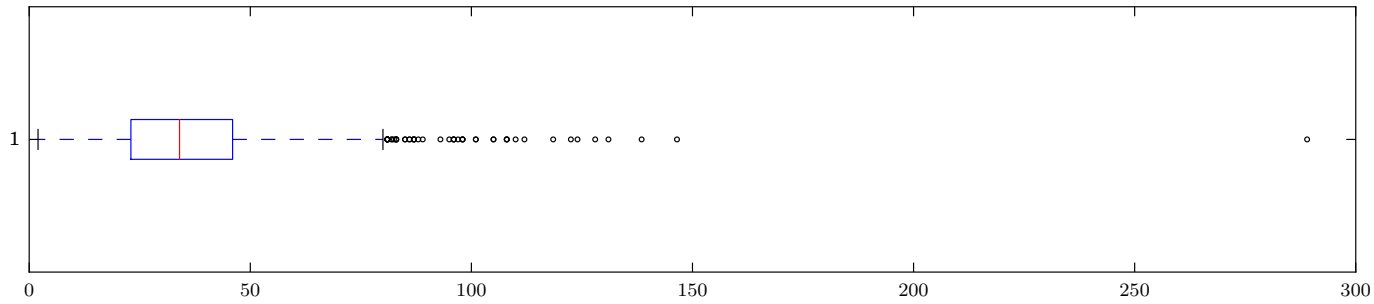

Figure 27: Boxplot of attribute *free sulfur dioxide*

0.1.10 chlorides

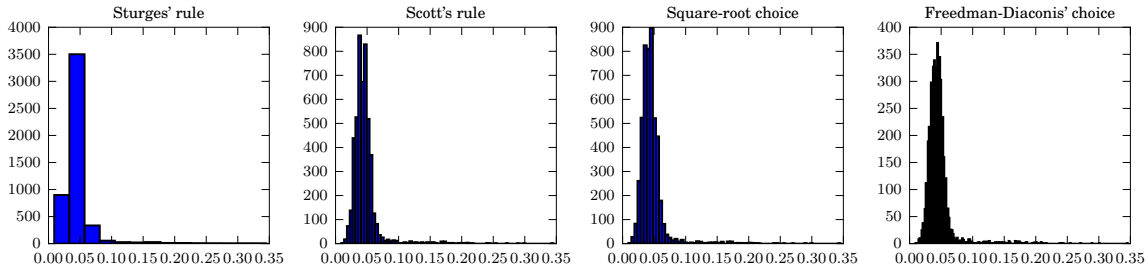

Figure 28: Histograms of attribute *chlorides* using different binning methods

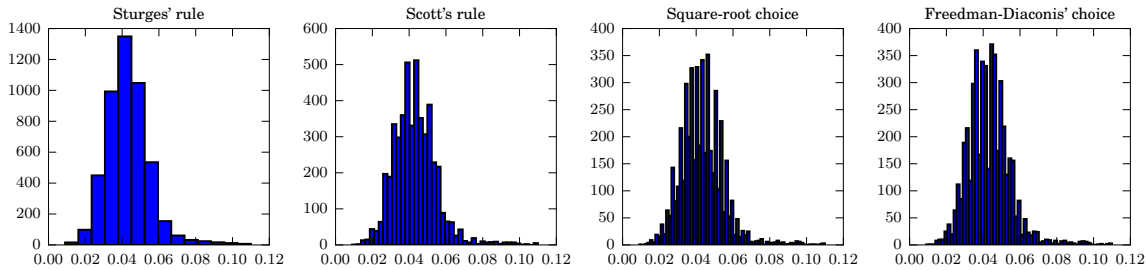

Figure 29: Histograms of attribute *chlorides* with outliers further than 3 standard deviations from the mean filtered

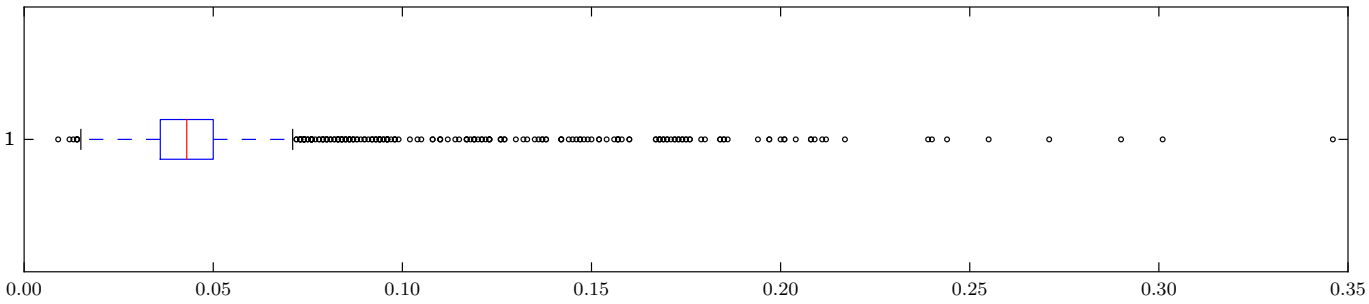

Figure 30: Boxplot of attribute *chlorides*

0.1.11 citric acid

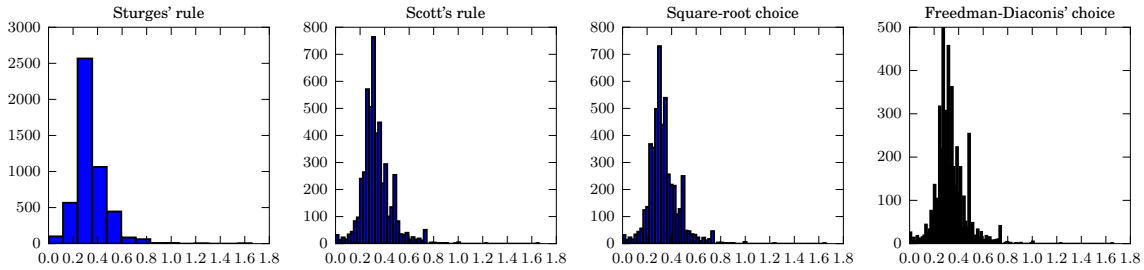

Figure 31: Histograms of attribute *citric acid* using different binning methods

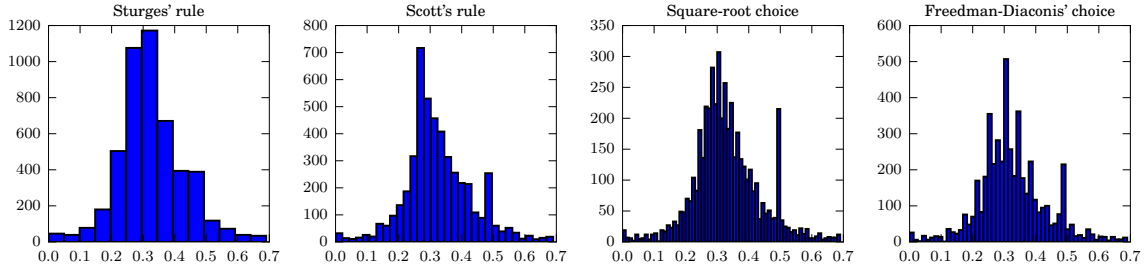

Figure 32: Histograms of attribute *citric acid* with outliers further than 3 standard deviations from the mean filtered

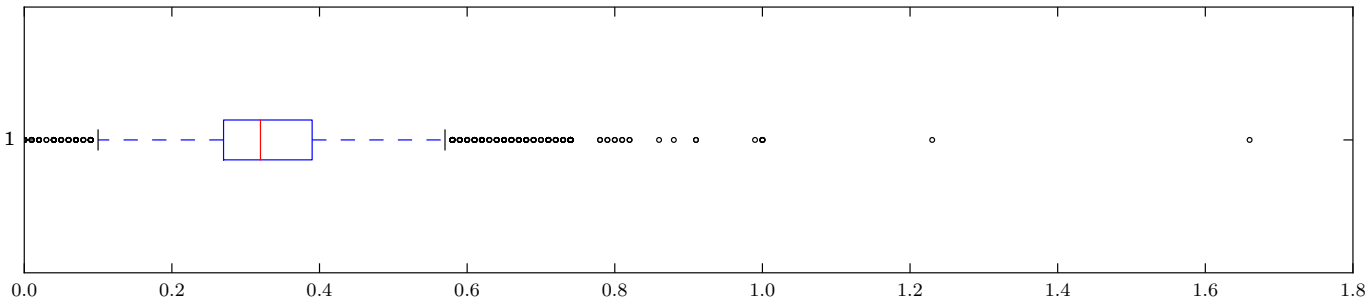

Figure 33: Boxplot of attribute *citric acid*

0.1.12 pH

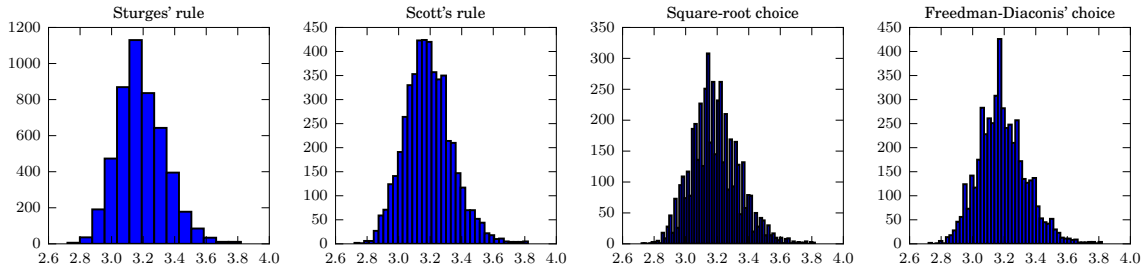

Figure 34: Histograms of attribute pH using different binning methods

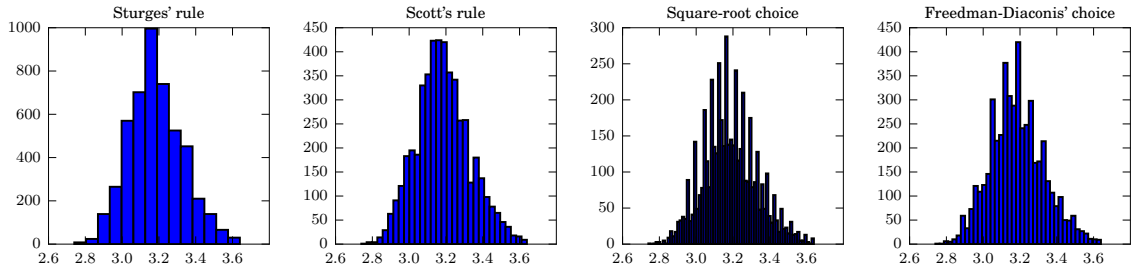

Figure 35: Histograms of attribute pH with outliers further than 3 standard deviations from the mean filtered

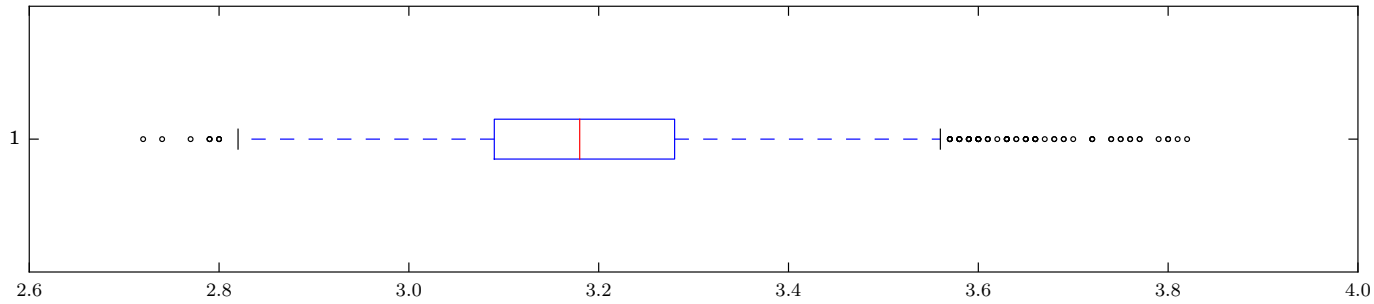

Figure 36: Boxplot of attribute pH

0.2 Plots for the whole feature set

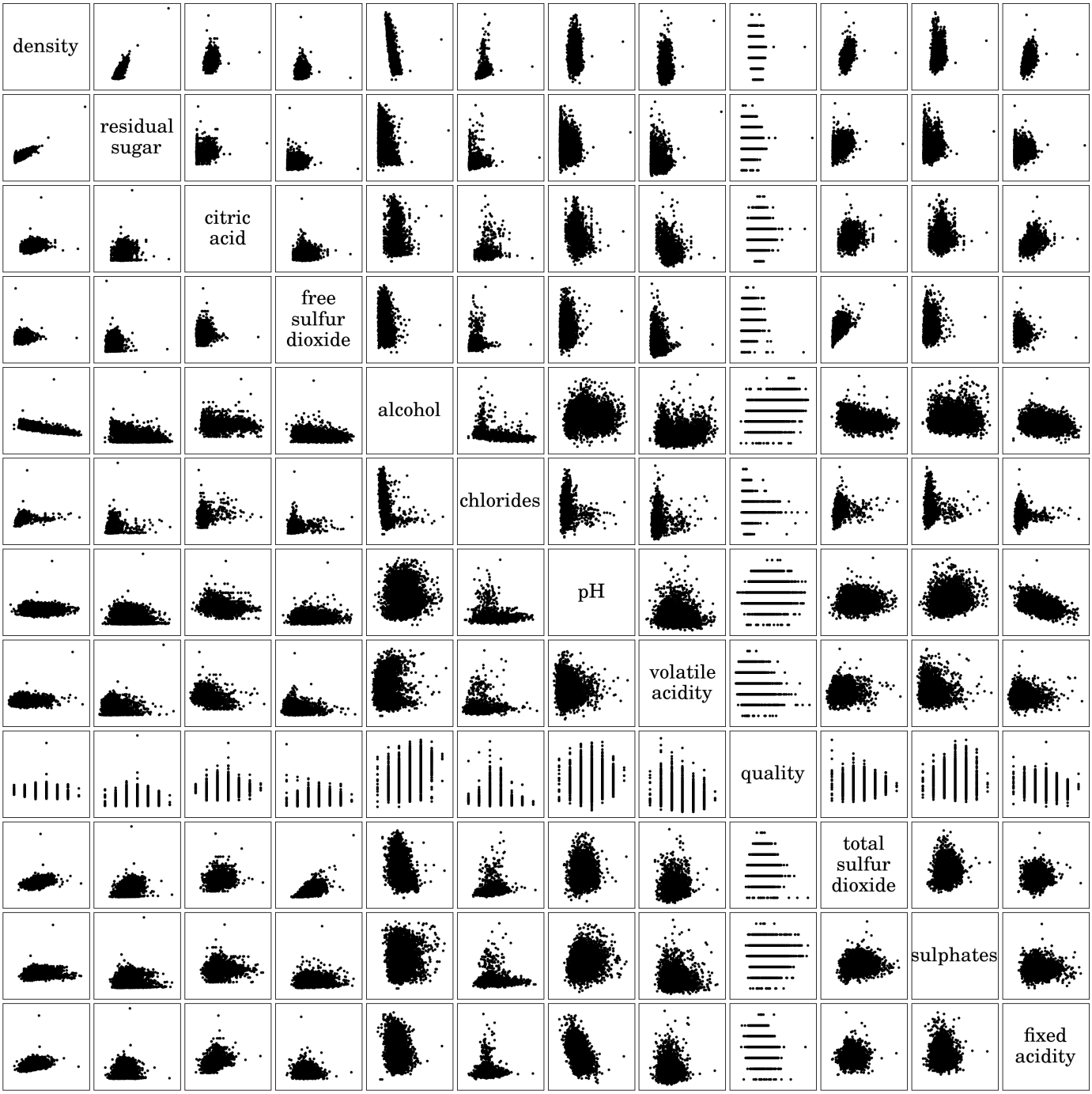

Figure 37: Scatter matrix of the whole feature set

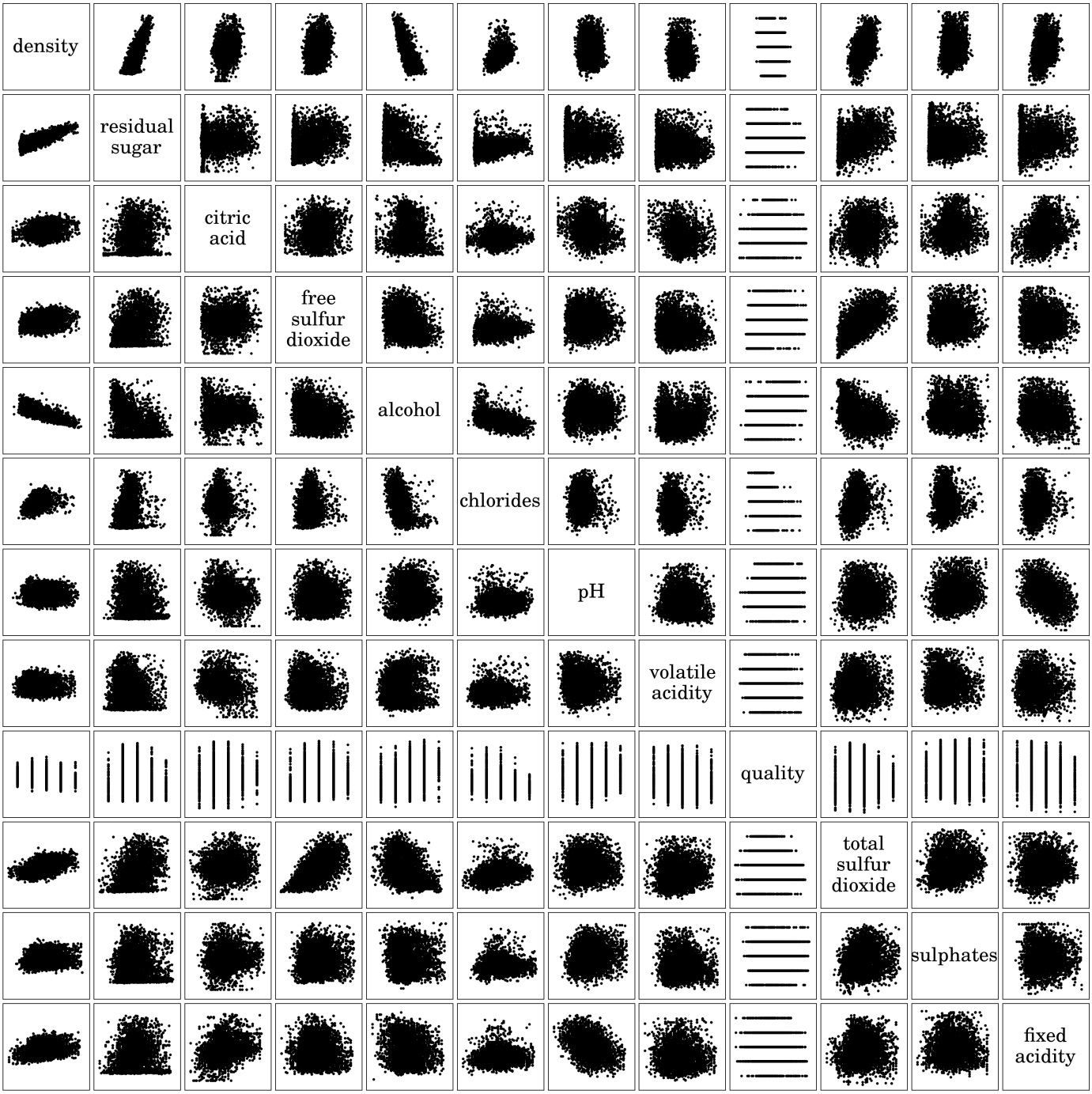

Figure 38: Scatter matrix of the whole feature set with outliers further than 3 standard deviations from the mean filtered

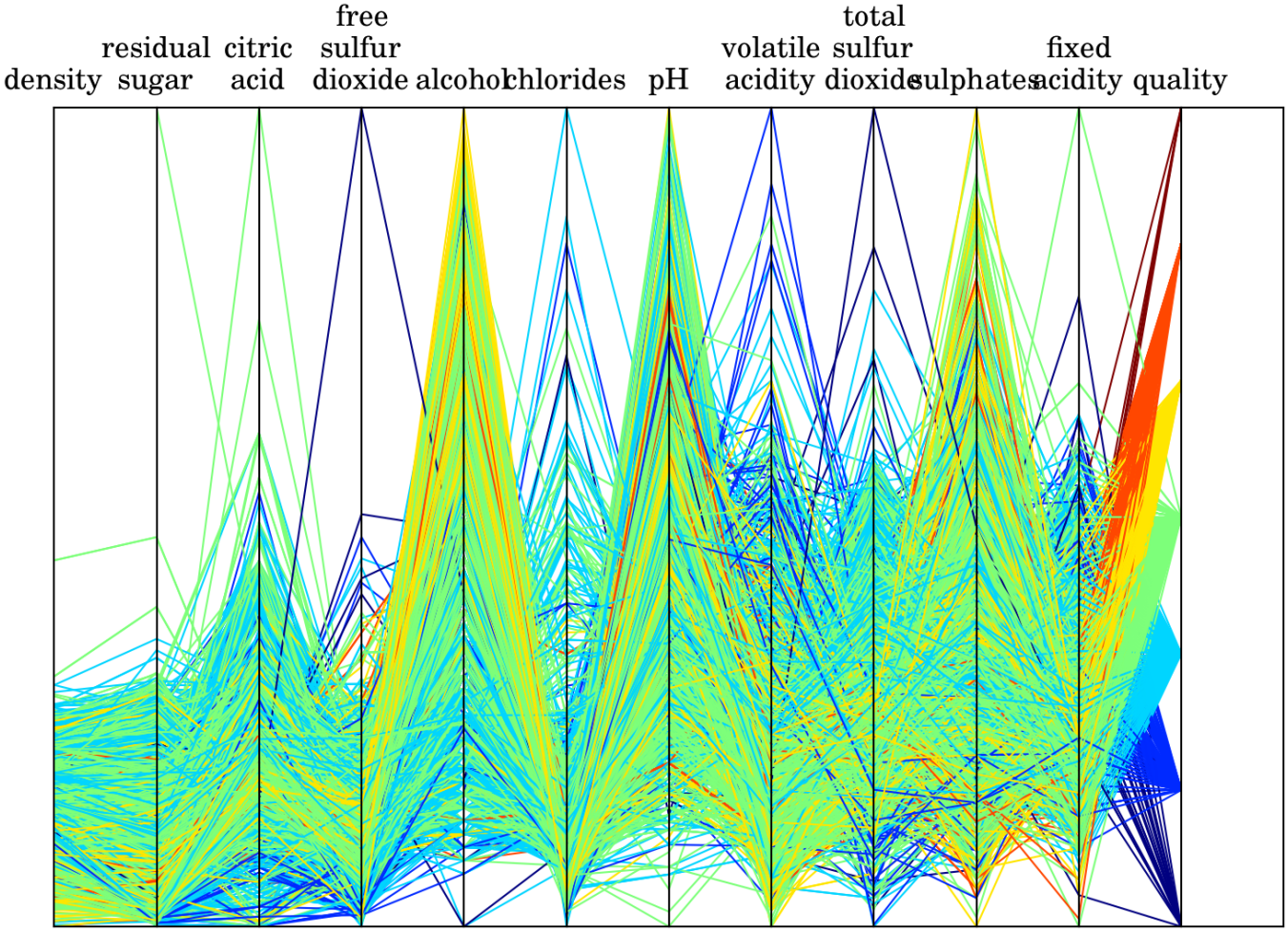

Figure 39: Parallel coordinates representation of the data set

0.2.1 Principal component analysis

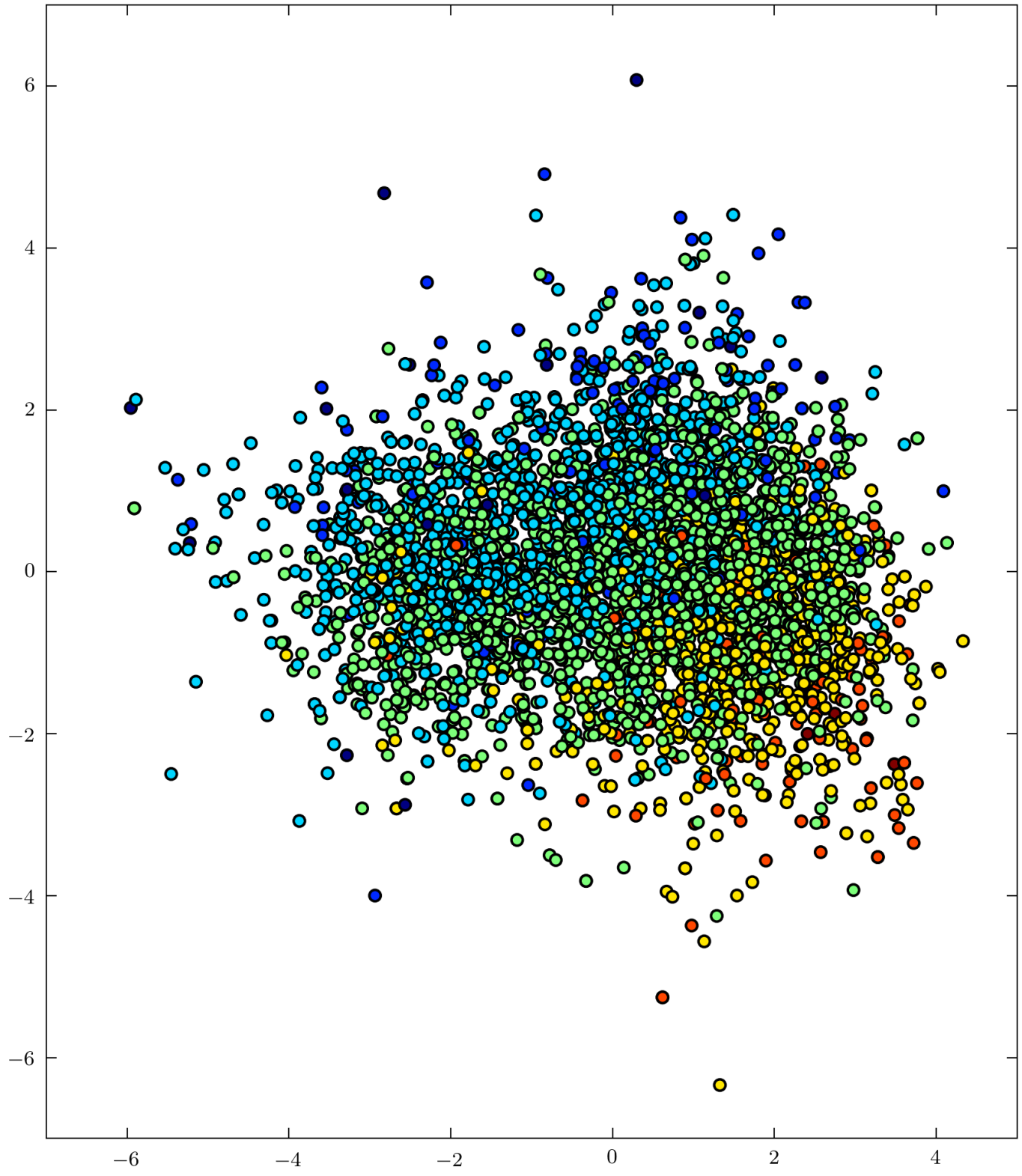

Figure 40: 2D projection of the data using PCA

	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9	PC10	PC11	PC12
Proportion of variance	0.2746	0.1317	0.1170	0.0923	0.0856	0.0746	0.0654	0.0581	0.0469	0.0293	0.0226	0.0017
Cumulative variance	0.2746	0.4063	0.5234	0.6157	0.7013	0.7760	0.8414	0.8995	0.9464	0.9757	0.9983	1.0000

0.3 Correlation coefficients using different functions

0.3.1 Correlation coefficients using Pearson's correlation coefficient

	residual sugar	fixed acidity	density	volatile acidity	total sulfur dioxide	alcohol	quality	sulphates	free sulfur dioxide	chlorides	citric acid	pH
residual sugar	**1.0000**	0.0890	**0.8390**	0.0643	0.4014	–0.4506	–0.0976	–0.0267	0.2991	0.0887	0.0942	–0.1941
fixed acidity	0.0890	**1.0000**	0.2653	–0.0227	0.0911	–0.1209	–0.1137	–0.0171	–0.0494	0.0231	0.2892	–0.4259
density	**0.8390**	0.2653	**1.0000**	0.0271	**0.5299**	**–0.7801**	–0.3071	0.0745	0.2942	0.2572	0.1495	–0.0936
volatile acidity	0.0643	–0.0227	0.0271	**1.0000**	0.0893	0.0677	–0.1947	–0.0357	–0.0970	0.0705	–0.1495	–0.0319
total sulfur dioxide	0.4014	0.0911	**0.5299**	0.0893	**1.0000**	–0.4489	–0.1747	0.1346	**0.6155**	0.1989	0.1211	0.0023
alcohol	–0.4506	–0.1209	**–0.7801**	0.0677	–0.4489	**1.0000**	0.4356	–0.0174	–0.2501	–0.3602	–0.0757	0.1214
quality	–0.0976	–0.1137	–0.3071	–0.1947	–0.1747	0.4356	**1.0000**	0.0537	0.0082	–0.2099	–0.0092	0.0994
sulphates	–0.0267	–0.0171	0.0745	–0.0357	0.1346	–0.0174	0.0537	**1.0000**	0.0592	0.0168	0.0623	0.1560
free sulfur dioxide	0.2991	–0.0494	0.2942	–0.0970	**0.6155**	–0.2501	0.0082	0.0592	**1.0000**	0.1014	0.0941	–0.0006
chlorides	0.0887	0.0231	0.2572	0.0705	0.1989	–0.3602	–0.2099	0.0168	0.1014	**1.0000**	0.1144	–0.0904
citric acid	0.0942	0.2892	0.1495	–0.1495	0.1211	–0.0757	–0.0092	0.0623	0.0941	0.1144	**1.0000**	–0.1637
pH	–0.1941	–0.4259	–0.0936	–0.0319	0.0023	0.1214	0.0994	0.1560	–0.0006	–0.0904	–0.1637	**1.0000**

0.3.2 Correlation coefficients using Spearman's rho

	residual sugar	fixed acidity	density	volatile acidity	total sulfur dioxide	alcohol	quality	sulphates	free sulfur dioxide	chlorides	citric acid	pH
residual sugar	**1.0000**	0.1067	**0.7804**	0.1086	0.4313	–0.4453	–0.0821	–0.0038	0.3461	0.2278	0.0246	–0.1800
fixed acidity	0.1067	**1.0000**	0.2700	–0.0429	0.1126	–0.1068	–0.0845	–0.0132	–0.0245	0.0947	0.2979	–0.4183
density	**0.7804**	0.2700	**1.0000**	0.0101	**0.5638**	**–0.8219**	–0.3484	0.0951	0.3278	**0.5083**	0.0914	–0.1101
volatile acidity	0.1086	–0.0429	0.0101	**1.0000**	0.1176	0.0340	–0.1966	–0.0169	–0.0812	–0.0049	–0.1504	–0.0452
total sulfur dioxide	0.4313	0.1126	**0.5638**	0.1176	**1.0000**	–0.4766	–0.1967	0.1578	**0.6186**	0.3752	0.0932	–0.0118
alcohol	–0.4453	–0.1068	**–0.8219**	0.0340	–0.4766	**1.0000**	0.4404	–0.0449	–0.2726	**–0.5708**	–0.0292	0.1489
quality	–0.0821	–0.0845	–0.3484	–0.1966	–0.1967	0.4404	**1.0000**	0.0333	0.0237	–0.3145	0.0183	0.1094
sulphates	–0.0038	–0.0132	0.0951	–0.0169	0.1578	–0.0449	0.0333	**1.0000**	0.0523	0.0939	0.0798	0.1402
free sulfur dioxide	0.3461	–0.0245	0.3278	–0.0812	**0.6186**	–0.2726	0.0237	0.0523	**1.0000**	0.1670	0.0883	–0.0063
chlorides	0.2278	0.0947	**0.5083**	–0.0049	0.3752	**–0.5708**	–0.3145	0.0939	0.1670	**1.0000**	0.0327	–0.0540
citric acid	0.0246	0.2979	0.0914	–0.1504	0.0932	–0.0292	0.0183	0.0798	0.0883	0.0327	**1.0000**	–0.1462
pH	–0.1800	–0.4183	–0.1101	–0.0452	–0.0118	0.1489	0.1094	0.1402	–0.0063	–0.0540	–0.1462	**1.0000**

0.3.3 Correlation coefficients using Kendall's tau

	residual sugar	fixed acidity	density	volatile acidity	total sulfur dioxide	alcohol	quality	sulphates	free sulfur dioxide	chlorides	citric acid	pH
residual sugar	**1.0000**	0.0749	**0.5890**	0.0728	0.2933	–0.3056	–0.0631	–0.0025	0.2367	0.1553	0.0153	–0.1256
fixed acidity	0.0749	**1.0000**	0.1855	–0.0296	0.0773	–0.0732	–0.0655	–0.0087	–0.0169	0.0654	0.2086	–0.2948
density	**0.5890**	0.1855	**1.0000**	0.0066	0.3884	**–0.6351**	–0.2666	0.0642	0.2173	0.3491	0.0615	–0.0756
volatile acidity	0.0728	–0.0296	0.0066	**1.0000**	0.0813	0.0235	–0.1548	–0.0116	–0.0548	–0.0035	–0.1040	–0.0304
total sulfur dioxide	0.2933	0.0773	0.3884	0.0813	**1.0000**	–0.3258	–0.1512	0.1087	0.4447	0.2571	0.0622	–0.0084
alcohol	–0.3056	–0.0732	**–0.6351**	0.0235	–0.3258	**1.0000**	0.3467	–0.0264	–0.1825	–0.4040	–0.0200	0.1026
quality	–0.0631	–0.0655	–0.2666	–0.1548	–0.1512	0.3467	**1.0000**	0.0264	0.0172	–0.2449	0.0146	0.0844
sulphates	–0.0025	–0.0087	0.0642	–0.0116	0.1087	–0.0264	0.0264	**1.0000**	0.0356	0.0626	0.0545	0.0958
free sulfur dioxide	0.2367	–0.0169	0.2173	–0.0548	0.4447	–0.1825	0.0172	0.0356	**1.0000**	0.1139	0.0608	–0.0052
chlorides	0.1553	0.0654	0.3491	–0.0035	0.2571	–0.4040	–0.2449	0.0626	0.1139	**1.0000**	0.0223	–0.0379
citric acid	0.0153	0.2086	0.0615	–0.1040	0.0622	–0.0200	0.0146	0.0545	0.0608	0.0223	**1.0000**	–0.1013
pH	–0.1256	–0.2948	–0.0756	–0.0304	–0.0084	0.1026	0.0844	0.0958	–0.0052	–0.0379	–0.1013	**1.0000**