Rolling window experiments – Prison Dataset

## ARIMA

**Input to ML method – base forecasts**

### MSE – training at every 10th iteration

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **ols** | **mintshrink** | **wls** | **bottomup** | **erm** | **case2\_lambda\_[0.1, 0.9]** |
| **Australia** | 5.82 | -21.17 | -24.63 | -129.82 | -750.49 | -22496.46 |
| **State** | 2.73 | -2.5 | -2.83 | -46.74 | -622.88 | -6070.32 |
| **Gender** | 4.63 | 3.12 | 4.26 | -35.98 | -614.71 | -5518.42 |
| **Legal** | 13.45 | 11.18 | 11.63 | -4.37 | -561.59 | -2404.44 |
| **Indigenous** | 11.29 | 13.12 | 13.43 | 0.0 | -545.22 | -1986.19 |
| **Overall** | 7.6 | -0.86 | -1.49 | -49.66 | -628.59 | -8793.85 |

**MSE – Training at every iteration**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **ols** | **mintshrink** | **wls** | **case2\_lambda\_[0.01, 5]** | **bottomup** | **erm** |
| **Australia** | 5.82 | -17.9 | -25.59 | -17.85 | -129.82 | -107.86 |
| **State** | 2.73 | -3.21 | -4.08 | -12.87 | -46.74 | -106.68 |
| **Gender** | 4.63 | 2.76 | 3.28 | -6.88 | -35.98 | -105.44 |
| **Legal** | 13.45 | 10.99 | 10.7 | 1.61 | -4.37 | -92.17 |
| **Indigenous** | 11.29 | 13.33 | 12.84 | 3.92 | 0.0 | -107.48 |
| **Overall** | 7.6 | -0.2 | -2.43 | -7.22 | -49.66 | -103.81 |

**Input to ML method – transformed base forecasts**

### MSE – training at every 10th iteration

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **ols** | **mintshrink** | **wls** | **bottomup** | **erm** | **case2\_lambda\_[0.1, 0.9]** |
| **Australia** | 5.82 | -21.17 | -24.63 | -129.82 | -750.49 | -21353.95 |
| **State** | 2.73 | -2.5 | -2.83 | -46.74 | -622.88 | -5802.45 |
| **Gender** | 4.63 | 3.12 | 4.26 | -35.98 | -614.71 | -5296.7 |
| **Legal** | 13.45 | 11.18 | 11.63 | -4.37 | -561.59 | -2319.34 |
| **Indigenous** | 11.29 | 13.12 | 13.43 | 0.0 | -545.22 | -1927.79 |
| **Overall** | 7.6 | -0.86 | -1.49 | -49.66 | -628.59 | -8379.77 |

**MSE – Training at every iteration**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **ols** | **mintshrink** | **wls** | **case2\_lambda\_[1, 4]** | **bottomup** | **erm** |
| **Australia** | 5.82 | -17.9 | -25.59 | -6.16 | -129.82 | -107.86 |
| **State** | 2.73 | -3.21 | -4.08 | -9.26 | -46.74 | -106.68 |
| **Gender** | 4.63 | 2.76 | 3.28 | -5.88 | -35.98 | -105.44 |
| **Legal** | 13.45 | 10.99 | 10.7 | 0.44 | -4.37 | -92.17 |
| **Indigenous** | 11.29 | 13.33 | 12.84 | 2.6 | 0.0 | -107.48 |
| **Overall** | 7.6 | -0.2 | -2.43 | -3.8 | -49.66 | -103.81 |

Rolling window experiments – Wikipedia Dataset

## ARIMA

**Input to ML method – base forecasts**

### MSE – training at every 10th iteration

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **mintshrink** | **wls** | **bottomup** | **ols** | **case1\_lambda\_[0.01, 0.09]** | **erm** |
| **Total** | 14.96 | 11.85 | 7.61 | 4.37 | 12.1 | -923.18 |
| **Access** | 18.98 | 14.15 | 8.59 | 6.29 | 12.31 | -600.83 |
| **Agent** | 8.9 | 3.62 | -2.67 | -2.54 | 3.64 | -620.11 |
| **Language** | 14.41 | 8.75 | 3.9 | 1.55 | 4.62 | -643.66 |
| **Purpose** | 11.02 | 7.05 | 6.26 | 0.14 | -42.55 | -921.73 |
| **Article** | 4.35 | 1.34 | 0.0 | 0.02 | -69.99 | -849.05 |
| **Overall** | 13.1 | 8.71 | 4.39 | 2.08 | -4.97 | -744.63 |

**MSE – Training at every iteration**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **mintshrink** | **wls** | **case1\_lambda\_[0.1, 0.9]** | **case2\_lambda\_[0.01, 0.09]** | **bottomup** | **ols** | **erm** |
| **Total** | 15.22 | 11.92 | 10.21 | 8.24 | 7.61 | 4.37 | -315.98 |
| **Access** | 19.22 | 14.23 | 11.05 | 9.5 | 8.59 | 6.29 | -258.02 |
| **Agent** | 9.16 | 3.72 | -0.24 | -1.05 | -2.67 | -2.54 | -284.99 |
| **Language** | 14.84 | 8.87 | 7.3 | 8.64 | 3.9 | 1.55 | -293.52 |
| **Purpose** | 11.24 | 7.12 | 3.19 | 4.68 | 6.26 | 0.14 | -312.98 |
| **Article** | 4.66 | 1.45 | 0.22 | 0.26 | 0.0 | 0.02 | -323.03 |
| **Overall** | 13.39 | 8.8 | 6.13 | 5.61 | 4.39 | 2.08 | -294.32 |

**Input to ML method – transformed base forecasts**

### MSE – training at every 10th iteration

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **mintshrink** | **wls** | **bottomup** | **ols** | **case1\_lambda\_[0.1, 0.9]** | **erm** |
| **Total** | 14.96 | 11.85 | 7.61 | 4.37 | 12.46 | -923.18 |
| **Access** | 18.98 | 14.15 | 8.59 | 6.29 | 5.25 | -600.83 |
| **Agent** | 8.9 | 3.62 | -2.67 | -2.54 | -4.49 | -620.11 |
| **Language** | 14.41 | 8.75 | 3.9 | 1.55 | -12.76 | -643.66 |
| **Purpose** | 11.02 | 7.05 | 6.26 | 0.14 | -31.38 | -921.73 |
| **Article** | 4.35 | 1.34 | 0.0 | 0.02 | -70.49 | -849.05 |
| **Overall** | 13.1 | 8.71 | 4.39 | 2.08 | -9.37 | -744.63 |

**MSE – Training at every iteration**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **case2\_lambda\_[0.01, 0.09]** | **case1\_lambda\_[0.01, 5]** | **mintshrink** | **wls** | **bottomup** | **ols** | **erm** |
| **Total** | 22.05 | 22.8 | 15.22 | 11.92 | 7.61 | 4.37 | -315.98 |
| **Access** | 20.0 | 18.55 | 19.22 | 14.23 | 8.59 | 6.29 | -258.02 |
| **Agent** | 10.07 | 9.13 | 9.16 | 3.72 | -2.67 | -2.54 | -284.99 |
| **Language** | 13.16 | 12.26 | 14.84 | 8.87 | 3.9 | 1.55 | -293.52 |
| **Purpose** | 9.28 | 10.01 | 11.24 | 7.12 | 6.26 | 0.14 | -312.98 |
| **Article** | 0.37 | 0.33 | 4.66 | 1.45 | 0.0 | 0.02 | -323.03 |
| **Overall** | 14.33 | 13.94 | 13.39 | 8.8 | 4.39 | 2.08 | -294.32 |