**Vanilla LSTM**

Standard Layer

Single steps prediction loss:0.03359409073838165

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| --- | --- |
|  |  |

Standard Layer

Multi steps prediction loss:0.1471704116171822

|  |  |
| --- | --- |
|  |  |

Phased Layer

Single steps prediction loss:0.033266029561836205

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| --- | --- |
|  |  |

Phased Layer

Multi steps prediction loss:0.07638278728765381

|  |  |
| --- | --- |
|  |  |

**Attention LSTM Model**

Standard LSTM Layer

Single step prediction loss: 0.043756114943156114

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| --- | --- |
|  |  |

Standard LSTM Layer

Multiple steps prediction loss: 0.277288867899092

|  |  |
| --- | --- |
|  |  |

Phased LSTM Layer

Single step prediction loss: 0.036083247917820076

|  |  |
| --- | --- |
|  |  |

Phased LSTM Layer

Multiple steps prediction loss: 0.09803661062005116

|  |  |
| --- | --- |
|  |  |

**Result Summary**

|  |  |  |
| --- | --- | --- |
|  | Single-Step | Multi-Steps |
| Standard Layer |  |  |
| Phased Layer |  |  |

Table 1: Summary of MSE Loss on Cross-Validation Set for Vanilla LSTM

|  |  |  |
| --- | --- | --- |
|  | Single-Step | Multi-Steps |
| Standard Layer |  |  |
| Phased Layer |  |  |

Table 2: Summary of MSE Loss on Cross-Validation Set for Attention LSTM

**Observations**

1. In both the Vanilla and Attention LSTM models, the single-step prediction always produces a lower error than the multiple-step prediction (for both type of layers), this is expected as the light-curve is stochastic in nature, our error increases as we predict more time-steps into the future
2. In both the Vanilla and Attention LSTM models, the phased-lstm layer produces a lower MSE than the standard layer (for both type of prediction), suggesting that the phased-lstm layer might be a better choice for irregularly sampled data
3. If we make a comparison between the two models, the Vanilla LSTM produces a lower MSE than the Attention LSTM (for both types of layer and prediction)

**Summary**

Implemented the attention LSTM with both the standard LSTM layer and the Phased LSTM layer; make a comparison between the results obtained from the Vanilla LSTM and Phased LSTM for a particular lightcurve