**Experimental Data**

**Experiment 1:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Opcode Length** | **Accuracy(%)** | **Precision(%)** | **Recall(%)** | **F1-score(%)** |
| 3000 | 92.74 | 92.48 | 92.96 | 92.72 |
| 4000 | 93.84 | 94.45 | 93.09 | 93.77 |
| 5000 | 91.64 | 93.11 | 89.84 | 91.45 |
| 6000 | **95.40** | **95.32** | **95.44** | **95.38** |
| 7000 | 94.10 | 95.19 | 92.83 | 94.00 |
| 8000 | 89.11 | 90.98 | 86.71 | 88.80 |

**Experiment 2:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model** | **Accuracy(%)** | **Precision(%)** | **Recall(%)** | **F1-score(%)** |
| CNN | 82.90 | 82.42 | 83.70 | 83.05 |
| LSTM | 93.13 | **96.84** | 89.48 | 93.01 |
| GRU | 93.19 | 93.51 | 93.15 | 93.33 |
| BiLSTM | 92.81 | 94.60 | 91.12 | 92.83 |
| BiGRU | 93.52 | 94.45 | 92.77 | 93.60 |
| BiLSTM+Attention | **95.40** | 95.32 | **95.44** | **95.38** |

**Experiment 3:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model** | **Accuracy(%)** | **Precision(%)** | **Recall(%)** | **F1-score(%)** |
| CNN+LSTM | 93.19 | **95.73** | 90.37 | 92.97 |
| CNN+BiLSTM | 93.19 | 93.57 | 92.71 | 93.14 |
| LSTM+Attention | 94.81 | 95.02 | 94.53 | 94.77 |
| BiLSTM+Attention | **95.40** | 95.32 | **95.44** | **95.38** |