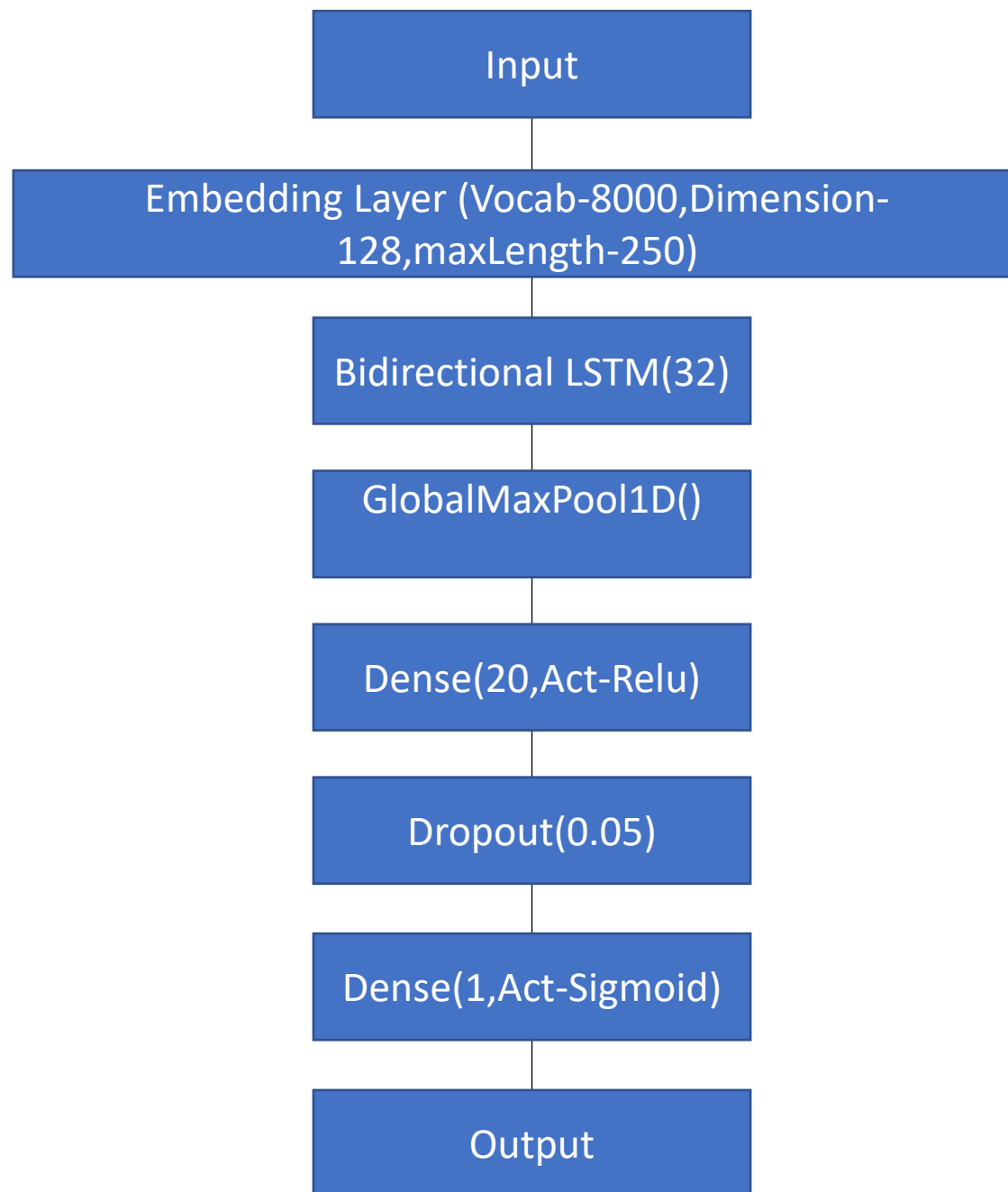


# LSTM Architecture



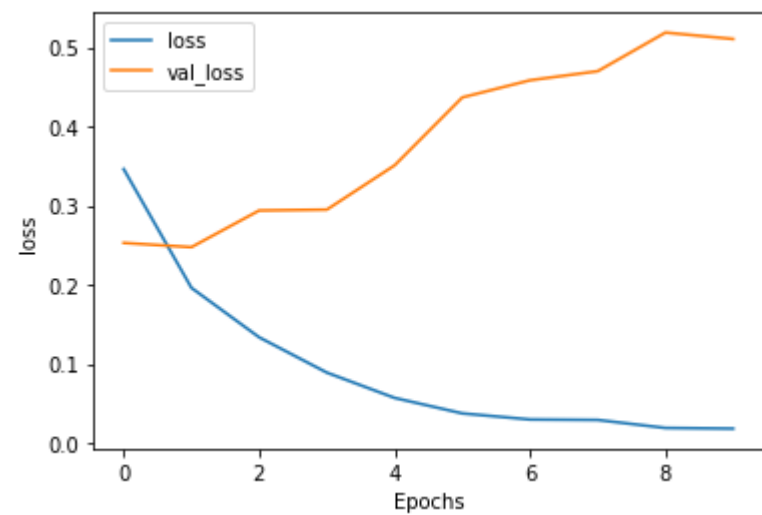
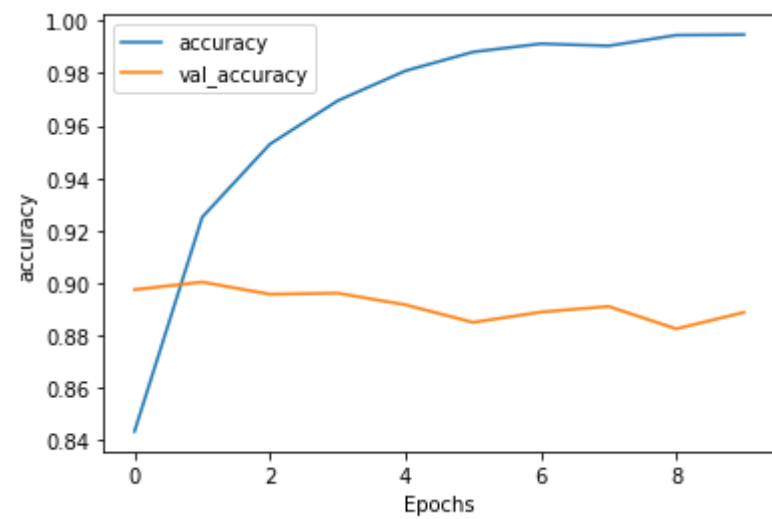
# Homework 6 – IMDB

| Problem                    | 1       |
|----------------------------|---------|
| Training Set               | 25000   |
| Testing Set                | 25000   |
| Mini Batch Size            | 128     |
| Total Number of Parameters | 42537   |
| Optimizer                  | Adam    |
| Initializer                | Glorat  |
| Learning Rate              | 0.001   |
| Epochs                     | 10      |
| Training Accuracy          | 0.9945  |
| Testing Accuracy           | 0.8798  |
| r                          | 0.299   |
| Hidden Layer Activation    | Relu    |
| Output Layer               | Sigmoid |

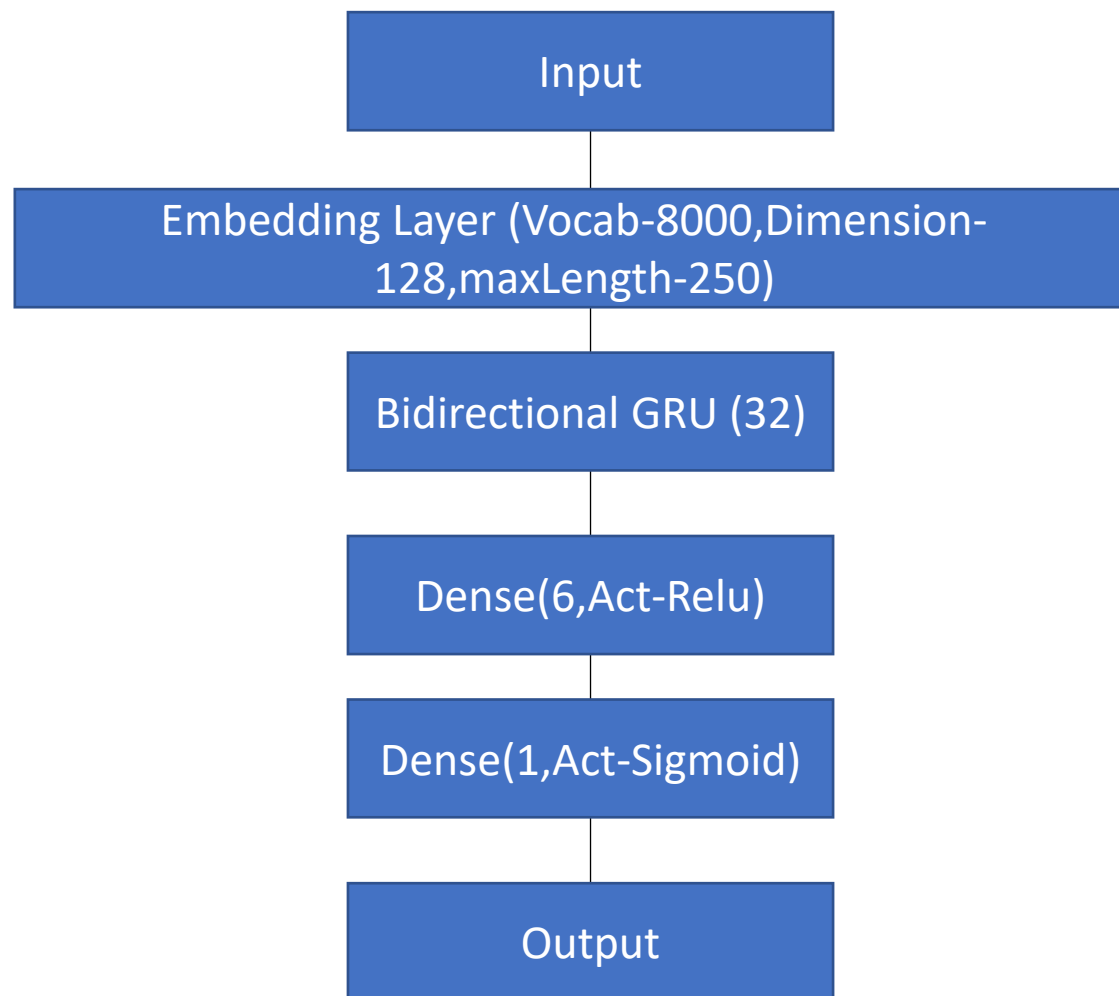
# Model Summary

Model: "sequential\_9"

| Layer (type)                 | Output Shape     | Param # |
|------------------------------|------------------|---------|
| embedding_9 (Embedding)      | (None, 250, 128) | 1024000 |
| bidirectional_6 (Bidirection | (None, 250, 64)  | 41216   |
| global_max_pooling1d_2 (Glob | (None, 64)       | 0       |
| dense_18 (Dense)             | (None, 20)       | 1300    |
| dropout_9 (Dropout)          | (None, 20)       | 0       |
| dense_19 (Dense)             | (None, 1)        | 21      |
| Total params: 1,066,537      |                  |         |
| Trainable params: 1,066,537  |                  |         |
| Non-trainable params: 0      |                  |         |



# GRU Architecture

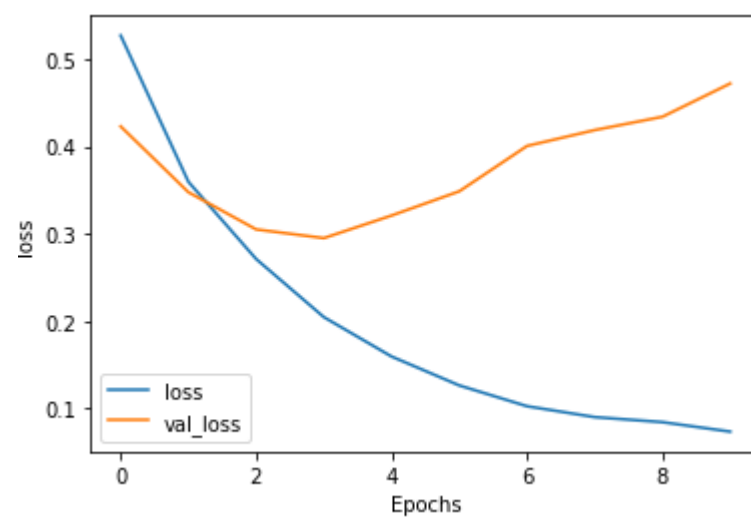
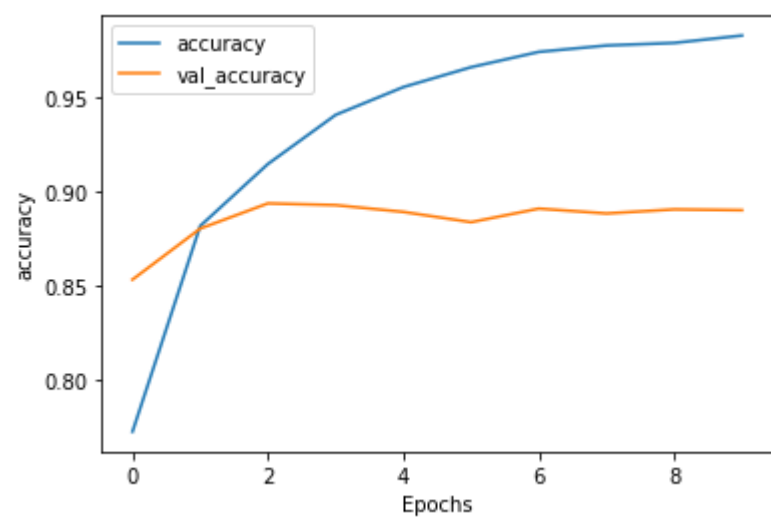


| Problem                    | 2       |
|----------------------------|---------|
| Training Set               | 25000   |
| Testing Set                | 25000   |
| Mini Batch Size            | 128     |
| Total Number of Parameters | 42537   |
| Optimizer                  | Adam    |
| Initializer                | Glorat  |
| Learning Rate              | 0.001   |
| Epochs                     | 10      |
| Training Accuracy          | 0.9827  |
| Testing Accuracy           | 0.89    |
| r                          | 0.315   |
| Hidden Layer Activation    | Relu    |
| Output Layer               | Sigmoid |

# Model Summary

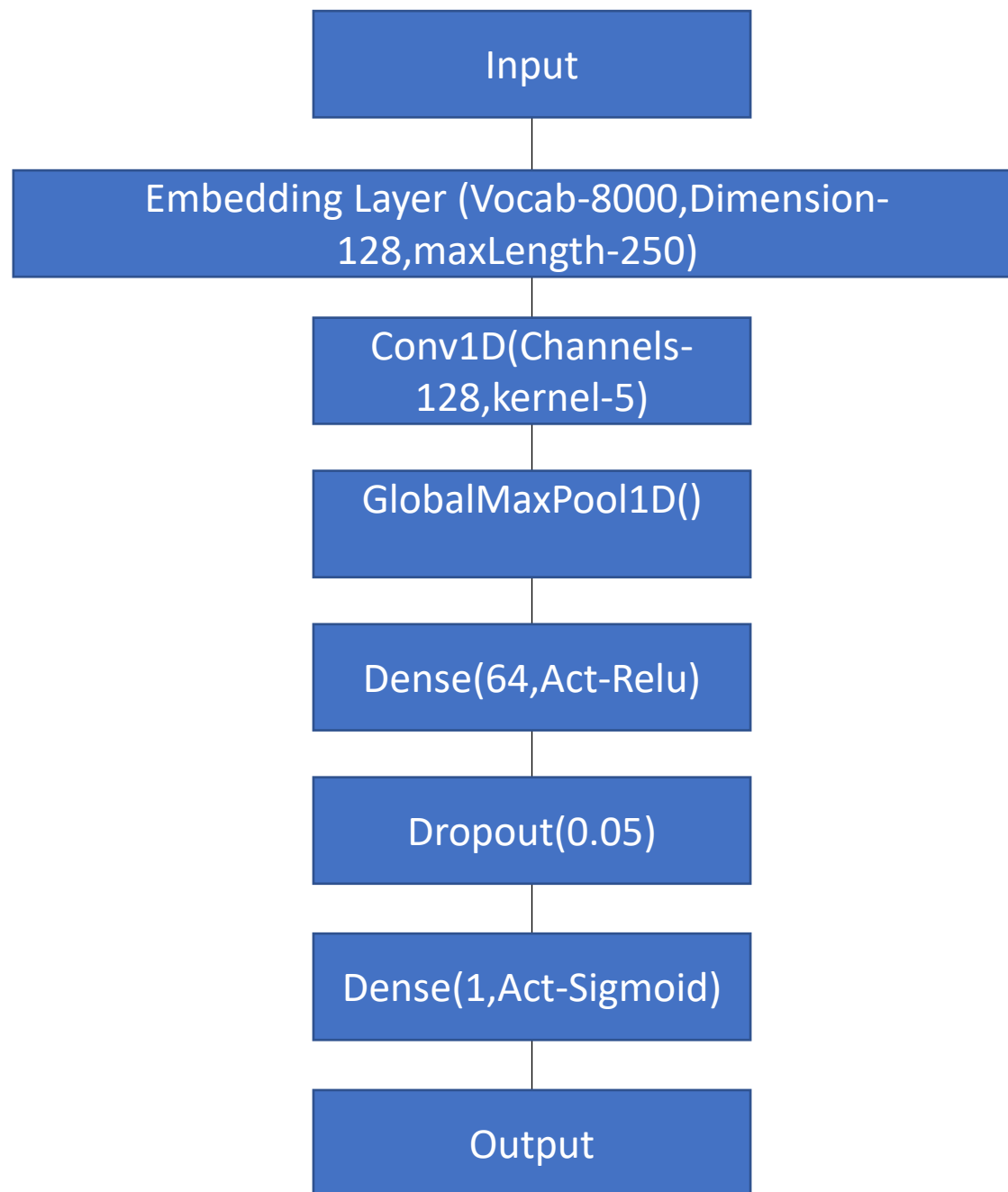
Model: "sequential"

| Layer (type)                  | Output Shape     | Param # |
|-------------------------------|------------------|---------|
| =====                         |                  |         |
| embedding (Embedding)         | (None, 250, 128) | 1024000 |
| =====                         |                  |         |
| bidirectional (Bidirectional) | (None, 64)       | 31104   |
| =====                         |                  |         |
| dense (Dense)                 | (None, 6)        | 390     |
| =====                         |                  |         |
| dense_1 (Dense)               | (None, 1)        | 7       |
| =====                         |                  |         |
| Total params: 1,055,501       |                  |         |
| Trainable params: 1,055,501   |                  |         |
| Non-trainable params: 0       |                  |         |
| =====                         |                  |         |





# Conv1D Architecture



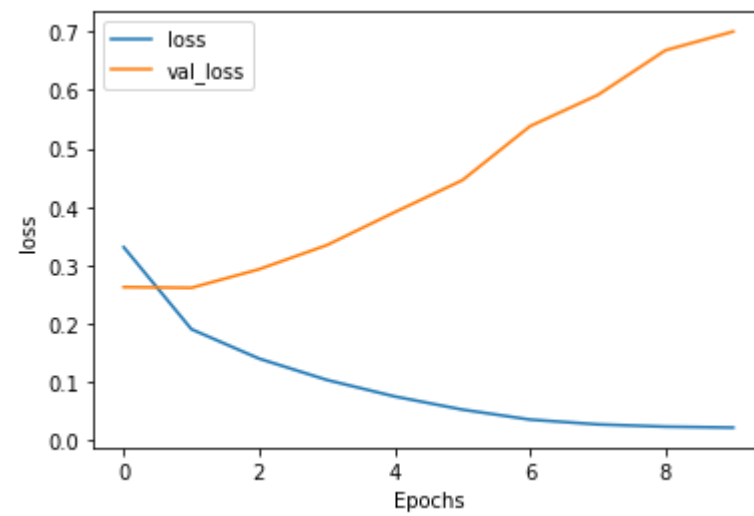
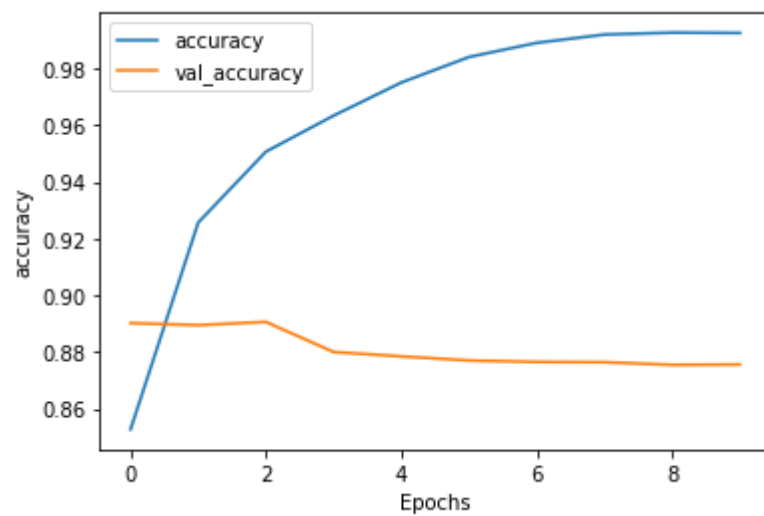
# Problem 2 with Augmentation

| Problem                    | 3       |
|----------------------------|---------|
| Training Set               | 25000   |
| Testing Set                | 25000   |
| Mini Batch Size            | 128     |
| Total Number of Parameters | 90369   |
| Optimizer                  | Adam    |
| Initializer                | Glorat  |
| Learning Rate              | 0.001   |
| Epochs                     | 10      |
| Training Accuracy          | 0.9944  |
| Testing Accuracy           | 0.8725  |
| r                          | 0.277   |
| Hidden Layer Activation    | Relu    |
| Output Layer               | Sigmoid |

Model: "sequential"

| Layer (type)                                      | Output Shape     | Param # |
|---|------------------|---------|
| embedding (Embedding)                             | (None, 250, 128) | 1024000 |
| conv1d (Conv1D)                                   | (None, 246, 128) | 82048   |
| global_average_pooling1d (GlobalAveragePooling1D) | (None, 128)      | 0       |
| dense (Dense)                                     | (None, 64)       | 8256    |
| dropout (Dropout)                                 | (None, 64)       | 0       |
| dense_1 (Dense)                                   | (None, 1)        | 65      |
| Total params: 1,114,369                           |                  |         |
| Trainable params: 1,114,369                       |                  |         |
| Non-trainable params: 0                           |                  |         |

# Model Summary



# Code Collab Links

- LSTM:<https://colab.research.google.com/drive/1RhrzqsiNiK5gUsBFbAvZFGSRHHJCJXps>
- GRU:[https://colab.research.google.com/drive/1aLMuAGwst\\_UgjqLkNYMMH6H0Gc7YEsr](https://colab.research.google.com/drive/1aLMuAGwst_UgjqLkNYMMH6H0Gc7YEsr)
- Conv1D:<https://colab.research.google.com/drive/1YHxwuQ0ruVt2VnCYk2ktdt4cLVNqNzOK>