Daehr: a Discriminant Analysis Framework for Electronic Health Record Data and an Application to Early Detection of Mental Health Disorders

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APPENDIX

In this Appendix, we include additional experiment results of *Daehr* evaluation. In following tables, we present the performance comparison between *Daehr* and baselines, where we introduce the results in terms of accuracy, F1-score, sensitivity, specificity, as well as the standard derivations. Specifically, we compare the performance using various experimental settings, such as the number of days in advance for early detection(e.g., 30 days, 60 days and 90 days) as well as by varying parameters for model training. *Daehr* clearly outperforms other algorithms in terms of overall accuracy, F1-score and sensitivity. In terms of specificity, the baseline algorithms outperform *Daehr*, in the most of cases. However, in terms of sensitivity and specificity trade-off, *Daehr* on average gains 31.0% higher sensitivity while sacrificing 23.1% specificity, when compared to baseline algorithms. Thus, we can conclude that *Daehr* overall outperforms the baseline algorithms in all experimental settings.

Table I: Performance Comparison with Training Set:50$\times$ 2, Testing Set: 200$\times$2

	Accuracy	F1-Score	Sensitivity	Specificity
Days in Advance: 30				
LDA	0.546 ± 0.032	0.538 ± 0.038	0.530 ± 0.051	0.563 ± 0.050
DIAG	0.592 ± 0.040	0.589 ± 0.053	0.589 ± 0.086	0.596 ± 0.089
Shrinkage ($\beta = 0.25$)	0.593 ± 0.038	0.590 ± 0.049	0.590 ± 0.076	0.597 ± 0.076
Shrinkage ($\beta = 0.5$)	0.594 ± 0.036	0.591 ± 0.047	0.589 ± 0.073	0.599 ± 0.074
Shrinkage ($\beta = 0.75$)	0.592 ± 0.034	0.588 ± 0.046	0.586 ± 0.074	0.598 ± 0.071
Daehr ($\lambda = 0.005$)	0.644 ± 0.038	0.692 ± 0.027	0.801 ± 0.085	0.488 ± 0.131
Daehr ($\lambda = 0.005 * 0.5^1$)	0.645 ± 0.039	0.694 ± 0.025	0.805 ± 0.078	0.484 ± 0.130
Daehr ($\lambda = 0.005 * 0.5^2$)	0.646 ± 0.038	0.697 ± 0.022	0.816 ± 0.073	0.477 ± 0.127
Daehr ($\lambda = 0.005 * 0.5^3$)	0.646 ± 0.038	0.694 ± 0.027	0.805 ± 0.085	0.486 ± 0.132
Daehr ($\lambda = 0.005 * 0.5^4$)	0.646 ± 0.038	0.695 ± 0.024	0.810 ± 0.078	0.481 ± 0.129
Daehr ($\lambda = 0.005 * 0.5^5$)	0.644 ± 0.038	0.691 ± 0.028	0.800 ± 0.086	0.488 ± 0.132
Daehr ($\lambda = 0.005 * 0.5^6$)	0.642 ± 0.038	0.689 ± 0.029	0.796 ± 0.088	0.487 ± 0.131
Daehr ($\lambda = 0.005 * 0.5^7$)	0.643 ± 0.037	0.690 ± 0.028	0.798 ± 0.087	0.488 ± 0.132
Daehr ($\lambda = 0.005 * 0.5^8$)	0.646 ± 0.038	0.696 ± 0.023	0.811 ± 0.075	0.481 ± 0.128
Daehr ($\lambda = 0.005 * 0.5^9$)	0.642 ± 0.038	0.690 ± 0.027	0.799 ± 0.085	0.486 ± 0.131
Days in Advance: 60				
LDA	0.557 ± 0.034	0.543 ± 0.040	0.528 ± 0.060	0.586 ± 0.076
DIAG	0.593 ± 0.036	0.584 ± 0.050	0.577 ± 0.074	0.609 ± 0.059
Shrinkage ($\beta = 0.25$)	0.595 ± 0.035	0.590 ± 0.043	0.584 ± 0.062	0.607 ± 0.063
Shrinkage ($\beta = 0.5$)	0.598 ± 0.033	0.592 ± 0.043	0.587 ± 0.060	0.609 ± 0.056
Shrinkage ($\beta = 0.75$)	0.592 ± 0.035	0.586 ± 0.041	0.579 ± 0.056	0.605 ± 0.056
Daehr ($\lambda = 0.005$)	0.645 ± 0.040	0.694 ± 0.048	0.817 ± 0.119	0.473 ± 0.153
Daehr ($\lambda = 0.005 * 0.5^1$)	0.645 ± 0.040	0.694 ± 0.048	0.817 ± 0.119	0.473 ± 0.153
Daehr ($\lambda = 0.005 * 0.5^2$)	0.645 ± 0.040	0.694 ± 0.048	0.817 ± 0.119	0.473 ± 0.153
Daehr ($\lambda = 0.005 * 0.5^3$)	0.645 ± 0.040	0.694 ± 0.048	0.817 ± 0.119	0.473 ± 0.153
Daehr ($\lambda = 0.005 * 0.5^4$)	0.645 ± 0.040	0.694 ± 0.048	0.817 ± 0.119	0.473 ± 0.153
Daehr ($\lambda = 0.005 * 0.5^5$)	0.645 ± 0.040	0.694 ± 0.048	0.817 ± 0.119	0.473 ± 0.153
Daehr ($\lambda = 0.005 * 0.5^6$)	0.645 ± 0.040	0.694 ± 0.048	0.817 ± 0.119	0.473 ± 0.153
Daehr ($\lambda = 0.005 * 0.5^7$)	0.645 ± 0.040	0.694 ± 0.048	0.817 ± 0.119	0.473 ± 0.153
Daehr ($\lambda = 0.005 * 0.5^8$)	0.645 ± 0.040	0.694 ± 0.048	0.817 ± 0.119	0.473 ± 0.153
Daehr ($\lambda = 0.005 * 0.5^9$)	0.645 ± 0.040	0.694 ± 0.048	0.817 ± 0.119	0.473 ± 0.153
Days in Advance: 90				
LDA	0.541 ± 0.034	0.531 ± 0.047	0.524 ± 0.065	0.557 ± 0.059
DIAG	0.590 ± 0.027	0.575 ± 0.034	0.557 ± 0.065	0.624 ± 0.082
Shrinkage ($\beta = 0.25$)	0.594 ± 0.029	0.580 ± 0.035	0.564 ± 0.059	0.623 ± 0.071
Shrinkage ($\beta = 0.5$)	0.591 ± 0.028	0.578 ± 0.038	0.564 ± 0.062	0.619 ± 0.065
Shrinkage ($\beta = 0.75$)	0.587 ± 0.028	0.574 ± 0.041	0.560 ± 0.064	0.614 ± 0.058
Daehr ($\lambda = 0.005$)	0.656 ± 0.032	0.690 ± 0.052	0.782 ± 0.130	0.530 ± 0.136
Daehr ($\lambda = 0.005 * 0.5^1$)	0.656 ± 0.032	0.690 ± 0.052	0.782 ± 0.130	0.530 ± 0.136
Daehr ($\lambda = 0.005 * 0.5^2$)	0.656 ± 0.032	0.690 ± 0.052	0.782 ± 0.130	0.530 ± 0.136
Daehr ($\lambda = 0.005 * 0.5^3$)	0.656 ± 0.032	0.690 ± 0.052	0.782 ± 0.130	0.530 ± 0.136
Daehr ($\lambda = 0.005 * 0.5^4$)	0.656 ± 0.032	0.690 ± 0.052	0.782 ± 0.130	0.530 ± 0.136
Daehr ($\lambda = 0.005 * 0.5^5$)	0.656 ± 0.032	0.690 ± 0.052	0.782 ± 0.130	0.530 ± 0.136
Daehr ($\lambda = 0.005 * 0.5^6$)	0.656 ± 0.032	0.690 ± 0.052	0.782 ± 0.130	0.530 ± 0.136
Daehr ($\lambda = 0.005 * 0.5^7$)	0.656 ± 0.032	0.690 ± 0.052	0.782 ± 0.130	0.530 ± 0.136
Daehr ($\lambda = 0.005 * 0.5^8$)	0.656 ± 0.032	0.690 ± 0.052	0.782 ± 0.130	0.530 ± 0.136
Daehr ($\lambda = 0.005 * 0.5^9$)	0.656 ± 0.032	0.690 ± 0.052	0.782 ± 0.130	0.530 ± 0.136

Table II: Performance Comparison with Training Set:100× 2, Testing Set: 200×2

	Accuracy	F1-Score	Sensitivity	Specificity
Days in Advance: 30				
LDA	0.598 ± 0.028	0.596 ± 0.035	0.594 ± 0.054	0.602 ± 0.046
DIAG	0.619 ± 0.023	0.620 ± 0.037	0.626 ± 0.072	0.612 ± 0.061
Shrinkage ($\beta = 0.25$)	0.625 ± 0.022	0.630 ± 0.031	0.639 ± 0.059	0.611 ± 0.050
Shrinkage ($\beta = 0.5$)	0.627 ± 0.023	0.631 ± 0.029	0.640 ± 0.052	0.613 ± 0.049
Shrinkage ($\beta = 0.75$)	0.626 ± 0.024	0.628 ± 0.029	0.634 ± 0.048	0.618 ± 0.046
Daehr ($\lambda = 0.005$)	0.665 ± 0.026	0.714 ± 0.022	0.838 ± 0.055	0.494 ± 0.075
Daehr ($\lambda = 0.005 * 0.5^1$)	0.669 ± 0.023	0.716 ± 0.018	0.836 ± 0.046	0.502 ± 0.065
Daehr ($\lambda = 0.005 * 0.5^2$)	0.665 ± 0.025	0.713 ± 0.025	0.836 ± 0.061	0.495 ± 0.073
Daehr ($\lambda = 0.005 * 0.5^3$)	0.667 ± 0.025	0.716 ± 0.020	0.843 ± 0.051	0.491 ± 0.072
Daehr ($\lambda = 0.005 * 0.5^4$)	0.665 ± 0.026	0.717 ± 0.017	0.851 ± 0.037	0.478 ± 0.068
Daehr ($\lambda = 0.005 * 0.5^5$)	0.667 ± 0.025	0.716 ± 0.018	0.842 ± 0.048	0.491 ± 0.073
Daehr ($\lambda = 0.005 * 0.5^6$)	0.665 ± 0.027	0.716 ± 0.018	0.843 ± 0.044	0.487 ± 0.074
Daehr ($\lambda = 0.005 * 0.5^7$)	0.666 ± 0.024	0.713 ± 0.020	0.833 ± 0.054	0.500 ± 0.072
Daehr ($\lambda = 0.005 * 0.5^8$)	0.667 ± 0.024	0.715 ± 0.019	0.836 ± 0.049	0.498 ± 0.070
Daehr ($\lambda = 0.005 * 0.5^9$)	0.666 ± 0.024	0.714 ± 0.020	0.834 ± 0.054	0.499 ± 0.074
Days in Advance: 60				
LDA	0.591 ± 0.033	0.582 ± 0.045	0.574 ± 0.068	0.608 ± 0.064
DIAG	0.614 ± 0.030	0.613 ± 0.038	0.614 ± 0.071	0.614 ± 0.078
Shrinkage ($\beta = 0.25$)	0.614 ± 0.036	0.614 ± 0.044	0.617 ± 0.074	0.611 ± 0.074
Shrinkage ($\beta = 0.5$)	0.613 ± 0.034	0.611 ± 0.044	0.613 ± 0.076	0.613 ± 0.074
Shrinkage ($\beta = 0.75$)	0.608 ± 0.033	0.605 ± 0.043	0.603 ± 0.075	0.613 ± 0.074
Daehr ($\lambda = 0.005$)	0.648 ± 0.038	0.711 ± 0.018	0.864 ± 0.049	0.432 ± 0.109
Daehr ($\lambda = 0.005 * 0.5^1$)	0.648 ± 0.038	0.711 ± 0.018	0.864 ± 0.049	0.432 ± 0.109
Daehr ($\lambda = 0.005 * 0.5^2$)	0.648 ± 0.038	0.711 ± 0.018	0.864 ± 0.049	0.432 ± 0.109
Daehr ($\lambda = 0.005 * 0.5^3$)	0.648 ± 0.038	0.711 ± 0.018	0.864 ± 0.049	0.432 ± 0.109
Daehr ($\lambda = 0.005 * 0.5^4$)	0.648 ± 0.038	0.711 ± 0.018	0.864 ± 0.049	0.432 ± 0.109
Daehr ($\lambda = 0.005 * 0.5^5$)	0.648 ± 0.038	0.711 ± 0.018	0.864 ± 0.049	0.432 ± 0.109
Daehr ($\lambda = 0.005 * 0.5^6$)	0.648 ± 0.038	0.711 ± 0.018	0.864 ± 0.049	0.432 ± 0.109
Daehr ($\lambda = 0.005 * 0.5^7$)	0.648 ± 0.038	0.711 ± 0.018	0.864 ± 0.049	0.432 ± 0.109
Daehr ($\lambda = 0.005 * 0.5^8$)	0.648 ± 0.038	0.711 ± 0.018	0.864 ± 0.049	0.432 ± 0.109
Daehr ($\lambda = 0.005 * 0.5^9$)	0.648 ± 0.038	0.711 ± 0.018	0.864 ± 0.049	0.432 ± 0.109
Days in Advance: 90				
LDA	0.604 ± 0.023	0.601 ± 0.030	0.598 ± 0.048	0.610 ± 0.044
DIAG	0.613 ± 0.028	0.603 ± 0.040	0.593 ± 0.066	0.633 ± 0.054
Shrinkage ($\beta = 0.25$)	0.617 ± 0.028	0.612 ± 0.037	0.607 ± 0.055	0.626 ± 0.045
Shrinkage ($\beta = 0.5$)	0.619 ± 0.031	0.616 ± 0.040	0.613 ± 0.058	0.625 ± 0.045
Shrinkage ($\beta = 0.75$)	0.619 ± 0.032	0.617 ± 0.038	0.617 ± 0.055	0.620 ± 0.047
Daehr ($\lambda = 0.005$)	0.655 ± 0.034	0.713 ± 0.019	0.857 ± 0.046	0.453 ± 0.095
Daehr ($\lambda = 0.005 * 0.5^1$)	0.655 ± 0.034	0.713 ± 0.019	0.857 ± 0.046	0.453 ± 0.095
Daehr ($\lambda = 0.005 * 0.5^2$)	0.655 ± 0.034	0.713 ± 0.019	0.857 ± 0.046	0.453 ± 0.095
Daehr ($\lambda = 0.005 * 0.5^3$)	0.655 ± 0.034	0.713 ± 0.019	0.857 ± 0.046	0.453 ± 0.095
Daehr ($\lambda = 0.005 * 0.5^4$)	0.655 ± 0.034	0.713 ± 0.019	0.857 ± 0.046	0.453 ± 0.095
Daehr ($\lambda = 0.005 * 0.5^5$)	0.655 ± 0.034	0.713 ± 0.019	0.857 ± 0.046	0.453 ± 0.095
Daehr ($\lambda = 0.005 * 0.5^6$)	0.655 ± 0.034	0.713 ± 0.019	0.857 ± 0.046	0.453 ± 0.095
Daehr ($\lambda = 0.005 * 0.5^7$)	0.655 ± 0.034	0.713 ± 0.019	0.857 ± 0.046	0.453 ± 0.095
Daehr ($\lambda = 0.005 * 0.5^8$)	0.655 ± 0.034	0.713 ± 0.019	0.857 ± 0.046	0.453 ± 0.095
Daehr ($\lambda = 0.005 * 0.5^9$)	0.655 ± 0.034	0.713 ± 0.019	0.857 ± 0.046	0.453 ± 0.095

Table III: Performance Comparison with Training Set:150$\times$ 2, Testing Set: 200$\times$2

	Accuracy	F1-Score	Sensitivity	Specificity
Days in Advance: 30				
LDA	0.617 ± 0.027	0.611 ± 0.035	0.603 ± 0.054	0.631 ± 0.043
DIAG	0.635 ± 0.024	0.634 ± 0.029	0.635 ± 0.057	0.635 ± 0.065
Shrinkage ($\beta = 0.25$)	0.636 ± 0.024	0.637 ± 0.030	0.641 ± 0.054	0.632 ± 0.059
Shrinkage ($\beta = 0.5$)	0.631 ± 0.022	0.630 ± 0.029	0.631 ± 0.051	0.631 ± 0.055
Shrinkage ($\beta = 0.75$)	0.626 ± 0.024	0.623 ± 0.029	0.621 ± 0.049	0.631 ± 0.053
Daehr ($\lambda = 0.005$)	0.667 ± 0.026	0.714 ± 0.015	0.833 ± 0.043	0.500 ± 0.078
Daehr ($\lambda = 0.005 * 0.5^1$)	0.666 ± 0.026	0.713 ± 0.016	0.831 ± 0.045	0.501 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^2$)	0.663 ± 0.023	0.714 ± 0.013	0.840 ± 0.045	0.486 ± 0.078
Daehr ($\lambda = 0.005 * 0.5^3$)	0.661 ± 0.026	0.712 ± 0.014	0.837 ± 0.045	0.485 ± 0.081
Daehr ($\lambda = 0.005 * 0.5^4$)	0.662 ± 0.023	0.714 ± 0.015	0.843 ± 0.042	0.481 ± 0.070
Daehr ($\lambda = 0.005 * 0.5^5$)	0.661 ± 0.023	0.711 ± 0.014	0.835 ± 0.044	0.488 ± 0.075
Daehr ($\lambda = 0.005 * 0.5^6$)	0.660 ± 0.024	0.710 ± 0.016	0.834 ± 0.053	0.486 ± 0.084
Daehr ($\lambda = 0.005 * 0.5^7$)	0.661 ± 0.027	0.712 ± 0.014	0.839 ± 0.037	0.482 ± 0.080
Daehr ($\lambda = 0.005 * 0.5^8$)	0.663 ± 0.023	0.712 ± 0.015	0.835 ± 0.051	0.490 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^9$)	0.665 ± 0.025	0.712 ± 0.015	0.830 ± 0.050	0.500 ± 0.084
Days in Advance: 60				
LDA	0.611 ± 0.021	0.612 ± 0.026	0.616 ± 0.042	0.607 ± 0.037
DIAG	0.627 ± 0.031	0.636 ± 0.037	0.656 ± 0.062	0.597 ± 0.056
Shrinkage ($\beta = 0.25$)	0.625 ± 0.029	0.633 ± 0.034	0.651 ± 0.056	0.599 ± 0.051
Shrinkage ($\beta = 0.5$)	0.626 ± 0.028	0.632 ± 0.032	0.644 ± 0.051	0.607 ± 0.048
Shrinkage ($\beta = 0.75$)	0.625 ± 0.025	0.629 ± 0.032	0.637 ± 0.052	0.613 ± 0.040
Daehr ($\lambda = 0.005$)	0.655 ± 0.030	0.712 ± 0.017	0.852 ± 0.040	0.459 ± 0.081
Daehr ($\lambda = 0.005 * 0.5^1$)	0.655 ± 0.030	0.712 ± 0.017	0.852 ± 0.040	0.459 ± 0.081
Daehr ($\lambda = 0.005 * 0.5^2$)	0.655 ± 0.030	0.712 ± 0.017	0.852 ± 0.040	0.459 ± 0.081
Daehr ($\lambda = 0.005 * 0.5^3$)	0.655 ± 0.030	0.712 ± 0.017	0.852 ± 0.040	0.459 ± 0.081
Daehr ($\lambda = 0.005 * 0.5^4$)	0.655 ± 0.030	0.712 ± 0.017	0.852 ± 0.040	0.459 ± 0.081
Daehr ($\lambda = 0.005 * 0.5^5$)	0.655 ± 0.030	0.712 ± 0.017	0.852 ± 0.040	0.459 ± 0.081
Daehr ($\lambda = 0.005 * 0.5^6$)	0.655 ± 0.030	0.712 ± 0.017	0.852 ± 0.040	0.459 ± 0.081
Daehr ($\lambda = 0.005 * 0.5^7$)	0.655 ± 0.030	0.712 ± 0.017	0.852 ± 0.040	0.459 ± 0.081
Daehr ($\lambda = 0.005 * 0.5^8$)	0.655 ± 0.030	0.712 ± 0.017	0.852 ± 0.040	0.459 ± 0.081
Daehr ($\lambda = 0.005 * 0.5^9$)	0.655 ± 0.030	0.712 ± 0.017	0.852 ± 0.040	0.459 ± 0.081
Days in Advance: 90				
LDA	0.619 ± 0.025	0.616 ± 0.030	0.614 ± 0.045	0.623 ± 0.037
DIAG	0.623 ± 0.029	0.622 ± 0.036	0.624 ± 0.060	0.622 ± 0.064
Shrinkage ($\beta = 0.25$)	0.627 ± 0.030	0.629 ± 0.036	0.634 ± 0.058	0.621 ± 0.055
Shrinkage ($\beta = 0.5$)	0.629 ± 0.030	0.630 ± 0.035	0.634 ± 0.055	0.625 ± 0.056
Shrinkage ($\beta = 0.75$)	0.631 ± 0.030	0.630 ± 0.038	0.631 ± 0.059	0.632 ± 0.054
Daehr ($\lambda = 0.005$)	0.657 ± 0.029	0.718 ± 0.018	0.873 ± 0.040	0.441 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^1$)	0.657 ± 0.029	0.718 ± 0.018	0.873 ± 0.040	0.441 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^2$)	0.657 ± 0.029	0.718 ± 0.018	0.873 ± 0.040	0.441 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^3$)	0.657 ± 0.029	0.718 ± 0.018	0.873 ± 0.040	0.441 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^4$)	0.657 ± 0.029	0.718 ± 0.018	0.873 ± 0.040	0.441 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^5$)	0.657 ± 0.029	0.718 ± 0.018	0.873 ± 0.040	0.441 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^6$)	0.657 ± 0.029	0.718 ± 0.018	0.873 ± 0.040	0.441 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^7$)	0.657 ± 0.029	0.718 ± 0.018	0.873 ± 0.040	0.441 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^8$)	0.657 ± 0.029	0.718 ± 0.018	0.873 ± 0.040	0.441 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^9$)	0.657 ± 0.029	0.718 ± 0.018	0.873 ± 0.040	0.441 ± 0.079

Table IV: Performance Comparison with Training Set:200$\times$ 2, Testing Set: 200$\times$2

	Accuracy	F1-Score	Sensitivity	Specificity
Days in Advance: 30				
LDA	0.630 ± 0.030	0.628 ± 0.033	0.626 ± 0.048	0.635 ± 0.049
DIAG	0.634 ± 0.024	0.629 ± 0.037	0.625 ± 0.066	0.642 ± 0.056
Shrinkage ($\beta = 0.25$)	0.636 ± 0.028	0.633 ± 0.039	0.631 ± 0.064	0.641 ± 0.052
Shrinkage ($\beta = 0.5$)	0.637 ± 0.030	0.634 ± 0.037	0.632 ± 0.059	0.642 ± 0.052
Shrinkage ($\beta = 0.75$)	0.637 ± 0.034	0.634 ± 0.037	0.632 ± 0.054	0.642 ± 0.055
Daehr ($\lambda = 0.005$)	0.660 ± 0.022	0.712 ± 0.019	0.843 ± 0.061	0.478 ± 0.084
Daehr ($\lambda = 0.005 * 0.5^1$)	0.665 ± 0.023	0.716 ± 0.014	0.847 ± 0.050	0.483 ± 0.082
Daehr ($\lambda = 0.005 * 0.5^2$)	0.663 ± 0.025	0.716 ± 0.014	0.851 ± 0.050	0.476 ± 0.086
Daehr ($\lambda = 0.005 * 0.5^3$)	0.660 ± 0.027	0.714 ± 0.018	0.850 ± 0.053	0.471 ± 0.085
Daehr ($\lambda = 0.005 * 0.5^4$)	0.660 ± 0.026	0.715 ± 0.018	0.853 ± 0.049	0.467 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^5$)	0.662 ± 0.028	0.717 ± 0.017	0.856 ± 0.040	0.467 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^6$)	0.666 ± 0.026	0.719 ± 0.016	0.854 ± 0.043	0.478 ± 0.076
Daehr ($\lambda = 0.005 * 0.5^7$)	0.663 ± 0.024	0.715 ± 0.014	0.847 ± 0.051	0.478 ± 0.084
Daehr ($\lambda = 0.005 * 0.5^8$)	0.664 ± 0.024	0.715 ± 0.015	0.844 ± 0.054	0.484 ± 0.088
Daehr ($\lambda = 0.005 * 0.5^9$)	0.665 ± 0.024	0.715 ± 0.016	0.840 ± 0.058	0.491 ± 0.088
Days in Advance: 60				
LDA	0.630 ± 0.022	0.631 ± 0.025	0.634 ± 0.039	0.625 ± 0.033
DIAG	0.635 ± 0.025	0.639 ± 0.031	0.647 ± 0.056	0.623 ± 0.057
Shrinkage ($\beta = 0.25$)	0.637 ± 0.024	0.641 ± 0.026	0.649 ± 0.046	0.625 ± 0.053
Shrinkage ($\beta = 0.5$)	0.637 ± 0.023	0.639 ± 0.024	0.645 ± 0.039	0.629 ± 0.044
Shrinkage ($\beta = 0.75$)	0.635 ± 0.021	0.636 ± 0.025	0.639 ± 0.041	0.630 ± 0.037
Daehr ($\lambda = 0.005$)	0.659 ± 0.029	0.714 ± 0.019	0.852 ± 0.037	0.466 ± 0.071
Daehr ($\lambda = 0.005 * 0.5^1$)	0.659 ± 0.029	0.714 ± 0.019	0.852 ± 0.037	0.466 ± 0.071
Daehr ($\lambda = 0.005 * 0.5^2$)	0.659 ± 0.029	0.714 ± 0.019	0.852 ± 0.037	0.466 ± 0.071
Daehr ($\lambda = 0.005 * 0.5^3$)	0.659 ± 0.029	0.714 ± 0.019	0.852 ± 0.037	0.466 ± 0.071
Daehr ($\lambda = 0.005 * 0.5^4$)	0.659 ± 0.029	0.714 ± 0.019	0.852 ± 0.037	0.466 ± 0.071
Daehr ($\lambda = 0.005 * 0.5^5$)	0.659 ± 0.029	0.714 ± 0.019	0.852 ± 0.037	0.466 ± 0.071
Daehr ($\lambda = 0.005 * 0.5^6$)	0.659 ± 0.029	0.714 ± 0.019	0.852 ± 0.037	0.466 ± 0.071
Daehr ($\lambda = 0.005 * 0.5^7$)	0.659 ± 0.029	0.714 ± 0.019	0.852 ± 0.037	0.466 ± 0.071
Daehr ($\lambda = 0.005 * 0.5^8$)	0.659 ± 0.029	0.714 ± 0.019	0.852 ± 0.037	0.466 ± 0.071
Daehr ($\lambda = 0.005 * 0.5^9$)	0.659 ± 0.029	0.714 ± 0.019	0.852 ± 0.037	0.466 ± 0.071
Days in Advance: 90				
LDA	0.627 ± 0.028	0.628 ± 0.032	0.631 ± 0.046	0.623 ± 0.041
DIAG	0.627 ± 0.029	0.625 ± 0.040	0.626 ± 0.069	0.629 ± 0.061
Shrinkage ($\beta = 0.25$)	0.635 ± 0.031	0.636 ± 0.041	0.641 ± 0.068	0.629 ± 0.054
Shrinkage ($\beta = 0.5$)	0.639 ± 0.030	0.640 ± 0.039	0.644 ± 0.063	0.633 ± 0.050
Shrinkage ($\beta = 0.75$)	0.636 ± 0.028	0.637 ± 0.033	0.641 ± 0.051	0.631 ± 0.045
Daehr ($\lambda = 0.005$)	0.661 ± 0.031	0.716 ± 0.021	0.853 ± 0.044	0.469 ± 0.081
Daehr ($\lambda = 0.005 * 0.5^1$)	0.661 ± 0.031	0.716 ± 0.021	0.853 ± 0.044	0.469 ± 0.081
Daehr ($\lambda = 0.005 * 0.5^2$)	0.661 ± 0.031	0.716 ± 0.021	0.853 ± 0.044	0.469 ± 0.081
Daehr ($\lambda = 0.005 * 0.5^3$)	0.661 ± 0.031	0.716 ± 0.021	0.853 ± 0.044	0.469 ± 0.081
Daehr ($\lambda = 0.005 * 0.5^4$)	0.661 ± 0.031	0.716 ± 0.021	0.853 ± 0.044	0.469 ± 0.081
Daehr ($\lambda = 0.005 * 0.5^5$)	0.661 ± 0.031	0.716 ± 0.021	0.853 ± 0.044	0.469 ± 0.081
Daehr ($\lambda = 0.005 * 0.5^6$)	0.661 ± 0.031	0.716 ± 0.021	0.853 ± 0.044	0.469 ± 0.081
Daehr ($\lambda = 0.005 * 0.5^7$)	0.661 ± 0.031	0.716 ± 0.021	0.853 ± 0.044	0.469 ± 0.081
Daehr ($\lambda = 0.005 * 0.5^8$)	0.661 ± 0.031	0.716 ± 0.021	0.853 ± 0.044	0.469 ± 0.081
Daehr ($\lambda = 0.005 * 0.5^9$)	0.661 ± 0.031	0.716 ± 0.021	0.853 ± 0.044	0.469 ± 0.081

Table V: Performance Comparison with Training Set:250$\times$ 2, Testing Set: 200$\times$2

	Accuracy	F1-Score	Sensitivity	Specificity
Days in Advance: 30				
LDA	0.639 ± 0.023	0.644 ± 0.027	0.654 ± 0.045	0.624 ± 0.043
DIAG	0.639 ± 0.022	0.637 ± 0.036	0.639 ± 0.066	0.639 ± 0.046
Shrinkage ($\beta = 0.25$)	0.640 ± 0.024	0.642 ± 0.035	0.649 ± 0.063	0.631 ± 0.049
Shrinkage ($\beta = 0.5$)	0.641 ± 0.023	0.644 ± 0.033	0.653 ± 0.060	0.629 ± 0.052
Shrinkage ($\beta = 0.75$)	0.639 ± 0.024	0.642 ± 0.030	0.650 ± 0.054	0.628 ± 0.050
Daehr ($\lambda = 0.005$)	0.662 ± 0.032	0.717 ± 0.020	0.854 ± 0.039	0.471 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^1$)	0.662 ± 0.032	0.717 ± 0.020	0.854 ± 0.039	0.471 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^2$)	0.662 ± 0.032	0.717 ± 0.020	0.854 ± 0.039	0.471 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^3$)	0.662 ± 0.032	0.717 ± 0.020	0.854 ± 0.039	0.471 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^4$)	0.662 ± 0.032	0.717 ± 0.020	0.854 ± 0.039	0.471 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^5$)	0.662 ± 0.032	0.717 ± 0.020	0.854 ± 0.039	0.471 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^6$)	0.662 ± 0.032	0.717 ± 0.020	0.854 ± 0.039	0.471 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^7$)	0.662 ± 0.032	0.717 ± 0.020	0.854 ± 0.039	0.471 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^8$)	0.662 ± 0.032	0.717 ± 0.020	0.854 ± 0.039	0.471 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^9$)	0.662 ± 0.032	0.717 ± 0.020	0.854 ± 0.039	0.471 ± 0.079
Days in Advance: 60				
LDA	0.637 ± 0.027	0.642 ± 0.028	0.653 ± 0.043	0.622 ± 0.050
DIAG	0.633 ± 0.036	0.634 ± 0.038	0.638 ± 0.060	0.628 ± 0.068
Shrinkage ($\beta = 0.25$)	0.639 ± 0.032	0.645 ± 0.036	0.657 ± 0.056	0.621 ± 0.057
Shrinkage ($\beta = 0.5$)	0.644 ± 0.029	0.650 ± 0.032	0.662 ± 0.050	0.626 ± 0.054
Shrinkage ($\beta = 0.75$)	0.642 ± 0.029	0.648 ± 0.032	0.660 ± 0.049	0.625 ± 0.053
Daehr ($\lambda = 0.005$)	0.670 ± 0.033	0.723 ± 0.021	0.858 ± 0.034	0.481 ± 0.078
Daehr ($\lambda = 0.005 * 0.5^1$)	0.670 ± 0.033	0.723 ± 0.021	0.858 ± 0.034	0.481 ± 0.078
Daehr ($\lambda = 0.005 * 0.5^2$)	0.670 ± 0.033	0.723 ± 0.021	0.858 ± 0.034	0.481 ± 0.078
Daehr ($\lambda = 0.005 * 0.5^3$)	0.670 ± 0.033	0.723 ± 0.021	0.858 ± 0.034	0.481 ± 0.078
Daehr ($\lambda = 0.005 * 0.5^4$)	0.670 ± 0.033	0.723 ± 0.021	0.858 ± 0.034	0.481 ± 0.078
Daehr ($\lambda = 0.005 * 0.5^5$)	0.670 ± 0.033	0.723 ± 0.021	0.858 ± 0.034	0.481 ± 0.078
Daehr ($\lambda = 0.005 * 0.5^6$)	0.670 ± 0.033	0.723 ± 0.021	0.858 ± 0.034	0.481 ± 0.078
Daehr ($\lambda = 0.005 * 0.5^7$)	0.670 ± 0.033	0.723 ± 0.021	0.858 ± 0.034	0.481 ± 0.078
Daehr ($\lambda = 0.005 * 0.5^8$)	0.670 ± 0.033	0.723 ± 0.021	0.858 ± 0.034	0.481 ± 0.078
Daehr ($\lambda = 0.005 * 0.5^9$)	0.670 ± 0.033	0.723 ± 0.021	0.858 ± 0.034	0.481 ± 0.078
Days in Advance: 90				
LDA	0.642 ± 0.026	0.646 ± 0.029	0.654 ± 0.043	0.629 ± 0.043
DIAG	0.636 ± 0.028	0.638 ± 0.035	0.644 ± 0.061	0.629 ± 0.055
Shrinkage ($\beta = 0.25$)	0.643 ± 0.026	0.646 ± 0.031	0.655 ± 0.051	0.631 ± 0.047
Shrinkage ($\beta = 0.5$)	0.644 ± 0.029	0.648 ± 0.034	0.658 ± 0.054	0.631 ± 0.048
Shrinkage ($\beta = 0.75$)	0.645 ± 0.028	0.649 ± 0.031	0.658 ± 0.049	0.632 ± 0.046
Daehr ($\lambda = 0.005$)	0.669 ± 0.022	0.720 ± 0.016	0.851 ± 0.033	0.487 ± 0.055
Daehr ($\lambda = 0.005 * 0.5^1$)	0.669 ± 0.022	0.720 ± 0.016	0.851 ± 0.033	0.487 ± 0.055
Daehr ($\lambda = 0.005 * 0.5^2$)	0.669 ± 0.022	0.720 ± 0.016	0.851 ± 0.033	0.487 ± 0.055
Daehr ($\lambda = 0.005 * 0.5^3$)	0.669 ± 0.022	0.720 ± 0.016	0.851 ± 0.033	0.487 ± 0.055
Daehr ($\lambda = 0.005 * 0.5^4$)	0.669 ± 0.022	0.720 ± 0.016	0.851 ± 0.033	0.487 ± 0.055
Daehr ($\lambda = 0.005 * 0.5^5$)	0.669 ± 0.022	0.720 ± 0.016	0.851 ± 0.033	0.487 ± 0.055
Daehr ($\lambda = 0.005 * 0.5^6$)	0.669 ± 0.022	0.720 ± 0.016	0.851 ± 0.033	0.487 ± 0.055
Daehr ($\lambda = 0.005 * 0.5^7$)	0.669 ± 0.022	0.720 ± 0.016	0.851 ± 0.033	0.487 ± 0.055
Daehr ($\lambda = 0.005 * 0.5^8$)	0.669 ± 0.022	0.720 ± 0.016	0.851 ± 0.033	0.487 ± 0.055
Daehr ($\lambda = 0.005 * 0.5^9$)	0.669 ± 0.022	0.720 ± 0.016	0.851 ± 0.033	0.487 ± 0.055

Table VI: Performance Comparison with Training Set:300$\times$ 2, Testing Set: 200$\times$2

	Accuracy	F1-Score	Sensitivity	Specificity
Days in Advance: 30				
LDA	0.647 ± 0.025	0.652 ± 0.029	0.661 ± 0.046	0.633 ± 0.040
DIAG	0.651 ± 0.022	0.654 ± 0.028	0.664 ± 0.053	0.638 ± 0.051
Shrinkage ($\beta = 0.25$)	0.658 ± 0.021	0.663 ± 0.027	0.675 ± 0.052	0.640 ± 0.049
Shrinkage ($\beta = 0.5$)	0.656 ± 0.023	0.661 ± 0.028	0.674 ± 0.051	0.638 ± 0.046
Shrinkage ($\beta = 0.75$)	0.655 ± 0.024	0.660 ± 0.030	0.672 ± 0.050	0.638 ± 0.041
Daehr ($\lambda = 0.005$)	0.658 ± 0.024	0.718 ± 0.011	0.871 ± 0.033	0.444 ± 0.074
Daehr ($\lambda = 0.005 * 0.5^1$)	0.658 ± 0.024	0.718 ± 0.011	0.871 ± 0.033	0.444 ± 0.074
Daehr ($\lambda = 0.005 * 0.5^2$)	0.658 ± 0.024	0.718 ± 0.011	0.871 ± 0.033	0.444 ± 0.074
Daehr ($\lambda = 0.005 * 0.5^3$)	0.658 ± 0.024	0.718 ± 0.011	0.871 ± 0.033	0.444 ± 0.074
Daehr ($\lambda = 0.005 * 0.5^4$)	0.658 ± 0.024	0.718 ± 0.011	0.871 ± 0.033	0.444 ± 0.074
Daehr ($\lambda = 0.005 * 0.5^5$)	0.658 ± 0.024	0.718 ± 0.011	0.871 ± 0.033	0.444 ± 0.074
Daehr ($\lambda = 0.005 * 0.5^6$)	0.658 ± 0.024	0.718 ± 0.011	0.871 ± 0.033	0.444 ± 0.074
Daehr ($\lambda = 0.005 * 0.5^7$)	0.658 ± 0.024	0.718 ± 0.011	0.871 ± 0.033	0.444 ± 0.074
Daehr ($\lambda = 0.005 * 0.5^8$)	0.658 ± 0.024	0.718 ± 0.011	0.871 ± 0.033	0.444 ± 0.074
Daehr ($\lambda = 0.005 * 0.5^9$)	0.658 ± 0.024	0.718 ± 0.011	0.871 ± 0.033	0.444 ± 0.074
Days in Advance: 60				
LDA	0.654 ± 0.026	0.657 ± 0.028	0.664 ± 0.043	0.643 ± 0.042
DIAG	0.647 ± 0.026	0.649 ± 0.032	0.656 ± 0.057	0.637 ± 0.052
Shrinkage ($\beta = 0.25$)	0.651 ± 0.028	0.655 ± 0.032	0.665 ± 0.054	0.638 ± 0.051
Shrinkage ($\beta = 0.5$)	0.652 ± 0.030	0.654 ± 0.036	0.661 ± 0.056	0.642 ± 0.048
Shrinkage ($\beta = 0.75$)	0.654 ± 0.029	0.655 ± 0.034	0.661 ± 0.052	0.647 ± 0.048
Daehr ($\lambda = 0.005$)	0.647 ± 0.036	0.712 ± 0.019	0.870 ± 0.031	0.425 ± 0.092
Daehr ($\lambda = 0.005 * 0.5^1$)	0.647 ± 0.036	0.712 ± 0.019	0.870 ± 0.031	0.425 ± 0.092
Daehr ($\lambda = 0.005 * 0.5^2$)	0.647 ± 0.036	0.712 ± 0.019	0.870 ± 0.031	0.425 ± 0.092
Daehr ($\lambda = 0.005 * 0.5^3$)	0.647 ± 0.036	0.712 ± 0.019	0.870 ± 0.031	0.425 ± 0.092
Daehr ($\lambda = 0.005 * 0.5^4$)	0.647 ± 0.036	0.712 ± 0.019	0.870 ± 0.031	0.425 ± 0.092
Daehr ($\lambda = 0.005 * 0.5^5$)	0.647 ± 0.036	0.712 ± 0.019	0.870 ± 0.031	0.425 ± 0.092
Daehr ($\lambda = 0.005 * 0.5^6$)	0.647 ± 0.036	0.712 ± 0.019	0.870 ± 0.031	0.425 ± 0.092
Daehr ($\lambda = 0.005 * 0.5^7$)	0.647 ± 0.036	0.712 ± 0.019	0.870 ± 0.031	0.425 ± 0.092
Daehr ($\lambda = 0.005 * 0.5^8$)	0.647 ± 0.036	0.712 ± 0.019	0.870 ± 0.031	0.425 ± 0.092
Daehr ($\lambda = 0.005 * 0.5^9$)	0.647 ± 0.036	0.712 ± 0.019	0.870 ± 0.031	0.425 ± 0.092
Days in Advance: 90				
LDA	0.651 ± 0.025	0.655 ± 0.029	0.665 ± 0.048	0.637 ± 0.046
DIAG	0.644 ± 0.031	0.642 ± 0.046	0.645 ± 0.077	0.642 ± 0.057
Shrinkage ($\beta = 0.25$)	0.651 ± 0.030	0.653 ± 0.041	0.662 ± 0.069	0.640 ± 0.052
Shrinkage ($\beta = 0.5$)	0.655 ± 0.030	0.658 ± 0.041	0.668 ± 0.070	0.642 ± 0.049
Shrinkage ($\beta = 0.75$)	0.653 ± 0.029	0.656 ± 0.037	0.665 ± 0.063	0.640 ± 0.051
Daehr ($\lambda = 0.005$)	0.656 ± 0.023	0.716 ± 0.014	0.865 ± 0.040	0.448 ± 0.068
Daehr ($\lambda = 0.005 * 0.5^1$)	0.656 ± 0.023	0.716 ± 0.014	0.865 ± 0.040	0.448 ± 0.068
Daehr ($\lambda = 0.005 * 0.5^2$)	0.656 ± 0.023	0.716 ± 0.014	0.865 ± 0.040	0.448 ± 0.068
Daehr ($\lambda = 0.005 * 0.5^3$)	0.656 ± 0.023	0.716 ± 0.014	0.865 ± 0.040	0.448 ± 0.068
Daehr ($\lambda = 0.005 * 0.5^4$)	0.656 ± 0.023	0.716 ± 0.014	0.865 ± 0.040	0.448 ± 0.068
Daehr ($\lambda = 0.005 * 0.5^5$)	0.656 ± 0.023	0.716 ± 0.014	0.865 ± 0.040	0.448 ± 0.068
Daehr ($\lambda = 0.005 * 0.5^6$)	0.656 ± 0.023	0.716 ± 0.014	0.865 ± 0.040	0.448 ± 0.068
Daehr ($\lambda = 0.005 * 0.5^7$)	0.656 ± 0.023	0.716 ± 0.014	0.865 ± 0.040	0.448 ± 0.068
Daehr ($\lambda = 0.005 * 0.5^8$)	0.656 ± 0.023	0.716 ± 0.014	0.865 ± 0.040	0.448 ± 0.068
Daehr ($\lambda = 0.005 * 0.5^9$)	0.656 ± 0.023	0.716 ± 0.014	0.865 ± 0.040	0.448 ± 0.068

Table VII: Performance Comparison with Training Set:350$\times$ 2, Testing Set: 200$\times$2

	Accuracy	F1-Score	Sensitivity	Specificity
Days in Advance: 30				
LDA	0.661 ± 0.028	0.670 ± 0.029	0.688 ± 0.043	0.635 ± 0.044
DIAG	0.653 ± 0.029	0.660 ± 0.030	0.675 ± 0.052	0.630 ± 0.062
Shrinkage ($\beta = 0.25$)	0.656 ± 0.030	0.665 ± 0.029	0.683 ± 0.045	0.630 ± 0.054
Shrinkage ($\beta = 0.5$)	0.660 ± 0.027	0.668 ± 0.027	0.686 ± 0.043	0.634 ± 0.049
Shrinkage ($\beta = 0.75$)	0.662 ± 0.028	0.672 ± 0.028	0.691 ± 0.042	0.633 ± 0.049
Daehr ($\lambda = 0.005$)	0.670 ± 0.022	0.722 ± 0.014	0.857 ± 0.036	0.484 ± 0.062
Daehr ($\lambda = 0.005 * 0.5^1$)	0.670 ± 0.022	0.722 ± 0.014	0.857 ± 0.036	0.484 ± 0.062
Daehr ($\lambda = 0.005 * 0.5^2$)	0.670 ± 0.022	0.722 ± 0.014	0.857 ± 0.036	0.484 ± 0.062
Daehr ($\lambda = 0.005 * 0.5^3$)	0.670 ± 0.022	0.722 ± 0.014	0.857 ± 0.036	0.484 ± 0.062
Daehr ($\lambda = 0.005 * 0.5^4$)	0.670 ± 0.022	0.722 ± 0.014	0.857 ± 0.036	0.484 ± 0.062
Daehr ($\lambda = 0.005 * 0.5^5$)	0.670 ± 0.022	0.722 ± 0.014	0.857 ± 0.036	0.484 ± 0.062
Daehr ($\lambda = 0.005 * 0.5^6$)	0.670 ± 0.022	0.722 ± 0.014	0.857 ± 0.036	0.484 ± 0.062
Daehr ($\lambda = 0.005 * 0.5^7$)	0.670 ± 0.022	0.722 ± 0.014	0.857 ± 0.036	0.484 ± 0.062
Daehr ($\lambda = 0.005 * 0.5^8$)	0.670 ± 0.022	0.722 ± 0.014	0.857 ± 0.036	0.484 ± 0.062
Daehr ($\lambda = 0.005 * 0.5^9$)	0.670 ± 0.022	0.722 ± 0.014	0.857 ± 0.036	0.484 ± 0.062
Days in Advance: 60				
LDA	0.654 ± 0.022	0.659 ± 0.027	0.671 ± 0.044	0.637 ± 0.038
DIAG	0.651 ± 0.024	0.652 ± 0.040	0.660 ± 0.074	0.642 ± 0.049
Shrinkage ($\beta = 0.25$)	0.657 ± 0.020	0.661 ± 0.031	0.673 ± 0.058	0.640 ± 0.044
Shrinkage ($\beta = 0.5$)	0.657 ± 0.025	0.662 ± 0.033	0.673 ± 0.056	0.641 ± 0.043
Shrinkage ($\beta = 0.75$)	0.660 ± 0.022	0.664 ± 0.029	0.675 ± 0.051	0.644 ± 0.040
Daehr ($\lambda = 0.005$)	0.667 ± 0.020	0.720 ± 0.017	0.856 ± 0.040	0.477 ± 0.050
Daehr ($\lambda = 0.005 * 0.5^1$)	0.667 ± 0.020	0.720 ± 0.017	0.856 ± 0.040	0.477 ± 0.050
Daehr ($\lambda = 0.005 * 0.5^2$)	0.667 ± 0.020	0.720 ± 0.017	0.856 ± 0.040	0.477 ± 0.050
Daehr ($\lambda = 0.005 * 0.5^3$)	0.667 ± 0.020	0.720 ± 0.017	0.856 ± 0.040	0.477 ± 0.050
Daehr ($\lambda = 0.005 * 0.5^4$)	0.667 ± 0.020	0.720 ± 0.017	0.856 ± 0.040	0.477 ± 0.050
Daehr ($\lambda = 0.005 * 0.5^5$)	0.667 ± 0.020	0.720 ± 0.017	0.856 ± 0.040	0.477 ± 0.050
Daehr ($\lambda = 0.005 * 0.5^6$)	0.667 ± 0.020	0.720 ± 0.017	0.856 ± 0.040	0.477 ± 0.050
Daehr ($\lambda = 0.005 * 0.5^7$)	0.667 ± 0.020	0.720 ± 0.017	0.856 ± 0.040	0.477 ± 0.050
Daehr ($\lambda = 0.005 * 0.5^8$)	0.667 ± 0.020	0.720 ± 0.017	0.856 ± 0.040	0.477 ± 0.050
Daehr ($\lambda = 0.005 * 0.5^9$)	0.667 ± 0.020	0.720 ± 0.017	0.856 ± 0.040	0.477 ± 0.050
Days in Advance: 90				
LDA	0.655 ± 0.027	0.664 ± 0.027	0.683 ± 0.038	0.627 ± 0.042
DIAG	0.652 ± 0.024	0.659 ± 0.035	0.679 ± 0.071	0.624 ± 0.056
Shrinkage ($\beta = 0.25$)	0.659 ± 0.022	0.668 ± 0.026	0.687 ± 0.052	0.631 ± 0.057
Shrinkage ($\beta = 0.5$)	0.660 ± 0.024	0.669 ± 0.025	0.688 ± 0.045	0.631 ± 0.053
Shrinkage ($\beta = 0.75$)	0.659 ± 0.027	0.667 ± 0.026	0.685 ± 0.042	0.632 ± 0.049
Daehr ($\lambda = 0.005$)	0.660 ± 0.025	0.718 ± 0.014	0.865 ± 0.031	0.456 ± 0.067
Daehr ($\lambda = 0.005 * 0.5^1$)	0.660 ± 0.025	0.718 ± 0.014	0.865 ± 0.031	0.456 ± 0.067
Daehr ($\lambda = 0.005 * 0.5^2$)	0.660 ± 0.025	0.718 ± 0.014	0.865 ± 0.031	0.456 ± 0.067
Daehr ($\lambda = 0.005 * 0.5^3$)	0.660 ± 0.025	0.718 ± 0.014	0.865 ± 0.031	0.456 ± 0.067
Daehr ($\lambda = 0.005 * 0.5^4$)	0.660 ± 0.025	0.718 ± 0.014	0.865 ± 0.031	0.456 ± 0.067
Daehr ($\lambda = 0.005 * 0.5^5$)	0.660 ± 0.025	0.718 ± 0.014	0.865 ± 0.031	0.456 ± 0.067
Daehr ($\lambda = 0.005 * 0.5^6$)	0.660 ± 0.025	0.718 ± 0.014	0.865 ± 0.031	0.456 ± 0.067
Daehr ($\lambda = 0.005 * 0.5^7$)	0.660 ± 0.025	0.718 ± 0.014	0.865 ± 0.031	0.456 ± 0.067
Daehr ($\lambda = 0.005 * 0.5^8$)	0.660 ± 0.025	0.718 ± 0.014	0.865 ± 0.031	0.456 ± 0.067
Daehr ($\lambda = 0.005 * 0.5^9$)	0.660 ± 0.025	0.718 ± 0.014	0.865 ± 0.031	0.456 ± 0.067

Table VIII: Performance Comparison with Training Set:50× 2, Testing Set: 1000×2

	Accuracy	F1-Score	Sensitivity	Specificity
Days in Advance: 30				
LDA	0.552 ± 0.021	0.544 ± 0.032	0.536 ± 0.053	0.567 ± 0.044
DIAG	0.595 ± 0.017	0.586 ± 0.034	0.579 ± 0.073	0.610 ± 0.073
Shrinkage ($\beta = 0.25$)	0.596 ± 0.016	0.590 ± 0.029	0.586 ± 0.063	0.605 ± 0.066
Shrinkage ($\beta = 0.5$)	0.594 ± 0.015	0.588 ± 0.028	0.582 ± 0.061	0.606 ± 0.064
Shrinkage ($\beta = 0.75$)	0.590 ± 0.014	0.583 ± 0.027	0.576 ± 0.057	0.604 ± 0.058
Daehr ($\lambda = 0.005$)	0.653 ± 0.036	0.711 ± 0.013	0.853 ± 0.053	0.453 ± 0.119
Daehr ($\lambda = 0.005 * 0.5^1$)	0.653 ± 0.036	0.711 ± 0.013	0.853 ± 0.052	0.453 ± 0.119
Daehr ($\lambda = 0.005 * 0.5^2$)	0.653 ± 0.036	0.712 ± 0.013	0.855 ± 0.050	0.451 ± 0.117
Daehr ($\lambda = 0.005 * 0.5^3$)	0.652 ± 0.036	0.710 ± 0.016	0.850 ± 0.060	0.455 ± 0.122
Daehr ($\lambda = 0.005 * 0.5^4$)	0.652 ± 0.036	0.710 ± 0.016	0.850 ± 0.060	0.455 ± 0.122
Daehr ($\lambda = 0.005 * 0.5^5$)	0.652 ± 0.036	0.710 ± 0.016	0.849 ± 0.062	0.455 ± 0.123
Daehr ($\lambda = 0.005 * 0.5^6$)	0.652 ± 0.036	0.710 ± 0.016	0.850 ± 0.060	0.455 ± 0.122
Daehr ($\lambda = 0.005 * 0.5^7$)	0.652 ± 0.036	0.710 ± 0.016	0.850 ± 0.060	0.455 ± 0.122
Daehr ($\lambda = 0.005 * 0.5^8$)	0.652 ± 0.036	0.710 ± 0.016	0.850 ± 0.060	0.455 ± 0.122
Daehr ($\lambda = 0.005 * 0.5^9$)	0.653 ± 0.036	0.710 ± 0.016	0.850 ± 0.060	0.455 ± 0.122
Days in Advance: 60				
LDA	0.552 ± 0.021	0.547 ± 0.029	0.544 ± 0.052	0.560 ± 0.057
DIAG	0.593 ± 0.025	0.585 ± 0.037	0.578 ± 0.062	0.607 ± 0.054
Shrinkage ($\beta = 0.25$)	0.592 ± 0.025	0.588 ± 0.033	0.585 ± 0.054	0.600 ± 0.051
Shrinkage ($\beta = 0.5$)	0.592 ± 0.026	0.587 ± 0.033	0.583 ± 0.056	0.600 ± 0.055
Shrinkage ($\beta = 0.75$)	0.591 ± 0.026	0.586 ± 0.036	0.582 ± 0.063	0.600 ± 0.061
Daehr ($\lambda = 0.005$)	0.649 ± 0.041	0.709 ± 0.015	0.853 ± 0.061	0.446 ± 0.133
Daehr ($\lambda = 0.005 * 0.5^1$)	0.649 ± 0.041	0.709 ± 0.015	0.853 ± 0.061	0.446 ± 0.133
Daehr ($\lambda = 0.005 * 0.5^2$)	0.649 ± 0.041	0.709 ± 0.015	0.853 ± 0.061	0.446 ± 0.133
Daehr ($\lambda = 0.005 * 0.5^3$)	0.649 ± 0.041	0.709 ± 0.015	0.853 ± 0.061	0.446 ± 0.133
Daehr ($\lambda = 0.005 * 0.5^4$)	0.649 ± 0.041	0.709 ± 0.015	0.853 ± 0.061	0.446 ± 0.133
Daehr ($\lambda = 0.005 * 0.5^5$)	0.649 ± 0.041	0.709 ± 0.015	0.853 ± 0.061	0.446 ± 0.133
Daehr ($\lambda = 0.005 * 0.5^6$)	0.649 ± 0.041	0.709 ± 0.015	0.853 ± 0.061	0.446 ± 0.133
Daehr ($\lambda = 0.005 * 0.5^7$)	0.649 ± 0.041	0.709 ± 0.015	0.853 ± 0.061	0.446 ± 0.133
Daehr ($\lambda = 0.005 * 0.5^8$)	0.649 ± 0.041	0.709 ± 0.015	0.853 ± 0.061	0.446 ± 0.133
Daehr ($\lambda = 0.005 * 0.5^9$)	0.649 ± 0.041	0.709 ± 0.015	0.853 ± 0.061	0.446 ± 0.133
Days in Advance: 90				
LDA	0.553 ± 0.023	0.539 ± 0.032	0.524 ± 0.051	0.582 ± 0.049
DIAG	0.595 ± 0.019	0.585 ± 0.040	0.577 ± 0.074	0.614 ± 0.060
Shrinkage ($\beta = 0.25$)	0.596 ± 0.019	0.588 ± 0.038	0.581 ± 0.071	0.612 ± 0.058
Shrinkage ($\beta = 0.5$)	0.595 ± 0.019	0.587 ± 0.036	0.580 ± 0.069	0.609 ± 0.061
Shrinkage ($\beta = 0.75$)	0.590 ± 0.019	0.582 ± 0.038	0.576 ± 0.070	0.605 ± 0.062
Daehr ($\lambda = 0.005$)	0.653 ± 0.032	0.709 ± 0.015	0.845 ± 0.057	0.462 ± 0.110
Daehr ($\lambda = 0.005 * 0.5^1$)	0.653 ± 0.032	0.709 ± 0.015	0.845 ± 0.057	0.462 ± 0.110
Daehr ($\lambda = 0.005 * 0.5^2$)	0.653 ± 0.032	0.709 ± 0.015	0.845 ± 0.057	0.462 ± 0.110
Daehr ($\lambda = 0.005 * 0.5^3$)	0.653 ± 0.032	0.709 ± 0.015	0.845 ± 0.057	0.462 ± 0.110
Daehr ($\lambda = 0.005 * 0.5^4$)	0.653 ± 0.032	0.709 ± 0.015	0.845 ± 0.057	0.462 ± 0.110
Daehr ($\lambda = 0.005 * 0.5^5$)	0.653 ± 0.032	0.709 ± 0.015	0.845 ± 0.057	0.462 ± 0.110
Daehr ($\lambda = 0.005 * 0.5^6$)	0.653 ± 0.032	0.709 ± 0.015	0.845 ± 0.057	0.462 ± 0.110
Daehr ($\lambda = 0.005 * 0.5^7$)	0.653 ± 0.032	0.709 ± 0.015	0.845 ± 0.057	0.462 ± 0.110
Daehr ($\lambda = 0.005 * 0.5^8$)	0.653 ± 0.032	0.709 ± 0.015	0.845 ± 0.057	0.462 ± 0.110
Daehr ($\lambda = 0.005 * 0.5^9$)	0.653 ± 0.032	0.709 ± 0.015	0.845 ± 0.057	0.462 ± 0.110

Table IX: Performance Comparison with Training Set:100× 2, Testing Set: 1000×2

	Accuracy	F1-Score	Sensitivity	Specificity
Days in Advance: 30				
LDA	0.592 ± 0.021	0.592 ± 0.027	0.592 ± 0.045	0.593 ± 0.042
DIAG	0.610 ± 0.022	0.605 ± 0.036	0.603 ± 0.066	0.617 ± 0.050
Shrinkage ($\beta = 0.25$)	0.612 ± 0.022	0.611 ± 0.033	0.613 ± 0.059	0.611 ± 0.044
Shrinkage ($\beta = 0.5$)	0.611 ± 0.021	0.611 ± 0.032	0.614 ± 0.056	0.608 ± 0.044
Shrinkage ($\beta = 0.75$)	0.608 ± 0.023	0.608 ± 0.032	0.611 ± 0.055	0.605 ± 0.046
Daehr ($\lambda = 0.005$)	0.658 ± 0.017	0.704 ± 0.019	0.819 ± 0.062	0.496 ± 0.077
Daehr ($\lambda = 0.005 * 0.5^1$)	0.657 ± 0.017	0.704 ± 0.019	0.819 ± 0.062	0.496 ± 0.077
Daehr ($\lambda = 0.005 * 0.5^2$)	0.658 ± 0.017	0.706 ± 0.018	0.823 ± 0.059	0.493 ± 0.076
Daehr ($\lambda = 0.005 * 0.5^3$)	0.658 ± 0.017	0.706 ± 0.018	0.823 ± 0.059	0.493 ± 0.076
Daehr ($\lambda = 0.005 * 0.5^4$)	0.658 ± 0.017	0.706 ± 0.018	0.823 ± 0.059	0.493 ± 0.076
Daehr ($\lambda = 0.005 * 0.5^5$)	0.658 ± 0.017	0.706 ± 0.018	0.823 ± 0.059	0.493 ± 0.076
Daehr ($\lambda = 0.005 * 0.5^6$)	0.658 ± 0.017	0.706 ± 0.018	0.823 ± 0.059	0.493 ± 0.076
Daehr ($\lambda = 0.005 * 0.5^7$)	0.658 ± 0.017	0.706 ± 0.018	0.823 ± 0.059	0.493 ± 0.076
Daehr ($\lambda = 0.005 * 0.5^8$)	0.658 ± 0.017	0.706 ± 0.018	0.823 ± 0.059	0.493 ± 0.076
Daehr ($\lambda = 0.005 * 0.5^9$)	0.658 ± 0.017	0.706 ± 0.018	0.823 ± 0.059	0.493 ± 0.076
Days in Advance: 60				
LDA	0.593 ± 0.019	0.584 ± 0.029	0.574 ± 0.048	0.612 ± 0.042
DIAG	0.611 ± 0.018	0.602 ± 0.029	0.592 ± 0.057	0.630 ± 0.054
Shrinkage ($\beta = 0.25$)	0.612 ± 0.020	0.602 ± 0.030	0.590 ± 0.055	0.634 ± 0.052
Shrinkage ($\beta = 0.5$)	0.610 ± 0.020	0.599 ± 0.030	0.586 ± 0.055	0.633 ± 0.051
Shrinkage ($\beta = 0.75$)	0.606 ± 0.019	0.595 ± 0.031	0.582 ± 0.055	0.630 ± 0.047
Daehr ($\lambda = 0.005$)	0.655 ± 0.022	0.708 ± 0.013	0.838 ± 0.055	0.471 ± 0.088
Daehr ($\lambda = 0.005 * 0.5^1$)	0.655 ± 0.022	0.708 ± 0.013	0.838 ± 0.055	0.471 ± 0.088
Daehr ($\lambda = 0.005 * 0.5^2$)	0.655 ± 0.022	0.708 ± 0.013	0.838 ± 0.055	0.471 ± 0.088
Daehr ($\lambda = 0.005 * 0.5^3$)	0.655 ± 0.022	0.708 ± 0.013	0.838 ± 0.055	0.471 ± 0.088
Daehr ($\lambda = 0.005 * 0.5^4$)	0.655 ± 0.022	0.708 ± 0.013	0.838 ± 0.055	0.471 ± 0.088
Daehr ($\lambda = 0.005 * 0.5^5$)	0.655 ± 0.022	0.708 ± 0.013	0.838 ± 0.055	0.471 ± 0.088
Daehr ($\lambda = 0.005 * 0.5^6$)	0.655 ± 0.022	0.708 ± 0.013	0.838 ± 0.055	0.471 ± 0.088
Daehr ($\lambda = 0.005 * 0.5^7$)	0.655 ± 0.022	0.708 ± 0.013	0.838 ± 0.055	0.471 ± 0.088
Daehr ($\lambda = 0.005 * 0.5^8$)	0.655 ± 0.022	0.708 ± 0.013	0.838 ± 0.055	0.471 ± 0.088
Daehr ($\lambda = 0.005 * 0.5^9$)	0.655 ± 0.022	0.708 ± 0.013	0.838 ± 0.055	0.471 ± 0.088
Days in Advance: 90				
LDA	0.591 ± 0.019	0.587 ± 0.025	0.583 ± 0.044	0.598 ± 0.045
DIAG	0.611 ± 0.018	0.614 ± 0.028	0.620 ± 0.052	0.602 ± 0.048
Shrinkage ($\beta = 0.25$)	0.614 ± 0.020	0.617 ± 0.027	0.624 ± 0.048	0.603 ± 0.045
Shrinkage ($\beta = 0.5$)	0.613 ± 0.020	0.616 ± 0.027	0.623 ± 0.048	0.602 ± 0.048
Shrinkage ($\beta = 0.75$)	0.609 ± 0.020	0.610 ± 0.026	0.615 ± 0.048	0.602 ± 0.052
Daehr ($\lambda = 0.005$)	0.653 ± 0.029	0.710 ± 0.010	0.850 ± 0.044	0.456 ± 0.099
Daehr ($\lambda = 0.005 * 0.5^1$)	0.653 ± 0.029	0.710 ± 0.010	0.850 ± 0.044	0.456 ± 0.099
Daehr ($\lambda = 0.005 * 0.5^2$)	0.653 ± 0.029	0.710 ± 0.010	0.850 ± 0.044	0.456 ± 0.099
Daehr ($\lambda = 0.005 * 0.5^3$)	0.653 ± 0.029	0.710 ± 0.010	0.850 ± 0.044	0.456 ± 0.099
Daehr ($\lambda = 0.005 * 0.5^4$)	0.653 ± 0.029	0.710 ± 0.010	0.850 ± 0.044	0.456 ± 0.099
Daehr ($\lambda = 0.005 * 0.5^5$)	0.653 ± 0.029	0.710 ± 0.010	0.850 ± 0.044	0.456 ± 0.099
Daehr ($\lambda = 0.005 * 0.5^6$)	0.653 ± 0.029	0.710 ± 0.010	0.850 ± 0.044	0.456 ± 0.099
Daehr ($\lambda = 0.005 * 0.5^7$)	0.653 ± 0.029	0.710 ± 0.010	0.850 ± 0.044	0.456 ± 0.099
Daehr ($\lambda = 0.005 * 0.5^8$)	0.653 ± 0.029	0.710 ± 0.010	0.850 ± 0.044	0.456 ± 0.099
Daehr ($\lambda = 0.005 * 0.5^9$)	0.653 ± 0.029	0.710 ± 0.010	0.850 ± 0.044	0.456 ± 0.099

Table X: Performance Comparison with Training Set:150× 2, Testing Set: 1000×2

	Accuracy	F1-Score	Sensitivity	Specificity
Days in Advance: 30				
LDA	0.619 ± 0.015	0.619 ± 0.025	0.621 ± 0.043	0.618 ± 0.029
DIAG	0.624 ± 0.018	0.624 ± 0.031	0.626 ± 0.059	0.623 ± 0.043
Shrinkage ($\beta = 0.25$)	0.629 ± 0.017	0.630 ± 0.028	0.636 ± 0.050	0.621 ± 0.034
Shrinkage ($\beta = 0.5$)	0.630 ± 0.017	0.632 ± 0.029	0.638 ± 0.050	0.622 ± 0.032
Shrinkage ($\beta = 0.75$)	0.629 ± 0.017	0.631 ± 0.029	0.637 ± 0.050	0.621 ± 0.030
Daehr ($\lambda = 0.005$)	0.655 ± 0.030	0.716 ± 0.012	0.869 ± 0.037	0.440 ± 0.091
Daehr ($\lambda = 0.005 * 0.5^1$)	0.655 ± 0.030	0.716 ± 0.012	0.869 ± 0.037	0.440 ± 0.091
Daehr ($\lambda = 0.005 * 0.5^2$)	0.655 ± 0.030	0.716 ± 0.012	0.869 ± 0.037	0.440 ± 0.091
Daehr ($\lambda = 0.005 * 0.5^3$)	0.655 ± 0.030	0.716 ± 0.012	0.869 ± 0.037	0.440 ± 0.091
Daehr ($\lambda = 0.005 * 0.5^4$)	0.655 ± 0.030	0.716 ± 0.012	0.869 ± 0.037	0.440 ± 0.091
Daehr ($\lambda = 0.005 * 0.5^5$)	0.655 ± 0.030	0.716 ± 0.012	0.869 ± 0.037	0.440 ± 0.091
Daehr ($\lambda = 0.005 * 0.5^6$)	0.655 ± 0.030	0.716 ± 0.012	0.869 ± 0.037	0.440 ± 0.091
Daehr ($\lambda = 0.005 * 0.5^7$)	0.655 ± 0.030	0.716 ± 0.012	0.869 ± 0.037	0.440 ± 0.091
Daehr ($\lambda = 0.005 * 0.5^8$)	0.655 ± 0.030	0.716 ± 0.012	0.869 ± 0.037	0.440 ± 0.091
Daehr ($\lambda = 0.005 * 0.5^9$)	0.655 ± 0.030	0.716 ± 0.012	0.869 ± 0.037	0.440 ± 0.091
Days in Advance: 60				
LDA	0.616 ± 0.016	0.616 ± 0.021	0.617 ± 0.036	0.614 ± 0.034
DIAG	0.628 ± 0.017	0.625 ± 0.029	0.622 ± 0.055	0.634 ± 0.048
Shrinkage ($\beta = 0.25$)	0.631 ± 0.018	0.630 ± 0.025	0.631 ± 0.046	0.631 ± 0.040
Shrinkage ($\beta = 0.5$)	0.630 ± 0.018	0.630 ± 0.026	0.632 ± 0.045	0.628 ± 0.036
Shrinkage ($\beta = 0.75$)	0.628 ± 0.018	0.628 ± 0.025	0.630 ± 0.044	0.626 ± 0.037
Daehr ($\lambda = 0.005$)	0.661 ± 0.021	0.717 ± 0.010	0.857 ± 0.030	0.465 ± 0.065
Daehr ($\lambda = 0.005 * 0.5^1$)	0.661 ± 0.021	0.717 ± 0.010	0.857 ± 0.030	0.465 ± 0.065
Daehr ($\lambda = 0.005 * 0.5^2$)	0.661 ± 0.021	0.717 ± 0.010	0.857 ± 0.030	0.465 ± 0.065
Daehr ($\lambda = 0.005 * 0.5^3$)	0.661 ± 0.021	0.717 ± 0.010	0.857 ± 0.030	0.465 ± 0.065
Daehr ($\lambda = 0.005 * 0.5^4$)	0.661 ± 0.021	0.717 ± 0.010	0.857 ± 0.030	0.465 ± 0.065
Daehr ($\lambda = 0.005 * 0.5^5$)	0.661 ± 0.021	0.717 ± 0.010	0.857 ± 0.030	0.465 ± 0.065
Daehr ($\lambda = 0.005 * 0.5^6$)	0.661 ± 0.021	0.717 ± 0.010	0.857 ± 0.030	0.465 ± 0.065
Daehr ($\lambda = 0.005 * 0.5^7$)	0.661 ± 0.021	0.717 ± 0.010	0.857 ± 0.030	0.465 ± 0.065
Daehr ($\lambda = 0.005 * 0.5^8$)	0.661 ± 0.021	0.717 ± 0.010	0.857 ± 0.030	0.465 ± 0.065
Daehr ($\lambda = 0.005 * 0.5^9$)	0.661 ± 0.021	0.717 ± 0.010	0.857 ± 0.030	0.465 ± 0.065
Days in Advance: 90				
LDA	0.621 ± 0.020	0.622 ± 0.025	0.626 ± 0.040	0.615 ± 0.031
DIAG	0.627 ± 0.015	0.629 ± 0.030	0.638 ± 0.064	0.615 ± 0.059
Shrinkage ($\beta = 0.25$)	0.632 ± 0.015	0.638 ± 0.021	0.649 ± 0.047	0.616 ± 0.050
Shrinkage ($\beta = 0.5$)	0.634 ± 0.018	0.641 ± 0.022	0.653 ± 0.045	0.616 ± 0.047
Shrinkage ($\beta = 0.75$)	0.631 ± 0.019	0.637 ± 0.022	0.648 ± 0.040	0.615 ± 0.040
Daehr ($\lambda = 0.005$)	0.667 ± 0.018	0.720 ± 0.009	0.855 ± 0.034	0.478 ± 0.061
Daehr ($\lambda = 0.005 * 0.5^1$)	0.669 ± 0.014	0.720 ± 0.009	0.850 ± 0.028	0.488 ± 0.048
Daehr ($\lambda = 0.005 * 0.5^2$)	0.669 ± 0.014	0.720 ± 0.009	0.850 ± 0.028	0.488 ± 0.048
Daehr ($\lambda = 0.005 * 0.5^3$)	0.669 ± 0.014	0.720 ± 0.009	0.850 ± 0.028	0.488 ± 0.048
Daehr ($\lambda = 0.005 * 0.5^4$)	0.669 ± 0.014	0.720 ± 0.009	0.850 ± 0.028	0.488 ± 0.048
Daehr ($\lambda = 0.005 * 0.5^5$)	0.669 ± 0.014	0.720 ± 0.009	0.850 ± 0.028	0.488 ± 0.048
Daehr ($\lambda = 0.005 * 0.5^6$)	0.669 ± 0.014	0.720 ± 0.009	0.850 ± 0.028	0.488 ± 0.048
Daehr ($\lambda = 0.005 * 0.5^7$)	0.669 ± 0.014	0.720 ± 0.009	0.850 ± 0.028	0.488 ± 0.048
Daehr ($\lambda = 0.005 * 0.5^8$)	0.669 ± 0.014	0.720 ± 0.009	0.850 ± 0.028	0.488 ± 0.048
Daehr ($\lambda = 0.005 * 0.5^9$)	0.669 ± 0.014	0.720 ± 0.009	0.850 ± 0.028	0.488 ± 0.048

Table XI: Performance Comparison with Training Set:200$\times$ 2, Testing Set: 1000$\times$2

	Accuracy	F1-Score	Sensitivity	Specificity
Days in Advance: 30				
LDA	0.632 ± 0.012	0.633 ± 0.017	0.637 ± 0.033	0.627 ± 0.030
DIAG	0.634 ± 0.017	0.630 ± 0.031	0.626 ± 0.059	0.643 ± 0.041
Shrinkage ($\beta = 0.25$)	0.638 ± 0.014	0.640 ± 0.024	0.645 ± 0.049	0.632 ± 0.039
Shrinkage ($\beta = 0.5$)	0.641 ± 0.013	0.644 ± 0.020	0.651 ± 0.042	0.631 ± 0.037
Shrinkage ($\beta = 0.75$)	0.640 ± 0.014	0.643 ± 0.018	0.650 ± 0.036	0.631 ± 0.035
Daehr ($\lambda = 0.005$)	0.669 ± 0.016	0.719 ± 0.008	0.847 ± 0.031	0.490 ± 0.056
Daehr ($\lambda = 0.005 * 0.5^1$)	0.669 ± 0.016	0.719 ± 0.008	0.847 ± 0.031	0.490 ± 0.056
Daehr ($\lambda = 0.005 * 0.5^2$)	0.669 ± 0.016	0.719 ± 0.008	0.847 ± 0.031	0.490 ± 0.056
Daehr ($\lambda = 0.005 * 0.5^3$)	0.669 ± 0.016	0.719 ± 0.008	0.847 ± 0.031	0.490 ± 0.056
Daehr ($\lambda = 0.005 * 0.5^4$)	0.669 ± 0.016	0.719 ± 0.008	0.847 ± 0.031	0.490 ± 0.056
Daehr ($\lambda = 0.005 * 0.5^5$)	0.669 ± 0.016	0.719 ± 0.008	0.847 ± 0.031	0.490 ± 0.056
Daehr ($\lambda = 0.005 * 0.5^6$)	0.669 ± 0.016	0.719 ± 0.008	0.847 ± 0.031	0.490 ± 0.056
Daehr ($\lambda = 0.005 * 0.5^7$)	0.669 ± 0.016	0.719 ± 0.008	0.847 ± 0.031	0.490 ± 0.056
Daehr ($\lambda = 0.005 * 0.5^8$)	0.669 ± 0.016	0.719 ± 0.008	0.847 ± 0.031	0.490 ± 0.056
Daehr ($\lambda = 0.005 * 0.5^9$)	0.669 ± 0.016	0.719 ± 0.008	0.847 ± 0.031	0.490 ± 0.056
Days in Advance: 60				
LDA	0.632 ± 0.018	0.633 ± 0.026	0.636 ± 0.045	0.628 ± 0.032
DIAG	0.631 ± 0.020	0.628 ± 0.041	0.628 ± 0.077	0.634 ± 0.053
Shrinkage ($\beta = 0.25$)	0.638 ± 0.018	0.639 ± 0.033	0.645 ± 0.063	0.631 ± 0.042
Shrinkage ($\beta = 0.5$)	0.638 ± 0.017	0.639 ± 0.030	0.644 ± 0.056	0.632 ± 0.037
Shrinkage ($\beta = 0.75$)	0.640 ± 0.017	0.641 ± 0.027	0.646 ± 0.050	0.633 ± 0.034
Daehr ($\lambda = 0.005$)	0.664 ± 0.019	0.718 ± 0.008	0.854 ± 0.034	0.475 ± 0.066
Daehr ($\lambda = 0.005 * 0.5^1$)	0.664 ± 0.019	0.718 ± 0.008	0.854 ± 0.034	0.475 ± 0.066
Daehr ($\lambda = 0.005 * 0.5^2$)	0.664 ± 0.019	0.718 ± 0.008	0.854 ± 0.034	0.475 ± 0.066
Daehr ($\lambda = 0.005 * 0.5^3$)	0.664 ± 0.019	0.718 ± 0.008	0.854 ± 0.034	0.475 ± 0.066
Daehr ($\lambda = 0.005 * 0.5^4$)	0.664 ± 0.019	0.718 ± 0.008	0.854 ± 0.034	0.475 ± 0.066
Daehr ($\lambda = 0.005 * 0.5^5$)	0.664 ± 0.019	0.718 ± 0.008	0.854 ± 0.034	0.475 ± 0.066
Daehr ($\lambda = 0.005 * 0.5^6$)	0.664 ± 0.019	0.718 ± 0.008	0.854 ± 0.034	0.475 ± 0.066
Daehr ($\lambda = 0.005 * 0.5^7$)	0.664 ± 0.019	0.718 ± 0.008	0.854 ± 0.034	0.475 ± 0.066
Daehr ($\lambda = 0.005 * 0.5^8$)	0.664 ± 0.019	0.718 ± 0.008	0.854 ± 0.034	0.475 ± 0.066
Daehr ($\lambda = 0.005 * 0.5^9$)	0.664 ± 0.019	0.718 ± 0.008	0.854 ± 0.034	0.475 ± 0.066
Days in Advance: 90				
LDA	0.631 ± 0.020	0.634 ± 0.024	0.642 ± 0.036	0.620 ± 0.027
DIAG	0.635 ± 0.015	0.641 ± 0.025	0.655 ± 0.053	0.614 ± 0.045
Shrinkage ($\beta = 0.25$)	0.641 ± 0.017	0.647 ± 0.022	0.661 ± 0.042	0.620 ± 0.037
Shrinkage ($\beta = 0.5$)	0.643 ± 0.018	0.648 ± 0.023	0.660 ± 0.039	0.626 ± 0.030
Shrinkage ($\beta = 0.75$)	0.641 ± 0.019	0.645 ± 0.023	0.654 ± 0.038	0.629 ± 0.026
Daehr ($\lambda = 0.005$)	0.662 ± 0.019	0.716 ± 0.009	0.852 ± 0.031	0.471 ± 0.063
Daehr ($\lambda = 0.005 * 0.5^1$)	0.662 ± 0.020	0.716 ± 0.009	0.852 ± 0.031	0.471 ± 0.064
Daehr ($\lambda = 0.005 * 0.5^2$)	0.662 ± 0.020	0.716 ± 0.009	0.852 ± 0.031	0.471 ± 0.064
Daehr ($\lambda = 0.005 * 0.5^3$)	0.662 ± 0.020	0.716 ± 0.009	0.852 ± 0.031	0.471 ± 0.064
Daehr ($\lambda = 0.005 * 0.5^4$)	0.662 ± 0.020	0.716 ± 0.009	0.852 ± 0.031	0.471 ± 0.064
Daehr ($\lambda = 0.005 * 0.5^5$)	0.662 ± 0.020	0.716 ± 0.009	0.852 ± 0.031	0.471 ± 0.064
Daehr ($\lambda = 0.005 * 0.5^6$)	0.662 ± 0.020	0.716 ± 0.009	0.852 ± 0.031	0.471 ± 0.064
Daehr ($\lambda = 0.005 * 0.5^7$)	0.662 ± 0.020	0.716 ± 0.009	0.852 ± 0.031	0.471 ± 0.064
Daehr ($\lambda = 0.005 * 0.5^8$)	0.662 ± 0.020	0.716 ± 0.009	0.852 ± 0.031	0.471 ± 0.064
Daehr ($\lambda = 0.005 * 0.5^9$)	0.662 ± 0.020	0.716 ± 0.009	0.852 ± 0.031	0.471 ± 0.064

Table XII: Performance Comparison with Training Set:250$\times$ 2, Testing Set: 1000$\times$2

	Accuracy	F1-Score	Sensitivity	Specificity
Days in Advance: 30				
LDA	0.644 ± 0.014	0.648 ± 0.017	0.657 ± 0.032	0.631 ± 0.036
DIAG	0.641 ± 0.015	0.641 ± 0.026	0.643 ± 0.051	0.638 ± 0.041
Shrinkage ($\beta = 0.25$)	0.644 ± 0.015	0.647 ± 0.022	0.654 ± 0.044	0.634 ± 0.039
Shrinkage ($\beta = 0.5$)	0.646 ± 0.015	0.649 ± 0.021	0.656 ± 0.041	0.636 ± 0.037
Shrinkage ($\beta = 0.75$)	0.647 ± 0.014	0.650 ± 0.019	0.657 ± 0.038	0.637 ± 0.037
Daehr ($\lambda = 0.005$)	0.666 ± 0.022	0.718 ± 0.013	0.850 ± 0.044	0.482 ± 0.074
Daehr ($\lambda = 0.005 * 0.5^1$)	0.666 ± 0.021	0.718 ± 0.012	0.851 ± 0.041	0.480 ± 0.072
Daehr ($\lambda = 0.005 * 0.5^2$)	0.666 ± 0.022	0.720 ± 0.013	0.856 ± 0.037	0.477 ± 0.067
Daehr ($\lambda = 0.005 * 0.5^3$)	0.666 ± 0.021	0.719 ± 0.008	0.855 ± 0.034	0.477 ± 0.071
Daehr ($\lambda = 0.005 * 0.5^4$)	0.666 ± 0.021	0.720 ± 0.009	0.858 ± 0.029	0.475 ± 0.066
Daehr ($\lambda = 0.005 * 0.5^5$)	0.666 ± 0.021	0.720 ± 0.009	0.856 ± 0.033	0.477 ± 0.070
Daehr ($\lambda = 0.005 * 0.5^6$)	0.666 ± 0.021	0.719 ± 0.008	0.855 ± 0.032	0.477 ± 0.069
Daehr ($\lambda = 0.005 * 0.5^7$)	0.666 ± 0.021	0.719 ± 0.011	0.855 ± 0.035	0.477 ± 0.068
Daehr ($\lambda = 0.005 * 0.5^8$)	0.666 ± 0.021	0.720 ± 0.008	0.856 ± 0.031	0.477 ± 0.069
Daehr ($\lambda = 0.005 * 0.5^9$)	0.666 ± 0.020	0.719 ± 0.009	0.854 ± 0.036	0.478 ± 0.070
Days in Advance: 60				
LDA	0.640 ± 0.014	0.645 ± 0.017	0.656 ± 0.031	0.624 ± 0.028
DIAG	0.643 ± 0.015	0.651 ± 0.025	0.670 ± 0.052	0.616 ± 0.042
Shrinkage ($\beta = 0.25$)	0.649 ± 0.014	0.659 ± 0.021	0.680 ± 0.042	0.617 ± 0.035
Shrinkage ($\beta = 0.5$)	0.649 ± 0.016	0.658 ± 0.021	0.678 ± 0.040	0.620 ± 0.033
Shrinkage ($\beta = 0.75$)	0.646 ± 0.015	0.653 ± 0.020	0.669 ± 0.037	0.623 ± 0.032
Daehr ($\lambda = 0.005$)	0.666 ± 0.018	0.719 ± 0.008	0.854 ± 0.022	0.478 ± 0.055
Daehr ($\lambda = 0.005 * 0.5^1$)	0.666 ± 0.018	0.719 ± 0.008	0.854 ± 0.022	0.478 ± 0.055
Daehr ($\lambda = 0.005 * 0.5^2$)	0.666 ± 0.018	0.719 ± 0.008	0.854 ± 0.022	0.478 ± 0.055
Daehr ($\lambda = 0.005 * 0.5^3$)	0.666 ± 0.018	0.719 ± 0.008	0.854 ± 0.022	0.478 ± 0.055
Daehr ($\lambda = 0.005 * 0.5^4$)	0.666 ± 0.018	0.719 ± 0.008	0.854 ± 0.022	0.478 ± 0.055
Daehr ($\lambda = 0.005 * 0.5^5$)	0.666 ± 0.018	0.719 ± 0.008	0.854 ± 0.022	0.478 ± 0.055
Daehr ($\lambda = 0.005 * 0.5^6$)	0.666 ± 0.018	0.719 ± 0.008	0.854 ± 0.022	0.478 ± 0.055
Daehr ($\lambda = 0.005 * 0.5^7$)	0.666 ± 0.018	0.719 ± 0.008	0.854 ± 0.022	0.478 ± 0.055
Daehr ($\lambda = 0.005 * 0.5^8$)	0.666 ± 0.018	0.719 ± 0.008	0.854 ± 0.022	0.478 ± 0.055
Daehr ($\lambda = 0.005 * 0.5^9$)	0.666 ± 0.018	0.719 ± 0.008	0.854 ± 0.022	0.478 ± 0.055
Days in Advance: 90				
LDA	0.645 ± 0.015	0.649 ± 0.019	0.657 ± 0.035	0.633 ± 0.031
DIAG	0.646 ± 0.016	0.646 ± 0.028	0.650 ± 0.053	0.643 ± 0.036
Shrinkage ($\beta = 0.25$)	0.651 ± 0.016	0.655 ± 0.025	0.665 ± 0.046	0.636 ± 0.031
Shrinkage ($\beta = 0.5$)	0.651 ± 0.015	0.656 ± 0.022	0.667 ± 0.040	0.635 ± 0.029
Shrinkage ($\beta = 0.75$)	0.650 ± 0.016	0.655 ± 0.021	0.664 ± 0.038	0.636 ± 0.030
Daehr ($\lambda = 0.005$)	0.665 ± 0.024	0.718 ± 0.009	0.854 ± 0.030	0.476 ± 0.074
Daehr ($\lambda = 0.005 * 0.5^1$)	0.665 ± 0.024	0.718 ± 0.009	0.854 ± 0.030	0.476 ± 0.074
Daehr ($\lambda = 0.005 * 0.5^2$)	0.665 ± 0.024	0.718 ± 0.009	0.854 ± 0.030	0.476 ± 0.074
Daehr ($\lambda = 0.005 * 0.5^3$)	0.665 ± 0.024	0.718 ± 0.009	0.854 ± 0.030	0.476 ± 0.074
Daehr ($\lambda = 0.005 * 0.5^4$)	0.665 ± 0.024	0.718 ± 0.009	0.854 ± 0.030	0.476 ± 0.074
Daehr ($\lambda = 0.005 * 0.5^5$)	0.665 ± 0.024	0.718 ± 0.009	0.854 ± 0.030	0.476 ± 0.074
Daehr ($\lambda = 0.005 * 0.5^6$)	0.665 ± 0.024	0.718 ± 0.009	0.854 ± 0.030	0.476 ± 0.074
Daehr ($\lambda = 0.005 * 0.5^7$)	0.665 ± 0.024	0.718 ± 0.009	0.854 ± 0.030	0.476 ± 0.074
Daehr ($\lambda = 0.005 * 0.5^8$)	0.665 ± 0.024	0.718 ± 0.009	0.854 ± 0.030	0.476 ± 0.074
Daehr ($\lambda = 0.005 * 0.5^9$)	0.665 ± 0.024	0.718 ± 0.009	0.854 ± 0.030	0.476 ± 0.074

Table XIII: Performance Comparison with Training Set:300× 2, Testing Set: 1000×2

	Accuracy	F1-Score	Sensitivity	Specificity
Days in Advance: 30				
LDA	0.645 ± 0.010	0.648 ± 0.017	0.655 ± 0.035	0.634 ± 0.029
DIAG	0.643 ± 0.015	0.641 ± 0.031	0.642 ± 0.060	0.644 ± 0.041
Shrinkage ($\beta = 0.25$)	0.648 ± 0.013	0.651 ± 0.024	0.658 ± 0.048	0.638 ± 0.036
Shrinkage ($\beta = 0.5$)	0.651 ± 0.012	0.655 ± 0.021	0.664 ± 0.043	0.638 ± 0.033
Shrinkage ($\beta = 0.75$)	0.650 ± 0.012	0.654 ± 0.020	0.662 ± 0.040	0.638 ± 0.032
Daehr ($\lambda = 0.005$)	0.613 ± 0.043	0.598 ± 0.093	0.601 ± 0.154	0.626 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^1$)	0.614 ± 0.044	0.598 ± 0.094	0.601 ± 0.155	0.627 ± 0.076
Daehr ($\lambda = 0.005 * 0.5^2$)	0.614 ± 0.043	0.598 ± 0.094	0.601 ± 0.155	0.626 ± 0.079
Daehr ($\lambda = 0.005 * 0.5^3$)	0.614 ± 0.044	0.598 ± 0.094	0.600 ± 0.154	0.628 ± 0.077
Daehr ($\lambda = 0.005 * 0.5^4$)	0.614 ± 0.044	0.598 ± 0.093	0.599 ± 0.152	0.630 ± 0.075
Daehr ($\lambda = 0.005 * 0.5^5$)	0.612 ± 0.042	0.598 ± 0.094	0.605 ± 0.160	0.619 ± 0.090
Daehr ($\lambda = 0.005 * 0.5^6$)	0.612 ± 0.042	0.598 ± 0.093	0.604 ± 0.158	0.620 ± 0.090
Daehr ($\lambda = 0.005 * 0.5^7$)	0.611 ± 0.042	0.595 ± 0.091	0.596 ± 0.149	0.626 ± 0.077
Daehr ($\lambda = 0.005 * 0.5^8$)	0.611 ± 0.042	0.595 ± 0.091	0.596 ± 0.150	0.626 ± 0.077
Daehr ($\lambda = 0.005 * 0.5^9$)	0.611 ± 0.042	0.594 ± 0.090	0.593 ± 0.145	0.630 ± 0.075
Days in Advance: 60				
LDA	0.647 ± 0.013	0.653 ± 0.018	0.664 ± 0.037	0.630 ± 0.035
DIAG	0.648 ± 0.013	0.650 ± 0.025	0.657 ± 0.058	0.639 ± 0.054
Shrinkage ($\beta = 0.25$)	0.652 ± 0.012	0.658 ± 0.020	0.672 ± 0.046	0.632 ± 0.041
Shrinkage ($\beta = 0.5$)	0.654 ± 0.012	0.661 ± 0.019	0.676 ± 0.042	0.633 ± 0.036
Shrinkage ($\beta = 0.75$)	0.653 ± 0.012	0.660 ± 0.017	0.674 ± 0.038	0.633 ± 0.034
Daehr ($\lambda = 0.005$)	0.612 ± 0.030	0.609 ± 0.066	0.620 ± 0.119	0.604 ± 0.071
Daehr ($\lambda = 0.005 * 0.5^1$)	0.612 ± 0.030	0.609 ± 0.066	0.620 ± 0.119	0.604 ± 0.071
Daehr ($\lambda = 0.005 * 0.5^2$)	0.612 ± 0.030	0.609 ± 0.066	0.620 ± 0.119	0.604 ± 0.071
Daehr ($\lambda = 0.005 * 0.5^3$)	0.612 ± 0.030	0.609 ± 0.066	0.620 ± 0.119	0.604 ± 0.071
Daehr ($\lambda = 0.005 * 0.5^4$)	0.612 ± 0.030	0.609 ± 0.066	0.620 ± 0.119	0.604 ± 0.071
Daehr ($\lambda = 0.005 * 0.5^5$)	0.612 ± 0.030	0.609 ± 0.066	0.620 ± 0.119	0.604 ± 0.071
Daehr ($\lambda = 0.005 * 0.5^6$)	0.612 ± 0.030	0.609 ± 0.066	0.620 ± 0.119	0.604 ± 0.071
Daehr ($\lambda = 0.005 * 0.5^7$)	0.612 ± 0.030	0.609 ± 0.066	0.620 ± 0.119	0.604 ± 0.071
Daehr ($\lambda = 0.005 * 0.5^8$)	0.612 ± 0.030	0.609 ± 0.066	0.620 ± 0.119	0.604 ± 0.071
Daehr ($\lambda = 0.005 * 0.5^9$)	0.612 ± 0.030	0.609 ± 0.066	0.620 ± 0.119	0.604 ± 0.071
Days in Advance: 90				
LDA	0.648 ± 0.016	0.654 ± 0.018	0.665 ± 0.033	0.632 ± 0.037
DIAG	0.648 ± 0.016	0.655 ± 0.023	0.669 ± 0.052	0.627 ± 0.050
Shrinkage ($\beta = 0.25$)	0.653 ± 0.015	0.660 ± 0.021	0.677 ± 0.046	0.628 ± 0.045
Shrinkage ($\beta = 0.5$)	0.654 ± 0.016	0.661 ± 0.019	0.677 ± 0.040	0.630 ± 0.043
Shrinkage ($\beta = 0.75$)	0.653 ± 0.016	0.660 ± 0.019	0.674 ± 0.037	0.632 ± 0.040
Daehr ($\lambda = 0.005$)	0.610 ± 0.037	0.602 ± 0.085	0.613 ± 0.151	0.608 ± 0.091
Daehr ($\lambda = 0.005 * 0.5^1$)	0.610 ± 0.037	0.602 ± 0.085	0.613 ± 0.151	0.608 ± 0.091
Daehr ($\lambda = 0.005 * 0.5^2$)	0.610 ± 0.037	0.602 ± 0.085	0.613 ± 0.151	0.608 ± 0.091
Daehr ($\lambda = 0.005 * 0.5^3$)	0.610 ± 0.037	0.602 ± 0.085	0.613 ± 0.151	0.608 ± 0.091
Daehr ($\lambda = 0.005 * 0.5^4$)	0.610 ± 0.037	0.602 ± 0.085	0.613 ± 0.151	0.608 ± 0.091
Daehr ($\lambda = 0.005 * 0.5^5$)	0.610 ± 0.037	0.602 ± 0.085	0.613 ± 0.151	0.608 ± 0.091
Daehr ($\lambda = 0.005 * 0.5^6$)	0.610 ± 0.037	0.602 ± 0.085	0.613 ± 0.151	0.608 ± 0.091
Daehr ($\lambda = 0.005 * 0.5^7$)	0.610 ± 0.037	0.602 ± 0.085	0.613 ± 0.151	0.608 ± 0.091
Daehr ($\lambda = 0.005 * 0.5^8$)	0.610 ± 0.037	0.602 ± 0.085	0.613 ± 0.151	0.608 ± 0.091
Daehr ($\lambda = 0.005 * 0.5^9$)	0.610 ± 0.037	0.602 ± 0.085	0.613 ± 0.151	0.608 ± 0.091

Table XIV: Performance Comparison with Training Set:350$\times$ 2, Testing Set: 1000$\times$2

	Accuracy	F1-Score	Sensitivity	Specificity
Days in Advance: 30				
LDA	0.656 ± 0.013	0.663 ± 0.019	0.679 ± 0.035	0.632 ± 0.023
DIAG	0.653 ± 0.016	0.661 ± 0.026	0.678 ± 0.050	0.628 ± 0.037
Shrinkage ($\beta = 0.25$)	0.657 ± 0.016	0.666 ± 0.026	0.687 ± 0.049	0.628 ± 0.031
Shrinkage ($\beta = 0.5$)	0.660 ± 0.016	0.669 ± 0.024	0.690 ± 0.046	0.630 ± 0.030
Shrinkage ($\beta = 0.75$)	0.660 ± 0.015	0.668 ± 0.022	0.686 ± 0.042	0.633 ± 0.027
Daehr ($\lambda = 0.005$)	0.667 ± 0.014	0.720 ± 0.007	0.857 ± 0.021	0.476 ± 0.043
Daehr ($\lambda = 0.005 * 0.5^1$)	0.667 ± 0.014	0.720 ± 0.007	0.857 ± 0.021	0.476 ± 0.043
Daehr ($\lambda = 0.005 * 0.5^2$)	0.667 ± 0.014	0.720 ± 0.007	0.857 ± 0.021	0.476 ± 0.043
Daehr ($\lambda = 0.005 * 0.5^3$)	0.667 ± 0.014	0.720 ± 0.007	0.857 ± 0.021	0.476 ± 0.043
Daehr ($\lambda = 0.005 * 0.5^4$)	0.667 ± 0.014	0.720 ± 0.007	0.857 ± 0.021	0.476 ± 0.043
Daehr ($\lambda = 0.005 * 0.5^5$)	0.667 ± 0.014	0.720 ± 0.007	0.857 ± 0.021	0.476 ± 0.043
Daehr ($\lambda = 0.005 * 0.5^6$)	0.667 ± 0.014	0.720 ± 0.007	0.857 ± 0.021	0.476 ± 0.043
Daehr ($\lambda = 0.005 * 0.5^7$)	0.667 ± 0.014	0.720 ± 0.007	0.857 ± 0.021	0.476 ± 0.043
Daehr ($\lambda = 0.005 * 0.5^8$)	0.667 ± 0.014	0.720 ± 0.007	0.857 ± 0.021	0.476 ± 0.043
Daehr ($\lambda = 0.005 * 0.5^9$)	0.667 ± 0.014	0.720 ± 0.007	0.857 ± 0.021	0.476 ± 0.043
Days in Advance: 60				
LDA	0.657 ± 0.012	0.662 ± 0.016	0.672 ± 0.031	0.641 ± 0.028
DIAG	0.655 ± 0.014	0.659 ± 0.022	0.670 ± 0.045	0.639 ± 0.036
Shrinkage ($\beta = 0.25$)	0.660 ± 0.012	0.668 ± 0.017	0.684 ± 0.034	0.636 ± 0.029
Shrinkage ($\beta = 0.5$)	0.660 ± 0.012	0.667 ± 0.016	0.682 ± 0.030	0.639 ± 0.027
Shrinkage ($\beta = 0.75$)	0.661 ± 0.012	0.667 ± 0.015	0.681 ± 0.029	0.641 ± 0.027
Daehr ($\lambda = 0.005$)	0.670 ± 0.016	0.722 ± 0.008	0.859 ± 0.025	0.480 ± 0.051
Daehr ($\lambda = 0.005 * 0.5^1$)	0.670 ± 0.016	0.722 ± 0.008	0.859 ± 0.025	0.480 ± 0.051
Daehr ($\lambda = 0.005 * 0.5^2$)	0.670 ± 0.016	0.722 ± 0.008	0.859 ± 0.025	0.480 ± 0.051
Daehr ($\lambda = 0.005 * 0.5^3$)	0.670 ± 0.016	0.722 ± 0.008	0.859 ± 0.025	0.480 ± 0.051
Daehr ($\lambda = 0.005 * 0.5^4$)	0.670 ± 0.016	0.722 ± 0.008	0.859 ± 0.025	0.480 ± 0.051
Daehr ($\lambda = 0.005 * 0.5^5$)	0.670 ± 0.016	0.722 ± 0.008	0.859 ± 0.025	0.480 ± 0.051
Daehr ($\lambda = 0.005 * 0.5^6$)	0.670 ± 0.016	0.722 ± 0.008	0.859 ± 0.025	0.480 ± 0.051
Daehr ($\lambda = 0.005 * 0.5^7$)	0.670 ± 0.016	0.722 ± 0.008	0.859 ± 0.025	0.480 ± 0.051
Daehr ($\lambda = 0.005 * 0.5^8$)	0.670 ± 0.016	0.722 ± 0.008	0.859 ± 0.025	0.480 ± 0.051
Daehr ($\lambda = 0.005 * 0.5^9$)	0.670 ± 0.016	0.722 ± 0.008	0.859 ± 0.025	0.480 ± 0.051
Days in Advance: 90				
LDA	0.659 ± 0.011	0.667 ± 0.013	0.685 ± 0.026	0.633 ± 0.024
DIAG	0.654 ± 0.014	0.658 ± 0.025	0.667 ± 0.053	0.642 ± 0.043
Shrinkage ($\beta = 0.25$)	0.661 ± 0.011	0.667 ± 0.019	0.682 ± 0.042	0.640 ± 0.036
Shrinkage ($\beta = 0.5$)	0.662 ± 0.011	0.670 ± 0.017	0.686 ± 0.036	0.638 ± 0.031
Shrinkage ($\beta = 0.75$)	0.662 ± 0.012	0.670 ± 0.017	0.687 ± 0.034	0.637 ± 0.028
Daehr ($\lambda = 0.005$)	0.668 ± 0.017	0.721 ± 0.008	0.858 ± 0.025	0.478 ± 0.054
Daehr ($\lambda = 0.005 * 0.5^1$)	0.668 ± 0.017	0.721 ± 0.008	0.858 ± 0.025	0.478 ± 0.054
Daehr ($\lambda = 0.005 * 0.5^2$)	0.668 ± 0.017	0.721 ± 0.008	0.858 ± 0.025	0.478 ± 0.054
Daehr ($\lambda = 0.005 * 0.5^3$)	0.668 ± 0.017	0.721 ± 0.008	0.858 ± 0.025	0.478 ± 0.054
Daehr ($\lambda = 0.005 * 0.5^4$)	0.668 ± 0.017	0.721 ± 0.008	0.858 ± 0.025	0.478 ± 0.054
Daehr ($\lambda = 0.005 * 0.5^5$)	0.668 ± 0.017	0.721 ± 0.008	0.858 ± 0.025	0.478 ± 0.054
Daehr ($\lambda = 0.005 * 0.5^6$)	0.668 ± 0.017	0.721 ± 0.008	0.858 ± 0.025	0.478 ± 0.054
Daehr ($\lambda = 0.005 * 0.5^7$)	0.668 ± 0.017	0.721 ± 0.008	0.858 ± 0.025	0.478 ± 0.054
Daehr ($\lambda = 0.005 * 0.5^8$)	0.668 ± 0.017	0.721 ± 0.008	0.858 ± 0.025	0.478 ± 0.054
Daehr ($\lambda = 0.005 * 0.5^9$)	0.668 ± 0.017	0.721 ± 0.008	0.858 ± 0.025	0.478 ± 0.054