Tokenization

L I S T E N

076 073 083 084 069 078

L I S T E N

083 073 076 069 078 084

S I L E N T

076 073 083 084 069 078

L I S T E N

I Love my dog

I Love my dog

001

I Love my dog

001 002 003 004

I Love my dog

001 002 003 004

I Love my cat

I Love my dog

001 002 003 004

I Love my cat

001 002 003

I Love my dog

001 002 003 004

I Love my cat

001 002 003 005

001	002	003	004
001	002	003	005

```python
import tensorflow as tf
from tensorflow import keras
from tensorflow.keras.preprocessing.text import Tokenizer

sentences = [
    'I love my dog',
    'I love my cat'
]

tokenizer = Tokenizer(num_words = 100)
tokenizer.fit_on_texts(sentences)
word_index = tokenizer.word_index
print(word_index)
```

```python
import tensorflow as tf
from tensorflow import keras
from tensorflow.keras.preprocessing.text import Tokenizer

sentences = [
    'I love my dog',
    'I love my cat'
]

tokenizer = Tokenizer(num_words = 100)
tokenizer.fit_on_texts(sentences)
word_index = tokenizer.word_index
print(word_index)
```

```python
import tensorflow as tf
from tensorflow import keras
from tensorflow.keras.preprocessing.text import Tokenizer

sentences = [
    'I love my dog',
    'I love my cat'
]

tokenizer = Tokenizer(num_words = 100)
tokenizer.fit_on_texts(sentences)
word_index = tokenizer.word_index
print(word_index)
```

```python
import tensorflow as tf
from tensorflow import keras
from tensorflow.keras.preprocessing.text import Tokenizer

sentences = [
    'I love my dog',
    'I love my cat'
]

tokenizer = Tokenizer(num_words = 100)
tokenizer.fit_on_texts(sentences)
word_index = tokenizer.word_index
print(word_index)
```

```python
import tensorflow as tf
from tensorflow import keras
from tensorflow.keras.preprocessing.text import Tokenizer

sentences = [
    'I love my dog',
    'I love my cat'
]

tokenizer = Tokenizer(num_words = 100)
tokenizer.fit_on_texts(sentences)
word_index = tokenizer.word_index
print(word_index)
```

```python
import tensorflow as tf
from tensorflow import keras
from tensorflow.keras.preprocessing.text import Tokenizer

sentences = [
    'I love my dog',
    'I love my cat'
]

tokenizer = Tokenizer(num_words = 100)
tokenizer.fit_on_texts(sentences)
word_index = tokenizer.word_index
print(word_index)
```

```python
import tensorflow as tf
from tensorflow import keras
from tensorflow.keras.preprocessing.text import Tokenizer

sentences = [
    'I love my dog',
    'I love my cat'
]

tokenizer = Tokenizer(num_words = 100)
tokenizer.fit_on_texts(sentences)
word_index = tokenizer.word_index
print(word_index)
```

```
{'i': 1, 'my': 3, 'dog': 4, 'cat': 5, 'love': 2}
```

```
sentences = [
    'I love my dog',
    'I love my cat',
    'You love my dog!'
]
```

```
sentences = [
    'I love my dog',
    'I love my cat',
    'You love my dog!'
]
```

```
{'i': 3, 'my': 2, 'you': 6, 'love': 1, 'cat': 5, 'dog': 4}
```

```
{'i': 3, 'my': 2, 'you': 6, 'love': 1, 'cat': 5, 'dog': 4}
```

```
{'i': 3, 'my': 2, 'you': 6, 'love': 1, 'cat': 5, 'dog': 4}
```

Sequences

```python
from tensorflow.keras.preprocessing.text import Tokenizer

sentences = [
    'I love my dog',
    'I love my cat',
    'You love my dog!',
    'Do you think my dog is amazing?'
]

tokenizer = Tokenizer(num_words = 100)
tokenizer.fit_on_texts(sentences)
word_index = tokenizer.word_index

sequences = tokenizer.texts_to_sequences(sentences)

print(word_index)
print(sequences)
```

```python
from tensorflow.keras.preprocessing.text import Tokenizer

sentences = [
    'I love my dog',
    'I love my cat',
    'You love my dog!',
    'Do you think my dog is amazing?'
]

tokenizer = Tokenizer(num_words = 100)
tokenizer.fit_on_texts(sentences)
word_index = tokenizer.word_index

sequences = tokenizer.texts_to_sequences(sentences)

print(word_index)
print(sequences)
```

```python
from tensorflow.keras.preprocessing.text import Tokenizer

sentences = [
    'I love my dog',
    'I love my cat',
    'You love my dog!',
    'Do you think my dog is amazing?'
]

tokenizer = Tokenizer(num_words = 100)
tokenizer.fit_on_texts(sentences)
word_index = tokenizer.word_index

sequences = tokenizer.texts_to_sequences(sentences)

print(word_index)
print(sequences)
```

```
{'amazing': 10, 'dog': 3, 'you': 5, 'cat': 6,
 'think': 8, 'i': 4, 'is': 9, 'my': 1, 'do': 7,
 'love': 2}
```

```
[[4, 2, 1, 3], [4, 2, 1, 6], [5, 2, 1, 3], [7, 5,
8, 1, 3, 9, 10]]
```

```
{'amazing': 10, 'dog': 3, 'you': 5, 'cat': 6,
 'think': 8, 'i': 4, 'is': 9, 'my': 1, 'do': 7,
 'love': 2}
```

```
[[4, 2, 1, 3], [4, 2, 1, 6], [5, 2, 1, 3], [7, 5,
8, 1, 3, 9, 10]]
```

```
{'amazing': 10, 'dog': 3, 'you': 5, 'cat': 6,
 'think': 8, 'i': 4, 'is': 9, 'my': 1, 'do': 7,
 'love': 2}
```

```
[[4, 2, 1, 3], [4, 2, 1, 6], [5, 2, 1, 3], [7, 5,
8, 1, 3, 9, 10]]
```

```python
from tensorflow.keras.preprocessing.text import Tokenizer

sentences = [
    'I love my dog',
    'I love my cat',
    'You love my dog!',
    'Do you think my dog is amazing?'
]

tokenizer = Tokenizer(num_words = 100)
tokenizer.fit_on_texts(sentences)
word_index = tokenizer.word_index

sequences = tokenizer.texts_to_sequences(sentences)

print(word_index)
print(sequences)
```

```python
test_data = [
    'i really love my dog',
    'my dog loves my manatee'
]

test_seq = tokenizer.texts_to_sequences(test_data)
print(test_seq)
```

```python
test_data = [
    'i really love my dog',
    'my dog loves my manatee'
]

test_seq = tokenizer.texts_to_sequences(test_data)
print(test_seq)
```

```
[[4, 2, 1, 3], [1, 3, 1]]
```

```
{'think': 8, 'amazing': 10, 'my': 1, 'love': 2, 'dog': 3, 'is': 9, 'you': 5, 'do': 7,
'cat': 6, 'i': 4}
```

```python
test_data = [
    'i really love my dog',
    'my dog loves my manatee'
]

test_seq = tokenizer.texts_to_sequences(test_data)
print(test_seq)
```

```
[[4, 2, 1, 3], [1, 3, 1]]
```

```
{'think': 8, 'amazing': 10, 'my': 1, 'love': 2, 'dog': 3, 'is': 9, 'you': 5, 'do': 7,
'cat': 6, 'i': 4}
```

```python
test_data = [
    'i really love my dog',
    'my dog loves my manatee'
]

test_seq = tokenizer.texts_to_sequences(test_data)
print(test_seq)
```

```
[[4, 2, 1, 3], [1, 3, 1]]
```

```
{'think': 8, 'amazing': 10, 'my': 1, 'love': 2, 'dog': 3, 'is': 9, 'you': 5, 'do': 7,
'cat': 6, 'i': 4}
```

```python
from tensorflow.keras.preprocessing.text import Tokenizer

sentences = [
    'I love my dog',
    'I love my cat',
    'You love my dog!',
    'Do you think my dog is amazing?'
]

tokenizer = Tokenizer(num_words = 100, oov_token="<OOV>")
tokenizer.fit_on_texts(sentences)
word_index = tokenizer.word_index

sequences = tokenizer.texts_to_sequences(sentences)

test_data = [
    'i really love my dog',
    'my dog loves my manatee'
]

test_seq = tokenizer.texts_to_sequences(test_data)
print(test_seq)
```

```python
from tensorflow.keras.preprocessing.text import Tokenizer

sentences = [
    'I love my dog',
    'I love my cat',
    'You love my dog!',
    'Do you think my dog is amazing?'
]

tokenizer = Tokenizer(num_words = 100, oov_token="<OOV>")
tokenizer.fit_on_texts(sentences)
word_index = tokenizer.word_index

sequences = tokenizer.texts_to_sequences(sentences)

test_data = [
    'i really love my dog',
    'my dog loves my manatee'
]

test_seq = tokenizer.texts_to_sequences(test_data)
print(test_seq)
```

```
[[5, 1, 3, 2, 4], [2, 4, 1, 2, 1]]
```

```
{'think': 9, 'amazing': 11, 'dog': 4, 'do': 8, 'i': 5, 'cat': 7,
 'you': 6, 'love': 3, '<OOV>': 1, 'my': 2, 'is': 10}
```

```
[[5, 1, 3, 2, 4], [2, 4, 1, 2, 1]]
```

```
{'think': 9, 'amazing': 11, 'dog': 4, 'do': 8, 'i': 5, 'cat': 7,
 'you': 6, 'love': 3, '<OOV>': 1, 'my': 2, 'is': 10}
```

```python
from tensorflow.keras.preprocessing.text import Tokenizer
from tensorflow.keras.preprocessing.sequence import pad_sequences

sentences = [
    'I love my dog',
    'I love my cat',
    'You love my dog!',
    'Do you think my dog is amazing?'
]

tokenizer = Tokenizer(num_words = 100, oov_token="<OOV>")
tokenizer.fit_on_texts(sentences)
word_index = tokenizer.word_index

sequences = tokenizer.texts_to_sequences(sentences)

padded = pad_sequences(sequences)
print(word_index)
print(sequences)
print(padded)
```

```python
from tensorflow.keras.preprocessing.text import Tokenizer
from tensorflow.keras.preprocessing.sequence import pad_sequences

sentences = [
    'I love my dog',
    'I love my cat',
    'You love my dog!',
    'Do you think my dog is amazing?'
]

tokenizer = Tokenizer(num_words = 100, oov_token="<OOV>")
tokenizer.fit_on_texts(sentences)
word_index = tokenizer.word_index

sequences = tokenizer.texts_to_sequences(sentences)

padded = pad_sequences(sequences)
print(word_index)
print(sequences)
print(padded)
```

```
{'do': 8, 'you': 6, 'love': 3, 'i': 5, 'amazing': 11, 'my': 2, 'is': 10, 'think': 9,
'dog': 4, '<OOV>': 1, 'cat': 7}


[[5, 3, 2, 4], [5, 3, 2, 7], [6, 3, 2, 4], [8, 6, 9, 2, 4, 10, 11]]


[[ 0  0  0  5  3  2  4]
 [ 0  0  0  5  3  2  7]
 [ 0  0  0  6  3  2  4]
 [ 8  6  9  2  4 10 11]]
```

```
{'do': 8, 'you': 6, 'love': 3, 'i': 5, 'amazing': 11, 'my': 2, 'is': 10, 'think': 9,
'dog': 4, '<OOV>': 1, 'cat': 7}


[[5, 3, 2, 4], [5, 3, 2, 7], [6, 3, 2, 4], [8, 6, 9, 2, 4, 10, 11]]
```

```
[[ 0  0  0  5  3  2  4]
 [ 0  0  0  5  3  2  7]
 [ 0  0  0  6  3  2  4]
 [ 8  6  9  2  4 10 11]]
```

```
{'do': 8, 'you': 6, 'love': 3, 'i': 5, 'amazing': 11, 'my': 2, 'is': 10, 'think': 9,
'dog': 4, '<OOV>': 1, 'cat': 7}
```

```
[[5, 3, 2, 4], [5, 3, 2, 7], [6, 3, 2, 4], [8, 6, 9, 2, 4, 10, 11]]
```

```
[[ 0  0  0  5  3  2  4]
 [ 0  0  0  5  3  2  7]
 [ 0  0  0  6  3  2  4]
 [ 8  6  9  2  4 10 11]]
```

```
padded = pad_sequences(sequences, padding='post')
```

```
padded = pad_sequences(sequences, padding='post', maxlen=5)
```

```
padded = pad_sequences(sequences, padding='post',
                                  truncating='post', maxlen=5)
```

Sarcasm in News Headlines Dataset by Rishabh Misra

https://rishabhmisra.github.io/publications/

Dataset

154

News Headlines Dataset For Sarcasm Detection

High quality dataset for the task of Sarcasm Detection

Rishabh Misra • updated a year ago (Version 1)

Data Kernels (39) Discussion (2) Activity Metadata Download (2 MB) New Kernel

CC0: Public Domain

classification, deep learning, nlp, linguistics

Description

Context

Past studies in Sarcasm Detection mostly make use of Twitter datasets collected using hashtag based supervision but such datasets are noisy in terms of labels and language. Furthermore, many tweets are replies to other tweets and detecting sarcasm in these requires the availability of contextual tweets.

To overcome the limitations related to noise in Twitter datasets, this **News Headlines dataset for Sarcasm Detection** is collected from two news website. *TheOnion* aims at producing sarcastic versions of current events and we collected all the headlines from News in Brief and News in Photos categories (which are sarcastic). We collect real (and non-sarcastic) news headlines from *HuffPost*.

This new dataset has following advantages over the existing Twitter datasets:

- Since news headlines are written by professionals in a formal manner, there are no spelling mistakes and informal usage. This reduces the sparsity and also increases the chance of finding pre-trained embeddings.
- Furthermore, since the sole purpose of *TheOnion* is to publish sarcastic news, we get high-quality labels with much less noise as compared to Twitter datasets.
- Unlike tweets which are replies to other tweets, the news headlines we obtained are self-contained. This would help us in teasing apart the real sarcastic elements.

Content

Each record consists of three attributes:

- `is_sarcastic` : 1 if the record is sarcastic otherwise 0
- `headline` : the headline of the news article
- `article_link` : link to the original news article. Useful in collecting supplementary data

`is_sarcastic`: 1 if the record is sarcastic otherwise 0

`headline`: the headline of the news article

`article_link`: link to the original news article. Useful in collecting supplementary data

{"article_link": "https://politics.theonion.com/boehner-just-wants-wife-to-listen-not-come-up-with-alt-1819574302", "headline": "boehner just wants wife to listen, not come up with alternative debt-reduction ideas", "is_sarcastic": 1}

{"article_link": "https://www.huffingtonpost.com/entry/roseanne-revival-review_us_5ab3a497e4b054d118e04365", "headline": "the 'roseanne' revival catches up to our thorny political mood, for better and worse", "is_sarcastic": 0}

{"article_link": "https://local.theonion.com/mom-starting-to-fear-son-s-web-series-closest-thing-she-1819576697", "headline": "mom starting to fear son's web series closest thing she will have to grandchild", "is_sarcastic": 1}

[

{"article_link": "https://politics.theonion.com/boehner-just-wants-wife-to-listen-not-come-up-with-alt-1819574302", "headline": "boehner just wants wife to listen, not come up with alternative debt-reduction ideas", "is_sarcastic": 1},

{"article_link": "https://www.huffingtonpost.com/entry/roseanne-revival-review_us_5ab3a497e4b054d118e04365", "headline": "the 'roseanne' revival catches up to our thorny political mood, for better and worse", "is_sarcastic": 0},

{"article_link": "https://local.theonion.com/mom-starting-to-fear-son-s-web-series-closest-thing-she-1819576697", "headline": "mom starting to fear son's web series closest thing she will have to grandchild", "is_sarcastic": 1}

]

```python
import json

with open("sarcasm.json", 'r') as f:
    datastore = json.load(f)

sentences = []
labels = []
urls = []
for item in datastore:
    sentences.append(item['headline'])
    labels.append(item['is_sarcastic'])
    urls.append(item['article_link'])
```

```python
import json

with open("sarcasm.json", 'r') as f:
    datastore = json.load(f)

sentences = []
labels = []
urls = []
for item in datastore:
    sentences.append(item['headline'])
    labels.append(item['is_sarcastic'])
    urls.append(item['article_link'])
```

```python
import json

with open("sarcasm.json", 'r') as f:
    datastore = json.load(f)

sentences = []
labels = []
urls = []
for item in datastore:
    sentences.append(item['headline'])
    labels.append(item['is_sarcastic'])
    urls.append(item['article_link'])
```

```python
import json

with open("sarcasm.json", 'r') as f:
    datastore = json.load(f)

sentences = []
labels = []
urls = []
for item in datastore:
    sentences.append(item['headline'])
    labels.append(item['is_sarcastic'])
    urls.append(item['article_link'])
```

```python
import json

with open("sarcasm.json", 'r') as f:
    datastore = json.load(f)

sentences = []
labels = []
urls = []
for item in datastore:
    sentences.append(item['headline'])
    labels.append(item['is_sarcastic'])
    urls.append(item['article_link'])
```

```python
from tensorflow.keras.preprocessing.text import Tokenizer
from tensorflow.keras.preprocessing.sequence import pad_sequences
tokenizer = Tokenizer(oov_token="<OOV>")
tokenizer.fit_on_texts(sentences)
word_index = tokenizer.word_index

sequences = tokenizer.texts_to_sequences(sentences)
padded = pad_sequences(sequences, padding='post')
print(padded[0])
print(padded.shape)
```

```python
from tensorflow.keras.preprocessing.text import Tokenizer
from tensorflow.keras.preprocessing.sequence import pad_sequences
tokenizer = Tokenizer(oov_token="<OOV>")
tokenizer.fit_on_texts(sentences)
word_index = tokenizer.word_index

sequences = tokenizer.texts_to_sequences(sentences)
padded = pad_sequences(sequences, padding='post')
print(padded[0])
print(padded.shape)
```

```python
from tensorflow.keras.preprocessing.text import Tokenizer
from tensorflow.keras.preprocessing.sequence import pad_sequences
tokenizer = Tokenizer(oov_token="<OOV>")
tokenizer.fit_on_texts(sentences)
word_index = tokenizer.word_index

sequences = tokenizer.texts_to_sequences(sentences)
padded = pad_sequences(sequences, padding='post')
print(padded[0])
print(padded.shape)
```

{'underwood': 24127, 'skillingsbolle': 23055, 'grabs': 12293, 'mobility': 8909, "'assassin's": 12648, 'visualize': 23973, 'hurting': 4992, 'orphaned': 9173, "'agreed'": 24365, 'narration': 28470

```python
from tensorflow.keras.preprocessing.text import Tokenizer
from tensorflow.keras.preprocessing.sequence import pad_sequences
tokenizer = Tokenizer(oov_token="<OOV>")
tokenizer.fit_on_texts(sentences)
word_index = tokenizer.word_index

sequences = tokenizer.texts_to_sequences(sentences)
padded = pad_sequences(sequences, padding='post')
print(padded[0])
print(padded.shape)
```

```python
from tensorflow.keras.preprocessing.text import Tokenizer
from tensorflow.keras.preprocessing.sequence import pad_sequences
tokenizer = Tokenizer(oov_token="<OOV>")
tokenizer.fit_on_texts(sentences)
word_index = tokenizer.word_index

sequences = tokenizer.texts_to_sequences(sentences)
padded = pad_sequences(sequences, padding='post')
print(padded[0])
print(padded.shape)
```

```
[  308 15115   679  3337  2298    48   382  2576 15116     6  2577  8434
     0     0     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0     0     0
     0     0     0     0]
```

```
(26709, 40)
```

```
[  308 15115   679  3337  2298    48   382  2576 15116     6  2577  8434
     0     0     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0     0     0
     0     0     0     0]
```

```
(26709, 40)
```

```
[  308 15115   679  3337  2298    48   382  2576 15116     6  2577  8434
     0     0     0     0     0     0     0     0     0     0     0     0
     0     0     0     0     0     0     0     0     0     0     0     0
     0     0     0     0]

(26709, 40)
```

Colab 1: Sarcasm Preprocess

Embeddings

```
vocab_size = 10000
embedding_dim = 16
max_length = 32
trunc_type='post'
padding_type='post'
oov_tok = "<OOV>"
training_size = 20000
```

```
training_sentences = sentences[0:training_size]
testing_sentences = sentences[training_size:]
training_labels = labels[0:training_size]
testing_labels = labels[training_size:]
```

```
training_sentences = sentences[0:training_size]
testing_sentences = sentences[training_size:]
training_labels = labels[0:training_size]
testing_labels = labels[training_size:]
```

```
training_sentences = sentences[0:training_size]
testing_sentences = sentences[training_size:]
training_labels = labels[0:training_size]
testing_labels = labels[training_size:]
```

```
training_sentences = sentences[0:training_size]
testing_sentences = sentences[training_size:]
training_labels = labels[0:training_size]
testing_labels = labels[training_size:]
```

```
tokenizer = Tokenizer(num_words=vocab_size, oov_token=oov_tok)
tokenizer.fit_on_texts(training_sentences)

word_index = tokenizer.word_index

training_sequences = tokenizer.texts_to_sequences(training_sentences)
training_padded = pad_sequences(training_sequences, maxlen=max_length,
                                padding=padding_type, truncating=trunc_type)

testing_sequences = tokenizer.texts_to_sequences(testing_sentences)
testing_padded = pad_sequences(testing_sequences, maxlen=max_length,
                               padding=padding_type, truncating=trunc_type)
```

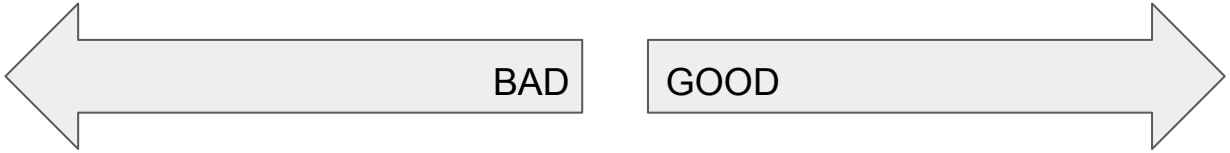
```
tokenizer = Tokenizer(num_words=vocab_size, oov_token=oov_tok)
tokenizer.fit_on_texts(training_sentences)

word_index = tokenizer.word_index

training_sequences = tokenizer.texts_to_sequences(training_sentences)
training_padded = pad_sequences(training_sequences, maxlen=max_length,
                                padding=padding_type, truncating=trunc_type)

testing_sequences = tokenizer.texts_to_sequences(testing_sentences)
testing_padded = pad_sequences(testing_sequences, maxlen=max_length,
                               padding=padding_type, truncating=trunc_type)
```

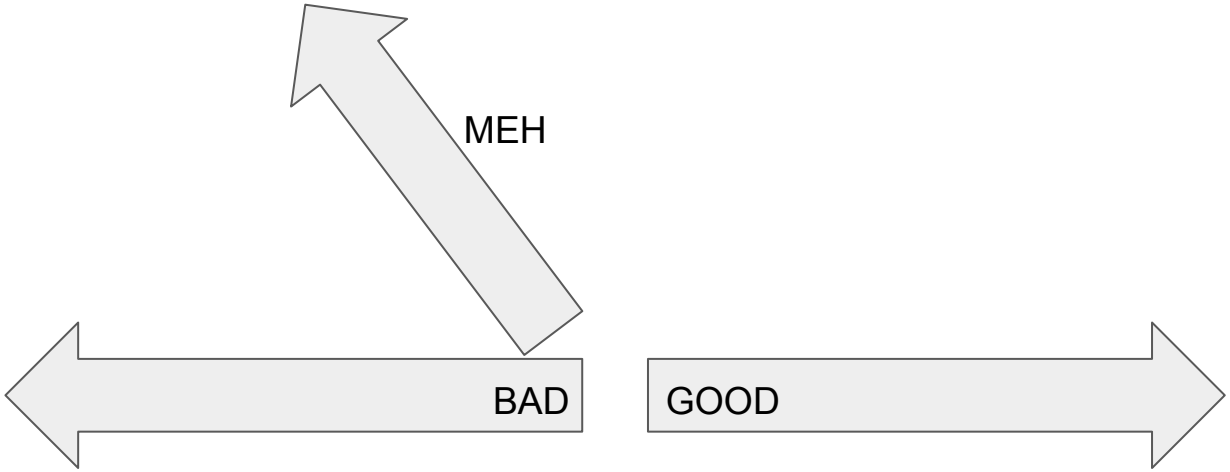
```
tokenizer = Tokenizer(num_words=vocab_size, oov_token=oov_tok)
tokenizer.fit_on_texts(training_sentences)

word_index = tokenizer.word_index

training_sequences = tokenizer.texts_to_sequences(training_sentences)
training_padded = pad_sequences(training_sequences, maxlen=max_length,
                                padding=padding_type, truncating=trunc_type)

testing_sequences = tokenizer.texts_to_sequences(testing_sentences)
testing_padded = pad_sequences(testing_sequences, maxlen=max_length,
                               padding=padding_type, truncating=trunc_type)
```

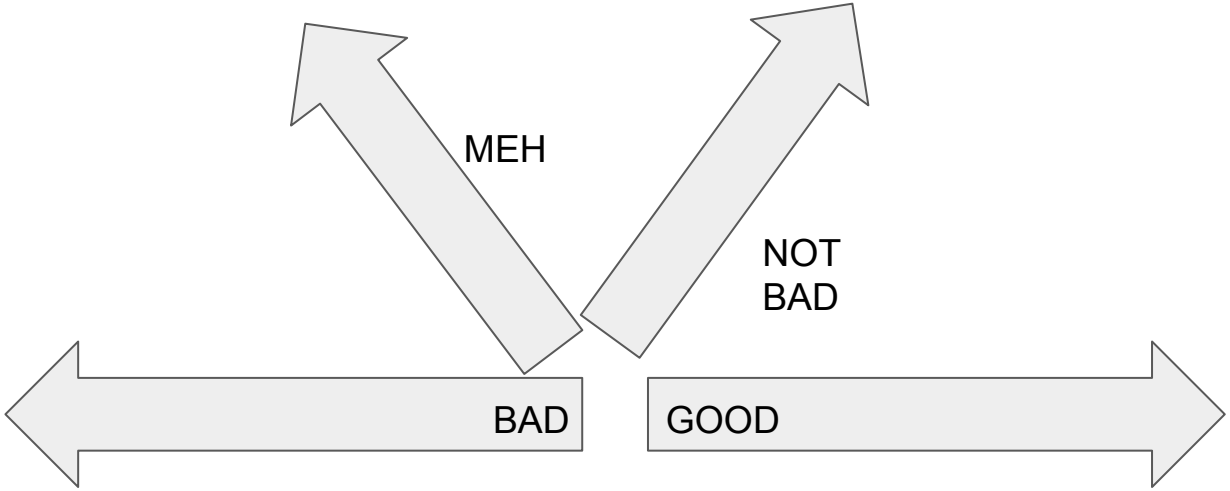
```
tokenizer = Tokenizer(num_words=vocab_size, oov_token=oov_tok)
tokenizer.fit_on_texts(training_sentences)

word_index = tokenizer.word_index

training_sequences = tokenizer.texts_to_sequences(training_sentences)
training_padded = pad_sequences(training_sequences, maxlen=max_length,
                                padding=padding_type, truncating=trunc_type)

testing_sequences = tokenizer.texts_to_sequences(testing_sentences)
testing_padded = pad_sequences(testing_sequences, maxlen=max_length,
                               padding=padding_type, truncating=trunc_type)
```

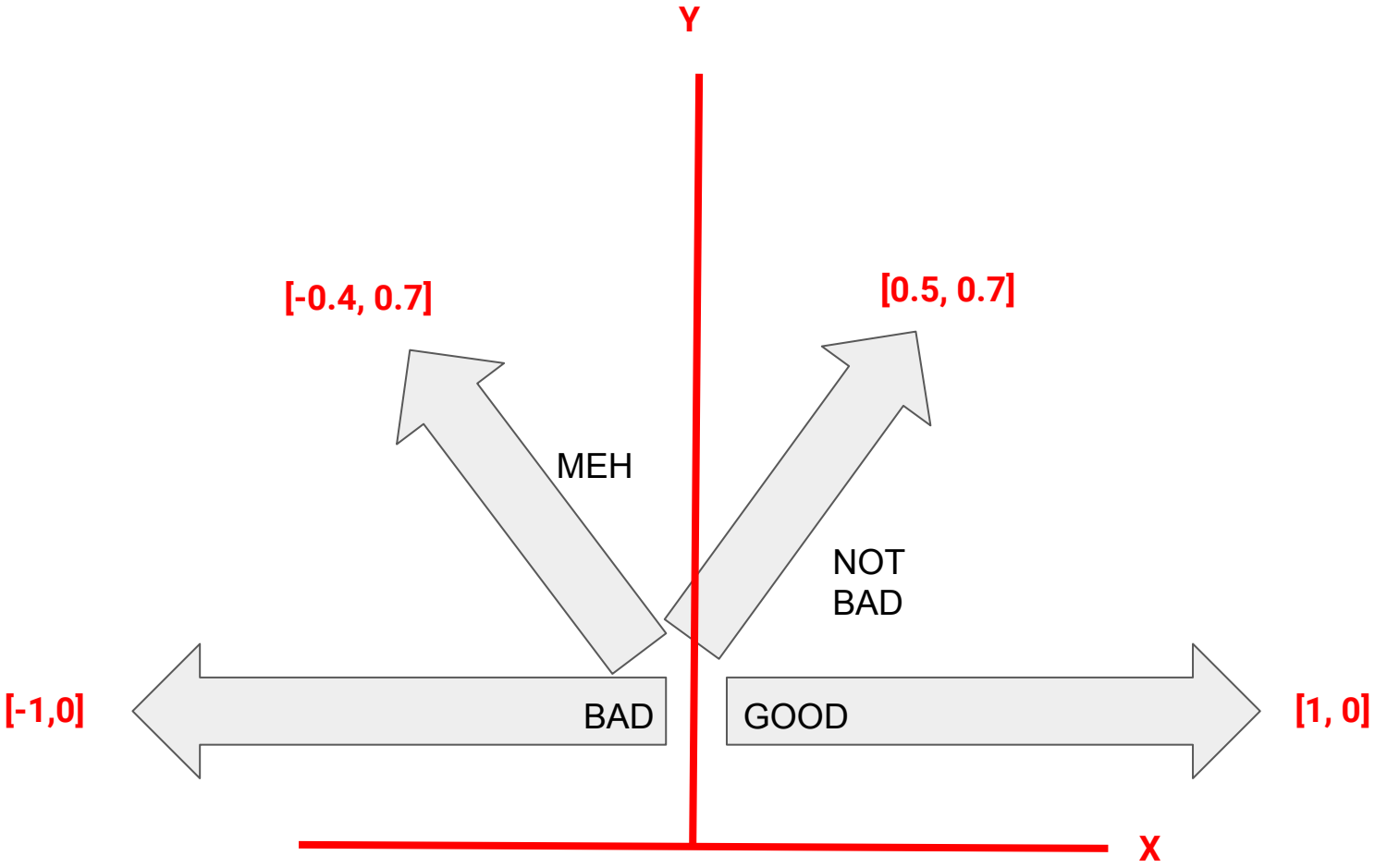
```
tokenizer = Tokenizer(num_words=vocab_size, oov_token=oov_tok)
tokenizer.fit_on_texts(training_sentences)

word_index = tokenizer.word_index

training_sequences = tokenizer.texts_to_sequences(training_sentences)
training_padded = pad_sequences(training_sequences, maxlen=max_length,
                                padding=padding_type, truncating=trunc_type)

testing_sequences = tokenizer.texts_to_sequences(testing_sentences)
testing_padded = pad_sequences(testing_sequences, maxlen=max_length,
                               padding=padding_type, truncating=trunc_type)
```

```
tokenizer = Tokenizer(num_words=vocab_size, oov_token=oov_tok)
tokenizer.fit_on_texts(training_sentences)

word_index = tokenizer.word_index

training_sequences = tokenizer.texts_to_sequences(training_sentences)
training_padded = pad_sequences(training_sequences, maxlen=max_length,
                                padding=padding_type, truncating=trunc_type)

testing_sequences = tokenizer.texts_to_sequences(testing_sentences)
testing_padded = pad_sequences(testing_sequences, maxlen=max_length,
                               padding=padding_type, truncating=trunc_type)
```


BAD
GOOD


MEH
BAD
GOOD


MEH
NOT
BAD
BAD
GOOD


Y
[-0.4, 0.7]
[0.5, 0.7]
MEH
NOT
BAD
[-1,0]
BAD
GOOD
[1, 0]
X

```python
model = tf.keras.Sequential([
    tf.keras.layers.Embedding(vocab_size, embedding_dim, input_length=max_length),
    tf.keras.layers.GlobalAveragePooling1D(),
    tf.keras.layers.Dense(24, activation='relu'),
    tf.keras.layers.Dense(1, activation='sigmoid')
])
model.compile(loss='binary_crossentropy',optimizer='adam',metrics=['accuracy'])
```

```python
model = tf.keras.Sequential([
    tf.keras.layers.Embedding(vocab_size, embedding_dim, input_length=max_length),
    tf.keras.layers.GlobalAveragePooling1D(),
    tf.keras.layers.Dense(24, activation='relu'),
    tf.keras.layers.Dense(1, activation='sigmoid')
])
model.compile(loss='binary_crossentropy',optimizer='adam',metrics=['accuracy'])
```

```
model.summary()
```

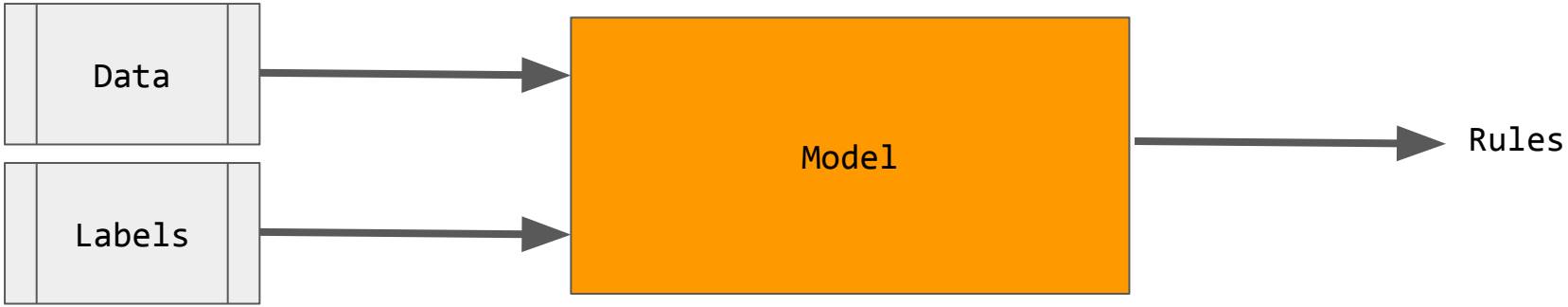
```
Layer (type)                 Output Shape              Param #
=================================================================
embedding_2 (Embedding)      (None, 32, 16)            160000
_________________________________________________________________
global_average_pooling1d_2 ( (None, 16)                0
_________________________________________________________________
dense_4 (Dense)              (None, 24)                408
_________________________________________________________________
dense_5 (Dense)              (None, 1)                 25
=================================================================
Total params: 160,433
Trainable params: 160,433
Non-trainable params: 0
```

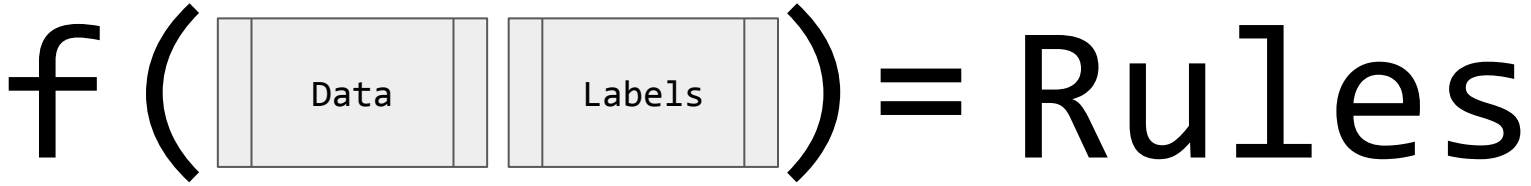
```
num_epochs = 30

history = model.fit(training_padded, training_labels, epochs=num_epochs,
                    validation_data=(testing_padded, testing_labels), verbose=2)
```

Colab 2: Sarcasm Classifier

Recurrence

```python
model = tf.keras.Sequential([
    tf.keras.layers.Embedding(vocab_size, embedding_dim, input_length=max_length),
    tf.keras.layers.GlobalAveragePooling1D(),
    tf.keras.layers.Dense(24, activation='relu'),
    tf.keras.layers.Dense(6, activation='softmax')
])
model.compile(loss='sparse_categorical_crossentropy',optimizer='adam')
model.summary()
```


Data
Labels
Model
Rules

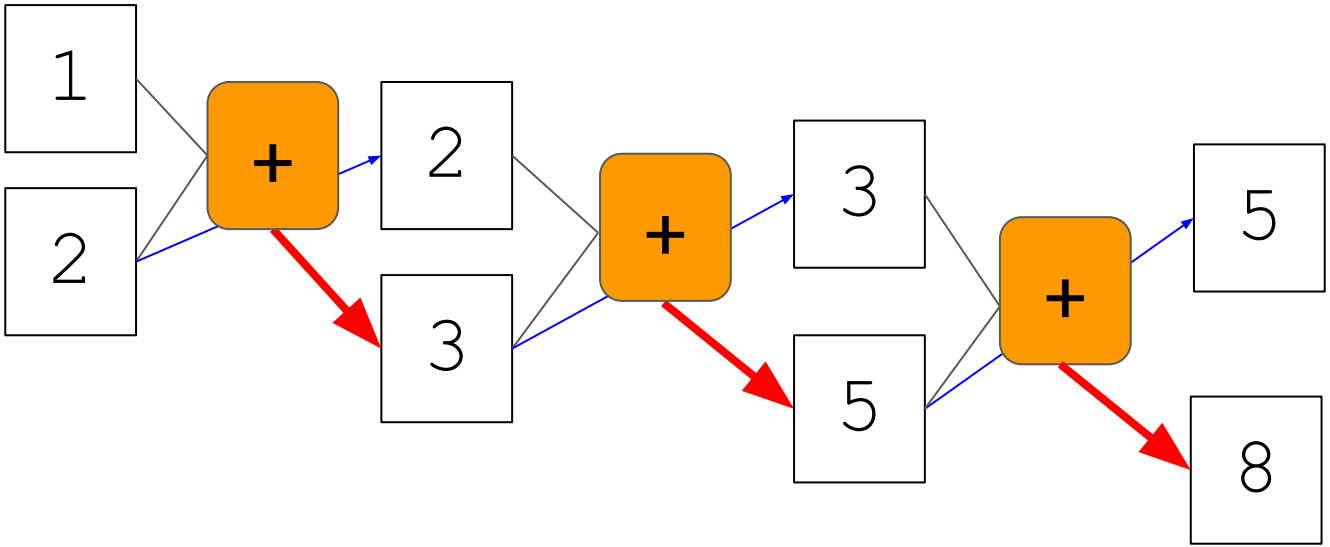

f(
Data
Labels
)=Rules

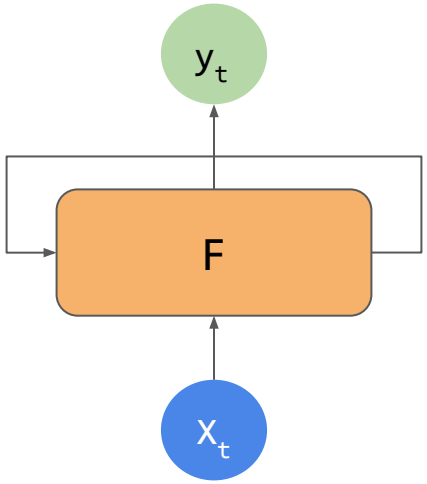
1	2	3	5	8	13	21	34	55	89

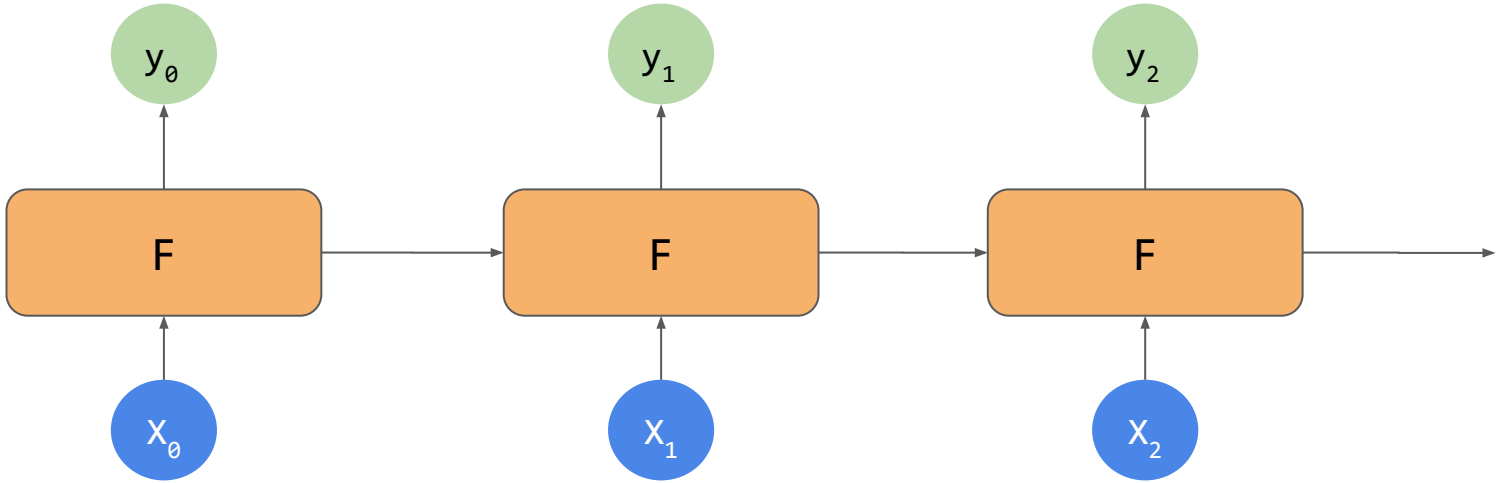
1	2	3	5	8	13	21	34	55	89
n_0	n_1	n_2	n_3	n_4	n_5	n_6	n_7	n_8	n_9

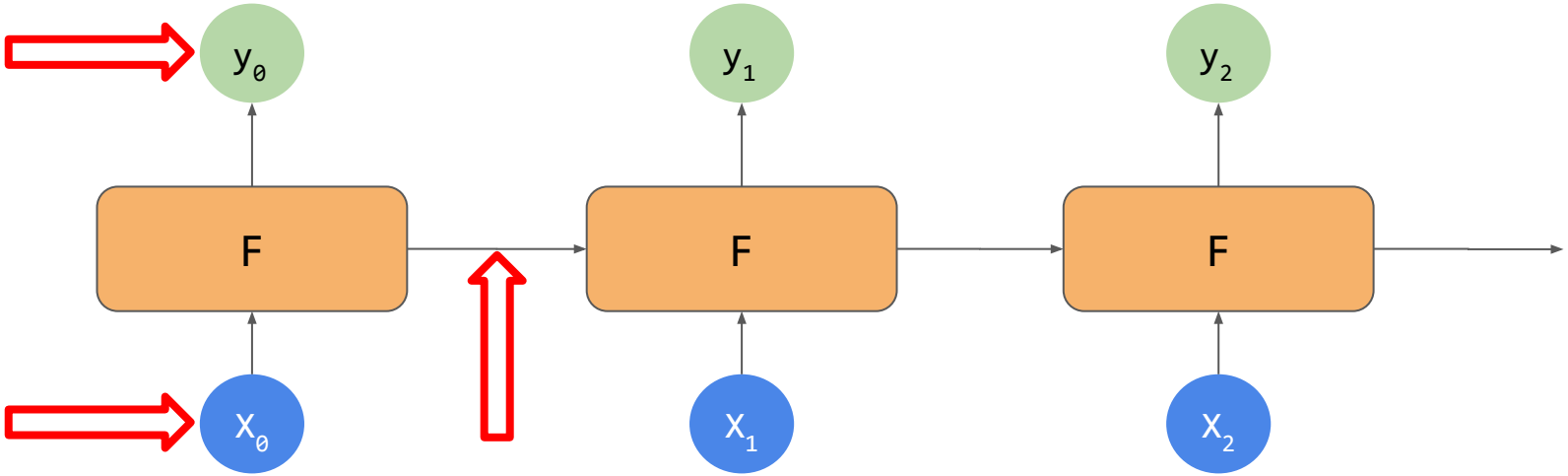
1	2	3	5	8	13	21	34	55	89
n_0	n_1	n_2	n_3	n_4	n_5	n_6	n_7	n_8	n_9

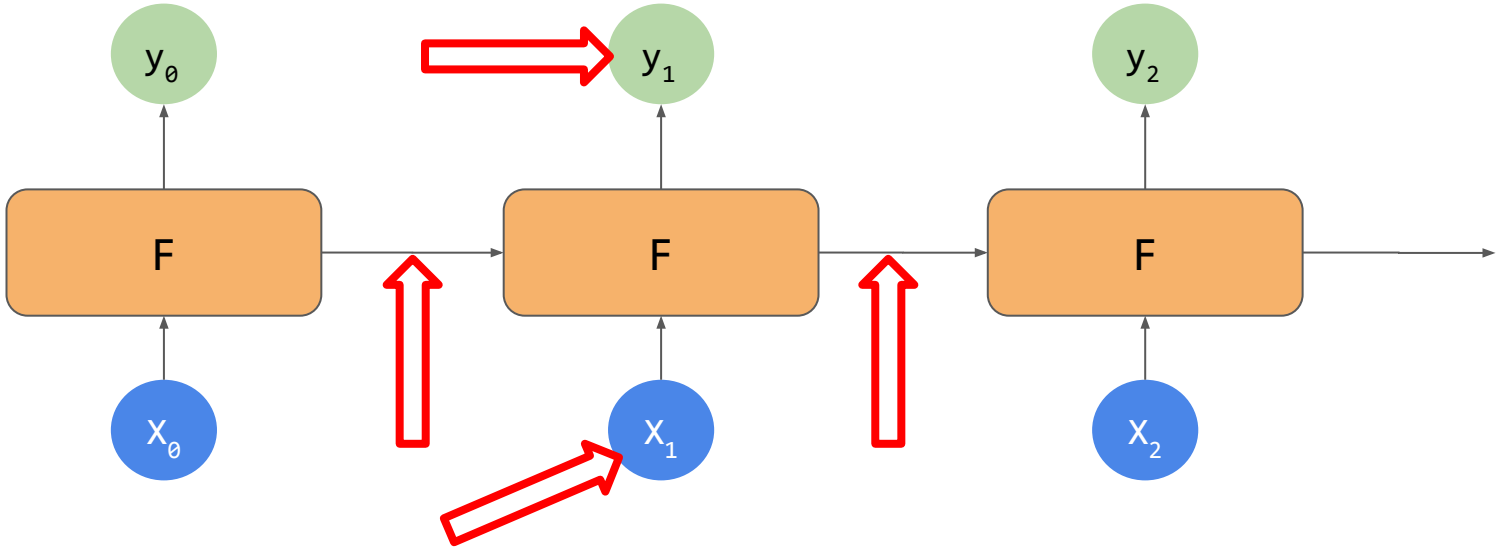
$$n_x = n_{x-1} + n_{x-2}$$

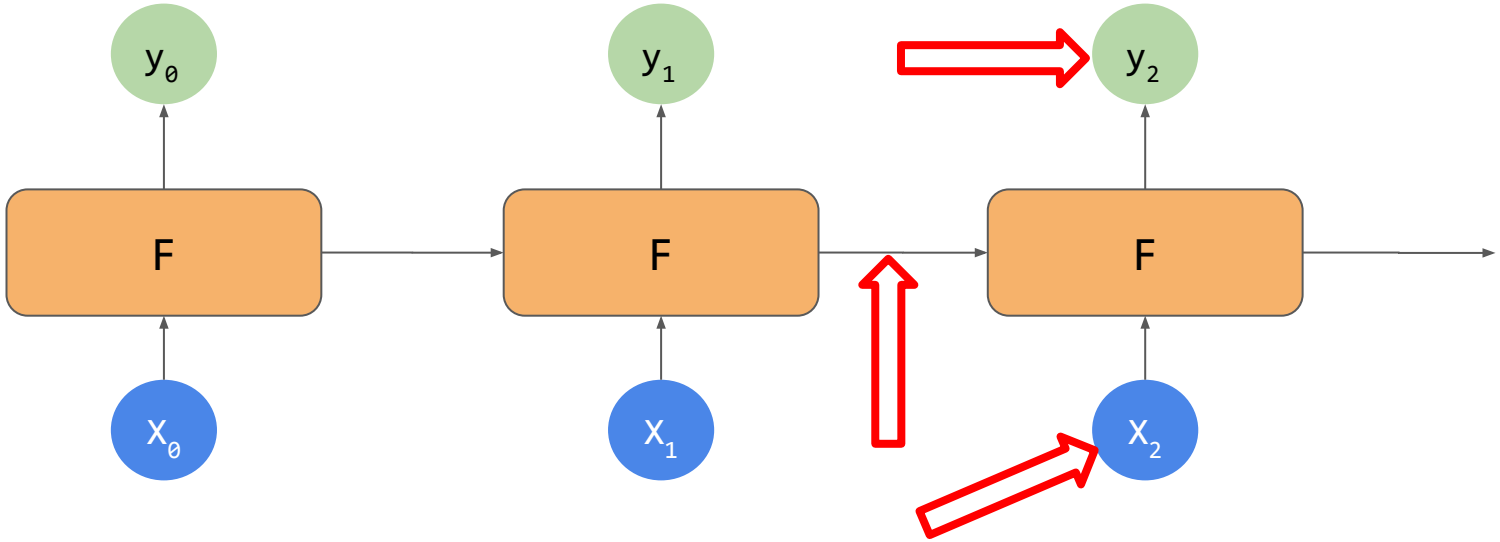

1
2
+
2
3
+
3
5
+
5
8

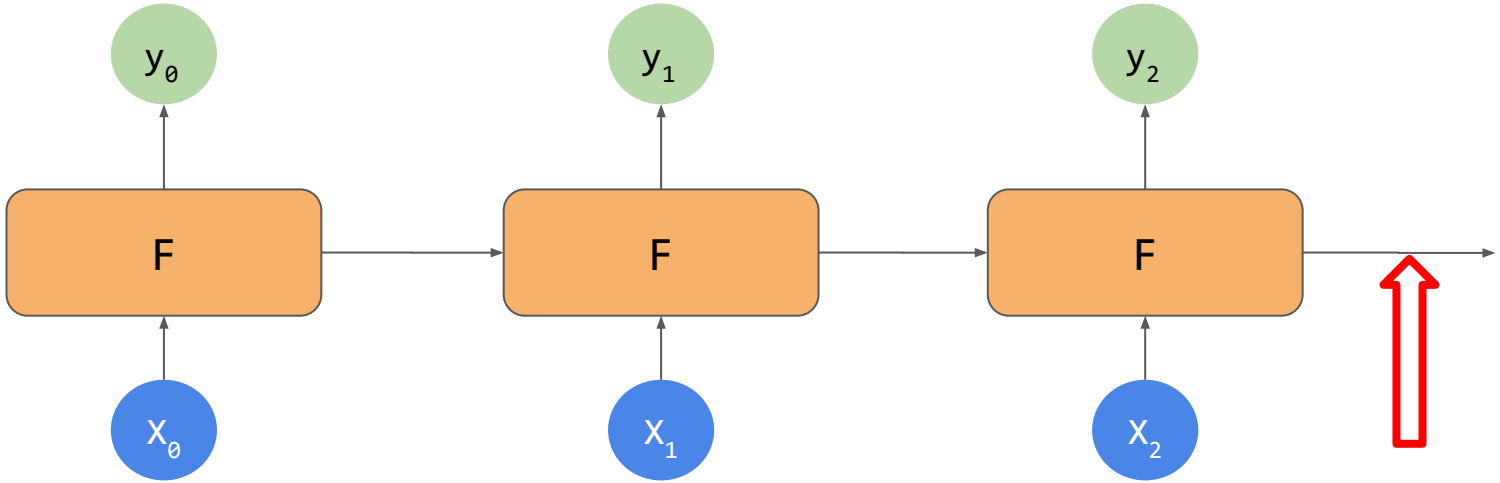

y_t
F
x_t


y_0
y_1
y_2
F
F
F
x_0
x_1
x_2


y_0
y_1
y_2
F
F
F
x_0
x_1
x_2


y_0
y_1
y_2
F
F
F
X_0
X_1
X_2


y_0
y_1
y_2
F
F
F
x_0
x_1
x_2


y_0
y_1
y_2
F
F
F
x_0
x_1
x_2

Today has a beautiful blue <...>

Today has a beautiful blue <...>

Today has a beautiful blue sky

Today has a beautiful blue <...>

Today has a beautiful blue sky

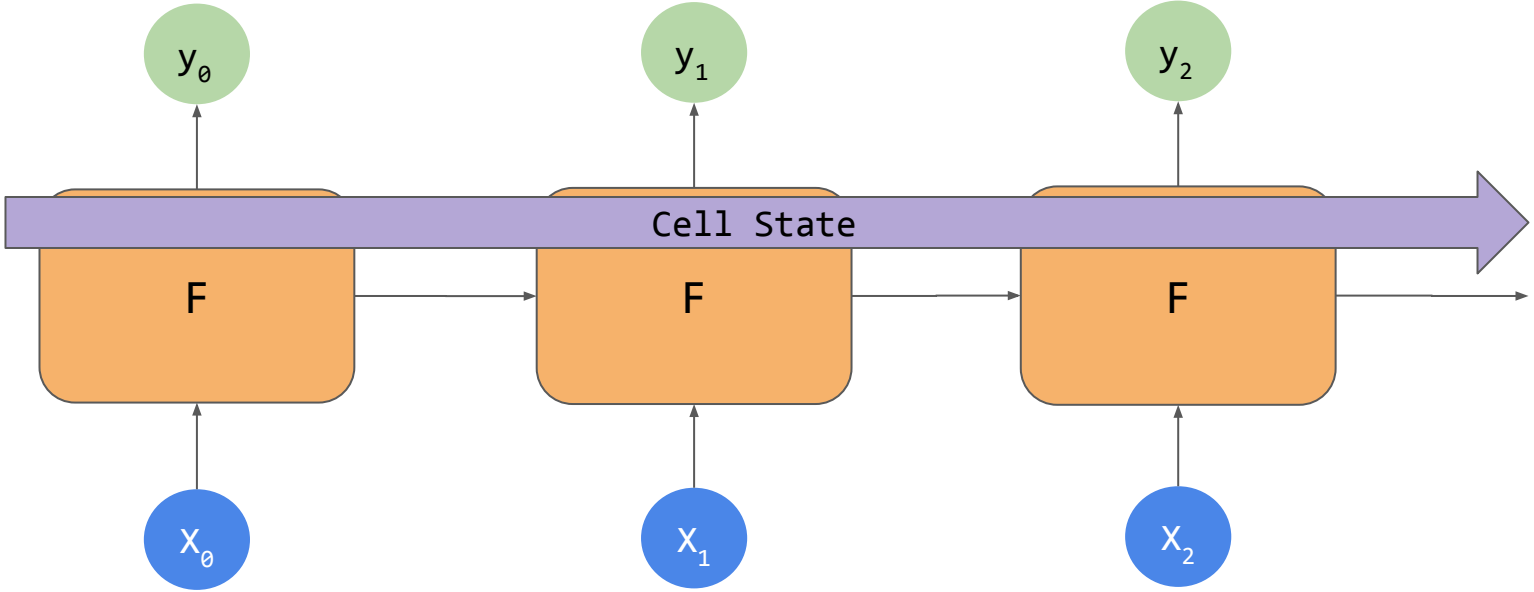
I lived in Ireland, so at school they made me learn how to speak <...>

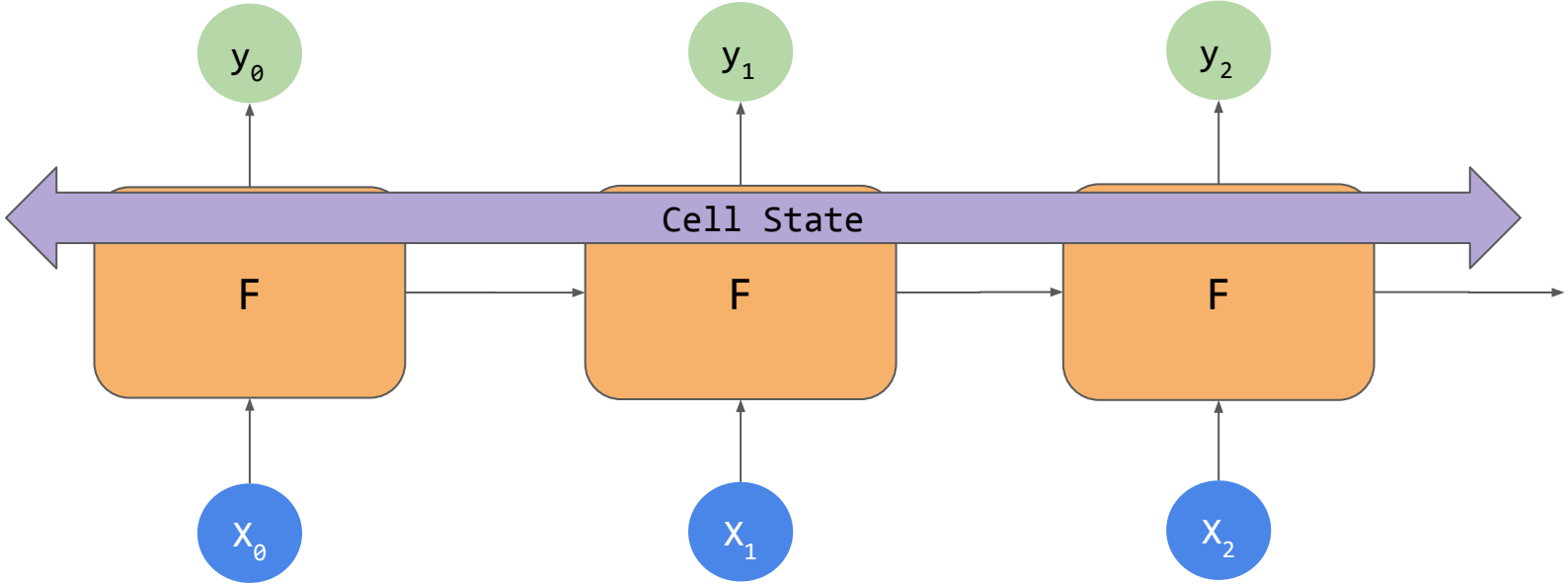
I lived in Ireland, so at school they made me learn how to speak <...>

I lived in Ireland, so at school they made me learn how to speak Gaelic

I lived in Ireland, so at school they made me learn how to speak <...>

I lived in Ireland, so at school they made me learn how to speak Gaelic


y_0
y_1
y_2
Cell State
F
F
F
x_0
x_1
x_2


y_0
y_1
y_2
Cell State
F
F
F
x_0
x_1
x_2

```python
model = tf.keras.Sequential([
    tf.keras.layers.Embedding(tokenizer.vocab_size, 64),
    tf.keras.layers.Bidirectional(tf.keras.layers.LSTM(64)),
    tf.keras.layers.Dense(64, activation='relu'),
    tf.keras.layers.Dense(1, activation='sigmoid')
])
```

```python
model = tf.keras.Sequential([
    tf.keras.layers.Embedding(tokenizer.vocab_size, 64),
    tf.keras.layers.Bidirectional(tf.keras.layers.LSTM(64)),
    tf.keras.layers.Dense(64, activation='relu'),
    tf.keras.layers.Dense(1, activation='sigmoid')
])
```

```python
model = tf.keras.Sequential([
    tf.keras.layers.Embedding(tokenizer.vocab_size, 64),
    tf.keras.layers.Bidirectional(tf.keras.layers.LSTM(64)),
    tf.keras.layers.Dense(64, activation='relu'),
    tf.keras.layers.Dense(1, activation='sigmoid')
])
```

```
_________________________________________________________________
Layer (type)                 Output Shape              Param #
=================================================================
embedding_2 (Embedding)      (None, None, 64)          523840
_________________________________________________________________
bidirectional_1 (Bidirection (None, 128)               66048
_________________________________________________________________
dense_4 (Dense)              (None, 64)                8256
_________________________________________________________________
dense_5 (Dense)              (None, 1)                 65
=================================================================
Total params: 598,209
Trainable params: 598,209
Non-trainable params: 0
```

```
_________________________________________________________________
Layer (type)                 Output Shape              Param #
=================================================================
embedding_2 (Embedding)      (None, None, 64)          523840
_________________________________________________________________
bidirectional_1 (Bidirection (None, 128)               66048
_________________________________________________________________
dense_4 (Dense)              (None, 64)                8256
_________________________________________________________________
dense_5 (Dense)              (None, 1)                 65
=================================================================
Total params: 598,209
Trainable params: 598,209
Non-trainable params: 0
```

```python
model = tf.keras.Sequential([
    tf.keras.layers.Embedding(tokenizer.vocab_size, 64),
    tf.keras.layers.Bidirectional(tf.keras.layers.LSTM(64, return_sequences=True)),
    tf.keras.layers.Bidirectional(tf.keras.layers.LSTM(32)),
    tf.keras.layers.Dense(64, activation='relu'),
    tf.keras.layers.Dense(1, activation='sigmoid')
])
```

```python
model = tf.keras.Sequential([
    tf.keras.layers.Embedding(tokenizer.vocab_size, 64),
    tf.keras.layers.Bidirectional(tf.keras.layers.LSTM(64, return_sequences=True)),
    tf.keras.layers.Bidirectional(tf.keras.layers.LSTM(32)),
    tf.keras.layers.Dense(64, activation='relu'),
    tf.keras.layers.Dense(1, activation='sigmoid')
])
```

```
Layer (type)                 Output Shape              Param #
=================================================================
embedding_3 (Embedding)      (None, None, 64)          523840
_________________________________________________________________
bidirectional_2 (Bidirection (None, None, 128)         66048
_________________________________________________________________
bidirectional_3 (Bidirection (None, 64)                41216
_________________________________________________________________
dense_6 (Dense)              (None, 64)                4160
_________________________________________________________________
dense_7 (Dense)              (None, 1)                 65
=================================================================
Total params: 635,329
Trainable params: 635,329
Non-trainable params: 0
```

Colab 3: Sarcasm Classifier with LSTMs

Generative

In the town of Athy one Jeremy Lanigan
Battered away til he hadnt a pound.
His father died and made him a man again
Left him a farm and ten acres of ground.

He gave a grand party for friends and relations
Who didnt forget him when come to the wall,
And if youll but listen Ill make your eyes glisten
Of the rows and the ructions of Lanigan's Ball.

Myself to be sure got free invitation,
For all the nice girls and boys I might ask,
And just in a minute both friends and relations
Were dancing round merry as bees round a cask.

Judy ODaly, that nice little milliner,
She tipped me a wink for to give her a call,
And I soon arrived with Peggy McGilligan
Just in time for Lanigans Ball.

In the town of Athy one Jeremy Lanigan

[4 2 66 8 67 68 69 70]

Line:

[4 2 66 8 67 68 69 70]

Input Sequences:

[4 2]

[4 2 66]

[4 2 66 8]

[4 2 66 8 67]

[4 2 66 8 67 68]

[4 2 66 8 67 68 69]

[4 2 66 8 67 68 69 70]

Line:

[4 2 66 8 67 68 69 70]

Padded Input Sequences:

[0 0 0 0 0 0 0 0 0 0 4 2]

[0 0 0 0 0 0 0 0 0 4 2 66]

[0 0 0 0 0 0 0 0 4 2 66 8]

[0 0 0 0 0 0 0 4 2 66 8 67]

[0 0 0 0 0 0 4 2 66 8 67 68]

[0 0 0 0 0 4 2 66 8 67 68 69]

[0 0 0 0 4 2 66 8 67 68 69 70]

Padded Input Sequences:

```
[0 0 0 0 0 0 0 0 0 0 4 2]

[0 0 0 0 0 0 0 0 0 4 2 66]

[0 0 0 0 0 0 0 0 4 2 66 8]

[0 0 0 0 0 0 0 4 2 66 8 67]

[0 0 0 0 0 0 4 2 66 8 67 68]

[0 0 0 0 0 4 2 66 8 67 68 69]

[0 0 0 0 4 2 66 8 67 68 69 70]
```

Padded Input Sequences:

Input (X)

Label (Y)

```
[0 0 0 0 0 0 0 0 0 0 4 2]
[0 0 0 0 0 0 0 0 0 4 2 66]
[0 0 0 0 0 0 0 0 4 2 66 8]
[0 0 0 0 0 0 0 4 2 66 8 67]
[0 0 0 0 0 0 4 2 66 8 67 68]
[0 0 0 0 0 4 2 66 8 67 68 69]
[0 0 0 0 4 2 66 8 67 68 69 70]
```

Padded Input Sequences:

```
[0 0 0 0 0 0 0 0 0 0 4 2]
[0 0 0 0 0 0 0 0 0 4 2 66]
[0 0 0 0 0 0 0 0 4 2 66 8]
[0 0 0 0 0 0 0 4 2 66 8 67]
[0 0 0 0 0 0 4 2 66 8 67 68]
[0 0 0 0 0 4 2 66 8 67 68 69]
[0 0 0 0 4 2 66 8 67 68 69 70]
```

Input (X)

Label (Y)

Padded Input Sequences:

```
[0 0 0 0 0 0 0 0 0 0 4 2]

[0 0 0 0 0 0 0 0 0 4 2 66]

[0 0 0 0 0 0 0 0 4 2 66 8]

[0 0 0 0 0 0 0 4 2 66 8 67]

[0 0 0 0 0 0 4 2 66 8 67 68]

[0 0 0 0 0 4 2 66 8 67 68 69]

[0 0 0 0 4 2 66 8 67 68 69 70]
```

Input (X)

Label (Y)

```
Sentence: [0 0 0 0 4 2 66 8 67 68 69 70]

       X:[0 0 0 0 4 2 66 8 67 68 69]

   Label:[ 70 ]

       Y:[ 0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
           0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
           0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
           0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  1.  0.
           0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
           0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
           0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
           0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
           0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
           0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
           0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
           0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
           0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
           0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
           0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.]
```

```
Sentence: [0 0 0 0 4 2 66 8 67 68 69 70]

       X: [0 0 0 0 4 2 66 8 67 68 69]

   Label: [ 70 ]

       Y: [ 0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
            0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
            0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
            0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  1.  0.
            0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
            0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
            0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
            0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
            0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
            0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
            0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
            0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
            0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
            0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.
            0.  0.  0.  0.  0.  0.  0.  0.  0.  0.  0.]
```

Laurence went to dublin think and wine for lanigans ball entangled in nonsense me
Laurence went to dublin his pipes bellows chanters and all all entangled all kinds
Laurence went to dublin how the room a whirligig ructions long at brooks fainted

Laurence went to dublin

```
token_list = tokenizer.texts_to_sequences([seed_text])[0]
```

Laurence went to dublin

[134, 13, 59]

```
token_list = pad_sequences([token_list], maxlen=max_sequence_len - 1, padding='pre')
```

```
[  0   0   0   0   0   0   0 134  13  59]
```

```
[  0   0   0   0   0   0   0 134  13  59] [ ? ]
```

```
[  0   0   0   0   0   0   0 134  13  59] [ 27 ]
```

```
[  0   0   0   0   0   0   134  13  59  27] [ ? ]
```

Laurence went to dublin round a cask cask cask cask cask
squeezed forget tea twas make eyes glisten mchugh mchugh
lanigan lanigan glisten glisten glisten glisten glisten
glisten glisten glisten glisten glisten glisten glisten
glisten glisten glisten glisten glisten glisten glisten
glisten glisten glisten glisten glisten glisten glisten
glisten glisten glisten glisten glisten glisten glisten
glisten glisten glisten glisten glisten glisten glisten
glisten glisten glisten glisten glisten glisten glisten
glisten glisten glisten glisten glisten glisten glisten
glisten glisten glisten glisten glisten glisten glisten
glisten glisten glisten glisten glisten glisten glisten
glisten glisten glisten glisten glisten glisten glisten
glisten glisten glisten glisten glisten glisten glisten

You know nothing, Jon Snow

You know nothing, Jon Snow
the place where he’s stationed
be it Cork or in the blue bird’s son
sailed out to summer
old sweet long and gladness rings
so i’ll wait for the wild colleen dying

You know nothing, Jon Snow
the place where he’s stationed
be it Cork or in the blue bird’s son
sailed out to summer
old sweet long and gladness rings
so i’ll wait for the wild colleen dying

Colab 4: Irish Songs Generator