

**Table 1:** Part of the Hyperparameters of the Informer Model

parameter names	parameter values
Input vector size	29
Number of multi-head self-attention operations	8
Number of coding layers	3
Number of decoding layers	2
Probsparse Attention factor	5
Dropout Probability	0.05
Number of training batches	32
Initial learning rate	0.0001
Update of learning rate	Adam Optimizer

<sup>1</sup> Adam Optimizer use a combination of Adaptive Gradient and RMSProp algorithms to update the learning rate.

**Table 2:** Predicted Effect of Informer of different *input\_len* and *output\_len*

Model	Loss function	Average absolute prediction error			Forecast accuracy of rise and fall		
		1min	5min	15min	1min	5min	15min
Informer(20, 1)	MSE	0.6135	0.6186	0.6222	75.48%	75.24%	75.35%
Informer(20, 2)	MSE	<b>0.6102</b>	0.6258	0.6302	76.12%	75.54%	75.94%
Informer(20, 3)	MSE	0.6123	0.6204	0.6624	75.23%	75.30%	74.91%
Informer(20, 4)	MSE	0.6125	0.6314	0.6536	75.33%	75.49%	74.84%
Informer(20, 5)	MSE	0.6389	0.6287	0.6627	74.98%	74.97%	73.27%
Informer(20, 6)	MSE	0.6358	0.6346	0.6567	74.02%	74.96%	74.52%
Informer(20, 7)	MSE	0.6410	0.6413	0.6329	74.58%	75.31%	75.57%
Informer(20, 8)	MSE	0.6541	0.6344	0.6883	73.97%	74.41%	73.08%
Informer(20, 9)	MSE	0.6398	0.6278	0.6390	75.03%	75.36%	75.85%
Informer(20, 10)	MSE	0.6356	0.6214	0.7158	73.64%	75.12%	71.12%
Informer(40, 1)	MSE	0.6243	0.6175	0.6300	75.45%	75.63%	75.85%
Informer(40, 2)	MSE	0.6201	<b>0.6107</b>	0.6305	75.01%	76.02%	76.42%
Informer(40, 3)	MSE	0.6197	0.6174	0.6274	76.00%	75.42%	76.06%
Informer(40, 4)	MSE	0.6287	0.6087	0.6223	75.86%	<b>75.54%</b>	76.75%
Informer(40, 5)	MSE	0.6312	0.6243	<b>0.6213</b>	73.39%	76.06%	76.36%
Informer(40, 6)	MSE	0.6374	0.6396	0.6545	75.09%	75.01%	74.49%
Informer(40, 7)	MSE	0.6421	0.6433	0.6778	74.20%	74.88%	73.85%
Informer(40, 8)	MSE	0.6451	0.6475	0.6966	74.54%	73.16%	73.70%
Informer(40, 9)	MSE	0.6537	0.6507	0.6928	73.28%	73.84%	74.22%
Informer(40, 10)	MSE	0.6520	0.6547	0.6901	74.30%	73.32%	72.38%
Informer(60, 1)	MSE	0.6185	0.6328	0.6310	75.88%	74.93%	<b>76.76%</b>
Informer(60, 2)	MSE	0.6140	0.6341	0.6402	75.93%	75.05%	75.81%
Informer(60, 3)	MSE	0.6277	0.6243	0.6369	76.14%	75.58%	76.42%
Informer(60, 4)	MSE	0.6289	0.6174	0.6531	<b>76.39%</b>	75.05%	76.00%
Informer(60, 5)	MSE	0.6323	0.6340	0.6454	75.13%	74.77%	75.66%
Informer(60, 6)	MSE	0.6358	0.6439	0.6815	74.84%	74.14%	73.02%
Informer(60, 7)	MSE	0.6396	0.6510	0.6742	73.36%	73.83%	74.28%
Informer(60, 8)	MSE	0.6447	0.6329	0.6320	74.54%	74.43%	75.84%
Informer(60, 9)	MSE	0.6334	0.6589	0.6482	75.09%	73.89%	74.98%
Informer(60, 10)	MSE	0.6482	0.6543	0.7017	74.30%	73.64%	73.91%

**Table 3:** Prediction Results of Different Models

Model	Loss function	Average absolute prediction error			Forecast accuracy of rise and fall		
		1min	5min	15min	1min	5min	15min
ARMA(1,1)	MSE	0.6147	0.6168	0.6258	52.09%	51.96%	52.42%
ARIMA(0,1,1)	MSE	0.6214	0.6178	0.6259	51.23%	51.86%	51.69%
LSTM	MSE	0.5745	0.5802	0.5984	50.48%	51.03%	51.46%
	MAE	0.5914	0.5839	0.5964	50.77%	51.35%	51.21%
LogTrans[11]	MSE	0.6172	0.6337	0.6214	68.93%	66.25%	65.71%
Reformer[9]	MSE	0.5983	0.6011	0.5970	70.62%	71.34%	70.90%
Informer[14]	MSE	0.6287	0.6087	0.6223	75.86%	76.54%	76.75%
Informers-CNN(3, 10, 1)	MSE	<b>0.3214</b>	<b>0.3159</b>	0.3268	85.97%	86.32%	86.97%
	MAE	0.3237	0.3169	0.3260	85.88%	<b>86.86%</b>	86.97%
Informers-CNN(3, 10, 2)	MSE	0.3888	0.3820	0.3846	<b>86.38%</b>	86.52%	86.29%
	MAE	0.3890	0.3787	0.3824	86.26%	86.63%	86.02%
Informers-CNN(3, 10, 3)	MSE	0.3849	0.3745	0.3838	85.36%	85.27%	85.56%
	MAE	0.3856	0.3719	0.3846	85.28%	85.01%	85.52%
Informers-CNN(3, 10, 4)	MSE	0.3952	0.3854	0.3949	81.88%	82.21%	81.67%
	MAE	0.3928	0.3896	0.3946	81.39%	82.37%	81.67%
Informers-CNN(3, 10, 5)	MSE	0.3898	0.3812	0.3877	85.39%	85.00%	85.84%
	MAE	0.3841	0.3814	0.3837	85.77%	85.10%	85.96%
Informers-CNN(4, 5, 1)	MSE	0.3877	0.3715	0.3784	85.03%	85.10%	84.12%
	MAE	0.3845	0.3794	0.3879	84.34%	84.74%	84.34%
Informers-CNN(4, 10, 1)	MSE	0.3364	0.3248	0.3305	85.34%	85.57%	85.69%
	MAE	0.3351	0.3254	0.3312	85.26%	85.41%	85.60%
Informers-CNN(5, 5, 1)	MSE	0.3589	0.3518	0.3556	84.31%	84.54%	84.67%
	MAE	0.3564	0.3542	0.3545	84.38%	84.37%	84.78%
Informers-CNN(5, 10, 1)	MSE	0.3286	0.3189	<b>0.3260</b>	85.67%	86.38%	<b>87.12%</b>
	MAE	0.3291	0.3214	0.3287	86.12%	86.53%	87.03%

<sup>1</sup> The parameters of ARMA, ARIMA and LSTM models are all the values that make the prediction results best

<sup>2</sup> In Informers-CNN(3, 10, k), *input\_len* takes the value from 20, 40 and 60, *output\_len* takes the value from 1 to 10

<sup>3</sup> In Informers-CNN(4, 5, k), *input\_len* takes the value from 10, 20, 40, 60, *output\_len* takes the value from 1 to 5

<sup>4</sup> In Informers-CNN(5, 10, k), *input\_len* takes the value from 10, 20, 40, 60, 80, *output\_len* takes the value from 1 to 10

**Table 4:** Features Utilized in Forecasting Models

	Feature name	Number of lags/window size	Number of features
1	Open, Close, High, Low	1	4
2	Weighted Price	1	1
3	Volume(BTC), Volume(Currency)	1	2
4	High - Low	1	1
5	Return	1,...,5	5
6	Correlation MA5 and MA30	1	1
7	Sum3, Sum5	5, 3	2
8	Sum5 - Sum3	1	1
9	RSI(6, 14)	6, 14	2
10	Rate of change	9, 14	2
11	Williams R	1	1
12	ATR	5, 10	2
13	CCI	1	1
14	DEMA	1	1

**Table 5:** MAE of prediction results of multiple time units in the future

pred_len	The <i>i</i> -th time unit in the future									
	1	2	3	4	5	6	7	8	9	10
1	<b>0.3268</b>									
2	0.3846	0.4806								
3	0.3838	<b>0.4803</b>	0.5394							
4	0.3949	0.4868	<b>0.5364</b>	0.5904						
5	0.3877	0.4826	0.5467	0.6100	0.6234					
6	0.3945	0.4879	0.5434	0.5949	0.6134	<b>0.6026</b>				
7	0.4042	0.4910	0.5443	<b>0.5899</b>	<b>0.6076</b>	0.6081	0.6251			
8	0.4119	0.4995	0.5524	0.5947	0.6145	0.6029	0.6250	0.6284		
9	0.4047	0.4949	0.5489	0.5963	0.6079	0.6086	0.6212	<b>0.6257</b>	<b>0.6185</b>	
10	0.3984	0.4879	0.5419	0.5924	0.6112	0.6028	<b>0.6176</b>	0.6292	0.6210	<b>0.6204</b>

**Table 6:** Accuracy of predicting rise and fall of multiple time units in the future

pred_len	The <i>i</i> -th time unit in the future									
	1	2	3	4	5	6	7	8	9	10
1	<b>86.97%</b>									
2	86.29%	77.78%								
3	85.56%	<b>80.47%</b>	80.10%							
4	81.67%	79.45%	78.27%	76.94%						
5	85.84%	75.54%	76.62%	74.81%	74.22%					
6	81.22%	77.43%	<b>80.97%</b>	75.81%	73.19%	73.61%				
7	82.76%	78.32%	79.33%	75.64%	<b>74.35%</b>	73.24%	<b>74.84%</b>			
8	82.21%	76.63%	78.54%	<b>77.89%</b>	73.47%	73.25%	74.00%	74.04%		
9	82.29%	76.08%	78.77%	77.31%	73.75%	73.00%	74.21%	<b>74.43%</b>	<b>76.19%</b>	
10	81.27%	77.49%	78.36%	77.41%	73.78%	<b>74.39%</b>	74.39%	74.30%	74.10%	<b>76.56%</b>