IS-655 Lab Week#14 Models Build & Comparison 00000034000

Creation Date: Monday, May 30, 2022 11:29:14 AM
Author: willi.brordus@student.umn.ac.id

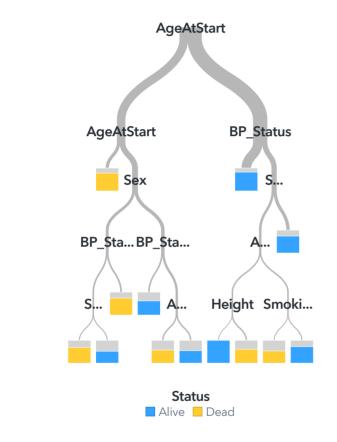IS-655 Lab Week#14 00000034000-WillibrordusBayu

Contents

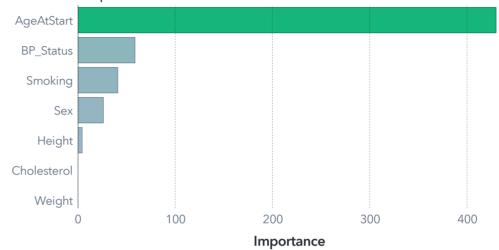IS-655 Lab Week#14 Models Build & Comparison 00000034000

C45 Prediction Status

Decision Tree **Status** (event=Dead) Misclassification Rate **0.2584** Observations Used **5,209**

Tree

Status
■ Alive ■ Dead
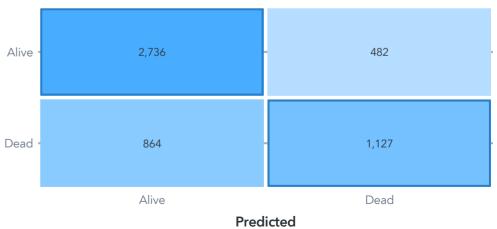
Variable Importance

Confusion Matrix

Observed

	Alive	Dead
Alive	2,736	482
Dead	864	1,127

Predicted

Node ID	Depth	Parent ID	N Children	Type	Observations	% Observations	Percent of Parent	Gain	Predicted Value	Alive	Dead
0	0	-1	2	Class	5,209	100.00%	.	0.1095	Alive	3,218 (61.78%)	1,991 (38.22%)
1	1	0	2	Class	1,901	36.49%	36.49%	0.0368	Dead	700 (36.82%)	1,201 (63.18%)
2	1	0	2	Class	3,308	63.51%	63.51%	0.0268	Alive	2,518 (76.12%)	790 (23.88%)
3	2	1	0	Leaf	646	12.40%	33.98%	0.0000	Dead	142 (21.98%)	504 (78.02%)
4	2	1	2	Class	1,255	24.09%	66.02%	0.0308	Dead	558 (44.46%)	697 (55.54%)
5	2	2	0	Leaf	2,174	41.74%	65.72%	0.0000	Alive	1,786 (82.15%)	388 (17.85%)
6	2	2	2	Class	1,134	21.77%	34.28%	0.0379	Alive	732 (64.55%)	402 (35.45%)
7	3	4	2	Class	557	10.69%	44.38%	0.0195	Dead	184 (33.03%)	373 (66.97%)
8	3	4	2	Class	698	13.40%	55.62%	0.0122	Alive	374 (53.58%)	324 (46.42%)
9	3	6	2	Class	470	9.02%	41.45%	0.0328	Alive	242 (51.49%)	228 (48.51%)
10	3	6	0	Leaf	664	12.75%	58.55%	0.0000	Alive	490 (73.80%)	174 (26.20%)
11	4	7	2	Class	268	5.14%	48.11%	0.0331	Dead	110 (41.04%)	158 (58.96%)
12	4	7	0	Leaf	289	5.55%	51.89%	0.0000	Dead	74 (25.61%)	215 (74.39%)
13	4	8	0	Leaf	258	4.95%	36.96%	0.0000	Alive	160 (62.02%)	98 (37.98%)
14	4	8	2	Class	440	8.45%	63.04%	0.0110	Dead	214 (48.64%)	226 (51.36%)
15	4	9	2	Class	231	4.43%	49.15%	0.0344	Dead	94 (40.69%)	137 (59.31%)
16	4	9	2	Class	239	4.59%	50.85%	0.0491	Alive	148 (61.92%)	91 (38.08%)
17	5	11	0	Leaf	139	2.67%	51.87%	0.0000	Dead	43 (30.94%)	96 (69.06%)
18	5	11	0	Leaf	129	2.48%	48.13%	0.0000	Alive	67 (51.94%)	62 (48.06%)
19	5	14	0	Leaf	215	4.13%	48.86%	0.0000	Dead	91 (42.33%)	124 (57.67%)
20	5	14	0	Leaf	225	4.32%	51.14%	0.0000	Alive	123 (54.67%)	102 (45.33%)
21	5	15	0	Leaf	6	0.12%	2.60%	0.0000	Alive	6 (100.00%)	
22	5	15	0	Leaf	225	4.32%	97.40%	0.0000	Dead	88 (39.11%)	137 (60.89%)
23	5	16	0	Leaf	95	1.82%	39.75%	0.0000	Dead	44 (46.32%)	51 (53.68%)
24	5	16	0	Leaf	144	2.76%	60.25%	0.0000	Alive	104 (72.22%)	40 (27.78%)

Decision tree - Status 1 Supplement 2

Node ID	Parent ID	Type	BP_Status	Sex	AgeAtStart	Cholesterol	Height	Smoking	Weight
0	-1	Class							
1	0	Class			≥ 48				
2	0	Class			28 to 48				
3	1	Leaf			≥ 56				
4	1	Class			48 to 56				
5	2	Leaf	Normal or Optimal		28 to 48				
6	2	Class	High		28 to 48				
7	4	Class		Male	48 to 56				
8	4	Class		Female	48 to 56				
9	6	Class	High		28 to 48			≥ 15 or Missing	
10	6	Leaf	High		28 to 48			0 to 15	
11	7	Class	Normal or Optimal	Male	48 to 56				
12	7	Leaf	High	Male	48 to 56				
13	8	Leaf	Normal or Optimal	Female	48 to 56				
14	8	Class	High	Female	48 to 56				
15	9	Class	High		40 to 48			≥ 15 or Missing	
16	9	Class	High		28 to 40			≥ 15 or Missing	
17	11	Leaf	Normal or Optimal	Male	48 to 56			≥ 10 or Missing	
18	11	Leaf	Normal or Optimal	Male	48 to 56			0 to 10	
19	14	Leaf	High	Female	51.84 to 56				
20	14	Leaf	High	Female	48 to 51.84				
21	15	Leaf	High		40 to 48		≥ 72.25	≥ 15 or Missing	
22	15	Leaf	High		40 to 48		51.5 to 72.25	≥ 15 or Missing	
23	16	Leaf	High		28 to 40			≥ 25 or Missing	
24	16	Leaf	High		28 to 40			15 to 25	

Decision tree - Status 1 Supplement 3

Variable	Importance	Standard Deviation
AgeAtStart	429.8799	153.9377
BP_Status	58.6347	18.8389
Smoking	40.9712	9.7346
Sex	26.1588	0.0000
Height	4.3334	0.0000
Cholesterol	0.0000	0.0000
Weight	0.0000	0.0000

Decision tree - Status 1 Supplement 4

Predicted	Observed	Frequency	Percentage
Alive	Alive	2,736	85.02%
Dead	Alive	482	14.98%
Alive	Dead	864	43.40%
Dead	Dead	1,127	56.60%

Percentile	Observations	Events	Model	Best	Cumulative Model	Cumulative Best
5.00	261	204	2.0455	2.6218	2.0455	2.6218
10.00	261	204	2.0455	2.6218	2.0455	2.6218
15.00	261	199	1.9956	2.6218	2.0289	2.6218
20.00	261	188	1.8921	2.6218	1.9947	2.6218
25.00	261	161	1.6191	2.6218	1.9196	2.6218
30.00	261	148	1.4913	2.6218	1.8482	2.6218
35.00	261	125	1.2600	2.6218	1.7641	2.6218
40.00	261	109	1.0963	1.6474	1.6807	2.5000
45.00	261	86	0.8646	0.0000	1.5900	2.2222
50.00	261	69	0.6896	0.0000	1.5000	2.0000
55.00	261	68	0.6870	0.0000	1.4261	1.8182
60.00	261	60	0.6006	0.0000	1.3573	1.6667
65.00	261	47	0.4679	0.0000	1.2888	1.5385
70.00	261	47	0.4679	0.0000	1.2302	1.4286
75.00	261	47	0.4679	0.0000	1.1794	1.3333
80.00	261	47	0.4679	0.0000	1.1349	1.2500
85.00	261	47	0.4679	0.0000	1.0957	1.1765
90.00	261	47	0.4679	0.0000	1.0608	1.1111
95.00	261	47	0.4679	0.0000	1.0296	1.0526
100.00	250	44	0.4374	0.0000	1.0000	1.0000

Cutoff	Sensitivity	1 - Specificity
0.00	1.0000	1.000
0.01	1.0000	0.998
0.02	1.0000	0.998
0.03	1.0000	0.998
0.04	1.0000	0.998
0.05	1.0000	0.998
0.06	1.0000	0.998
0.07	1.0000	0.998
0.08	1.0000	0.998
0.09	1.0000	0.998
0.10	1.0000	0.998
0.11	1.0000	0.998
0.12	1.0000	0.998
0.13	1.0000	0.998
0.14	1.0000	0.998
0.15	1.0000	0.998
0.16	1.0000	0.998
0.17	1.0000	0.998
0.18	0.8051	0.443
0.19	0.8051	0.443
0.20	0.8051	0.443
0.21	0.8051	0.443
0.22	0.8051	0.443
0.23	0.8051	0.443
0.24	0.8051	0.443
0.25	0.8051	0.443
0.26	0.8051	0.443
0.27	0.7177	0.291
0.28	0.6976	0.259
0.29	0.6976	0.259
0.30	0.6976	0.259
0.31	0.6976	0.259
0.32	0.6976	0.259
0.33	0.6976	0.259
0.34	0.6976	0.259
0.35	0.6976	0.259
0.36	0.6976	0.259
0.37	0.6976	0.259
0.38	0.6484	0.209
0.39	0.6484	0.209
0.40	0.6484	0.209
0.41	0.6484	0.209
0.42	0.6484	0.209
0.43	0.6484	0.209
0.44	0.6484	0.209
0.45	0.6484	0.209
0.46	0.5972	0.171
0.47	0.5972	0.171
0.48	0.5972	0.171
0.49	0.5660	0.150
0.50	0.5660	0.150
0.51	0.5660	0.150
0.52	0.5660	0.150
0.53	0.5660	0.150
0.54	0.5404	0.136
0.55	0.5404	0.136
0.56	0.5404	0.136
0.57	0.5404	0.136
0.58	0.4782	0.108
0.59	0.4782	0.108
0.60	0.4782	0.108
0.61	0.4093	0.080
0.62	0.4093	0.080
0.63	0.4093	0.080
0.64	0.4093	0.080
0.65	0.4093	0.080
0.66	0.4093	0.080
0.67	0.4093	0.080
0.68	0.4093	0.080
0.69	0.4093	0.080
0.70	0.3611	0.067
0.71	0.3611	0.067
0.72	0.3611	0.067
0.73	0.3611	0.067
0.74	0.3611	0.067
0.75	0.2531	0.044
0.76	0.2531	0.044
0.77	0.2531	0.044
0.78	0.2531	0.044
0.79	0.0000	0.000
0.80	0.0000	0.000
0.81	0.0000	0.000
0.82	0.0000	0.000
0.83	0.0000	0.000
0.84	0.0000	0.000
0.85	0.0000	0.000
0.86	0.0000	0.000
0.87	0.0000	0.000
0.88	0.0000	0.000
0.89	0.0000	0.000
0.90	0.0000	0.000
0.91	0.0000	0.000
0.92	0.0000	0.000
0.93	0.0000	0.000
0.94	0.0000	0.000
0.95	0.0000	0.000
0.96	0.0000	0.000
0.97	0.0000	0.000
0.98	0.0000	0.000
0.99	0.0000	0.000

Decision tree - Status 1 Supplement 7

Response	Event	Value	Frequency
Correct	Dead	True Positive	1,127
Incorrect	Dead	False Negative	864
Correct	Alive	True Negative	2,736
Incorrect	Alive	False Positive	482

Decision tree - Status 1 Supplement 8

KS (Youden)	Misclassification Rate	Misclassification Rat...	C Statistic	FPR	FDR	F1 Score	Lift	Cumulative Lift	Cumulative % Events	Cumulative % Captu...	Gain	Gini	Gamma	Tau	Observations Used	Unused
0.4396	0.2584	0.2584	0.763	0.150	0.300	0.626	2.045	2.045	78.019	10.227	1.045	0.526	0.615	0.248	5,209	0