Zwei-Stufen-XGBoost – Experiment-Report

Experiment-ID: v9_h4_thr0p5pct_tol0p3_30dfeat

Dieses Dokument fasst die wichtigsten Parameter, Datenquellen und Metriken eines Zwei-Stufen-XGBoost-Experiments zusammen.

Stufe 1 (Signal): neutral vs. Bewegung ('move'). Stufe 2 (Richtung): down vs. up – nur an Bewegungstagen.

Label-Parameter:

- horizon_days: 4
- up_threshold: 0.005
- down_threshold: -0.005
- strict_monotonic: False

Datensatz & Splits:

- dataset_path: /Users/jeremynathan/Documents/GitHub/hs2025_ml_project/hs2025_ml_project/data/processed/datasets/eurusd_news_training.csv
- test_start: 2025-01-01
- train_frac_within_pretest: 0.8

Features (FEATURE_COLS): vollständige Liste auf der Feature-Seite weiter unten.

Legende & Begriffe

Zielvariablen:

- label: 3-Klassen-Ziel auf Basis des 4-Tage-Lookaheads (neutral / up / down).

- signal: 0 = neutral, 1 = Bewegung (up oder down).

- direction: 0 = down, 1 = up; nur definiert, wenn signal == 1.

Wichtige Metriken:

- precision: Anteil der vorhergesagten positiven Fälle, die wirklich positiv sind.

- recall: Anteil der tatsächlichen positiven Fälle, die erkannt wurden.

- f1: harmonischer Mittelwert aus precision und recall (Balance beider Größen).

- support: Anzahl der Beobachtungen in der jeweiligen Klasse.

Feature-Abkürzungen (Auswahl):

- article_count: Anzahl News-Artikel pro Tag.

- avg_polarity / avg_neg / avg_neu / avg_pos: durchschnittliche Sentiment-Werte.

- pos_share / neg_share: Anteil positiver bzw. negativer Sentiment-Komponente.

- intraday_range_pct: (High - Low) / Close – relative Tages-Spanne (Volatilität).

- upper_shadow / lower_shadow: obere/untere Dochte der Kerzen (High/Low vs. Körper).

- month / quarter: Kalendermonat und Quartal.

Modell-Parameter (XGBoost)

Signal-Modell (Stufe 1):

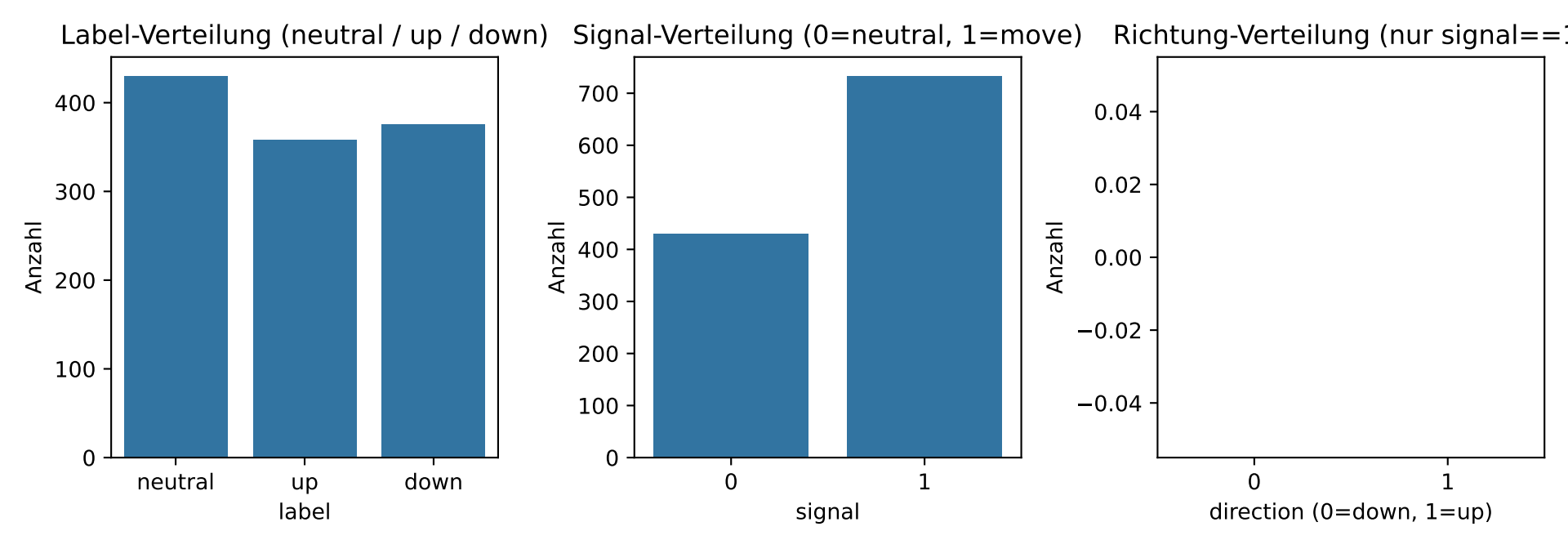
- objective: binary:logistic
- max_depth: 3
- learning_rate: 0.05
- n_estimators: None
- subsample: 0.9
- colsample_bytree: 0.9
- scale_pos_weight: 1.2366863905325445

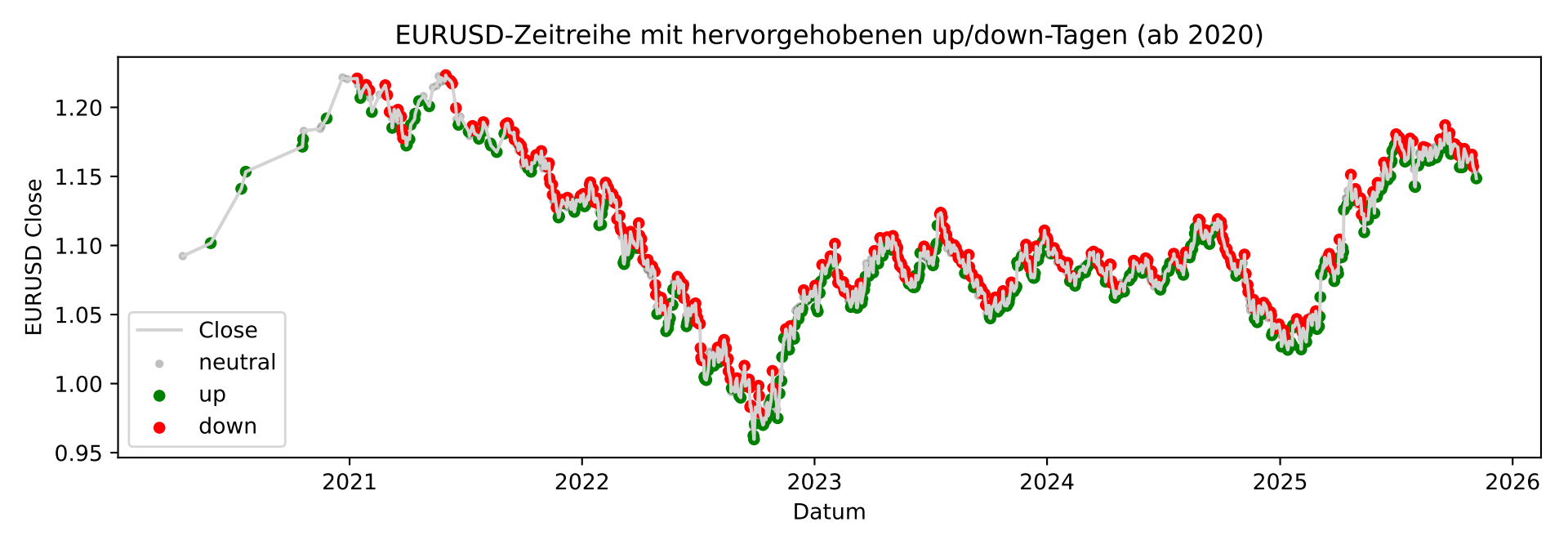
Richtungs-Modell (Stufe 2):

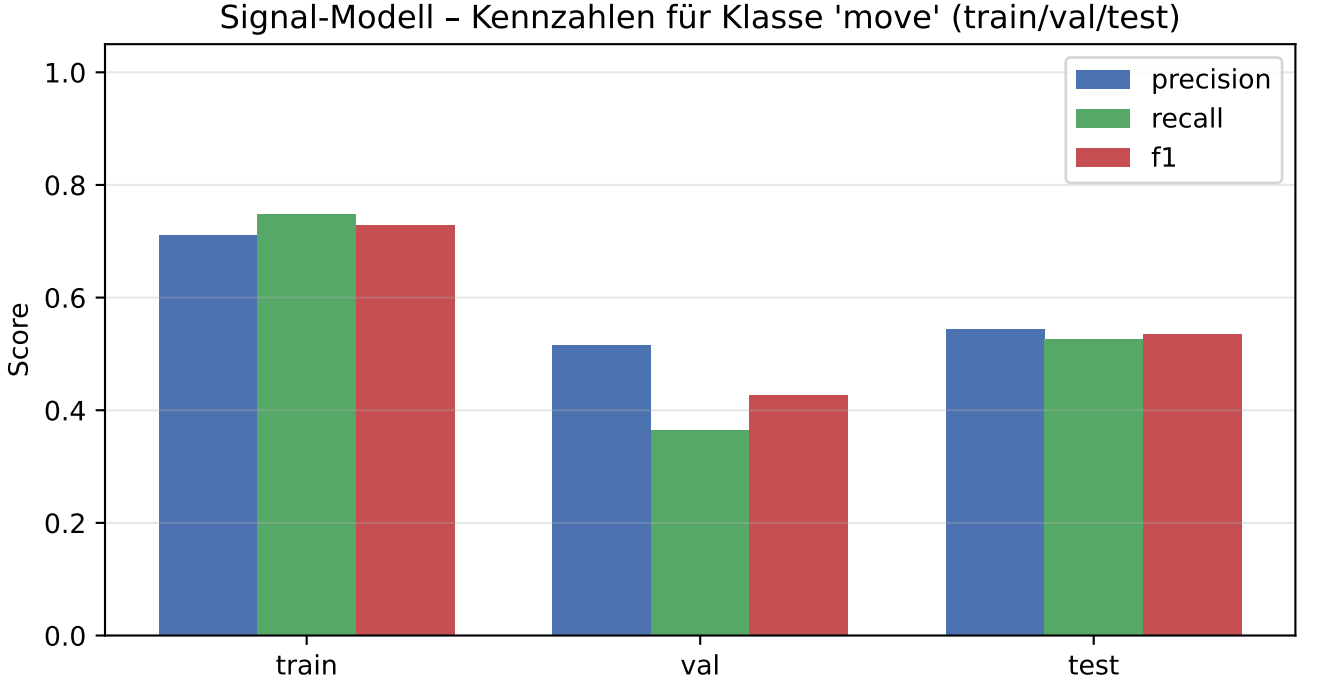
- objective: binary:logistic
- max_depth: 3
- learning_rate: 0.05
- n_estimators: None
- subsample: 0.9
- colsample_bytree: 0.9
- scale_pos_weight: 1.0

Verwendete Features (FEATURE_COLS)

#	feature_name
0	article_count
1	avg_polarity
2	avg_neg
3	avg_neu
4	avg_pos
5	pos_share
6	neg_share
7	intraday_range_pct
8	upper_shadow
9	lower_shadow
10	price_close_ret_1d
11	price_close_ret_5d
12	price_range_pct_5d_std
13	price_body_pct_5d_mean
14	news_article_count_3d_sum
15	news_article_count_7d_sum
16	news_pos_share_5d_mean
17	news_neg_share_5d_mean
18	news_article_count_lag1
19	news_pos_share_lag1
20	news_neg_share_lag1
21	month
22	quarter
23	cal_dow
24	cal_day_of_month
25	cal_is_monday
26	cal_is_friday
27	cal_is_month_start
28	cal_is_month_end
29	hol_is_us_federal_holiday
30	hol_is_day_before_us_federal_holiday
31	hol_is_day_after_us_federal_holiday

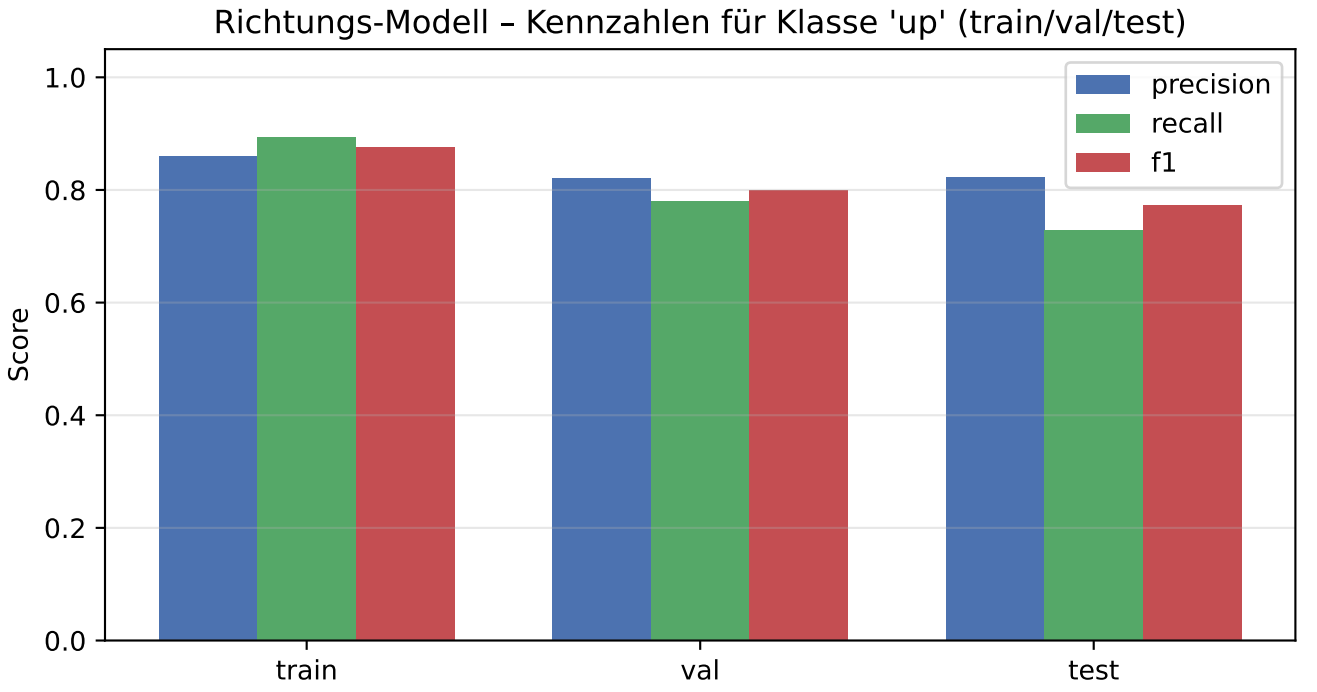

Label-Verteilung (neutral / up / down)
Anzahl
0
100
200
300
400
neutral
up
down
label
Signal-Verteilung (0=neutral, 1=move)
Anzahl
0
100
200
300
400
500
600
700
0
1
signal
Richtung-Verteilung (nur signal==1
Anzahl
−0.04
−0.02
0.00
0.02
0.04
0
1
direction (0=down, 1=up)


EURUSD-Zeitreihe mit hervorgehobenen up/down-Tagen (ab 2020)
EURUSD Close
1.20
1.15
1.10
1.05
1.00
0.95
Close
neutral
up
down
2021
2022
2023
2024
2025
2026
Datum


Signal-Modell – Kennzahlen für Klasse 'move' (train/val/test)
precision
recall
f1
Score
1.0
0.8
0.6
0.4
0.2
0.0
train
val
test

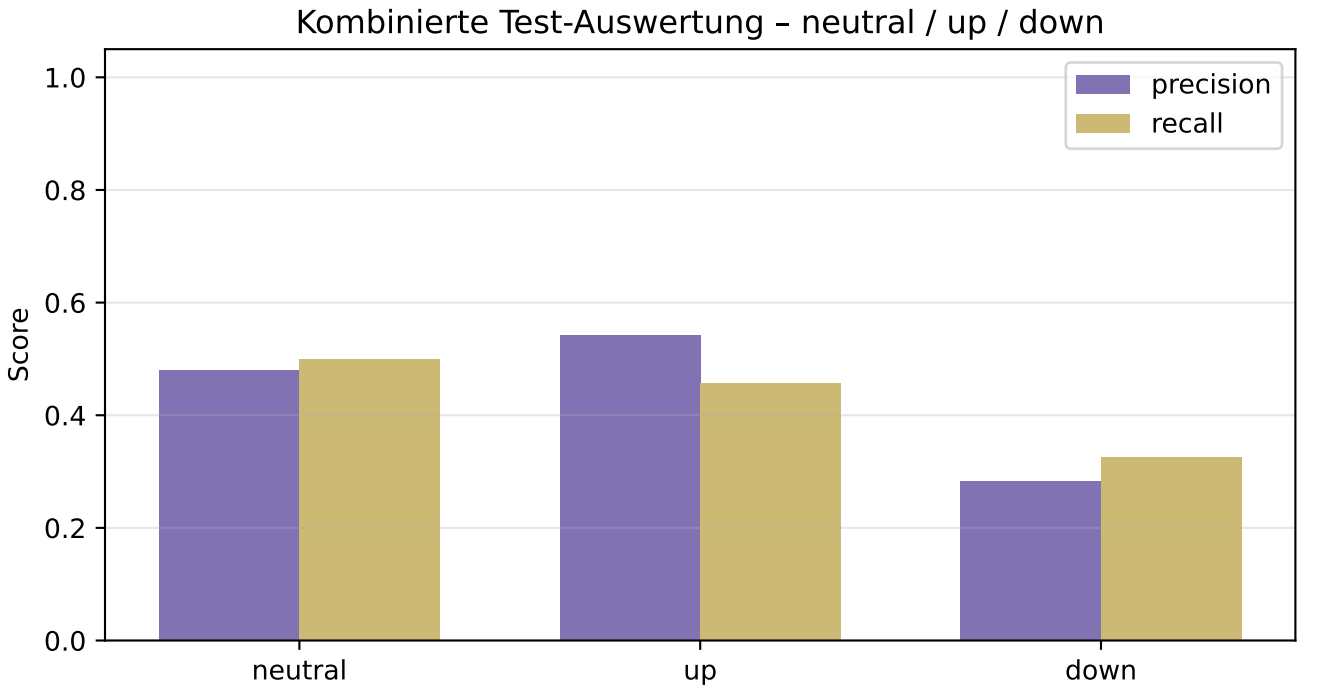
Signal-Modell – Tabelle (Klasse 'move')

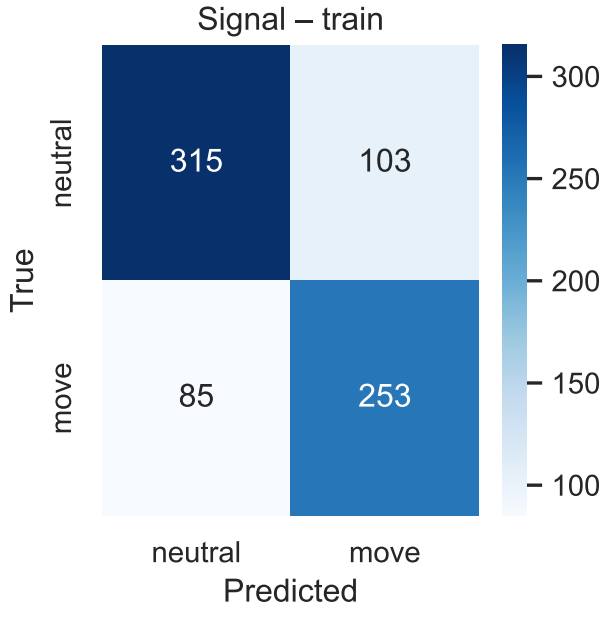
split	precision	recall	f1	support
train	0.711	0.749	0.729	338.000
val	0.517	0.365	0.428	85.000
test	0.545	0.526	0.535	116.000

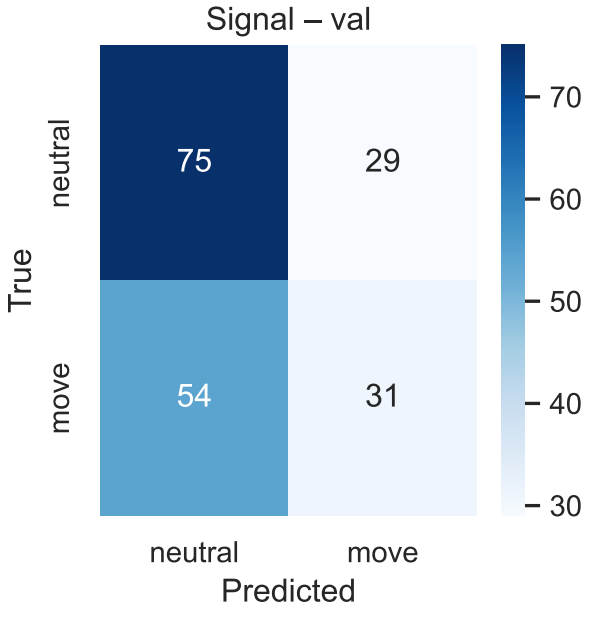

Richtungs-Modell – Kennzahlen für Klasse 'up' (train/val/test)
precision
recall
f1
Score
1.0
0.8
0.6
0.4
0.2
0.0
train
val
test

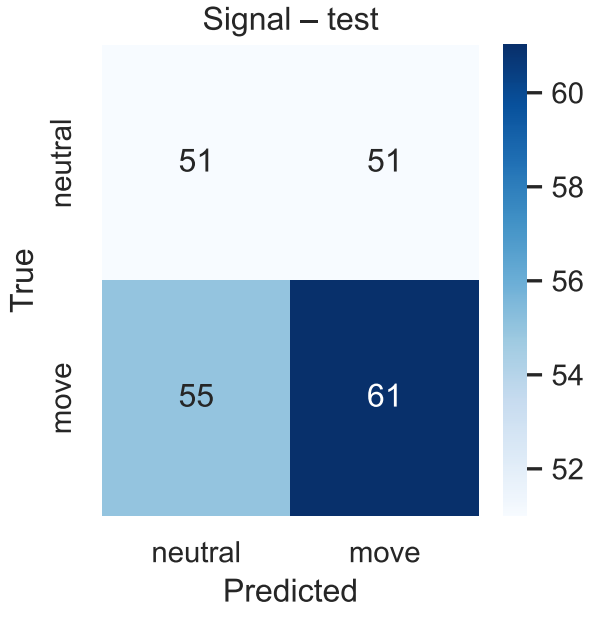
Richtungs-Modell – Tabelle (Klasse 'up')

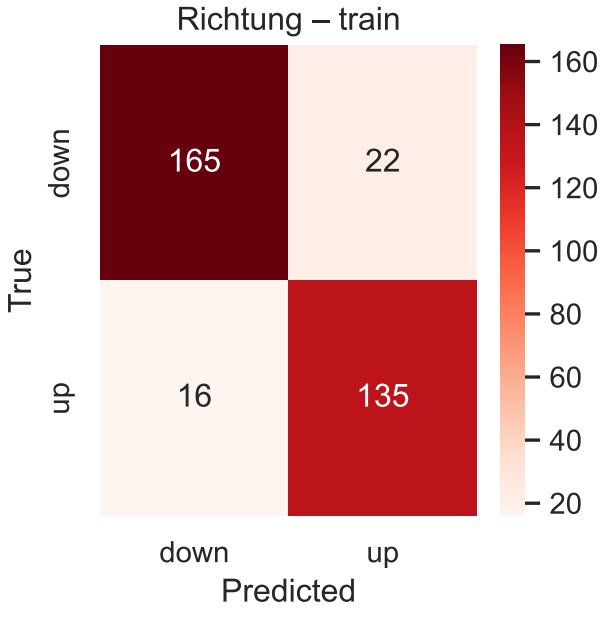
split	precision	recall	f1	support
train	0.860	0.894	0.877	151.000
val	0.821	0.780	0.800	41.000
test	0.823	0.729	0.773	70.000

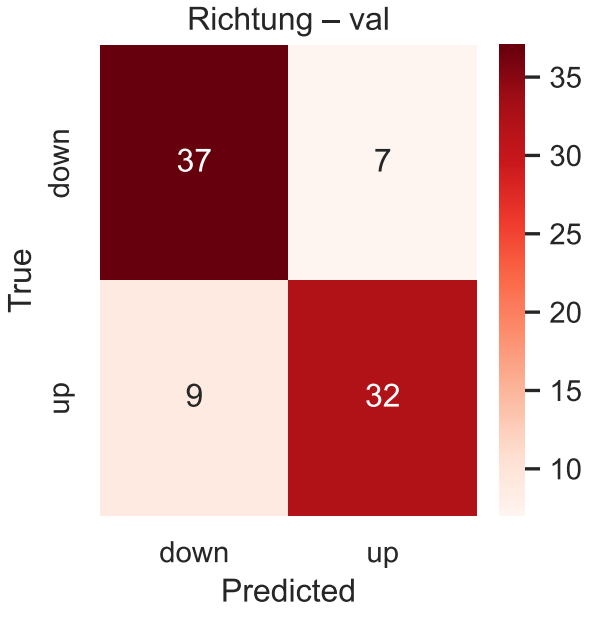

Kombinierte Test-Auswertung – neutral / up / down
precision
recall
Score
1.0
0.8
0.6
0.4
0.2
0.0
neutral
up
down

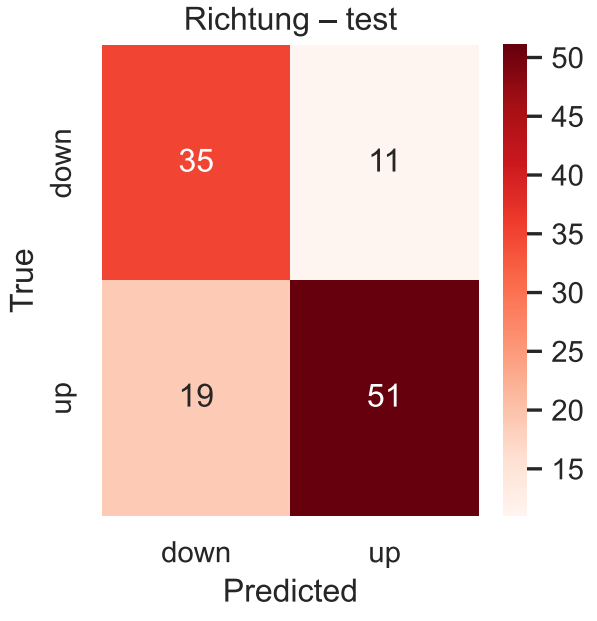

Signal – train
True
neutral
move
315
103
85
253
neutral
move
Predicted
300
250
200
150
100

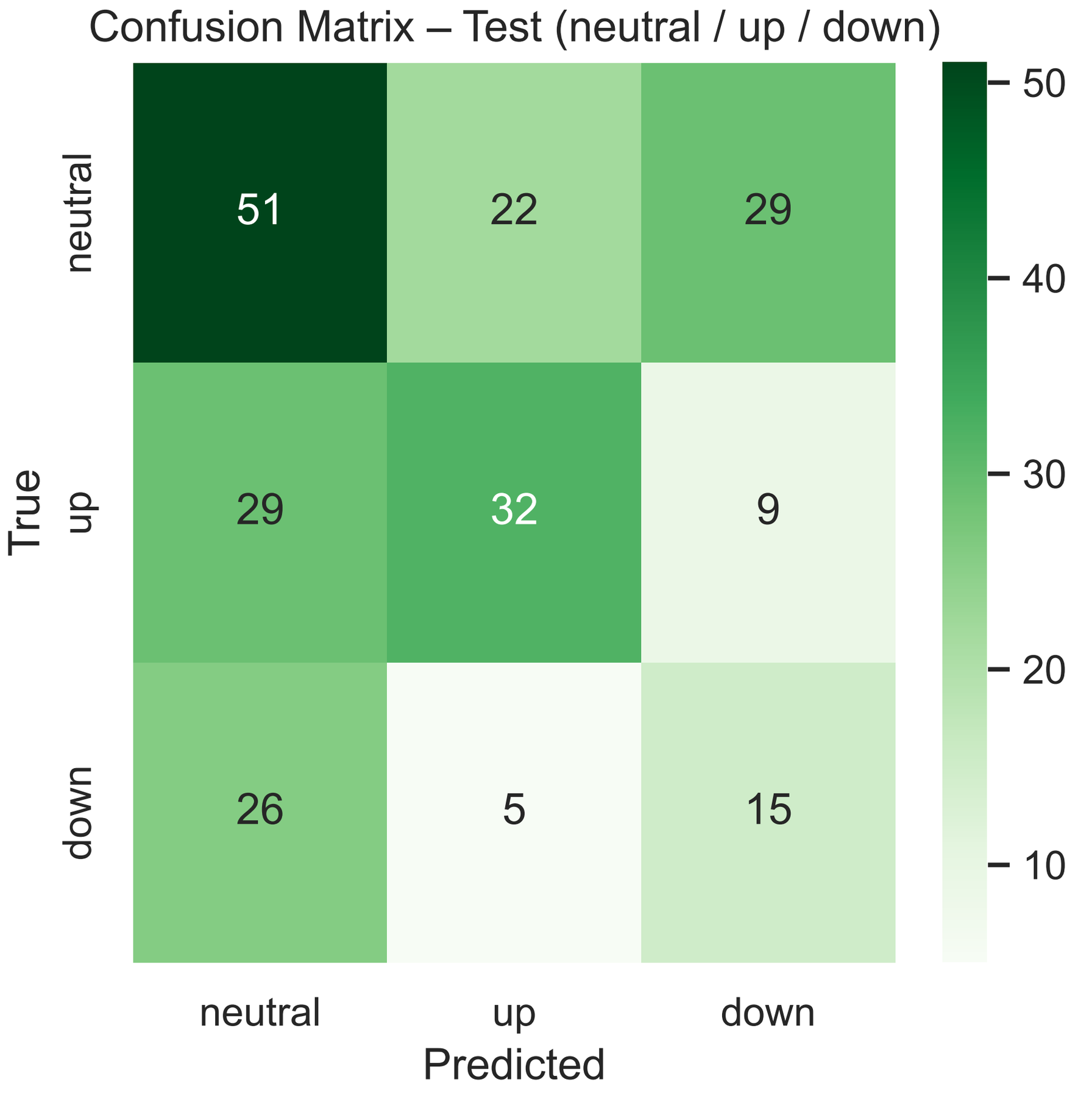

Signal – val
True
neutral
move
75
29
54
31
neutral
move
Predicted
70
60
50
40
30


Signal – test
True
neutral
move
51
51
55
61
neutral
move
Predicted
60
58
56
54
52


Richtung – train
True
down
up
165
22
16
135
down
up
Predicted
160
140
120
100
80
60
40
20

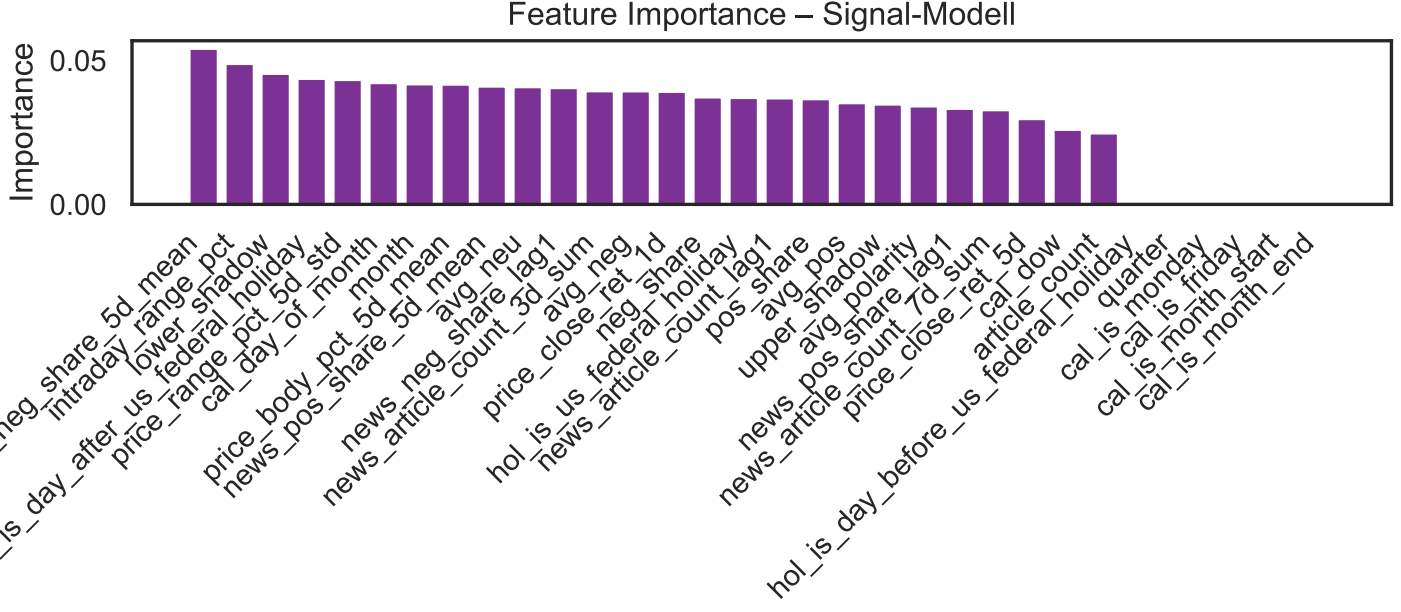

Richtung – val
True
down
up
37
7
9
32
down
up
Predicted
35
30
25
20
15
10

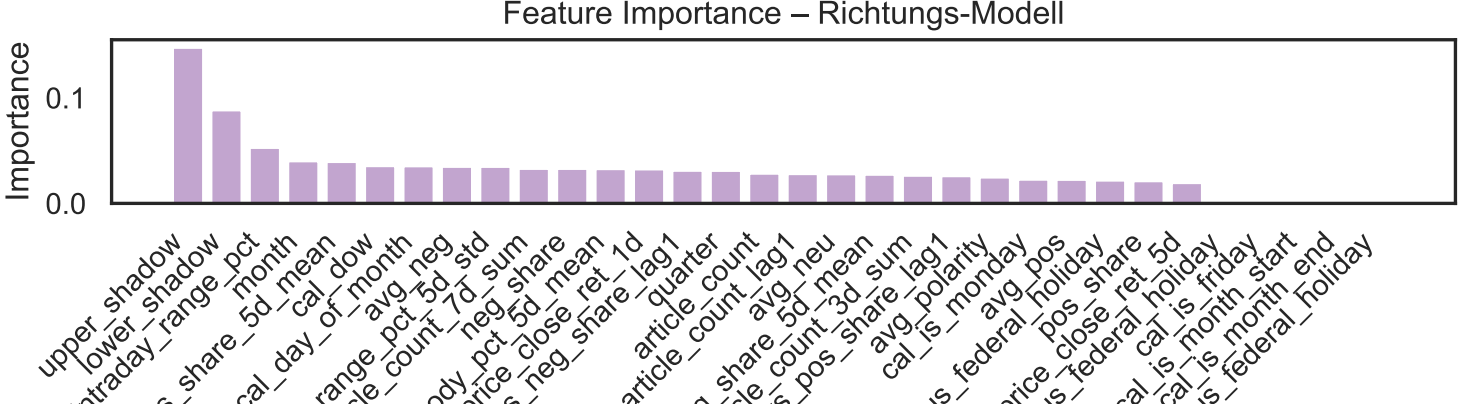

Richtung – test
True
down
up
35
11
19
51
down
up
Predicted
50
45
40
35
30
25
20
15

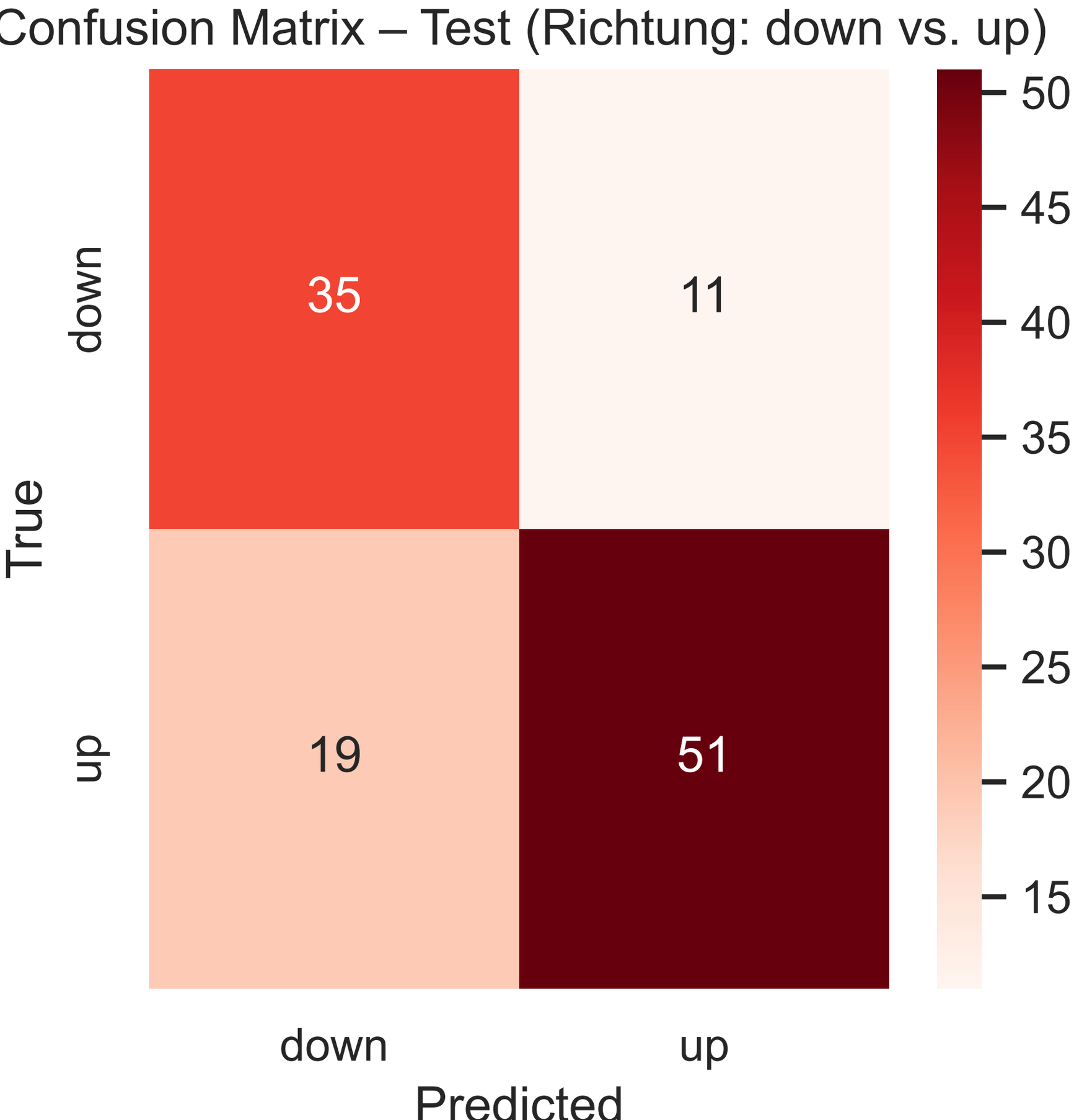

Confusion Matrix – Test (neutral / up / down)
True
neutral
up
down
51
22
29
29
32
9
26
5
15
neutral
up
down
Predicted
50
40
30
20
10

Konfusionsmatrizen – Zählwerte (TN/FP/FN/TP)

modell	split	TN	FP	FN	TP
signal (neutral vs. mov	train	315	103	85	253
signal (neutral vs. mov	val	75	29	54	31
signal (neutral vs. mov	test	51	51	55	61
direction (down vs. up	train	165	22	16	135
direction (down vs. up	val	37	7	9	32
direction (down vs. up	test	35	11	19	51


Feature Importance – Signal-Modell
Importance
0.05
0.00
news_neg_share_5d_mean
intraday_range_pct
lower_shadow
hol_is_day_after_us_federal_holiday
price_range_pct_5d_std
cal_day_of_month
month
price_body_pct_5d_mean
news_pos_share_5d_mean
avg_neu
news_neg_share_lag1
news_article_count_3d_sum
avg_neg
price_close_ret_1d
neg_share
hol_is_us_federal_holiday
news_article_count_lag1
pos_share
avg_pos
upper_shadow
avg_polarity
news_pos_share_lag1
news_article_count_7d_sum
price_close_ret_5d
cal_dow
article_count
hol_is_day_before_us_federal_holiday
quarter
cal_is_monday
cal_is_friday
cal_is_month_start
cal_is_month_end


Feature Importance – Richtungs-Modell
Importance
0.1
0.0
upper_shadow
lower_shadow
intraday_range_pct
month
news_pos_share_5d_mean
cal_dow
cal_day_of_month
avg_neg
price_range_pct_5d_std
news_article_count_7d_sum
neg_share
price_body_pct_5d_mean
price_close_ret_1d
news_neg_share_lag1
quarter
article_count
news_article_count_lag1
avg_neu
news_neg_share_5d_mean
news_article_count_3d_sum
news_pos_share_lag1
avg_polarity
cal_is_monday
avg_pos
hol_is_us_federal_holiday
pos_share
price_close_ret_5d
hol_is_day_before_us_federal_holiday
cal_is_friday
cal_is_month_start
cal_is_month_end
hol_is_day_after_us_federal_holiday


Confusion Matrix – Test (Richtung: down vs. up)
35
11
19
51
down
up
True
down
up
Predicted
50
45
40
35
30
25
20
15