1. DMD-LSTM TRAINING

dmd\_lstm\_training.tex

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ERROR METRICS** | **WINDOW SIZE** | | | |
| **5** | **10** | **15** | **20** |
| **MSE** | 0.000037 | 0.787877 | 0.006917 | 0.057851 |
| **RMSE** | 0.006106 | 0.887624 | 0.083166 | 0.240522 |
| **MAE** | 0.004175 | 0.755407 | 0.067645 | 0.202746 |
| **MAPE** | 0.000001 | 0.000194 | 0.000017 | 0.000053 |

1. BASELINE LSTM TRAINING

baseline\_lstm\_training.tex

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ERROR METRICS** | **WINDOW SIZE** | | | |
| **5** | **10** | **15** | **20** |
| **MSE** | 2912.840703 | 191.935882 | 1118.183283 | 706.136814 |
| **RMSE** | 53.970739 | 13.854093 | 33.439248 | 26.573235 |
| **MAE** | 35.301888 | 9.480864 | 22.099720 | 18.285352 |
| **MAPE** | 0.009618 | 0.002527 | 0.006024 | 0.005004 |

1. DMD-LSTM EVALUATION (Different Window Sizes)

<See Diagrams>

1. BASELINE LSTM EVALUATION (Different Window Sizes)

<See Diagrams>

1. DMD-LSTM VALIDATION (Window Size = 5)

dmd\_lstm\_cross.tex

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **STOCKS** | **MSE** | **RMSE** | **MAE** | **MAPE** |
| **PSEI** | 0.00002 | 0.00419 | 0.00328 | 1.510000e-03 |
| **AC** | 0.00236 | 0.04856 | 0.03414 | 6.110000e-03 |
| **ALI** | 0.00255 | 0.05054 | 0.03645 | 1.597000e-02 |
| **AP** | 0.00129 | 0.03596 | 0.02515 | 9.220000e-03 |
| **BDO** | 0.00160 | 0.03999 | 0.02799 | 7.250000e-03 |
| **BLOOM** | 0.01883 | 0.13721 | 0.06901 | 1.052898e+12 |
| **FGEN** | 0.00224 | 0.04733 | 0.03265 | 1.197000e-02 |
| **GLO** | 0.00211 | 0.04595 | 0.03149 | 4.680000e-03 |
| **ICT** | 0.00335 | 0.05785 | 0.03731 | 3.005818e+11 |
| **JGS** | 0.00331 | 0.05752 | 0.03992 | 2.009923e+11 |
| **LTG** | 0.01567 | 0.12518 | 0.05858 | 3.583335e+12 |
| **MEG** | 0.00431 | 0.06565 | 0.04422 | 1.393042e+11 |
| **MER** | 0.00326 | 0.05708 | 0.03770 | 9.170000e-03 |
| **MPI** | 0.00273 | 0.05230 | 0.03390 | 2.497000e-02 |
| **PGOLD** | 0.00149 | 0.03865 | 0.02818 | 7.880000e-03 |
| **RLC** | 0.00338 | 0.05817 | 0.03978 | 6.922000e-02 |
| **RRHI** | 0.00131 | 0.03618 | 0.02699 | 6.390000e-03 |
| **SMC** | 0.00137 | 0.03702 | 0.02317 | 5.690000e-03 |
| **TEL** | 0.00178 | 0.04214 | 0.03002 | 4.240000e-03 |
| **URC** | 0.00297 | 0.05447 | 0.03742 | 1.798000e-02 |

1. DMD-LSTM SUCCESSIVE PREDICTIONS

dmd\_lstm\_successive.tex

|  |  |  |
| --- | --- | --- |
| **Successive Days Predicted** | **Actual Data and Predicted Data Ratio** | **MAPE VALUE** |
| 1 | 100% | 0.00973 |
| 2 | 80% | 0.13403 |
| 3 | 60% | 0.15782 |
| 4 | 40% | 0.15646 |
| 5 | 20% | 0.13910 |
| 6 | 0% | 0.12494 |
| 7 | -20% | 0.11283 |
| 8 | -40% | 0.10014 |
| 9 | -60% | 0.08914 |
| 10 | -100% | 0.08976 |

1. Optimal Alma Parameters Validation Results

alma\_validation.tex

|  |  |
| --- | --- |
| **Stock** | **Compounded**  **Expected Return** |
| **PSEI** | 113966.8500 |
| **AC** | 20893.1914 |
| **ALI** | 1072.1418 |
| **AP** | 690.7100 |
| **BDO** | 2541.9970 |
| **BLOOM** | 495.4600 |
| **FGEN** | 581.0804 |
| **GLO** | 60538.0035 |
| **ICT** | 2815.6103 |
| **JGS** | 1569.8650 |
| **LTG** | 397.2854 |
| **MEG** | 149.2233 |
| **MER** | 8586.0306 |
| **MPI** | 146.0200 |
| **PGOLD** | 721.2700 |
| **RLC** | 649.4767 |
| **RRHI** | 1050.7000 |
| **SMC** | 2557.0770 |
| **TEL** | 72070.5000 |
| **URC** | 3207.5394 |

1. Idle System Usage Statistics

idle\_sys\_utilization.tex

|  |  |  |  |
| --- | --- | --- | --- |
|  | **alamAPI** | **alamDB** | **alamPREPROCESSOR** |
| **CPU Utilization (%)** | 0.168125 | 0.254313 | 0.009769 |
| **Memory Utilization (MiB)** | 45.718311 | 166.775377 | 312.798300 |

1. Internal Load Average Resource Usage Statistics

internal\_load\_stats.tex

|  |  |  |  |
| --- | --- | --- | --- |
|  | **INTERNAL COMPONENT/MODULE** | | |
| **Data Collector** | **Data Processor** | **alamSYS PREPROCESSOR**  *(Data Collector & Data Processor)* |
| **Failure Rate** (%) | 0 | 0 | 0 |
| **Success Rate** (%) | 100 | 100 | 100 |
| **AVERAGE RUNTIME** (s) | 41.72398 | 8.38061 | 48.30466 |
| **Average Cpu** (%) **Utilization** | 11.40659 | 92.71117 | 20.03138 |
| **AVERAGE MEMORY UTILIZATION** (Mb) | 3.64200 | 57.09545 | 794.29436 |
| **Average Network Utilization** (Mb) | 232.73640 | 154 | 77.27655 |

*\* Out of 100 total runs*

1. Deployment Load Test Results (Buy)

buy\_dep.tex

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Number of Requests** | | |
|  | **10** | **100** | **1000** |
| Success Rate (%) | 100 | 100 | 100 |
| Average Processing Time  (s) | 11.905222 | 139.618550 | 1159.773569 |

1. Deployment Load Test Results (Sell)

sell\_dep.tex

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Number of Requests** | | |
|  | **10** | **100** | **1000** |
| Success Rate (%) | 100 | 100 | 100 |
| Average Processing Time  (s) | 13.384126 | 130.119867 | 1642.995011 |

Note: Average Processing Time to Process a Request is 1.3381812583333332

1. REAL WORLD APPLICATION RESULTS

profits.tex

|  |  |  |
| --- | --- | --- |
|  | **Realized Profit (PHP)** | **Realized Gain (%)** |
| **alamSYS** | 7,839.75 | 1.51 |
| **PSEI** | -22,788.90 | -13.810 |