

Solution

Given Training Data

Relation: abalone									
No.	1: Sex Nominal	2: Length Numeric	3: Diameter Numeric	4: Height Numeric	5: Whole weight Numeric	6: Shucked weight Numeric	7: Viscera weight Numeric	8: Shell weight Numeric	9: Class_Rings Numeric
4143	M	0.655	0.525	0.18	1.402	0.624	0.2935	0.365	13.0
4144	F	0.655	0.5	0.22	1.359	0.642	0.3255	0.405	13.0
4145	M	0.67	0.535	0.19	1.669	0.7465	0.2935	0.508	11.0
4146	M	0.67	0.525	0.2	1.7405	0.6205	0.297	0.657	11.0
4147	M	0.695	0.53	0.21	1.51	0.664	0.4095	0.385	10.0
4148	M	0.695	0.55	0.195	1.6645	0.727	0.36	0.445	11.0
4149	M	0.77	0.605	0.175	2.0505	0.8005	0.526	0.355	11.0
4150	I	0.28	0.215	0.07	0.124	0.063	0.0215	0.03	6.0
4151	I	0.33	0.23	0.08	0.14	0.0565	0.0365	0.046	7.0
4152	I	0.35	0.25	0.075	0.1695	0.0835	0.0355	0.041	6.0
4153	I	0.37	0.28	0.09	0.218	0.0995	0.0545	0.0615	7.0
4154	I	0.43	0.315	0.115	0.384	0.1885	0.0715	0.11	8.0
4155	I	0.435	0.33	0.095	0.393	0.219	0.075	0.0885	6.0
4156	I	0.44	0.35	0.11	0.3805	0.1575	0.0895	0.115	6.0
4157	M	0.475	0.37	0.11	0.4895	0.2185	0.107	0.146	8.0
4158	M	0.475	0.36	0.14	0.5135	0.241	0.1045	0.155	8.0
4159	I	0.48	0.355	0.11	0.4495	0.201	0.089	0.14	8.0
4160	F	0.56	0.44	0.135	0.8025	0.35	0.1615	0.259	9.0
4161	F	0.585	0.475	0.165	1.053	0.458	0.217	0.3	11.0
4162	F	0.585	0.455	0.17	0.9945	0.4255	0.263	0.2845	11.0
4163	M	0.385	0.255	0.1	0.3175	0.137	0.068	0.092	8.0
4164	I	0.39	0.31	0.085	0.344	0.181	0.0695	0.079	7.0
4165	I	0.39	0.29	0.1	0.2845	0.1255	0.0635	0.081	7.0
4166	I	0.405	0.3	0.085	0.3035	0.15	0.0505	0.088	7.0
4167	I	0.475	0.365	0.115	0.499	0.232	0.0885	0.156	10.0
4168	M	0.5	0.38	0.125	0.577	0.269	0.1265	0.1535	9.0
4169	F	0.515	0.4	0.125	0.615	0.2865	0.123	0.1765	8.0
4170	M	0.52	0.385	0.165	0.791	0.375	0.18	0.1815	10.0
4171	M	0.55	0.43	0.13	0.8395	0.3155	0.1955	0.2405	10.0
4172	M	0.56	0.43	0.155	0.8675	0.4	0.172	0.229	8.0
4173	F	0.565	0.45	0.165	0.887	0.37	0.239	0.249	11.0
4174	M	0.59	0.44	0.135	0.966	0.439	0.2145	0.2605	10.0
4175	M	0.6	0.475	0.205	1.176	0.5255	0.2875	0.308	9.0
4176	F	0.625	0.485	0.15	1.0945	0.531	0.261	0.296	10.0
4177	M	0.71	0.555	0.195	1.9485	0.9455	0.3765	0.495	12.0

Given Test Data

abalone.data.test - Excel

File Home Insert Page Layout Formulas Data Review View Developer Help

Clipboard: Cut, Copy, Paste, Format Painter

Font: Calibri, 11, Bold, Italic, Underline, Text Color, Background Color

Alignment: Left, Center, Right, Indent, Decrease Indent, Increase Indent, Wrap Text, Merge & Center

Formulas: fx, Rings

	A	B	C	D	E	F	G	H	I
1	Sex	Length	Diameter	Height	Wheight	Sweight	Vweight	Shweight	Rings
2	F	0.31	0.221	0.065	0.1495	0.311	0.0345	0.044	7
3	F	0.45	0.351	0.145	0.486	0.451	0.126	0.154	11
4	F	0.465	0.421	0.15	0.747	0.466	0.153	0.239	8
5	F	0.47	0.346	0.125	0.495	0.471	0.104	0.154	18
6	F	0.485	0.381	0.13	0.537	0.486	0.143	0.172	14
7	F	0.495	0.381	0.145	0.7875	0.496	0.141	0.239	23
8	F	0.5	0.396	0.15	0.6455	0.501	0.1335	0.204	17
9	F	0.51	0.406	0.13	0.658	0.511	0.134	0.194	15
10	F	0.53	0.416	0.155	0.757	0.531	0.174	0.274	9
11	F	0.555	0.436	0.145	0.8955	0.556	0.152	0.319	19
12	F	0.555	0.461	0.175	1.2135	0.556	0.206	0.524	27
13	F	0.575	0.436	0.12	0.866	0.576	0.1735	0.269	12
14	F	0.58	0.416	0.13	0.858	0.581	0.148	0.2115	10
15	F	0.59	0.446	0.12	0.875	0.591	0.2085	0.224	6
16	F	0.625	0.476	0.16	1.0135	0.626	0.4375	0.323	10
17	F	0.64	0.511	0.185	1.3725	0.641	0.306	0.449	10
18	F	0.65	0.486	0.21	1.407	0.651	0.2295	0.509	25
19	F	0.685	0.546	0.195	1.597	0.686	0.4085	0.584	21
20	F	0.705	0.581	0.18	1.8085	0.706	0.3225	0.474	29
21	F	0.725	0.591	0.22	1.97	0.726	0.424	0.659	16
22	F	0.805	0.626	0.19	2.527	0.806	0.591	0.619	23
23	I	0.075	0.051	0.005	0.003	0.076	0.0015	0.0005	1
24	I	0.145	0.101	0.03	0.015	0.146	0.0035	0.003	3
25	I	0.155	0.096	0.02	0.016	0.156	0.005	0.004	2
26	I	0.185	0.121	0.03	0.0275	0.186	0.0065	0.0075	4
27	I	0.21	0.151	0.04	0.0505	0.211	0.012	0.013	3
28	I	0.275	0.196	0.065	0.101	0.276	0.0255	0.034	5
29	I	0.33	0.246	0.05	0.167	0.331	0.052	0.044	5
30	I	0.365	0.271	0.07	0.2215	0.366	0.045	0.065	7
31	I	0.425	0.311	0.095	0.3445	0.426	0.0805	0.089	6
32	I	0.425	0.316	0.095	0.341	0.426	0.051	0.0935	8
33	I	0.445	0.346	0.13	0.436	0.446	0.084	0.124	12
34	I	0.45	0.331	0.095	0.4905	0.451	0.087	0.1095	7
35	I	0.485	0.366	0.12	0.5445	0.486	0.102	0.164	9
36	I	0.535	0.421	0.125	0.782	0.536	0.2015	0.214	9
37	I	0.63	0.461	0.15	0.973	0.631	0.1855	0.349	14

Since the attribute names of the training and test data are different, we will use Arffviewer to rename them as below



abalone.data.arff

Relation: abalone

No.	1: Sex Nominal	2: Length Numeric	3: Diameter Numeric	4: Height Numeric	5: Wheight Numeric	6: Sweight Numeric	7: Vweight Numeric	8: Shweight Numeric	9: Rings Numeric
1	M	0.455	0.365	0.095	0.514	0.2245	0.101	0.15	15.0
2	M	0.35	0.265	0.09	0.2255	0.0995	0.0485	0.07	7.0
3	F	0.53	0.42	0.135	0.677	0.2565	0.1415	0.21	9.0
4	M	0.44	0.365	0.125	0.516	0.2155	0.114	0.155	10.0
5	I	0.33	0.255	0.08	0.205	0.0895	0.0395	0.055	7.0
6	I	0.425	0.3	0.095	0.3515	0.141	0.0775	0.12	8.0
7	F	0.53	0.415	0.15	0.7775	0.237	0.1415	0.33	20.0
8	F	0.545	0.425	0.125	0.768	0.294	0.1495	0.26	16.0
9	M	0.475	0.37	0.125	0.5095	0.2165	0.1125	0.165	9.0
10	F	0.55	0.44	0.15	0.8945	0.3145	0.151	0.32	19.0
11	F	0.525	0.38	0.14	0.6065	0.194	0.1475	0.21	14.0
12	M	0.43	0.35	0.11	0.406	0.1675	0.081	0.135	10.0
13	M	0.49	0.38	0.135	0.5415	0.2175	0.095	0.19	11.0
14	F	0.535	0.405	0.145	0.6845	0.2725	0.171	0.205	10.0
15	F	0.47	0.355	0.1	0.4755	0.1675	0.0805	0.185	10.0
16	M	0.5	0.4	0.13	0.6645	0.258	0.133	0.24	12.0
17	I	0.355	0.28	0.085	0.2905	0.095	0.0395	0.115	7.0
18	F	0.44	0.34	0.1	0.451	0.188	0.087	0.13	10.0
19	M	0.365	0.295	0.08	0.2555	0.097	0.043	0.1	7.0
20	M	0.45	0.32	0.1	0.381	0.1705	0.075	0.115	9.0
21	M	0.355	0.28	0.095	0.2455	0.0955	0.062	0.075	11.0
22	I	0.38	0.275	0.1	0.2255	0.08	0.049	0.085	10.0
23	F	0.565	0.44	0.155	0.9395	0.4275	0.214	0.27	12.0
24	F	0.55	0.415	0.135	0.7635	0.318	0.21	0.2	9.0
25	F	0.615	0.48	0.165	1.1615	0.513	0.301	0.305	10.0
26	F	0.56	0.44	0.14	0.9285	0.3825	0.188	0.3	11.0
27	F	0.58	0.45	0.185	0.9955	0.3945	0.272	0.285	11.0
28	M	0.59	0.445	0.14	0.931	0.356	0.234	0.28	12.0
29	M	0.605	0.475	0.18	0.9365	0.394	0.219	0.295	15.0
30	M	0.575	0.425	0.14	0.8635	0.393	0.227	0.2	11.0
31	M	0.58	0.47	0.165	0.9975	0.3935	0.242	0.33	10.0
32	F	0.68	0.56	0.165	1.639	0.6055	0.2805	0.46	15.0

Since the training data label (Rings) is in continuous format, in order to classifier work we need to discretize the data using binning method by setting “**useEqualFrequency**” we will use python code to transform data.

```
import pandas as pd

# Load the abalone dataset
url = '/kaggle/input/abalone-1-data/abalone-1.data.csv'
column_names = ['Sex', 'Length', 'Diameter', 'Height', 'Wheight', 'Sweight', 'Vweight', 'Shweight', 'Rings']
abalone = pd.read_csv(url, names=column_names)

# Examine the Rings attribute
print(abalone['Rings'].describe())

abalone['Length'] = pd.to_numeric(abalone['Length'], errors='coerce')
abalone['Diameter'] = pd.to_numeric(abalone['Diameter'], errors='coerce')
abalone['Height'] = pd.to_numeric(abalone['Height'], errors='coerce')
abalone['Wheight'] = pd.to_numeric(abalone['Wheight'], errors='coerce')
abalone['Sweight'] = pd.to_numeric(abalone['Sweight'], errors='coerce')
abalone['Vweight'] = pd.to_numeric(abalone['Vweight'], errors='coerce')
abalone['Shweight'] = pd.to_numeric(abalone['Shweight'], errors='coerce')
abalone['Rings'] = pd.to_numeric(abalone['Rings'], errors='coerce')

# Choose a discretization method - e.g., equal-width binning
num_bins = 5

# Alternatively, use equal-frequency binning
abalone['Rings_binned_quantile'] = pd.qcut(abalone['Rings'], q=num_bins, labels=False)

# Display the discretized attribute
print(abalone[['Rings', 'Rings_binned_quantile']].head())

# Define category labels
labels = ["Very Low", "Low", "Medium", "High", "Very High"]

# Map the bins to these labels
abalone['Rings_category'] = abalone['Rings_binned_quantile'].map({
    0: "Very Low",
    1: "Low",
    2: "Medium",
    3: "High",
    4: "Very High"
})

# Display the categorized attribute
print(abalone[['Rings', 'Rings_binned_quantile', 'Rings_category']].head())

# Save the updated dataset
abalone.to_csv('abalone_discretized.csv', index=False)
```

Dataset after discretization looks as below

Relation: abalone_discretized

No.	1: Sex Nominal	2: Length Numeric	3: Diameter Numeric	4: Height Numeric	5: Wheight Numeric	6: Sweight Numeric	7: Vweight Numeric	8: Shweight Numeric	9: Rings Numeric	10: Rings_binned_quantile Numeric	11: Rings_category Nominal
1	M	0.455	0.365	0.095	0.514	0.2245	0.101	0.15	15.0		4.0 Very High
2	M	0.35	0.265	0.09	0.2255	0.0995	0.0485	0.07	7.0		0.0 Very Low
3	F	0.53	0.42	0.135	0.677	0.2565	0.1415	0.21	9.0		1.0 Low
4	M	0.44	0.365	0.125	0.516	0.2155	0.114	0.155	10.0		2.0 Medium
5	I	0.33	0.255	0.08	0.205	0.0895	0.0395	0.055	7.0		0.0 Very Low
6	I	0.425	0.3	0.095	0.3515	0.141	0.0775	0.12	8.0		1.0 Low
7	F	0.53	0.415	0.15	0.7775	0.237	0.1415	0.33	20.0		4.0 Very High
8	F	0.545	0.425	0.125	0.768	0.294	0.1495	0.26	16.0		4.0 Very High
9	M	0.475	0.37	0.125	0.5095	0.2165	0.1125	0.165	9.0		1.0 Low
10	F	0.55	0.44	0.15	0.8945	0.3145	0.151	0.32	19.0		4.0 Very High
11	F	0.525	0.38	0.14	0.6065	0.194	0.1475	0.21	14.0		4.0 Very High
12	M	0.43	0.35	0.11	0.406	0.1675	0.081	0.135	10.0		2.0 Medium
13	M	0.49	0.38	0.135	0.5415	0.2175	0.095	0.19	11.0		3.0 High
14	F	0.535	0.405	0.145	0.6845	0.2725	0.171	0.205	10.0		2.0 Medium
15	F	0.47	0.355	0.1	0.4755	0.1675	0.0805	0.185	10.0		2.0 Medium
16	M	0.5	0.4	0.13	0.6645	0.258	0.133	0.24	12.0		3.0 High
17	I	0.355	0.28	0.085	0.2905	0.095	0.0395	0.115	7.0		0.0 Very Low
18	F	0.44	0.34	0.1	0.451	0.188	0.087	0.13	10.0		2.0 Medium
19	M	0.365	0.295	0.08	0.2555	0.097	0.043	0.1	7.0		0.0 Very Low
20	M	0.45	0.32	0.1	0.381	0.1705	0.075	0.115	9.0		1.0 Low
21	M	0.355	0.28	0.095	0.2455	0.0955	0.062	0.075	11.0		3.0 High
22	I	0.38	0.275	0.1	0.2255	0.08	0.049	0.085	10.0		2.0 Medium
23	F	0.565	0.44	0.155	0.9395	0.4275	0.214	0.27	12.0		3.0 High
24	F	0.55	0.415	0.135	0.7635	0.318	0.21	0.2	9.0		1.0 Low
25	F	0.615	0.48	0.165	1.1615	0.513	0.301	0.305	10.0		2.0 Medium
26	F	0.56	0.44	0.14	0.9285	0.3825	0.188	0.3	11.0		3.0 High
27	F	0.58	0.45	0.185	0.9955	0.3945	0.272	0.285	11.0		3.0 High
28	M	0.59	0.445	0.14	0.931	0.356	0.234	0.28	12.0		3.0 High
29	M	0.605	0.475	0.18	0.9365	0.394	0.219	0.295	15.0		4.0 Very High
30	M	0.575	0.425	0.14	0.8635	0.393	0.227	0.2	11.0		3.0 High
31	M	0.58	0.47	0.165	0.9975	0.3935	0.242	0.33	10.0		2.0 Medium
32	F	0.68	0.56	0.165	1.639	0.6055	0.2805	0.46	15.0		4.0 Very High
33	M	0.665	0.525	0.165	1.338	0.5515	0.3575	0.35	18.0		4.0 Very High
34	F	0.68	0.55	0.175	1.798	0.815	0.3925	0.455	19.0		4.0 Very High
35	F	0.705	0.55	0.2	1.7095	0.633	0.4115	0.49	13.0		4.0 Very High
36	M	0.465	0.355	0.105	0.4795	0.227	0.124	0.125	8.0		1.0 Low
37	F	0.54	0.475	0.155	1.217	0.5305	0.3075	0.34	16.0		4.0 Very High
38	F	0.45	0.355	0.105	0.5225	0.237	0.1165	0.145	8.0		1.0 Low
39	F	0.575	0.445	0.135	0.883	0.381	0.2035	0.26	11.0		3.0 High
40	M	0.355	0.29	0.09	0.3275	0.134	0.086	0.09	9.0		1.0 Low
41	F	0.45	0.335	0.105	0.425	0.1865	0.091	0.115	9.0		1.0 Low
42	F	0.55	0.425	0.135	0.8515	0.362	0.196	0.27	14.0		4.0 Very High
43	I	0.24	0.175	0.045	0.07	0.0315	0.0235	0.02	5.0		0.0 Very Low
44	I	0.205	0.15	0.055	0.042	0.0255	0.015	0.012	5.0		0.0 Very Low
45	I	0.21	0.15	0.05	0.042	0.0175	0.0125	0.015	4.0		0.0 Very Low
46	I	0.39	0.295	0.095	0.203	0.0875	0.045	0.075	7.0		0.0 Very Low
47	M	0.47	0.37	0.12	0.5795	0.293	0.227	0.14	9.0		1.0 Low
48	F	0.46	0.375	0.12	0.4605	0.1775	0.11	0.15	7.0		0.0 Very Low

Rings_category is now our new class and we use the classifiers.

Similar processing, we need to do for test data

```

import pandas as pd

# Load the abalone dataset
url = '/kaggle/input/abalone-data-test/abalone.data.test.csv'
column_names = ['Sex', 'Length', 'Diameter', 'Height', 'Wheight', 'Sweight', 'Vweight', 'Shweight', 'Rings']
abalone = pd.read_csv(url, names=column_names)

# Examine the Rings attribute
print(abalone['Rings'].describe())

abalone['Length'] = pd.to_numeric(abalone['Length'], errors='coerce')
abalone['Diameter'] = pd.to_numeric(abalone['Diameter'], errors='coerce')
abalone['Height'] = pd.to_numeric(abalone['Height'], errors='coerce')
abalone['Wheight'] = pd.to_numeric(abalone['Wheight'], errors='coerce')
abalone['Sweight'] = pd.to_numeric(abalone['Sweight'], errors='coerce')
abalone['Vweight'] = pd.to_numeric(abalone['Vweight'], errors='coerce')
abalone['Shweight'] = pd.to_numeric(abalone['Shweight'], errors='coerce')
abalone['Rings'] = pd.to_numeric(abalone['Rings'], errors='coerce')

# Choose a discretization method - e.g., equal-width binning
num_bins = 5

# Alternatively, use equal-frequency binning
abalone['Rings_binned_quantile'] = pd.qcut(abalone['Rings'], q=num_bins, labels=False)

# Display the discretized attribute
print(abalone[['Rings', 'Rings_binned_quantile']].head())

# Display the categorized attribute
print(abalone[['Rings', 'Rings_binned_quantile']].head())

# Save the updated dataset
abalone.to_csv('abalone_discretized_test.csv', index=False)

```

The test data will not have Rings_category which we need to predict.

abalone_discretized_test.csv

Relation: abalone_discretized_test

No.	1: Sex Nominal	2: Length Numeric	3: Diameter Numeric	4: Height Numeric	5: Wheight Numeric	6: Sweight Numeric	7: Vweight Numeric	8: Shweight Numeric	9: Rings Numeric	10: Rings_binned_quantile Numeric	11: Ring Category Nominal
1	F	0.31	0.221	0.065	0.1495	0.311	0.0345	0.044	7.0		0.0 Very Low
2	F	0.45	0.351	0.145	0.486	0.451	0.126	0.154	11.0		2.0 Medium
3	F	0.465	0.421	0.15	0.747	0.466	0.153	0.239	8.0		1.0 Low
4	F	0.47	0.346	0.125	0.495	0.471	0.104	0.154	18.0		3.0 High
5	F	0.485	0.381	0.13	0.537	0.486	0.143	0.172	14.0		2.0 Medium
6	F	0.495	0.381	0.145	0.7875	0.496	0.141	0.239	23.0		4.0 Very High
7	F	0.5	0.396	0.15	0.6455	0.501	0.1335	0.204	17.0		3.0 High
8	F	0.51	0.406	0.13	0.658	0.511	0.134	0.194	15.0		2.0 Medium
9	F	0.53	0.416	0.155	0.757	0.531	0.174	0.274	9.0		1.0 Low
10	F	0.555	0.436	0.145	0.8955	0.556	0.152	0.319	19.0		3.0 High
11	F	0.555	0.461	0.175	1.2135	0.556	0.206	0.524	27.0		4.0 Very High
12	F	0.575	0.436	0.12	0.866	0.576	0.1735	0.269	12.0		2.0 Medium
13	F	0.58	0.416	0.13	0.858	0.581	0.148	0.2115	10.0		1.0 Low
14	F	0.59	0.446	0.12	0.875	0.591	0.2085	0.224	6.0		0.0 Very Low
15	F	0.625	0.476	0.16	1.0135	0.626	0.4375	0.323	10.0		1.0 Low
16	F	0.64	0.511	0.185	1.3725	0.641	0.306	0.449	10.0		1.0 Low
17	F	0.65	0.486	0.21	1.407	0.651	0.2295	0.509	25.0		4.0 Very High
18	F	0.685	0.546	0.195	1.597	0.686	0.4085	0.584	21.0		4.0 Very High
19	F	0.705	0.581	0.18	1.8085	0.706	0.3225	0.474	29.0		4.0 Very High
20	F	0.725	0.591	0.22	1.97	0.726	0.424	0.659	16.0		3.0 High
21	F	0.805	0.626	0.19	2.527	0.806	0.591	0.619	23.0		4.0 Very High
22	I	0.075	0.051	0.005	0.003	0.076	0.0015	5.0E-4	1.0		0.0 Very Low
23	I	0.145	0.101	0.03	0.015	0.146	0.0035	0.003	3.0		0.0 Very Low
24	I	0.155	0.096	0.02	0.016	0.156	0.005	0.004	2.0		0.0 Very Low
25	I	0.185	0.121	0.03	0.0275	0.186	0.0065	0.0075	4.0		0.0 Very Low
26	I	0.21	0.151	0.04	0.0505	0.211	0.012	0.013	3.0		0.0 Very Low
27	I	0.275	0.196	0.065	0.101	0.276	0.0255	0.034	5.0		0.0 Very Low
28	I	0.33	0.246	0.05	0.167	0.331	0.052	0.044	5.0		0.0 Very Low
29	I	0.365	0.271	0.07	0.2215	0.366	0.045	0.065	7.0		0.0 Very Low
30	I	0.425	0.311	0.095	0.3445	0.426	0.0805	0.089	6.0		0.0 Very Low
31	I	0.425	0.316	0.095	0.341	0.426	0.051	0.0935	8.0		1.0 Low
32	I	0.445	0.346	0.13	0.436	0.446	0.084	0.124	12.0		2.0 Medium
33	I	0.45	0.331	0.095	0.4905	0.451	0.087	0.1095	7.0		0.0 Very Low
34	I	0.485	0.366	0.12	0.5445	0.486	0.102	0.164	9.0		1.0 Low
35	I	0.535	0.421	0.125	0.782	0.536	0.2015	0.214	9.0		1.0 Low
36	I	0.63	0.461	0.15	0.973	0.631	0.1855	0.349	14.0		2.0 Medium
37	M	0.16	0.111	0.02	0.025	0.161	0.006	0.0065	5.0		0.0 Very Low
38	M	0.24	0.156	0.055	0.0555	0.241	0.0105	0.014	4.0		0.0 Very Low
39	M	0.28	0.196	0.075	0.1	0.281	0.025	0.029	5.0		0.0 Very Low
40	M	0.305	0.236	0.085	0.162	0.306	0.04	0.049	6.0		0.0 Very Low
41	M	0.33	0.226	0.085	0.148	0.331	0.035	0.044	4.0		0.0 Very Low
42	M	0.34	0.256	0.07	0.221	0.341	0.041	0.084	6.0		0.0 Very Low
43	M	0.44	0.331	0.105	0.4395	0.441	0.0725	0.1305	7.0		0.0 Very Low

Training AdaBoostM1

Classifier

Choose **AdaBoostM1** -P 100 -S 1 -I 10 -W weka.classifiers.trees.DecisionStump

Test options

☒ Use training set

☐ Supplied test set

Set...

☐ Cross-validation

Folds 10

☐ Percentage split

% 66

More options...

(Nom) Rings_category

Start Stop

Result list (right-click for options)

21:01:54 - meta.AdaBoostM1

Classifier output

=== Run information ===

Scheme: weka.classifiers.meta.AdaBoostM1 -P 100 -S 1 -I 10 -W weka.classifiers.trees.DecisionStump

Relation: abalone_discretized

Instances: 4177

Attributes: 11

Sex

Length

Diameter

Height

Wheight

Swheight

Vweight

Shweight

Rings

Rings_binned_quantile

Rings_category

Test mode: evaluate on training data

=== Classifier model (full training set) ===

AdaBoostM1: No boosting possible, one classifier used!

Decision Stump

Classifications

Rings <= 9.5 : Low

Rings > 9.5 : High

Rings is missing : Low

Class distributions

Rings <= 9.5

Very High Very Low Low Medium High

0.0 0.4002862595419847 0.5997137404580153 0.0 0.0

Rings > 9.5

Very High Very Low Low Medium High

0.33301297453147527 0.0 0.0 0.3046612205670351 0.3623258049014897

Rings is missing

Very High Very Low Low Medium High

0.16590854680392628 0.2008618625807996 0.30093368446253294 0.15178357672971032 0.1805123294230309

Time taken to build model: 0.02 seconds

=== Predictions on training set ===

inst# actual predicted error prediction

1 1:'Very High' 5:High + 0.362

2 2:'Very Low' 3:Low + 0.6

3 3:Low 3:Low 0.6

4 4:Medium 5:High + 0.362

5 2:'Very Low' 3:Low + 0.6

6 3:Low 3:Low 0.6

7 1:'Very High' 5:High + 0.362

8 1:'Very High' 5:High + 0.362

9 3:Low 3:Low 0.6

10 1:'Very High' 5:High + 0.362

11 1:'Very High' 5:High + 0.362

12 4:Medium 5:High + 0.362

13 5:High 5:High 0.362

14 4:Medium 5:High + 0.362

15 4:Medium 5:High + 0.362

16 5:High 5:High 0.362

17 2:'Very Low' 3:Low + 0.6

18 4:Medium 5:High + 0.362

19 2:'Very Low' 3:Low + 0.6

20 3:Low 3:Low 0.6


```

=== Evaluation on training set ===

Time taken to test model on training data: 1.13 seconds

=== Summary ===

Correctly Classified Instances      2011      48.1446 %
Incorrectly Classified Instances    2166      51.8554 %
Kappa statistic                    0.3168
Mean absolute error                 0.2289
Root mean squared error             0.3383
Relative absolute error             72.806 %
Root relative squared error         85.3273 %
Total Number of Instances          4177

=== Detailed Accuracy By Class ===

      TP Rate  FP Rate  Precision  Recall  F-Measure  MCC      ROC Area  PRC Area  Class
      0.000    0.000    ?          0.000    ?          ?        0.801    0.333    Very High
      0.000    0.000    ?          0.000    ?          ?        0.812    0.400    Very Low
      1.000    0.287    0.600     1.000    0.750     0.654    0.856    0.600    Low
      0.000    0.000    ?          0.000    ?          ?        0.796    0.305    Medium
      1.000    0.388    0.362     1.000    0.532     0.471    0.806    0.362    High
Weighted Avg.   0.481    0.156    ?          0.481    ?          ?        0.820    0.428

=== Confusion Matrix ===

  a   b   c   d   e  <-- classified as
  0   0   0   0 693 |  a = Very High
  0   0 839   0   0 |  b = Very Low
  0   0 1257  0   0 |  c = Low
  0   0   0   0 634 |  d = Medium
  0   0   0   0 754 |  e = High

```

Save the model and load the model

Test AdaBoostM1

Classifier

Choose

AdaBoostM1 - P 100 - S 1 - I 10 - W weka.classifiers.trees.DecisionStump

Test options

☐ Use training set
 ☒ Supplied test set

Set...

☐ Cross-validation

Folds 10

☐ Percentage split

% 66

More options...

(Nom) Rings_category

Start

Stop

Result list (right-click for options)

21:25:35 - meta.AdaBoostM1

21:25:54 - meta.AdaBoostM1 from file 'adaboost.model'

21:26:03 - misc.InputMappedClassifier

Classifier output

Rings <= 9.5 : Low
 Rings > 9.5 : High
 Rings is missing : Low

Class distributions

Rings <= 9.5
 Very High Very Low Low Medium High
 0.0 0.4002862595419847 0.5997137404580153 0.0 0.0

 Rings > 9.5
 Very High Very Low Low Medium High
 0.33301297453147527 0.0 0.0 0.3046612205670351 0.3623258049014897

Rings is missing
 Very High Very Low Low Medium High
 0.16590854680392628 0.2008618625807996 0.30093368446253294 0.15178357672971032 0.18051232942303

Attribute mappings:

Model attributes

Incoming attributes

(nominal) Sex --> 1 (nominal) Sex
 (numeric) Length --> 2 (numeric) Length
 (numeric) Diameter --> 3 (numeric) Diameter
 (numeric) Height --> 4 (numeric) Height
 (numeric) Wheight --> 5 (numeric) Wheight
 (numeric) Sweight --> 6 (numeric) Sweight
 (numeric) Vweight --> 7 (numeric) Vweight
 (numeric) Shweight --> 8 (numeric) Shweight
 (numeric) Rings --> 9 (numeric) Rings
 (numeric) Rings_binned_quantile --> 10 (numeric) Rings_binned_quantile
 (nominal) Rings_category --> 11 (nominal) Rings_Category

Time taken to build model: 0.02 seconds

=== Predictions on test set ===

inst# actual predicted error prediction

1 2:'Very Low' 3:Low + 0.6
 2 4:Medium 5:High + 0.362
 3 3:Low 3:Low 0.6
 4 5:High 5:High 0.362
 5 4:Medium 5:High + 0.362
 6 1:'Very High' 5:High + 0.362
 7 5:High 5:High 0.362
 8 4:Medium 5:High + 0.362
 9 3:Low 3:Low 0.6
 10 5:High 5:High 0.362
 11 1:'Very High' 5:High + 0.362
 12 4:Medium 5:High + 0.362
 13 3:Low 5:High + 0.362
 14 2:'Very Low' 3:Low + 0.6
 15 3:Low 5:High + 0.362
 16 3:Low 5:High + 0.362
 17 1:'Very High' 5:High + 0.362
 18 1:'Very High' 5:High + 0.362
 19 1:'Very High' 5:High + 0.362
 20 5:High 5:High 0.362

Prediction Output from test sample

inst#	actual	predicted error	prediction
1	2:'Very Low'	3:Low	0.6
2	4:Medium	5:High +	0.362
3	3:Low	3:Low	0.6
4	5:High	5:High	0.362
5	4:Medium	5:High +	0.362
6	1:'Very High	' 5:High	0.362

7	5:High	5:High	0.362
8	4:Medium	5:High +	0.362
9	3:Low	3:Low	0.6
10	5:High	5:High	0.362
11	1:'Very High	' 5:High	0.362
12	4:Medium	5:High +	0.362
13	3:Low	5:High +	0.362
14	2:'Very Low'	3:Low	0.6
15	3:Low	5:High +	0.362
16	3:Low	5:High +	0.362
17	1:'Very High	' 5:High	0.362
18	1:'Very High	' 5:High	0.362
19	1:'Very High	' 5:High	0.362
20	5:High	5:High	0.362
21	1:'Very High	' 5:High	0.362
22	2:'Very Low'	3:Low	0.6
23	2:'Very Low'	3:Low	0.6
24	2:'Very Low'	3:Low	0.6
25	2:'Very Low'	3:Low	0.6
26	2:'Very Low'	3:Low	0.6
27	2:'Very Low'	3:Low	0.6
28	2:'Very Low'	3:Low	0.6
29	2:'Very Low'	3:Low	0.6
30	2:'Very Low'	3:Low	0.6
31	3:Low	3:Low	0.6
32	4:Medium	5:High +	0.362
33	2:'Very Low'	3:Low	0.6
34	3:Low	3:Low	0.6
35	3:Low	3:Low	0.6

36	4:Medium	5:High +	0.362
37	2:'Very Low'	3:Low	0.6
38	2:'Very Low'	3:Low	0.6
39	2:'Very Low'	3:Low	0.6
40	2:'Very Low'	3:Low	0.6
41	2:'Very Low'	3:Low	0.6
42	2:'Very Low'	3:Low	0.6
43	2:'Very Low'	3:Low	0.6
44	3:Low	3:Low	0.6
45	5:High	5:High	0.362
46	3:Low	5:High +	0.362
47	5:High	5:High	0.362
48	4:Medium	5:High +	0.362
49	3:Low	3:Low	0.6
50	5:High	5:High	0.362
51	4:Medium	5:High +	0.362
52	4:Medium	5:High +	0.362
53	5:High	5:High	0.362
54	5:High	5:High	0.362
55	2:'Very Low'	3:Low	0.6
56	5:High	5:High	0.362
57	4:Medium	5:High +	0.362
58	1:'Very High	' 5:High	0.362
59	4:Medium	5:High +	0.362
60	4:Medium	5:High +	0.362
61	5:High	5:High	0.362
62	5:High	5:High	0.362
63	4:Medium	5:High +	0.362
64	1:'Very High	' 5:High	0.362
65	1:'Very High	' 5:High	0.362
66	4:Medium	5:High +	0.362
67	3:Low	3:Low	0.6

68	1:'Very High	' 5:High	0.362
69	1:'Very High	' 5:High	0.362
70	5:High	5:High	0.362
71	1:'Very High	' 5:High	0.362
72	5:High	5:High	0.362
73	1:'Very High	' 5:High	0.362
74	1:'Very High	' 5:High	0.362
75	4:Medium	5:High +	0.362
76	1:'Very High	' 5:High	0.362
77	4:Medium	5:High +	0.362
78	1:'Very High	' 5:High	0.362
79	4:Medium	5:High +	0.362
80	4:Medium	5:High +	0.36

Correctly Classified Instances 22 27.5 %

Training Bagging

Classifier

ChooseBagging -P 100 -S 1 -num-slots 1 -I 10 -W weka.classifiers.trees.REPTree -- -M 2 -V 0.001 -N 3 -S 1 -L 1 -I 0.0

Test options

☒ Use training set

☐ Supplied test set

☐ Cross-validation

☐ Percentage split

Folds10

%66

More options...

(Nom) Rings_category

StartStop

Result list (right-click for options)

21:25:35 - meta.AdaBoostM1

21:25:54 - meta.AdaBoostM1 from file 'adaboost.model'

21:26:03 - misc.InputMappedClassifier

21:31:26 - meta.Bagging

Classifier output

=== Run information ===

Scheme: weka.classifiers.meta.Bagging -P 100 -S 1 -num-slots 1 -I 10 -W weka.classifiers.trees.REPTree -- -M 2 -V 0.001 -N 3 -S 1 -L 1 -I 0.0

Relation: abalone_discretized

Instances: 4177

Attributes: 11

Sex

Length

Diameter

Height

Weight

Sweight

Vweight

Shweight

Rings

Rings_binned_quantile

Rings_category

Test mode: evaluate on training data

=== Classifier model (full training set) ===

Bagging with 10 iterations and base learner

weka.classifiers.trees.REPTree -M 2 -V 0.001 -N 3 -S 1 -L 1 -I 0.0

Time taken to build model: 0.16 seconds

=== Predictions on training set ===

inst# actual predicted error prediction

1 1:'Very High' 1:'Very High' 1

2 2:'Very Low' 2:'Very Low' 1

3 3:Low 3:Low 1

4 4:Medium 4:Medium 1

5 2:'Very Low' 2:'Very Low' 1

6 3:Low 3:Low 1

7 1:'Very High' 1:'Very High' 1

8 1:'Very High' 1:'Very High' 1

9 3:Low 3:Low 1

10 1:'Very High' 1:'Very High' 1

11 1:'Very High' 1:'Very High' 1

12 4:Medium 4:Medium 1

13 5:High 5:High 1

14 4:Medium 4:Medium 1

15 4:Medium 4:Medium 1

16 5:High 5:High 1

17 2:'Very Low' 2:'Very Low' 1

18 4:Medium 4:Medium 1

19 2:'Very Low' 2:'Very Low' 1

20 3:Low 3:Low 1

```
=== Evaluation on training set ===

Time taken to test model on training data: 0.85 seconds

=== Summary ===

Correctly Classified Instances      4177      100 %
Incorrectly Classified Instances      0        0 %
Kappa statistic      1
Mean absolute error      0
Root mean squared error      0
Relative absolute error      0 %
Root relative squared error      0 %
Total Number of Instances      4177

=== Detailed Accuracy By Class ===

          TP Rate  FP Rate  Precision  Recall  F-Measure  MCC      ROC Area  PRC Area  Class
          1.000    0.000    1.000    1.000    1.000    1.000    1.000    1.000    Very High
          1.000    0.000    1.000    1.000    1.000    1.000    1.000    1.000    Very Low
          1.000    0.000    1.000    1.000    1.000    1.000    1.000    1.000    Low
          1.000    0.000    1.000    1.000    1.000    1.000    1.000    1.000    Medium
          1.000    0.000    1.000    1.000    1.000    1.000    1.000    1.000    High
Weighted Avg.    1.000    0.000    1.000    1.000    1.000    1.000    1.000    1.000

=== Confusion Matrix ===

  a   b   c   d   e  <-- classified as
693   0   0   0   0 |  a = Very High
  0 839   0   0   0 |  b = Very Low
  0   0 1257   0   0 |  c = Low
  0   0   0 634   0 |  d = Medium
  0   0   0   0 754 |  e = High
```

Test Bagging

Classifier

Choose **Bagging** -P 100 -S 1 -num-slots 1 -I 10 -W weka.classifiers.trees.REPTree -- -M 2 -V 0.001 -N 3 -S 1 -L -1 -I 0.0

Test options

☐ Use training set
 ☒ Supplied test set Set...

☐ Cross-validation Folds 10
☐ Percentage split % 66

More options...

(Nom) Rings_category

Start Stop

Result list (right-click for options)

21:25:35 - meta.AdaBoostM1
 21:25:54 - meta.AdaBoostM1 from file 'adaboost.model'
 21:26:03 - misc.InputMappedClassifier
 21:31:26 - meta.Bagging
 21:33:04 - meta.Bagging from file 'bagging.model'
 21:33:13 - misc.InputMappedClassifier
 21:33:43 - meta.Bagging
 21:34:11 - meta.Bagging from file 'bagging.model'
 21:34:15 - misc.InputMappedClassifier

Classifier output

=== Run information ===

Scheme: weka.classifiers.misc.InputMappedClassifier -I -trim -W weka.classifiers.meta.Bagging -- -P 100 -S 1 -num-slots
 Relation: abalone_discretized
 Instances: 4177
 Attributes: 11
 Sex
 Length
 Diameter
 Height
 Weight
 Sweight
 Vweight
 Shweight
 Rings
 Rings_binned_quantile
 Rings_category
 Test mode: user supplied test set: size unknown (reading incrementally)

=== Classifier model (full training set) ===
 InputMappedClassifier:
 Bagging with 10 iterations and base learner
 weka.classifiers.trees.REPTree -M 2 -V 0.001 -N 3 -S 1 -L -1 -I 0.0
 Attribute mappings:

Model attributes	Incoming attributes
(nominal) Sex	--> 1 (nominal) Sex
(numeric) Length	--> 2 (numeric) Length
(numeric) Diameter	--> 3 (numeric) Diameter
(numeric) Height	--> 4 (numeric) Height
(numeric) Weight	--> 5 (numeric) Weight
(numeric) Sweight	--> 6 (numeric) Sweight
(numeric) Vweight	--> 7 (numeric) Vweight
(numeric) Shweight	--> 8 (numeric) Shweight
(numeric) Rings	--> 9 (numeric) Rings
(numeric) Rings_binned_quantile	--> 10 (numeric) Rings_binned_quantile
(nominal) Rings_category	--> 11 (nominal) Rings_Category

 Time taken to build model: 0.05 seconds
 === Predictions on test set ===

inst#	actual	predicted	error	prediction
1	2:'Very Low'	2:Very Low		1
2	4:Medium	5:High	+	1
3	3:Low	3:Low		1
4	5:High	1:Very High	+	1
5	4:Medium	1:Very High	+	1
6	1:'Very High'	1:Very High		1
7	5:High	1:Very High	+	1
8	4:Medium	1:Very High	+	1
9	3:Low	3:Low		1
10	5:High	1:Very High	+	1
11	1:'Very High'	1:Very High		1
12	4:Medium	5:High	+	1
13	3:Low	4:Medium	+	1
14	2:'Very Low'	2:Very Low		1
15	3:Low	4:Medium	+	1
16	3:Low	4:Medium	+	1
17	1:'Very High'	1:Very High		1
18	1:'Very High'	1:Very High		1
19	1:'Very High'	1:Very High		1
20	5:High	1:Very High	+	1

Prediction Output from test sample

inst# actual predicted error prediction

1 2:'Very Low' 2:Very Low 1

2 4:Medium 5:High + 1

3 3:Low 3:Low 1

4 5:High 1:Very High + 1

5 4:Medium 1:Very High + 1

6 1:'Very High' 1:Very High 1
7 5:High 1:Very High + 1
8 4:Medium 1:Very High + 1
9 3:Low 3:Low 1
10 5:High 1:Very High + 1
11 1:'Very High' 1:Very High 1
12 4:Medium 5:High + 1
13 3:Low 4:Medium + 1
14 2:'Very Low' 2:Very Low 1
15 3:Low 4:Medium + 1
16 3:Low 4:Medium + 1
17 1:'Very High' 1:Very High 1
18 1:'Very High' 1:Very High 1
19 1:'Very High' 1:Very High 1
20 5:High 1:Very High + 1
21 1:'Very High' 1:Very High 1
22 2:'Very Low' 2:Very Low 1
23 2:'Very Low' 2:Very Low 1
24 2:'Very Low' 2:Very Low 1
25 2:'Very Low' 2:Very Low 1
26 2:'Very Low' 2:Very Low 1
27 2:'Very Low' 2:Very Low 1
28 2:'Very Low' 2:Very Low 1
29 2:'Very Low' 2:Very Low 1
30 2:'Very Low' 2:Very Low 1

31 3:Low 3:Low 1
32 4:Medium 5:High + 1
33 2:'Very Low' 2:Very Low 1
34 3:Low 3:Low 1
35 3:Low 3:Low 1
36 4:Medium 1:Very High + 1
37 2:'Very Low' 2:Very Low 1
38 2:'Very Low' 2:Very Low 1
39 2:'Very Low' 2:Very Low 1
40 2:'Very Low' 2:Very Low 1
41 2:'Very Low' 2:Very Low 1
42 2:'Very Low' 2:Very Low 1
43 2:'Very Low' 2:Very Low 1
44 3:Low 3:Low 1
45 5:High 1:Very High + 1
46 3:Low 4:Medium + 1
47 5:High 1:Very High + 1
48 4:Medium 1:Very High + 1
49 3:Low 3:Low 1
50 5:High 1:Very High + 1
51 4:Medium 1:Very High + 1
52 4:Medium 5:High + 1
53 5:High 1:Very High + 1
54 5:High 1:Very High + 1
55 2:'Very Low' 2:Very Low 1

56 5:High 1:Very High + 1
57 4:Medium 1:Very High + 1
58 1:'Very High' 1:Very High 1
59 4:Medium 1:Very High + 1
60 4:Medium 1:Very High + 1
61 5:High 1:Very High + 1
62 5:High 1:Very High + 1
63 4:Medium 1:Very High + 1
64 1:'Very High' 1:Very High 1
65 1:'Very High' 1:Very High 1
66 4:Medium 1:Very High + 1
67 3:Low 3:Low 1
68 1:'Very High' 1:Very High 1
69 1:'Very High' 1:Very High 1
70 5:High 1:Very High + 1
71 1:'Very High' 1:Very High 1
72 5:High 1:Very High + 1
73 1:'Very High' 1:Very High 1
74 1:'Very High' 1:Very High 1
75 4:Medium 5:High + 1
76 1:'Very High' 1:Very High 1
77 4:Medium 5:High + 1
78 1:'Very High' 1:Very High 1
79 4:Medium 5:High + 1
80 4:Medium 1:Very High + 1

Correctly Classified Instances

44

55

%

Train Randomcommittee

Classifier

Choose RandomCommittee -S 1 -num-slots 1 -I 10 -W weka.classifiers.trees.RandomTree -- -K 0 -M 1.0 -V 0.001 -S 1

Test options

☒ Use training set

☐ Supplied test set

☐ Cross-validation

☐ Percentage split

Folds 10

% 66

More options...

(Nom) Rings_category

Start Stop

Result list (right-click for options)

21:25:35 - meta.AdaBoostM1

21:25:54 - meta.AdaBoostM1 from file 'adaboost.model'

21:26:03 - misc.InputMappedClassifier

21:31:26 - meta.Bagging

21:33:04 - meta.Bagging from file 'bagging.model'

21:33:13 - misc.InputMappedClassifier

21:33:43 - meta.Bagging

21:34:11 - meta.Bagging from file 'bagging.model'

21:34:15 - misc.InputMappedClassifier

21:41:40 - meta.RandomCommittee

Classifier output

=== Run information ===

Scheme: weka.classifiers.meta.RandomCommittee -S 1 -num-slots 1 -I 10 -W weka.classifiers.trees.RandomTree -- -K 0 -M 1.0 -V 0.001 -S 1

Relation: abalone_discretized

Instances: 4177

Attributes: 11

Sex

Length

Diameter

Height

Wheight

Shweight

Vweight

Shweight

Rings

Rings_binned_quantile

Rings_category

Test mode: evaluate on training data

=== Classifier model (full training set) ===

All the base classifiers:

RandomTree

=====

Vweight < 0.11

| Rings_binned_quantile < 0.5 : Very Low (734/0)

| Rings_binned_quantile >= 0.5

| | Rings < 9.5 : Low (370/0)

| | Rings >= 9.5

| | | Shweight < 0.17

| | | | Rings_binned_quantile < 2.5 : Medium (70/0)

| | | | Rings_binned_quantile >= 2.5

| | | | Rings_binned_quantile < 3.5 : High (59/0)

| | | | Rings_binned_quantile >= 3.5 : Very High (27/0)

| | | Shweight >= 0.17

| | | | Rings_binned_quantile < 3.5

| | | | Height < 0.11 : Medium (3/0)

| | | | Height >= 0.11

| | | | | Shweight < 0.24 : High (7/0)

| | | | | Shweight >= 0.24

| | | | | Diameter < 0.43

| | | | | Shweight < 0.32

| | | | | Shweight < 0.18 : Medium (1/0)

| | | | | Shweight >= 0.18 : High (2/0)

| | | | | Shweight >= 0.32 : Medium (2/0)

| | | | | Diameter >= 0.43 : High (3/0)

| | | Rings_binned_quantile >= 3.5 : Very High (25/0)

Vweight >= 0.11

| Rings < 10.5

| | Rings_binned_quantile < 1.5

| | | Rings_binned_quantile < 0.5 : Very Low (105/0)

| | | Rings_binned_quantile >= 0.5 : Low (887/0)

| | | Rings_binned_quantile >= 1.5 : Medium (558/0)

| Rings >= 10.5

| | Rings_binned_quantile < 3.5 : High (683/0)

| | Rings_binned_quantile >= 3.5 : Very High (641/0)

Size of the tree : 33

```

Time taken to test model on training data: 0.93 seconds

=== Summary ===

Correctly Classified Instances      4177          100 %
Incorrectly Classified Instances    0              0 %
Kappa statistic                     1
Mean absolute error                 0
Root mean squared error            0
Relative absolute error             0 %
Root relative squared error        0 %
Total Number of Instances          4177

=== Detailed Accuracy By Class ===

              TP Rate  FP Rate  Precision  Recall  F-Measure  MCC      ROC Area  PRC Area  Class
              1.000    0.000    1.000     1.000    1.000     1.000    1.000    1.000    Very High
              1.000    0.000    1.000     1.000    1.000     1.000    1.000    1.000    Very Low
              1.000    0.000    1.000     1.000    1.000     1.000    1.000    1.000    Low
              1.000    0.000    1.000     1.000    1.000     1.000    1.000    1.000    Medium
              1.000    0.000    1.000     1.000    1.000     1.000    1.000    1.000    High
Weighted Avg.    1.000    0.000    1.000     1.000    1.000     1.000    1.000    1.000

=== Confusion Matrix ===

      a   b   c   d   e  <-- classified as
693   0   0   0   0   0 |  a = Very High
0 839   0   0   0   0 |  b = Very Low
0 0 1257   0   0   0 |  c = Low
0 0 0 634   0   0 |  d = Medium
0 0 0 0 754   0   0 |  e = High

```

Test Randomcommittee

Classifier

Choose **RandomCommittee** -S1 -num-slots 1 -I 10 -W weka.classifiers.trees.RandomTree -- -K 0 -M 1.0 -V 0.001 -S 1

Test options

☐ Use training set
☒ Supplied test set Set...
☐ Cross-validation Folds 10
☐ Percentage split % 66
More options...

(Nom) Rings_category

Start Stop

Result list (right-click for options)

21:25:35 - meta.AdaBoostM1
21:25:54 - meta.AdaBoostM1 from file 'adaboost.model'
21:26:03 - misc.InputMappedClassifier
21:31:26 - meta.Bagging
21:33:04 - meta.Bagging from file 'bagging.model'
21:33:13 - misc.InputMappedClassifier
21:33:43 - meta.Bagging
21:34:11 - meta.Bagging from file 'bagging.model'
21:34:15 - misc.InputMappedClassifier
21:41:40 - meta.RandomCommittee
21:42:58 - meta.RandomCommittee from file 'randomcommittee.model'
21:43:13 - misc.InputMappedClassifier

Classifier output

Run Information
Scheme: weka.classifiers.misc.InputMappedClassifier -I -trim -W weka.classifiers.meta.RandomCommittee -- -S 1 -num-slots 1 -I 10 -W weka.classifiers.trees.RandomTree -- -K 0 -M 1.0 -V 0.001 -S 1
Relation: absolute_discretized
Instances: 4177
Attributes: 11
Sex
Length
Diameter
Height
Weight
Shweight
Rings
Rings_binned_quantile
Rings_category
Test mode: user supplied test set: size unknown (reading incrementally)

Classifier model (full training set)

InputMappedClassifier:
All the base classifiers:
RandomTree
=====

```

Vweight < 0.11
| Rings_binned_quantile < 0.5 : Very Low (734/0)
| Rings_binned_quantile >= 0.5
| | Rings < 9.5 : Low (370/0)
| | Rings >= 9.5
| | | Shweight < 0.17
| | | | Rings_binned_quantile < 2.5 : Medium (70/0)
| | | | Rings_binned_quantile >= 2.5
| | | | | Rings_binned_quantile < 3.5 : High (59/0)
| | | | | Rings_binned_quantile >= 3.5 : Very High (27/0)
| | | | Shweight >= 0.17
| | | | | Rings_binned_quantile < 3.5
| | | | | | Height < 0.11 : Medium (3/0)
| | | | | | Height >= 0.11
| | | | | | | Swight < 0.24 : High (7/0)
| | | | | | | Swight >= 0.24
| | | | | | | Diameter < 0.43
| | | | | | | | Swight < 0.32
| | | | | | | | | Shweight < 0.18 : Medium (1/0)
| | | | | | | | | Shweight >= 0.18 : High (2/0)
| | | | | | | | | Swight >= 0.32 : Medium (2/0)
| | | | | | | | | Diameter >= 0.43 : High (3/0)
| | | | | | | | Rings_binned_quantile >= 3.5 : Very High (25/0)
Vweight >= 0.11
| Rings < 10.5
| | Rings_binned_quantile < 1.5
| | | Rings_binned_quantile < 0.5 : Very Low (105/0)
| | | Rings_binned_quantile >= 0.5 : Low (887/0)
| | | Rings_binned_quantile >= 1.5 : Medium (955/0)
| | Rings >= 10.5
| | | Rings_binned_quantile < 3.5 : High (693/0)
| | | Rings_binned_quantile >= 3.5 : Very High (641/0)

```

Size of the tree : 33

Prediction Results from randomcommitte

=== Predictions on test set ===

inst# actual predicted error prediction

1	2:'Very Low'	2:Very Low	1
2	4:Medium	4:Medium	0.5
3	3:Low	3:Low	1
4	5:High	5:High	0.6
5	4:Medium	4:Medium	0.4
6	1:'Very High'	1:Very High	1
7	5:High	5:High	0.6
8	4:Medium	4:Medium	0.4
9	3:Low	3:Low	1
10	5:High	1:Very High +	0.5
11	1:'Very High'	1:Very High	1
12	4:Medium	4:Medium	0.6
13	3:Low	4:Medium +	0.6
14	2:'Very Low'	2:Very Low	1
15	3:Low	4:Medium +	0.7
16	3:Low	4:Medium +	0.7
17	1:'Very High'	1:Very High	1
18	1:'Very High'	1:Very High	1
19	1:'Very High'	1:Very High	1
20	5:High	1:Very High +	0.5
21	1:'Very High'	1:Very High	1
22	2:'Very Low'	2:Very Low	1
23	2:'Very Low'	2:Very Low	1
24	2:'Very Low'	2:Very Low	1

25	2:'Very Low'	2:Very Low	1
26	2:'Very Low'	2:Very Low	1
27	2:'Very Low'	2:Very Low	1
28	2:'Very Low'	2:Very Low	1
29	2:'Very Low'	2:Very Low	1
30	2:'Very Low'	2:Very Low	1
31	3:Low	3:Low	1
32	4:Medium	5:High +	0.7
33	2:'Very Low'	2:Very Low	1
34	3:Low	3:Low	1
35	3:Low	3:Low	1
36	4:Medium	4:Medium	0.6
37	2:'Very Low'	2:Very Low	1
38	2:'Very Low'	2:Very Low	1
39	2:'Very Low'	2:Very Low	1
40	2:'Very Low'	2:Very Low	1
41	2:'Very Low'	2:Very Low	1
42	2:'Very Low'	2:Very Low	1
43	2:'Very Low'	2:Very Low	1
44	3:Low	3:Low	1
45	5:High	5:High	0.6
46	3:Low	4:Medium +	0.6
47	5:High	5:High	0.6
48	4:Medium	4:Medium	0.4
49	3:Low	3:Low	1

50	5:High	1:Very High	+	0.5
51	4:Medium	4:Medium		0.4
52	4:Medium	4:Medium		0.5
53	5:High	1:Very High	+	0.5
54	5:High	1:Very High	+	0.5
55	2:'Very Low'	2:Very Low		1
56	5:High	1:Very High	+	0.5
57	4:Medium	4:Medium		0.4
58	1:'Very High'	1:Very High		1
59	4:Medium	4:Medium		0.5
60	4:Medium	4:Medium		0.4
61	5:High	1:Very High	+	0.5
62	5:High	1:Very High	+	0.5
63	4:Medium	4:Medium		0.6
64	1:'Very High'	1:Very High		1
65	1:'Very High'	1:Very High		1
66	4:Medium	4:Medium		0.5
67	3:Low	3:Low		1
68	1:'Very High'	1:Very High		1
69	1:'Very High'	1:Very High		1
70	5:High	1:Very High	+	0.6
71	1:'Very High'	1:Very High		1
72	5:High	1:Very High	+	0.6
73	1:'Very High'	1:Very High		1
74	1:'Very High'	1:Very High		1

Correctly Classified Instances	64	80	%
--------------------------------	----	----	---

Classifier		
Choose	LogitBoost -P 100 -L -1.7976931348623157E308 -H 1.0 -Z 3.0 -O -1 -E 1 -S 1 -I 10 -W weka.classifiers.trees.DecisionStump	
Test options		
<input checked="" type="radio"/> Use training set <input type="radio"/> Supplied test set <input type="text" value="Set..."/> <input type="radio"/> Cross-validation Folds: 10 <input type="radio"/> Percentage split %: 66 More options...		
(Nom) Rings_category v		
<div>Start <input type="button" value="Stop"/></div>		
Result list (right-click for options)		
21:25:35 - meta.AdaBoostM1 21:25:54 - meta.AdaBoostM1 from file 'adaboost.model' 21:26:03 - misc.InputMappedClassifier 21:31:26 - meta.Bagging 21:33:04 - meta.Bagging from file 'bagging.model' 21:33:13 - misc.InputMappedClassifier 21:33:43 - meta.Bagging 21:34:11 - meta.Bagging from file 'bagging.model' 21:34:15 - misc.InputMappedClassifier 21:41:40 - meta.RandomCommittee 21:42:58 - meta.RandomCommittee from file 'randomcommittee.model' 21:43:13 - misc.InputMappedClassifier 21:46:09 - meta.LogitBoost		
Classifier output		
=== Run information ===		
Scheme:	weka.classifiers.meta.LogitBoost -P 100 -L -1.7976931348623157E308 -H 1.0 -Z 3.0 -O -1 -E 1 -S 1 -I 10 -W weka.classifiers.trees.DecisionStump	
Relation:	abalone_discretized	
Instances:	4177	
Attributes:	11	
	Sex	
	Length	
	Diameter	
	Height	
	Weight	
	Sweight	
	Vweight	
	Shweight	
	Rings	
	Rings_binned_quantile	
	Rings_category	
Test mode:	evaluate on training data	
=== Classifier model (full training set) ===		
LogitBoost: Base classifiers and their weights:		
Iteration 1		
Class 1 (Rings_category=Very High)		
Decision Stump		
Classifications		
Rings_binned_quantile <= 3.5 : -1.2500000000000022		
Rings_binned_quantile > 3.5 : 3.0000000000000043		
Rings_binned_quantile is missing : -0.1918516921750535		
Class 2 (Rings_category=Very Low)		
Decision Stump		
Classifications		
Rings <= 7.5 : 2.9999999999999935		
Rings > 7.5 : -1.2500000000000062		
Rings is missing : 0.004750510240015205		
Class 3 (Rings_category=Low)		
Decision Stump		
Classifications		
Rings <= 9.5 : 1.784679618268591		
Rings > 9.5 : -1.2500000000000004		
Rings is missing : 0.5254237288135798		
Class 4 (Rings_category=Medium)		


```

Time taken to test model training data: 0.89 seconds

=== Summary ===

Correctly Classified Instances      4177      100 %
Incorrectly Classified Instances    0         0 %
Kappa statistic                     1
Mean absolute error                 0.0002
Root mean squared error            0.0003
Relative absolute error             0.0503 %
Root relative squared error        0.0676 %
Total Number of Instances          4177

=== Detailed Accuracy By Class ===

      TP Rate  FP Rate  Precision  Recall   F-Measure  MCC      ROC Area  PRC Area  Class
1.000  0.000  1.000  1.000  1.000  1.000  1.000  1.000  Very High
1.000  0.000  1.000  1.000  1.000  1.000  1.000  1.000  Very Low
1.000  0.000  1.000  1.000  1.000  1.000  1.000  1.000  Low
1.000  0.000  1.000  1.000  1.000  1.000  1.000  1.000  Medium
1.000  0.000  1.000  1.000  1.000  1.000  1.000  1.000  High
Weighted Avg.  1.000  0.000  1.000  1.000  1.000  1.000  1.000  1.000

=== Confusion Matrix ===

  a    b    c    d    e  <-- classified as
693  0    0    0    0 |  a = Very High
    0 839  0    0    0 |  b = Very Low
    0 0 1257  0    0 |  c = Low
    0 0 0 634  0    |  d = Medium
    0 0 0 0 754 |  e = High

```

Test LogitBoost

Choose
KaggleHost -P 100 -L 1.7976931349623157E308-H1.0-Z3.0-O1-E1-S1-I10-Wweek.classifiers.trees.DecisionDump

Test options

- ☐ Use training set
- ☒ Supplied test set Set...
- Cross-validation folds 10
- Percentage split % 50
- [More options...](#)

(New) Rings_category

Result list (right-click for options)

```

21:03:05 - meta.AdaboostSGM
21:03:06 - meta.AdaboostSGM from file 'adaboost.model'
21:04:03 - misc.InputMappedClassifier
21:03:06 - meta.Bagging
21:03:04 - meta.Bagging from file 'bagging.model'
21:03:03 - misc.InputMappedClassifier
21:03:03 - meta.Bagging
21:04:01 - meta.Bagging from file 'bagging.model'
21:04:05 - misc.InputMappedClassifier
21:04:00 - meta.RandomCommittee
21:05:00 - meta.RandomCommittee from file 'randomcommittee.model'
21:03:03 - misc.InputMappedClassifier
21:04:09 - meta.LogitBoost
21:07:40 - misc.InputMappedClassifier
          
```

Classifier output

--- Run information ---

Scheme: week.classifiers.misc.InputMappedClassifier -I trim -W week.classifiers.meta.LogitBoost -- -P 100 -L -1.7976931349623157E308 -R 1.0 -Z 3.0 -O 1 -E 1 -S 1 -I 10 -W week.classifiers.trees.DecisionDump
Relation: absolute_discretized
Instances: 4177
Attributes: 11

Sex	Length
Diameter	Height
Weight	Oweight
Yweight	Xweight
Rings	Rings_binned_quantile
Rings_category	

Test mode: user supplied test set: size unknown (reading incrementally)
--- Classifier model (full training set) ---
InputMappedClassifier:
LogitBoost: Base classifiers and their weights:

Iteration 1

Class 1 (Rings_category=Very High)

Decision Dump

Classifications

```

Rings_binned_quantile <= 3.5 : -1.2500000000000022
Rings_binned_quantile > 3.5 : 3.0000000000000043
Rings_binned_quantile is missing : -0.391816821761035

      Class 2 (Rings_category=Very Low)
    
```

Decision Dump

Classifications

```

Rings <= 7.5 : 2.9999999999999935
Rings > 7.5 : -1.2500000000000042
Rings is missing : 0.00476512460152805

      Class 3 (Rings_category=Low)
    
```

Decision Dump

Classifications

```

Rings <= 9.5 : 1.78477961826591
Rings > 9.5 : -1.250000000000004
Rings is missing : 0.02643728139135798

      Class 4 (Rings_category=Medium)
    
```

Decision Dump

Classifications

```

Rings <= 9.5 : -1.2499999999999954
Rings > 9.5 : 0.349702596564660
Rings is missing : -0.273611345443000
          
```

Prediction Results

=== Predictions on test set ===

inst#	actual	predicted	error	prediction
-------	--------	-----------	-------	------------

1 2:'Very Low' 2:Very Low 1
2 4:Medium 5:High + 0.797
3 3:Low 3:Low 1
4 5:High 5:High 0.895
5 4:Medium 1:Very High + 0.7
6 1:'Very High' 1:Very High 1
7 5:High 5:High 0.895
8 4:Medium 1:Very High + 0.7
9 3:Low 3:Low 1
10 5:High 5:High 0.895
11 1:'Very High' 1:Very High 1
12 4:Medium 5:High + 0.797
13 3:Low 4:Medium + 0.847
14 2:'Very Low' 2:Very Low 1
15 3:Low 4:Medium + 0.847
16 3:Low 4:Medium + 0.847
17 1:'Very High' 1:Very High 1
18 1:'Very High' 1:Very High 1
19 1:'Very High' 1:Very High 1
20 5:High 5:High 0.895
21 1:'Very High' 1:Very High 1
22 2:'Very Low' 2:Very Low 1
23 2:'Very Low' 2:Very Low 1
24 2:'Very Low' 2:Very Low 1
25 2:'Very Low' 2:Very Low 1

26	2:'Very Low'	2:Very Low	1
27	2:'Very Low'	2:Very Low	1
28	2:'Very Low'	2:Very Low	1
29	2:'Very Low'	2:Very Low	1
30	2:'Very Low'	2:Very Low	1
31	3:Low	3:Low	1
32	4:Medium	5:High	+ 0.797
33	2:'Very Low'	2:Very Low	1
34	3:Low	3:Low	1
35	3:Low	3:Low	1
36	4:Medium	1:Very High	+ 0.7
37	2:'Very Low'	2:Very Low	1
38	2:'Very Low'	2:Very Low	1
39	2:'Very Low'	2:Very Low	1
40	2:'Very Low'	2:Very Low	1
41	2:'Very Low'	2:Very Low	1
42	2:'Very Low'	2:Very Low	1
43	2:'Very Low'	2:Very Low	1
44	3:Low	3:Low	1
45	5:High	5:High	0.895
46	3:Low	4:Medium	+ 0.847
47	5:High	5:High	0.895
48	4:Medium	1:Very High	+ 0.7
49	3:Low	3:Low	1
50	5:High	5:High	0.895

51 4:Medium 1:Very High + 0.7
52 4:Medium 5:High + 0.797
53 5:High 5:High 0.895
54 5:High 5:High 0.895
55 2:'Very Low' 2:Very Low 1
56 5:High 5:High 0.895
57 4:Medium 1:Very High + 0.7
58 1:'Very High' 1:Very High 1
59 4:Medium 1:Very High + 0.7
60 4:Medium 1:Very High + 0.7
61 5:High 5:High 0.895
62 5:High 5:High 0.895
63 4:Medium 1:Very High + 0.7
64 1:'Very High' 1:Very High 1
65 1:'Very High' 1:Very High 1
66 4:Medium 1:Very High + 0.7
67 3:Low 3:Low 1
68 1:'Very High' 1:Very High 1
69 1:'Very High' 1:Very High 1
70 5:High 5:High 0.895
71 1:'Very High' 1:Very High 1
72 5:High 5:High 0.895
73 1:'Very High' 1:Very High 1
74 1:'Very High' 1:Very High 1
75 4:Medium 5:High + 0.797

Correctly Classified Instances	58	72.5	%
--------------------------------	----	------	---

Classifier

Choose RandomTree K 0 -M 1.0 -V 0.001 -S 1

Test options

☒ Use training set

Set...

☐ Supplied test set

☐ Cross-validation

Folds 10

☐ Percentage split

% 66

More options...

(Nom) Rings_category

Start

Stop

Result list (right-click for options)

21:25:35 - meta.AdaBoostM1

21:25:54 - meta.AdaBoostM1 from file 'adaboost.model'

21:26:03 - misc.InputMappedClassifier

21:31:26 - meta.Bagging

21:33:04 - meta.Bagging from file 'bagging.model'

21:33:13 - misc.InputMappedClassifier

21:33:43 - meta.Bagging

21:34:11 - meta.Bagging from file 'bagging.model'

21:34:15 - misc.InputMappedClassifier

21:41:40 - meta.RandomCommittee

21:42:58 - meta.RandomCommittee from file 'randomcommittee.model'

21:43:13 - misc.InputMappedClassifier

21:46:09 - meta.LogitBoost

21:47:40 - misc.InputMappedClassifier

21:52:30 - trees.RandomTree

Classifier output

=== Run information ===

Scheme: weka.classifiers.trees.RandomTree -K 0 -M 1.0 -V 0.001 -S 1

Relation: abalone_discretized

Instances: 4177

Attributes: 11

Sex

Length

Diameter

Height

Weight

Shweight

Vweight

Shweight

Rings

Rings_binned_quantile

Rings_category

Test mode: evaluate on training data

=== Classifier model (full training set) ===

RandomTree

=====

Shweight < 0.14

| Shweight < 0.07

| | Rings_binned_quantile < 0.5 : Very Low (389/0)

| | | Rings_binned_quantile >= 0.5

| | | | Shweight < 0.04

| | | | | Rings < 10 : Low (14/0)

| | | | | Rings >= 10 : High (1/0)

| | | | Shweight >= 0.04

| | | | | Rings < 9.5 : Low (26/0)

| | | | | Rings >= 9.5

| | | | | | Shweight < 0.09

| | | | | | Rings < 10.5 : Medium (9/0)

| | | | | | Rings >= 10.5

| | | | | | | Sex = M : High (2/0)

| | | | | | | Sex = F : Very High (0/0)

| | | | | | | Sex = I

| | | | | | | Length < 0.33 : Very High (1/0)

| | | | | | | Length >= 0.33 : High (1/0)

| | | | | | | Shweight >= 0.09 : Very High (1/0)

| | Shweight >= 0.07

| | | Rings < 7.5 : Very Low (347/0)

| | | Rings >= 7.5

| | | | Rings < 9.5 : Low (271/0)

| | | | Rings >= 9.5

| | | | | Rings < 10.5 : Medium (54/0)

| | | | | Rings >= 10.5

| | | | | | Rings_binned_quantile < 3.5 : High (48/0)

| | | | | | Rings_binned_quantile >= 3.5 : Very High (21/0)

Shweight >= 0.14

| Shweight < 0.29

| | Rings < 9.5

| | | Rings < 7.5 : Very Low (96/0)

| | | Rings >= 7.5 : Low (726/0)

| | | | Rings >= 9.5

| | | | | Length < 0.57

| | | | | Rings < 12.5

| | | | | | Shweight < 0.43

| | | | | | Rings < 10.5 : Medium (152/0)

| | | | | | Rings >= 10.5 : High (186/0)

| | | | | | Shweight >= 0.43

| | | | | | | Height < 0.16 : Medium (11/0)

| | | | | | | Height >= 0.16

| | | | | | | Sex = M : Medium (2/0)

| | | | | | | Sex = F : Very High (0/0)

| | | | | | | Sex = I : High (1/0)

| | | | | Rings >= 12.5 : Very High (197/0)

```

=== Evaluation on training set ===

Time taken to test model on training data: 0.89 seconds

=== Summary ===

Correctly Classified Instances      4177      100 %
Incorrectly Classified Instances    0         0 %
Kappa statistic                     1
Mean absolute error                 0
Root mean squared error             0
Relative absolute error             0 %
Root relative squared error         0 %
Total Number of Instances          4177

=== Detailed Accuracy By Class ===

              TP Rate  FP Rate  Precision  Recall   F-Measure  MCC      ROC Area  PRC Area  Class
1.000    0.000    1.000    1.000    1.000    1.000    1.000    1.000    Very High
1.000    0.000    1.000    1.000    1.000    1.000    1.000    1.000    Very Low
1.000    0.000    1.000    1.000    1.000    1.000    1.000    1.000    Low
1.000    0.000    1.000    1.000    1.000    1.000    1.000    1.000    Medium
1.000    0.000    1.000    1.000    1.000    1.000    1.000    1.000    High
Weighted Avg.   1.000    0.000    1.000    1.000    1.000    1.000    1.000    1.000

=== Confusion Matrix ===

      a   b   c   d   e  <-- classified as
693    0    0    0    0 | a = Very High
      0 839    0    0    0 | b = Very Low
      0  0 1257    0    0 | c = Low
      0  0  0  634    0 | d = Medium
      0  0  0  0 754 | e = High

```

Test Random Tree

Classifier

Choose **RandomTree -K 4-M 1.0-V 0.001-S 1**

Test options

☐ Use training set
☒ Supplied test set Set...
☐ Cross-validation Folds: 10
☐ Percentage split %: 66

More options...

(Nom) Rings_category

Start Stop

Result list (right-click for options)

21:25:35 - meta.AdaBoostM1
21:25:54 - meta.AdaBoostM1 from file 'adaboost.model'
21:26:03 - misc.InputMappedClassifier
21:31:26 - meta.Bagging
21:33:04 - meta.Bagging from file 'bagging.model'
21:33:13 - misc.InputMappedClassifier
21:33:43 - meta.Bagging
21:34:11 - meta.Bagging from file 'bagging.model'
21:34:15 - misc.InputMappedClassifier
21:41:40 - meta.RandomCommittee
21:42:58 - meta.RandomCommittee from file 'randomcommittee.model'
21:43:13 - misc.InputMappedClassifier
21:46:09 - meta.LogitBoost
21:47:40 - misc.InputMappedClassifier
21:52:30 - trees.RandomTree
21:55:07 - trees.RandomTree from file 'random.model'
21:55:11 - misc.InputMappedClassifier

Classifier output

=== Run information ===

Scheme: weka.classifiers.misc.InputMappedClassifier -I -trim -W weka.classifiers.trees.RandomTree -- -K 4 -M 1.0 -V 0.001 -S 1
Relation: abalone_discretized
Instances: 4177
Attributes: 11
Sex
Length
Diameter
Height
Shweight
Vweight
Shweight
Rings
Rings_binned_quantile
Rings_category
Test mode: user supplied test set: size unknown (reading incrementally)

=== Classifier model (full training set) ===

InputMappedClassifier:
RandomTree
=====

```

Shweight < 0.14
| Shweight < 0.07
| | Rings_binned_quantile < 0.5 : Very Low (389/0)
| | Rings_binned_quantile >= 0.5
| | | Shweight < 0.04
| | | Rings < 10 : Low (14/0)
| | | Rings >= 10 : High (1/0)
| | | Shweight >= 0.04
| | | Rings < 9.5 : Low (26/0)
| | | Rings >= 9.5
| | | | Shweight < 0.09
| | | | Rings < 10.5 : Medium (9/0)
| | | | Rings >= 10.5
| | | | | Sex = M : High (2/0)
| | | | | Sex = F : Very High (0/0)
| | | | | Sex = I
| | | | | Length < 0.33 : Very High (1/0)
| | | | | Length >= 0.33 : High (1/0)
| | | | Shweight >= 0.09 : Very High (1/0)
| | Shweight >= 0.07
| | Rings < 7.5 : Very Low (347/0)
| | Rings >= 7.5
| | | Rings < 9.5 : Low (271/0)
| | | Rings >= 9.5
| | | Rings < 10.5 : Medium (54/0)
| | | Rings >= 10.5
| | | | Rings_binned_quantile < 3.5 : High (48/0)
| | | | Rings_binned_quantile >= 3.5 : Very High (21/0)
Shweight >= 0.14
| Shweight < 0.29
| | Rings < 9.5
| | | Rings < 7.5 : Very Low (96/0)
| | | Rings >= 7.5 : Low (726/0)
| | Rings >= 9.5
| | | Length < 0.57
| | | Rings < 12.5
| | | | Shweight < 0.43
| | | | Rings < 10.5 : Medium (152/0)
| | | | Rings >= 10.5 : High (156/0)
| | | | Shweight >= 0.43
| | | | Height < 0.16 : Medium (11/0)
| | | | Height >= 0.16
| | | | | Sex = M : Medium (2/0)
| | | | | Sex = F : Very High (0/0)
| | | | | Sex = T : Medium (1/0)

```

Prediction Results

=== Predictions on test set ===

inst#	actual	predicted	error	prediction
-------	--------	-----------	-------	------------

1	2:'Very Low'	2:Very Low		1
---	--------------	------------	--	---

2	4:Medium	4:Medium		1
---	----------	----------	--	---

3	3:Low	3:Low		1
---	-------	-------	--	---

4	5:High	1:Very High	+	1
---	--------	-------------	---	---

5	4:Medium	1:Very High	+	1
---	----------	-------------	---	---

6	1:'Very High'	1:Very High		1
---	---------------	-------------	--	---

7	5:High	1:Very High	+	1
---	--------	-------------	---	---

8	4:Medium	1:Very High	+	1
---	----------	-------------	---	---

9	3:Low	3:Low		1
---	-------	-------	--	---

10	5:High	5:High		1
----	--------	--------	--	---

11	1:'Very High'	1:Very High		1
----	---------------	-------------	--	---

12	4:Medium	4:Medium		1
----	----------	----------	--	---

13	3:Low	4:Medium	+	1
----	-------	----------	---	---

14	2:'Very Low'	2:Very Low		1
----	--------------	------------	--	---

15	3:Low	3:Low		1
----	-------	-------	--	---

16	3:Low	3:Low		1
----	-------	-------	--	---

17	1:'Very High'	1:Very High		1
----	---------------	-------------	--	---

18	1:'Very High'	1:Very High		1
----	---------------	-------------	--	---

19	1:'Very High'	1:Very High		1
----	---------------	-------------	--	---

20	5:High	5:High		1
----	--------	--------	--	---

21	1:'Very High'	1:Very High		1
----	---------------	-------------	--	---

22	2:'Very Low'	2:Very Low	1
23	2:'Very Low'	2:Very Low	1
24	2:'Very Low'	2:Very Low	1
25	2:'Very Low'	2:Very Low	1
26	2:'Very Low'	2:Very Low	1
27	2:'Very Low'	2:Very Low	1
28	2:'Very Low'	2:Very Low	1
29	2:'Very Low'	2:Very Low	1
30	2:'Very Low'	2:Very Low	1
31	3:Low	3:Low	1
32	4:Medium	5:High +	1
33	2:'Very Low'	2:Very Low	1
34	3:Low	3:Low	1
35	3:Low	3:Low	1
36	4:Medium	4:Medium	1
37	2:'Very Low'	2:Very Low	1
38	2:'Very Low'	2:Very Low	1
39	2:'Very Low'	2:Very Low	1
40	2:'Very Low'	2:Very Low	1
41	2:'Very Low'	2:Very Low	1
42	2:'Very Low'	2:Very Low	1
43	2:'Very Low'	2:Very Low	1
44	3:Low	3:Low	1
45	5:High	1:Very High +	1
46	3:Low	4:Medium +	1

47	5:High	1:Very High	+	1
48	4:Medium	1:Very High	+	1
49	3:Low	3:Low		1
50	5:High	5:High		1
51	4:Medium	1:Very High	+	1
52	4:Medium	4:Medium		1
53	5:High	1:Very High	+	1
54	5:High	5:High		1
55	2:'Very Low'	2:Very Low		1
56	5:High	5:High		1
57	4:Medium	1:Very High	+	1
58	1:'Very High'	1:Very High		1
59	4:Medium	4:Medium		1
60	4:Medium	1:Very High	+	1
61	5:High	5:High		1
62	5:High	1:Very High	+	1
63	4:Medium	4:Medium		1
64	1:'Very High'	1:Very High		1
65	1:'Very High'	1:Very High		1
66	4:Medium	4:Medium		1
67	3:Low	3:Low		1
68	1:'Very High'	1:Very High		1
69	1:'Very High'	1:Very High		1
70	5:High	5:High		1
71	1:'Very High'	1:Very High		1

72	5:High	5:High	1
73	1:'Very High'	1:Very High	1
74	1:'Very High'	1:Very High	1
75	4:Medium	4:Medium	1
76	1:'Very High'	1:Very High	1
77	4:Medium	4:Medium	1
78	1:'Very High'	1:Very High	1
79	4:Medium	4:Medium	1
80	4:Medium	4:Medium	1

Correctly Classified Instances	65	81.25 %
---------------------------------------	-----------	----------------

Training Dagging

Classifier

ChooseDagging -F 10 -S 1 -W weka.classifiers.trees.DecisionStump

Test options

☒ Use training set

☐ Supplied test set

☐ Cross-validation

☐ Percentage split

Set...

Folds10

%66

More options...

(Nom) Rings_category

StartStop

Result list (right-click for options)

20:39:18 - meta.MultiBoostAB

20:39:30 - meta.MultiBoostAB

20:39:58 - meta.MultiBoostAB

20:40:13 - meta.MultiBoostAB

20:41:06 - meta.MultiBoostAB

20:44:23 - meta.MultiBoostAB

20:44:33 - misc.InputMappedClassifier

20:46:18 - meta.Dagging

Classifier output

=== Run information ===

Scheme:weka.classifiers.meta.Dagging -F 10 -S 1 -W weka.classifiers.trees.DecisionStump

Relation:abalone_discretized

Instances:4177

Attributes:11

Sex

Length

Diameter

Height

Wheight

Sweight

Vweight

Shweight

Rings

Rings_binned_quantile

Rings_category

Test mode:evaluate on training data

=== Classifier model (full training set) ===

Vote combines the probability distributions of these base learners:

weka.classifiers.trees.DecisionStump

weka.classifiers.trees.DecisionStump

weka.classifiers.trees.DecisionStump

weka.classifiers.trees.DecisionStump

weka.classifiers.trees.DecisionStump

weka.classifiers.trees.DecisionStump

weka.classifiers.trees.DecisionStump

weka.classifiers.trees.DecisionStump

weka.classifiers.trees.DecisionStump

weka.classifiers.trees.DecisionStump

using the 'Average' combination rule

All the models:

Decision Stump

Classifications

Rings <= 9.5 : Low

Rings > 9.5 : High

Rings is missing : Low

Class distributions

Rings <= 9.5

Very HighVery LowLowMedium High

0.00.40.60.00.0

Rings > 9.5

Very HighVery LowLowMedium High

0.33173076923076920.00.00.30769230769230770.3605769230769231

Rings is missing

Very HighVery LowLowMedium High

0.165071770334928230.200956937799043060.30143540669856460.153110047846889950.17942583732057416

Decision Stump

Classifications

Rings <= 9.5 : Low

Rings > 9.5 : High

Rings is missing : Low

Class distributions

Time taken to test model on training data: 1.25 seconds

=== Summary ===

Correctly Classified Instances	2011	48.1446 %
Incorrectly Classified Instances	2166	51.8554 %
Kappa statistic	0.3168	
Mean absolute error	0.2289	
Root mean squared error	0.3383	
Relative absolute error	72.806 %	
Root relative squared error	85.3273 %	
Total Number of Instances	4177	

=== Detailed Accuracy By Class ===

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
	0.000	0.000	?	0.000	?	?	0.801	0.333	Very High
	0.000	0.000	?	0.000	?	?	0.812	0.400	Very Low
	1.000	0.287	0.600	1.000	0.750	0.654	0.856	0.600	Low
	0.000	0.000	?	0.000	?	?	0.796	0.305	Medium
	1.000	0.388	0.362	1.000	0.532	0.471	0.806	0.362	High
Weighted Avg.	0.481	0.156	?	0.481	?	?	0.820	0.428	

=== Confusion Matrix ===

a	b	c	d	e	<-- classified as
0	0	0	0	693	a = Very High
0	0	839	0	0	b = Very Low
0	0	1257	0	0	c = Low
0	0	0	0	634	d = Medium
0	0	0	0	754	e = High

Test Dagging

Classifier

Choose **Dagging -F 10 -S 1 -W weka.classifiers.trees.DecisionStump**

Test options

☐ Use training set

☒ Supplied test set

Set...

☐ Cross-validation

Folds 10

☐ Percentage split

% 66

More options...

(Nom) Rings_category

Start

Stop

Result list (right-click for options)

20:39:18 - meta.MultiBoostAB

20:39:30 - meta.MultiBoostAB

20:39:50 - meta.MultiBoostAB

20:40:13 - meta.MultiBoostAB

20:41:06 - meta.MultiBoostAB

20:44:23 - meta.MultiBoostAB

20:44:33 - misc.InputMappedClassifier

20:46:10 - meta.Dagging

20:48:33 - meta.Dagging from file 'dagging.model'

20:48:44 - misc.InputMappedClassifier

Classifier output

=== Run information ===

Scheme: weka.classifiers.misc.InputMappedClassifier -I -trim -W weka.classifiers.meta.Dagging -- -F 10 -S 1 -W weka.classifiers.trees.DecisionStump

Relation: abalone_discretized

Instances: 4177

Attributes: 11

Sex

Length

Diameter

Height

Weight

Shweight

Rings

Rings_binned_quantile

Rings_category

Test mode: user supplied test set: size unknown (reading incrementally)

=== Classifier model (full training set) ===

InputMappedClassifier:

Vote combines the probability distributions of these base learners:

weka.classifiers.trees.DecisionStump

weka.classifiers.trees.DecisionStump

weka.classifiers.trees.DecisionStump

weka.classifiers.trees.DecisionStump

weka.classifiers.trees.DecisionStump

weka.classifiers.trees.DecisionStump

weka.classifiers.trees.DecisionStump

weka.classifiers.trees.DecisionStump

weka.classifiers.trees.DecisionStump

weka.classifiers.trees.DecisionStump

using the 'Average' combination rule

All the models:

Decision Stump

Classifications

Rings <= 9.5 : Low

Rings > 9.5 : High

Rings is missing : Low

Class distributions

Rings <= 9.5

Very High Very Low Low Medium High

0.0 0.4 0.6 0.0 0.0

Rings > 9.5

Very High Very Low Low Medium High

0.3317307692307692 0.0 0.0 0.3076923076923077 0.3605769230769231

Rings is missing

Very High Very Low Low Medium High

0.1650717703452023 0.20095693779904306 0.30143540669895646 0.15311004794688995 0.179423593732057416

Decision Stump

Classifications

Rings <= 9.5 : Low

Rings > 9.5 : High

Rings is missing : Low

Prediction Results

=== Predictions on test set ===

inst#	actual	predicted	error	prediction
-------	--------	-----------	-------	------------

1	2:'Very Low'	3:Low	+	0.6
---	--------------	-------	---	-----

2	4:Medium	5:High	+	0.362
---	----------	--------	---	-------

3	3:Low	3:Low		0.6
---	-------	-------	--	-----

4	5:High	5:High		0.362
---	--------	--------	--	-------

5	4:Medium	5:High	+	0.362
---	----------	--------	---	-------

6	1:'Very High'	5:High	+	0.362
---	---------------	--------	---	-------

7	5:High	5:High		0.362
---	--------	--------	--	-------

8	4:Medium	5:High	+	0.362
---	----------	--------	---	-------

9	3:Low	3:Low		0.6
---	-------	-------	--	-----

10	5:High	5:High		0.362
----	--------	--------	--	-------

11	1:'Very High'	5:High	+	0.362
----	---------------	--------	---	-------

12	4:Medium	5:High	+	0.362
----	----------	--------	---	-------

13	3:Low	5:High	+	0.362
----	-------	--------	---	-------

14	2:'Very Low'	3:Low	+	0.6
----	--------------	-------	---	-----

15	3:Low	5:High	+	0.362
----	-------	--------	---	-------

16	3:Low	5:High	+	0.362
----	-------	--------	---	-------

17	1:'Very High'	5:High	+	0.362
----	---------------	--------	---	-------

18	1:'Very High'	5:High	+	0.362
----	---------------	--------	---	-------

19	1:'Very High'	5:High	+	0.362
----	---------------	--------	---	-------

20	5:High	5:High		0.362
----	--------	--------	--	-------

21	1:'Very High'	5:High	+	0.362
----	---------------	--------	---	-------

22	2:'Very Low'	3:Low	+	0.6
23	2:'Very Low'	3:Low	+	0.6
24	2:'Very Low'	3:Low	+	0.6
25	2:'Very Low'	3:Low	+	0.6
26	2:'Very Low'	3:Low	+	0.6
27	2:'Very Low'	3:Low	+	0.6
28	2:'Very Low'	3:Low	+	0.6
29	2:'Very Low'	3:Low	+	0.6
30	2:'Very Low'	3:Low	+	0.6
31	3:Low	3:Low		0.6
32	4:Medium	5:High	+	0.362
33	2:'Very Low'	3:Low	+	0.6
34	3:Low	3:Low		0.6
35	3:Low	3:Low		0.6
36	4:Medium	5:High	+	0.362
37	2:'Very Low'	3:Low	+	0.6
38	2:'Very Low'	3:Low	+	0.6
39	2:'Very Low'	3:Low	+	0.6
40	2:'Very Low'	3:Low	+	0.6
41	2:'Very Low'	3:Low	+	0.6
42	2:'Very Low'	3:Low	+	0.6
43	2:'Very Low'	3:Low	+	0.6
44	3:Low	3:Low		0.6
45	5:High	5:High		0.362
46	3:Low	5:High	+	0.362

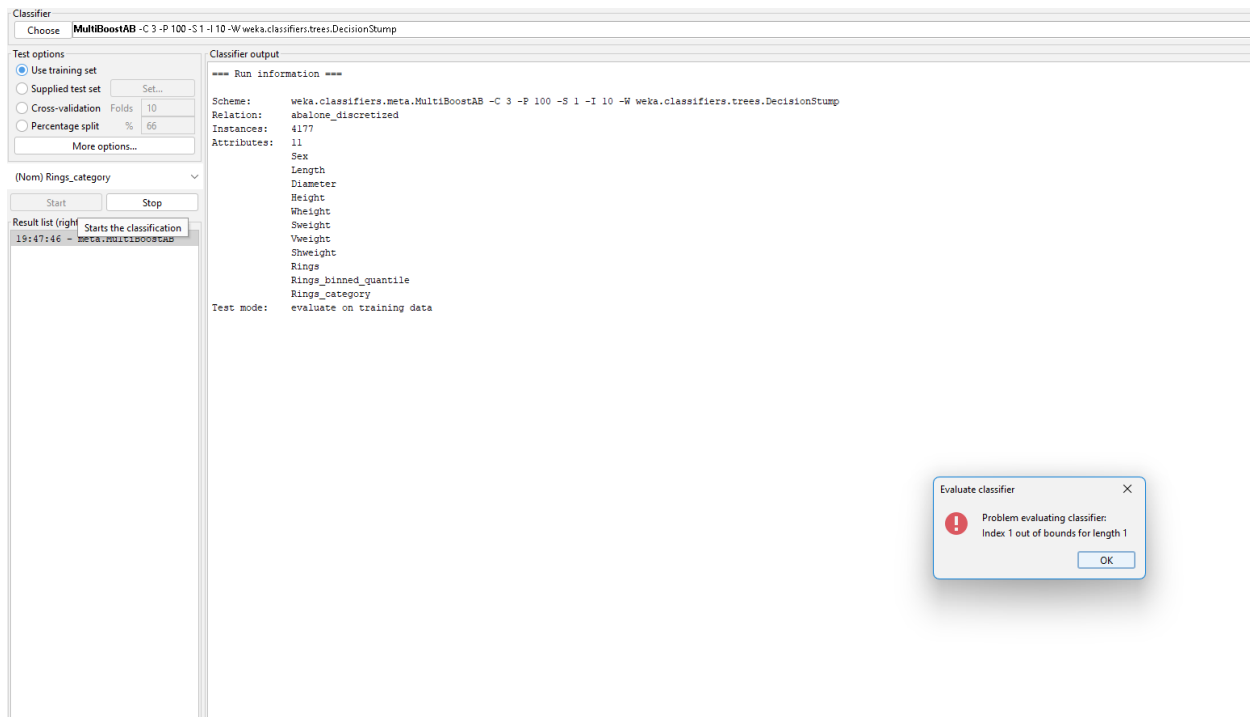
47	5:High	5:High	0.362
48	4:Medium	5:High	+ 0.362
49	3:Low	3:Low	0.6
50	5:High	5:High	0.362
51	4:Medium	5:High	+ 0.362
52	4:Medium	5:High	+ 0.362
53	5:High	5:High	0.362
54	5:High	5:High	0.362
55	2:'Very Low'	3:Low	+ 0.6
56	5:High	5:High	0.362
57	4:Medium	5:High	+ 0.362
58	1:'Very High'	5:High	+ 0.362
59	4:Medium	5:High	+ 0.362
60	4:Medium	5:High	+ 0.362
61	5:High	5:High	0.362
62	5:High	5:High	0.362
63	4:Medium	5:High	+ 0.362
64	1:'Very High'	5:High	+ 0.362
65	1:'Very High'	5:High	+ 0.362
66	4:Medium	5:High	+ 0.362
67	3:Low	3:Low	0.6
68	1:'Very High'	5:High	+ 0.362
69	1:'Very High'	5:High	+ 0.362
70	5:High	5:High	0.362
71	1:'Very High'	5:High	+ 0.362

72	5:High	5:High	0.362
73	1:'Very High'	5:High	+ 0.362
74	1:'Very High'	5:High	+ 0.362
75	4:Medium	5:High	+ 0.362
76	1:'Very High'	5:High	+ 0.362
77	4:Medium	5:High	+ 0.362
78	1:'Very High'	5:High	+ 0.362
79	4:Medium	5:High	+ 0.362
80	4:Medium	5:High	+ 0.362

Correctly Classified Instances	22	27.5 %
---------------------------------------	-----------	---------------

Training MultiBoostAB

Weka tool showing an error for same training and test data.



Final Accuracy table

Classifier	Accuracy(%)	Correct Instance
RandomTree	81.25	65
RandomCommittee	80	64
Logitboost	72.5	58
Bagging	55	44
AdaBoostM1	27.5	22
Dagging	27.5	22