ECE 361 Project Part 3

Group # 13

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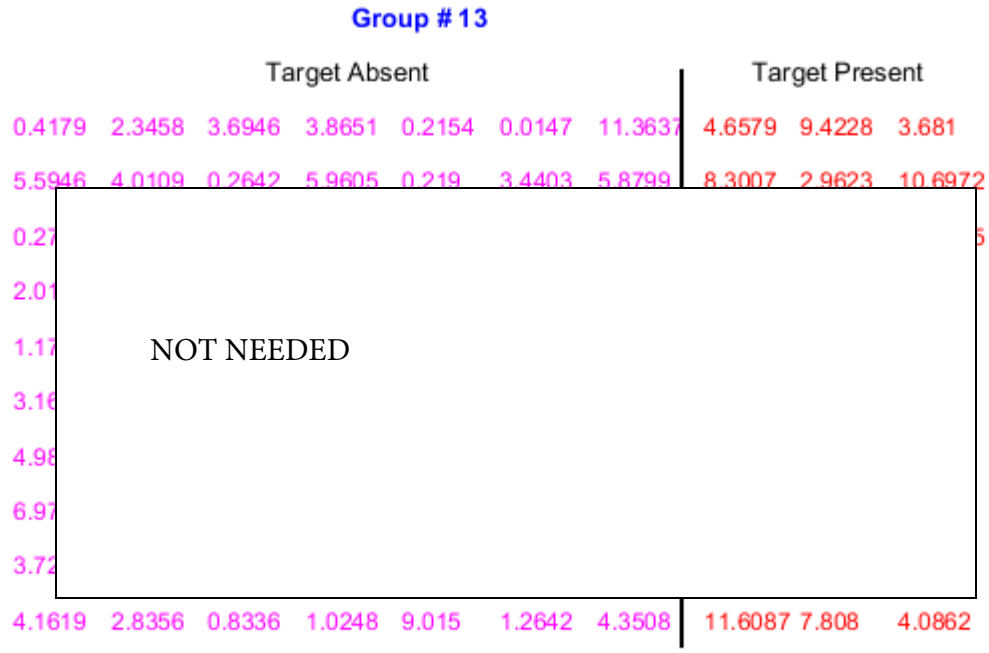
Name2

Name 3

Executive Summary [no more than 10 lines]

Report due, Week #10, Wednesday 5:00 PM as a single .pdf document e-mailed to shankapm@drexel.edu


Group # 13
Target Absent
Target Present
0.4179 2.3458 3.6946 3.8651 0.2154 0.0147 11.3637 4.6579 9.4228 3.681
5.5946 4.0109 0.2642 5.9605 0.219 3.4403 5.8799 8.3007 2.9623 10.6972
0.27
2.01
1.17
3.16
4.98
6.97
3.72
NOT NEEDED
4.1619 2.8356 0.8336 1.0248 9.015 1.2642 4.3508 11.6087 7.808 4.0862

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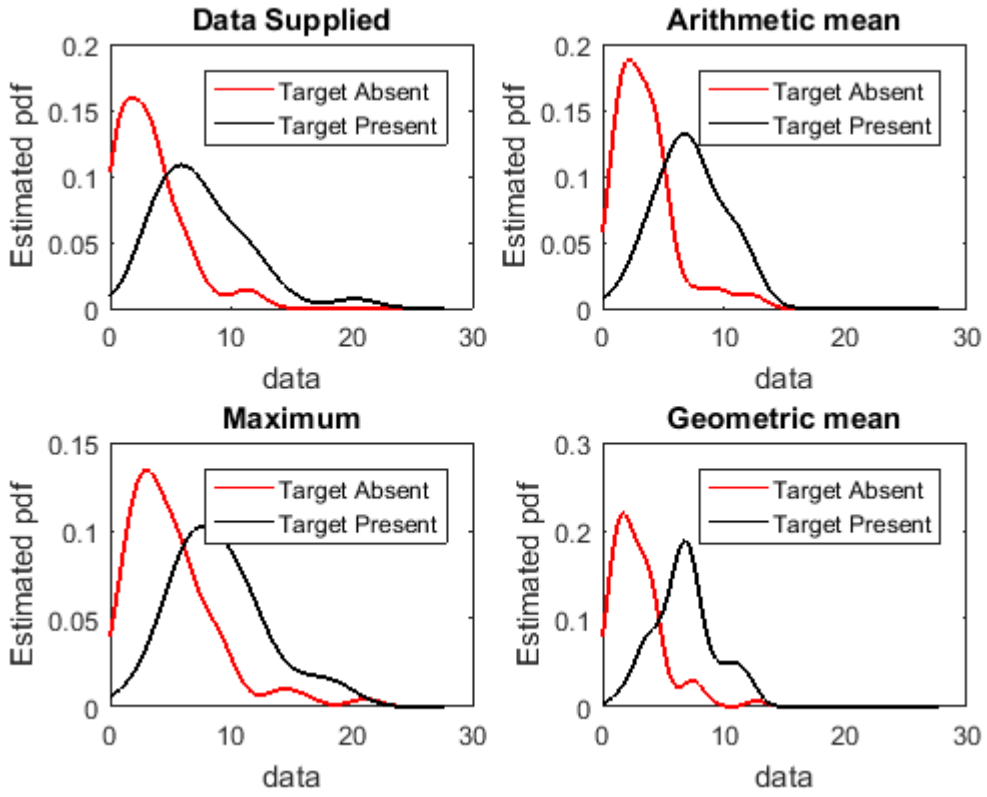
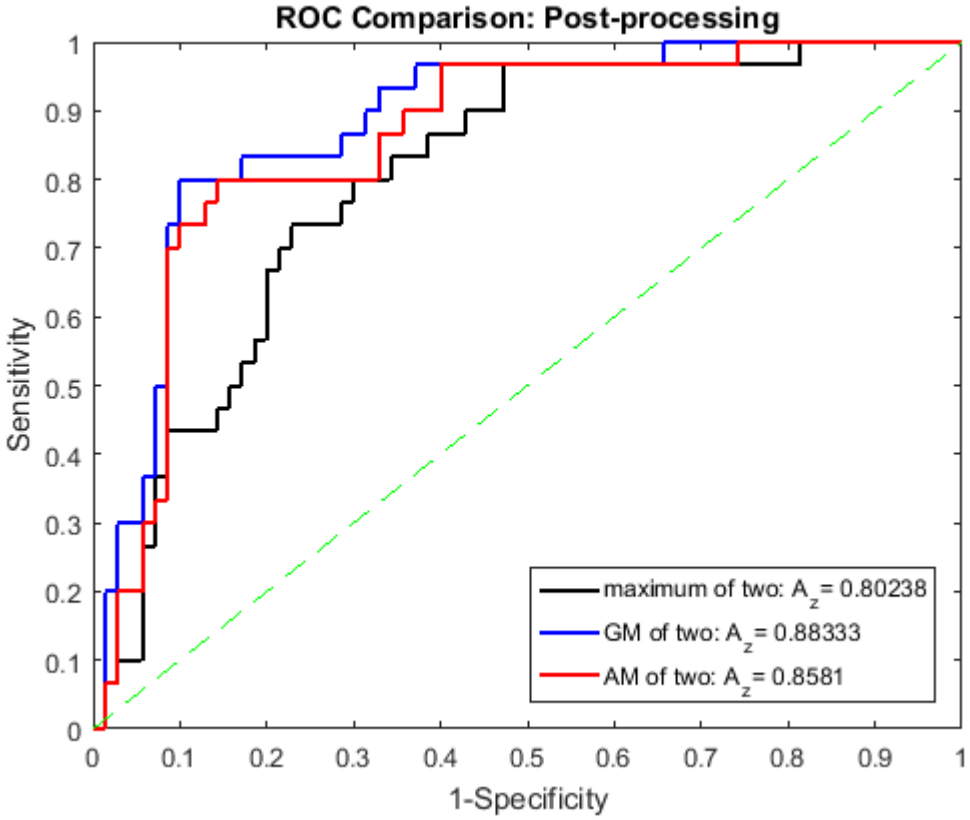

Data Supplied
Arithmetic mean
Maximum
Geometric mean
Target Absent
Target Present
Estimated pdf
data



Group #13 (Input Data)

Confusion Matrix: Threshold Value = 4.4193

Data Collected	Target Detected	Target Not Detected	Total Samples
Target Absent	(16)	54	70
Target Present	25	(5)	30
Total Samples	41	59	100

Errors are circled

$P_F = \frac{8}{35}$ = 0.22857 $P_D = \frac{5}{6}$ = 0.83333 $\mathrm{PPV} = \frac{25}{41}$ = 0.60976

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Group #13 (Arithmetic Mean)

Confusion Matrix: Threshold Value = 4.934

Data Collected	Target Detected	Target Not Detected	Total Samples
Target Absent	10	60	70
Target Present	24	6	30
Total Samples	34	66	100

Errors are circled

$P_F = \frac{1}{7}$ = 0.14286 $P_D = \frac{4}{5}$ = 0.8 $\mathrm{PPV} = \frac{12}{17}$ = 0.70588

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Group #13 (Maximum)

Confusion Matrix: Threshold Value = 6.4866

Data Collected	Target Detected	Target Not Detected	Total Samples
Target Absent	16	54	70
Target Present	22	8	30
Total Samples	38	62	100

Errors are circled

$P_F = \frac{8}{35}$ = 0.22857 $P_D = \frac{11}{15}$ = 0.73333 $\mathrm{PPV} = \frac{11}{19}$ = 0.57895

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Group #13 (Geometric Mean)

Confusion Matrix: Threshold Value = 4.6995

Errors are circled

Data Collected	Target Detected	Target Not Detected	Total Samples
Target Absent	7	63	70
Target Present	24	6	30
Total Samples	31	69	100

$P_F = \frac{1}{10}$ = 0.1 $P_D = \frac{4}{5}$ = 0.8 $\mathrm{PPV} = \frac{24}{31}$ = 0.77419

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Summary

Hypothesis testing-Target Absent (70)

gamma hypothesis not rejected, h = 0 with χ^2stat = 3.42 Deg. freedom = 6

gamma parameters: a = 1.2205, b = 2.6702

Hypothesis testing-Target Present (30)

gamma hypothesis not rejected, h = 0 with χ^2stat = 1.8 Deg. freedom = 5

gamma parameters: a = 4.4831, b = 1.6965

Performance measures

Positive Predictive Value at optimal threshold = 0.60976

Performance Index = 0.91979, A_z = 0.85381 (σ = 0.046564)

Post-Processing Results

Positive Predictive Value at optimal threshold

0.70588 (Arithmetic Mean), 0.77419 (Geometric Mean), 0.57895 (Maximum)

Performance Index

1.0097 (Arithmetic Mean), 1.1531 (Geometric Mean), 0.72034 (Maximum)

Area under the ROC curve

0.8581 (Arithmetic Mean), 0.88333 (Geometric Mean), 0.80238 (Maximum)