```
# Pandas for data loading and processing
import pandas as pd
#Data Analysis
from sklearn.linear model import LogisticRegression
#Data splitting
from sklearn.model selection import train test split
#Numpy for diverse math functions
import numpy as np
#Model validation
from sklearn.metrics import matthews corrcoef
from sklearn.metrics import accuracy score
from sklearn.metrics import roc curve, roc auc score
from sklearn.metrics import fl score
from sklearn.metrics import r2 score
#visualization libraries
import matplotlib.pyplot as plt
import seaborn as sns
#Upsampling
from sklearn.utils import resample
from keras.models import Sequential
from keras.layers import Dense
from keras.callbacks import EarlyStopping
from keras.optimizers import Adam
from keras.layers import LSTM
#Keras Plot
from keras.utils.vis utils import plot model
from numpy.random import seed
seed(1)
# Reading data from schwartau
schwartau daily = pd.read csv('schwartau daily filtered.csv')
wurzburg daily = pd.read csv('wurzburg daily filtered.csv')
#describe our data
schwartau daily[schwartau daily.select dtypes(exclude='object').columns].describe()
style.background gradient(axis=1,cmap=sns.light palette('green', as cmap=True))
```

humidity temperature weight flow_processed count 876.000000 876.000000 876.000000 876.000000 mean 0.919858 0.687783 0.623752 0.414384 **std** 0.128482 0.285003 0.184739 0.492897 **min** 0.000000 0.000000 0.000000 0.000000 **25%** 0.891383 0.438502 0.546425 0.000000 **50%** 0.954106 0.731163 0.637123 0.000000 0.738289 **75%** 0.982003 0.971083 1.000000

1 de 5

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partition_wurzburg=500
train_wurzburg = wurzburg_daily.loc[:partition_wurzburg]
test_wurzburg = wurzburg_daily.loc[partition_wurzburg:]

train_schwartau.head(5)

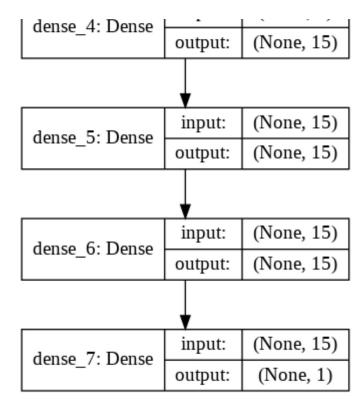
	timestamp	humidity	temperature	weight	flow_processed
0	2017-01-01	0.990202	0.512689	0.556983	0
1	2017-01-02	0.994032	0.461218	0.556118	0
2	2017-01-03	0.992017	0.529935	0.557344	0
3	2017-01-04	0.986461	0.494228	0.554749	0
4	2017-01-05	0.982919	0.355459	0.550123	0

```
x train = train schwartau[:-1]
y train = train schwartau[1:]
x test = test schwartau[:-1]
y test = test schwartau[1:]
x train schwartau = x train.drop(['flow processed','timestamp'], axis=1)
y train schwartau = y train.drop(['timestamp','humidity','temperature','weight'], 
x test schwartau = x test.drop(['flow processed','timestamp'], axis=1)
y test schwartau = y test.drop(['timestamp','humidity','temperature','weight'], ax:
nn model = Sequential()
nn model.add(Dense(15, input dim=3, activation='relu'))
nn model.add(Dense(15, activation='sigmoid'))
nn model.add(Dense(15, activation='relu'))
nn model.add(Dense(1, activation='sigmoid'))
nn model.compile(loss='mean squared error', optimizer='adam')
early stop = EarlyStopping(monitor='loss', patience=5, verbose=1)
history = nn model.fit(x train schwartau, y train schwartau, epochs=10000, batch s:
    Epoch 1/10000
    Epoch 2/10000
```

2 de 5 1/06/2021, 11:29 p. m.

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Epoch 10/10000]		0.5	эшэ/ эсер		1033.	0.2440
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Epoch 11/10000	•						
3/3 [===================================	=====]	-	0s	3ms/step	_	loss:	0.2436
Epoch 12/10000							
3/3 [===================================	=====]	-	0s	6ms/step	-	loss:	0.2434
Epoch 13/10000							
3/3 [===================================	=====]	-	0s	4ms/step	-	loss:	0.2432
Epoch 14/10000	_					_	
3/3 [===================================	=====]	-	0s	4ms/step	_	loss:	0.2430
Epoch 15/10000 3/3 [===================================	1		0 0	Ama /aton		1000.	0 2420
Epoch 16/10000		_	US	4ms/scep	_	TOSS:	0.2429
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Epoch 17/10000	J		OB	me, seep		1000.	0.2127
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Epoch 18/10000	-			,			
3/3 [===================================	=====]	-	0s	4ms/step	_	loss:	0.2423
Epoch 19/10000							
3/3 [===================================	=====]	-	0s	5ms/step	-	loss:	0.2421
Epoch 20/10000							
3/3 [===================================	=====]	-	0s	5ms/step	-	loss:	0.2419
Epoch 21/10000	_					_	
3/3 [===================================	=====]	-	0s	4ms/step	_	loss:	0.2417
Epoch 22/10000 3/3 [===================================	1		0 0	Ema/aton		1000.	0 2/15
Epoch 23/10000		_	US	oms/scep	_	TOSS:	0.2413
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Epoch 25/10000				-			
3/3 [===================================	=====]	-	0s	4ms/step	-	loss:	0.2409
Epoch 26/10000							
3/3 [===================================	=====]	-	0s	4ms/step	-	loss:	0.2407
Epoch 27/10000							
3/3 [===================================	=====]	-	0s	3ms/step	-	loss:	0.2405
Epoch 28/10000	7		0 -	F / :		1	0 0400
3/3 [===================================	=====]	-	US	oms/step	-	TOSS:	0.2402
Epoch 29/10000							

3 de 5 1/06/2021, 11:29 p. m.



4 de 5 1/06/2021, 11:29 p. m.

5 de 5