The following RNN hyperparameters were used when testing for the **batch size**:

HIDDEN\_LAYER\_SIZE = 300, TOP\_WORDS = 5000, EMBEDDING\_VECTOR = 128, DROPOUT = 0.2.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Batch Size | Evaluation’s  F1 Score | Evaluation’s Accuracy (%) | Validation’s  F1 Score | Validation’s Accuracy (%) |
| 16 | 0.74 | 58.62 | 0.77 | 55.65 |
| 32 | 0.71 | 69.49 | 0.75 | 56.09 |
| 39 | 0.68 | 58.86 | 0.70 | 55.65 |
| 48 | 0.70 | 58.21 | 0.75 | 55.22 |
| 52 | 0.70 | 57.07 | 0.73 | 53.04 |
| 64 | 0.70 | 54.47 | 0.70 | 54.78 |

The **batch size** of 32 yielded the most accurate model.

The following RNN hyperparameters were used when testing for the **hidden layer size**:

BATCH\_SIZE = 32, TOP\_WORDS = 5000, EMBEDDING\_VECTOR = 128, DROPOUT = 0.2.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Hidden Layer Size | Evaluation’s  F1 Score | Evaluation’s Accuracy (%) | Validation’s  F1 Score | Validation’s Accuracy (%) |
| 250 | 0.72 | 57.32 | 0.77 | 54.78 |
| 275 | 0.73 | 57.48 | 0.77 | 53.48 |
| 295 | 0.72 | 57.48 | 0.75 | 56.09 |
| 300 | 0.71 | 60.49 | 0.75 | 56.09 |
| 305 | 0.72 | 56.91 | 0.75 | 53.04 |
| 315 | 0.69 | 54.31 | 0.69 | 50.43 |
| 325 | 0.71 | 58.70 | 0.76 | 53.48 |
| 350 | 0.86 | 55.53 | 0.90 | 53.04 |

The **hidden layer size** of 300 yielded the most accurate model.

The following RNN hyperparameters were used when testing for **top word**:

HIDDEN\_LAYER\_SIZE = 300, BATCH\_SIZE = 32, EMBEDDING\_VECTOR = 128, DROPOUT = 0.2.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Top Word | Evaluation’s  F1 Score | Evaluation’s Accuracy (%) | Validation’s  F1 Score | Validation’s Accuracy (%) |
| 4750 | 0.70 | 56.26 | 0.73 | 53.91 |
| 5000 | 0.71 | 60.49 | 0.75 | 56.09 |
| 5250 | 0.71 | 59.35 | 0.75 | 56.96 |
| 5500 | 0.73 | 58.46 | 0.76 | 56.52 |

The **top word** of size 5000 yielded the most accurate model.

The following RNN hyperparameters were used when testing for the **embedding vector length**:

TOP\_WORD = 5000, HIDDEN\_LAYER\_SIZE = 300, BATCH\_SIZE = 32, DROPOUT = 0.2.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Embedding  Vector Length | Evaluation’s  F1 Score | Evaluation’s Accuracy (%) | Validation’s  F1 Score | Validation’s Accuracy (%) |
| 32 | 0.72 | 60.24 | 0.74 | 60.87 |
| 64 | 0.69 | 60.73 | 0.71 | 56.52 |
| 96 | 0.72 | 60.24 | 0.74 | 60.87 |
| 108 | 0.75 | 58.05 | 0.79 | 53.91 |
| 112 | 0.70 | 60.98 | 0.73 | 60.43 |
| 116 | 0.72 | 57.56 | 0.74 | 53.91 |
| 120 | 0.71 | 56.34 | 0.73 | 55.65 |

The **embedding vector length** of 112 yielded the most accurate model.

The following RNN hyperparameters were used when testing for the **dropout rate**:

TOP\_WORD = 5000, HIDDEN\_LAYER\_SIZE = 300, BATCH\_SIZE = 32, EMBEDDING\_VECTOR = 112.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Dropout Rate | Evaluation’s  F1 Score | Evaluation’s Accuracy (%) | Validation’s  F1 Score | Validation’s Accuracy (%) |
| 0.15 | 0.71 | 57.97 | 0.74 | 54.35 |
| 0.19 | 0.72 | 59.43 | 0.75 | 59.13 |
| 0.20 | 0.70 | 60.98 | 0.73 | 60.43 |
| 0.21 | 0.71 | 57.89 | 0.77 | 56.09 |
| 0.25 | 0.71 | 54.15 | 0.74 | 49.13 |

The **dropout rate** of 0.20 yielded the most accurate model.

Trying to add **another dropout layer** yielded:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Dropout Rate | Evaluation’s  F1 Score | Evaluation’s Accuracy (%) | Validation’s  F1 Score | Validation’s Accuracy (%) |
| 0.20 | 0.7-0 | 59.11 | 0.74 | 58.70 |

Therefore, **another** **dropout layer** should not be included to yield the most accurate model.