1.

‘

```
for i, file in enumerate(list_of_audiofiles):
    y, sr = librosa.load(file)
    mfcc = librosa.feature.mfcc(y=y, sr=sr, hop_length=self.hop_length, n_mfcc=13)
    spectral_center = librosa.feature.spectral_centroid(y=y, sr=sr, hop_length=self.hop_length)
    chroma = librosa.feature.chroma_cens(y=y, sr=sr, hop_length=self.hop_length)
    rmse = librosa.feature.rmse(y=y, hop_length=self.hop_length)

    splits = re.split('[ .]', file)
    genre = re.split('[ /]', splits[1])[3]
    target.append(genre)

    data[i, :, 0:13] = mfcc.T[0:timeseries_length, :]
    data[i, :, 13:14] = spectral_center.T[0:timeseries_length, :]
    data[i, :, 14:26] = chroma.T[0:timeseries_length, :]
    data[i, :, 26:33] = rmse.T[0:timeseries_length, :]
```

```
Epoch 400/400

 35/420 [=>............................] - ETA: 1s - loss: 0.2383 - acc: 0.9714
 70/420 [====>.........................] - ETA: 1s - loss: 0.3148 - acc: 0.9000
105/420 [======>.......................] - ETA: 1s - loss: 0.4082 - acc: 0.8571
140/420 [=========>....................] - ETA: 1s - loss: 0.3624 - acc: 0.8786
175/420 [===========>..................] - ETA: 0s - loss: 0.3770 - acc: 0.8743
210/420 [==============>...............] - ETA: 0s - loss: 0.3632 - acc: 0.8810
245/420 [================>.............] - ETA: 0s - loss: 0.3586 - acc: 0.8816
280/420 [===================>..........] - ETA: 0s - loss: 0.3301 - acc: 0.8929
315/420 [=====================>........] - ETA: 0s - loss: 0.3383 - acc: 0.8889
350/420 [========================>.....] - ETA: 0s - loss: 0.3478 - acc: 0.8800
385/420 [==========================>...] - ETA: 0s - loss: 0.3613 - acc: 0.8701
420/420 [==============================] - 2s 4ms/step - loss: 0.3626 - acc: 0.8643

Validating ...

 35/120 [=======>......................] - ETA: 0s
105/120 [=========================>....] - ETA: 0s
120/120 [==============================] - 0s 3ms/step
Dev loss:    1.1321315790216129
Dev accuracy:    0.6666666828095913

Testing ...

35/60 [================>.............] - ETA: 0s
60/60 [==============================] - 0s 909us/step
Test loss:    1.2191942036151886
Test accuracy:    0.6833333422740301
```

2.

```
for i, file in enumerate(list_of_audiofiles):
    y, sr = librosa.load(file)
    mfcc = librosa.feature.mfcc(y=y, sr=sr, hop_length=self.hop_length, n_mfcc=13)
    spectral_center = librosa.feature.spectral_centroid(y=y, sr=sr, hop_length=self.hop_length)
    chroma = librosa.feature.chroma_cens(y=y, sr=sr, hop_length=self.hop_length)
    spectral_contrast = librosa.feature.spectral_contrast(y=y, sr=sr, hop_length=self.hop_length)

    splits = re.split('[ .]', file)
    genre = re.split('[ /]', splits[1])[3]
    target.append(genre)

    data[i, :, 0:13] = mfcc.T[0:timeseries_length, :]
    data[i, :, 13:14] = spectral_center.T[0:timeseries_length, :]
    data[i, :, 14:26] = chroma.T[0:timeseries_length, :]
    data[i, :, 26:33] = spectral_contrast.T[0:timeseries_length, :]
```

```
Epoch 400/400

 35/420 [=>............................] - ETA: 1s - loss: 0.3663 - acc: 0.8857
 70/420 [====>.........................] - ETA: 1s - loss: 0.2992 - acc: 0.9000
105/420 [======>.......................] - ETA: 1s - loss: 0.3019 - acc: 0.9048
140/420 [=========>....................] - ETA: 1s - loss: 0.2965 - acc: 0.8929
175/420 [===========>..................] - ETA: 1s - loss: 0.3143 - acc: 0.8800
210/420 [==============>...............] - ETA: 0s - loss: 0.3222 - acc: 0.8810
245/420 [================>.............] - ETA: 0s - loss: 0.3409 - acc: 0.8735
280/420 [===================>..........] - ETA: 0s - loss: 0.3224 - acc: 0.8857
315/420 [=====================>........] - ETA: 0s - loss: 0.3129 - acc: 0.8889
350/420 [========================>.....] - ETA: 0s - loss: 0.3051 - acc: 0.8914
385/420 [==========================>...] - ETA: 0s - loss: 0.3115 - acc: 0.8857
420/420 [==============================] - 2s 4ms/step - loss: 0.3237 - acc: 0.8810

Validating ...

 35/120 [=======>......................] - ETA: 0s
105/120 [=========================>....] - ETA: 0s
120/120 [==============================] - 0s 3ms/step
Dev loss:   1.0959213078022003
Dev accuracy:   0.6416666842997074

Testing ...

35/60 [================>.............] - ETA: 0s
60/60 [==============================] - 0s 884us/step
Test loss:   1.1959176063537598
Test accuracy:   0.6500000208616257
```

3.

```
for i, file in enumerate(list_of_audiofiles):
    y, sr = librosa.load(file)
    mfcc = librosa.feature.mfcc(y=y, sr=sr, hop_length=self.hop_length, n_mfcc=13)
    spectral_center = librosa.feature.spectral_centroid(y=y, sr=sr, hop_length=self.hop_length)
    chroma = librosa.feature.chroma_cens(y=y, sr=sr, hop_length=self.hop_length)
    spectral_bandwidth = librosa.feature.spectral_bandwidth(y=y, sr=sr, hop_length=self.hop_length)

    splits = re.split('[ .]', file)
    genre = re.split('[ /]', splits[1])[3]
    target.append(genre)

    data[i, :, 0:13] = mfcc.T[0:timeseries_length, :]
    data[i, :, 13:14] = spectral_center.T[0:timeseries_length, :]
    data[i, :, 14:26] = chroma.T[0:timeseries_length, :]
    data[i, :, 26:33] = spectral_bandwidth.T[0:timeseries_length, :]
```

```
Epoch 400/400

 35/420 [=>............................] - ETA: 1s - loss: 1.1163 - acc: 0.5143
 70/420 [====>.........................] - ETA: 1s - loss: 0.9843 - acc: 0.6286
105/420 [======>.......................] - ETA: 1s - loss: 1.0822 - acc: 0.6000
140/420 [=========>....................] - ETA: 1s - loss: 1.0109 - acc: 0.6357
175/420 [===========>..................] - ETA: 0s - loss: 0.9601 - acc: 0.6514
210/420 [==============>...............] - ETA: 0s - loss: 0.9193 - acc: 0.6667
245/420 [================>.............] - ETA: 0s - loss: 0.9080 - acc: 0.6694
280/420 [===================>..........] - ETA: 0s - loss: 0.8786 - acc: 0.6750
315/420 [=====================>........] - ETA: 0s - loss: 0.8894 - acc: 0.6667
350/420 [========================>.....] - ETA: 0s - loss: 0.8771 - acc: 0.6714
385/420 [==========================>...] - ETA: 0s - loss: 0.8778 - acc: 0.6649
420/420 [==============================] - 2s 4ms/step - loss: 0.8833 - acc: 0.6667

Validating ...

 35/120 [=======>......................] - ETA: 0s
105/120 [=========================>....] - ETA: 0s
120/120 [==============================] - 0s 3ms/step
Dev loss:    1.020694226026535
Dev accuracy:    0.6166666895151138

Testing ...

35/60 [================>.............] - ETA: 0s
60/60 [==============================] - 0s 901us/step
Test loss:    0.9509770373503367
Test accuracy:    0.5833333432674408
```

4.

```
for i, file in enumerate(list_of_audiofiles):
    y, sr = librosa.load(file)
    mfcc = librosa.feature.mfcc(y=y, sr=sr, hop_length=self.hop_length, n_mfcc=13)
    spectral_center = librosa.feature.spectral_centroid(y=y, sr=sr, hop_length=self.hop_length)
    chroma = librosa.feature.chroma_cens(y=y, sr=sr, hop_length=self.hop_length)
    spectral_flatness = librosa.feature.spectral_flatness(y=y, hop_length=self.hop_length)

    splits = re.split('[ .]', file)
    genre = re.split('[ /]', splits[1])[3]
    target.append(genre)

    data[i, :, 0:13] = mfcc.T[0:timeseries_length, :]
    data[i, :, 13:14] = spectral_center.T[0:timeseries_length, :]
    data[i, :, 14:26] = chroma.T[0:timeseries_length, :]
    data[i, :, 26:33] = spectral_flatness.T[0:timeseries_length, :]
```

```
Epoch 400/400

 35/420 [=>............................] - ETA: 1s - loss: 0.2677 - acc: 0.8857
 70/420 [====>.........................] - ETA: 1s - loss: 0.3010 - acc: 0.8714
105/420 [======>.......................] - ETA: 1s - loss: 0.2863 - acc: 0.8952
140/420 [=========>....................] - ETA: 1s - loss: 0.2556 - acc: 0.9071
175/420 [===========>..................] - ETA: 0s - loss: 0.2629 - acc: 0.9029
210/420 [==============>...............] - ETA: 0s - loss: 0.2766 - acc: 0.8952
245/420 [================>.............] - ETA: 0s - loss: 0.2941 - acc: 0.8980
280/420 [===================>..........] - ETA: 0s - loss: 0.2730 - acc: 0.9071
315/420 [=====================>........] - ETA: 0s - loss: 0.2676 - acc: 0.9079
350/420 [========================>.....] - ETA: 0s - loss: 0.2711 - acc: 0.9114
385/420 [==========================>...] - ETA: 0s - loss: 0.2693 - acc: 0.9117
420/420 [==============================] - 2s 4ms/step - loss: 0.2690 - acc: 0.9119

Validating ...

 35/120 [=======>......................] - ETA: 0s
105/120 [=========================>....] - ETA: 0s
120/120 [==============================] - 0s 3ms/step
Dev loss:   0.8947887097795805
Dev accuracy:   0.7583333477377892

Testing ...

35/60 [================>.............] - ETA: 0s
60/60 [==============================] - 0s 907us/step
Test loss:   1.029723157485326
Test accuracy:   0.6333333551883698
```

5.

```
for i, file in enumerate(list_of_audiofiles):
    y, sr = librosa.load(file)
    mfcc = librosa.feature.mfcc(y=y, sr=sr, hop_length=self.hop_length, n_mfcc=13)
    spectral_center = librosa.feature.spectral_centroid(y=y, sr=sr, hop_length=self.hop_length)
    chroma = librosa.feature.chroma_cens(y=y, sr=sr, hop_length=self.hop_length)
    spectral_rolloff = librosa.feature.spectral_rolloff(y=y, sr=sr, hop_length=self.hop_length)

    splits = re.split('[ .]', file)
    genre = re.split('[ /]', splits[1])[3]
    target.append(genre)

    data[i, :, 0:13] = mfcc.T[0:timeseries_length, :]
    data[i, :, 13:14] = spectral_center.T[0:timeseries_length, :]
    data[i, :, 14:26] = chroma.T[0:timeseries_length, :]
    data[i, :, 26:33] = spectral_rolloff.T[0:timeseries_length, :]
```

```
Epoch 400/400

 35/420 [=>............................] - ETA: 2s - loss: 0.8835 - acc: 0.6857
 70/420 [====>.........................] - ETA: 1s - loss: 1.0689 - acc: 0.5571
105/420 [======>.......................] - ETA: 1s - loss: 1.0933 - acc: 0.5810
140/420 [=========>....................] - ETA: 1s - loss: 1.0484 - acc: 0.5929
175/420 [===========>..................] - ETA: 1s - loss: 1.0241 - acc: 0.6229
210/420 [==============>...............] - ETA: 1s - loss: 1.0300 - acc: 0.6190
245/420 [================>.............] - ETA: 0s - loss: 1.0319 - acc: 0.6245
280/420 [==================>...........] - ETA: 0s - loss: 1.0403 - acc: 0.6214
315/420 [====================>.........] - ETA: 0s - loss: 1.0488 - acc: 0.6222
350/420 [======================>.....] - ETA: 0s - loss: 1.0733 - acc: 0.6086
385/420 [========================>...] - ETA: 0s - loss: 1.0566 - acc: 0.6104
420/420 [==============================] - 2s 5ms/step - loss: 1.0416 - acc: 0.6143

Validating ...

 35/120 [=======>......................] - ETA: 0s
105/120 [=========================>....] - ETA: 0s
120/120 [==============================] - 0s 3ms/step
Dev loss:   1.000188333292802
Dev accuracy:   0.6000000151495138

Testing ...

35/60 [================>.............] - ETA: 0s
60/60 [==============================] - 0s 1ms/step
Test loss:   1.244888613621394
Test accuracy:   0.4666666661699613
```

6.