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trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-01-01	0	403.93	2	True	6.001242	-0.040007	0	1	0	1	0.000000e+00	1.000000e+00	383.225000	14.594297	0	16.16	0.00	16
2024-01-01	1	387.77	2	True	5.960412	-0.040007	1	1	0	1	2.588190e-01	9.659258e-01	383.225000	14.594297	0	16.16	0.00	16
2024-01-01	2	371.25	2	True	5.916876	-0.042603	2	1	0	1	5.000000e-01	8.660254e-01	383.225000	14.594297	0	16.52	0.00	16
2024-01-01	3	372.40	2	True	5.919969	0.003098	3	1	0	1	7.071068e-01	7.071068e-01	383.225000	14.594297	0	0.00	1.15	10
2024-01-01	4	383.11	2	True	5.948322	0.028759	4	1	0	1	8.660254e-01	5.000000e-01	383.225000	14.594297	0	0.00	10.71	8.1
2024-01-01	5	389.65	2	True	5.965249	0.017071	5	1	0	1	9.659258e-01	2.588190e-01	383.225000	14.594297	0	0.00	6.54	6.5
2024-01-01	6	379.72	2	True	5.939434	-0.025484	6	1	0	1	1.000000e+00	6.123234e-17	383.225000	14.594297	0	9.93	0.00	7.1
2024-01-01	7	349.71	2	True	5.857104	-0.079032	7	1	0	1	9.659258e-01	-2.588190e-01	383.225000	14.594297	0	30.01	0.00	10
2024-01-01	8	353.57	2	True	5.868081	0.011038	8	1	0	1	8.660254e-01	-5.000000e-01	383.225000	14.594297	0	0.00	3.86	9.0
2024-01-01	9	382.15	2	True	5.945813	0.080833	9	1	0	1	7.071068e-01	-7.071068e-01	383.225000	14.594297	0	0.00	28.58	8.0
2024-01-01	10	392.31	2	True	5.972052	0.026586	10	1	0	1	5.000000e-01	-8.660254e-01	383.225000	14.594297	0	0.00	10.16	7.2
2024-01-01	11	405.14	2	True	6.004233	0.032704	11	1	0	1	2.588190e-01	-9.659258e-01	383.225000	14.594297	0	0.00	12.83	6.6
2024-01-01	12	402.03	2	True	5.996527	-0.007676	12	1	0	1	1.224647e-16	-1.000000e+00	383.225000	14.594297	0	3.11	0.00	6.2
2024-01-01	13	403.10	2	True	5.999185	0.002661	13	1	0	1	-2.588190e-01	-9.659258e-01	383.225000	14.594297	0	0.00	1.07	5.8
2024-01-01	14	391.05	2	True	5.968835	-0.029893	14	1	0	1	-5.000000e-01	-8.660254e-01	383.225000	14.594297	0	12.05	0.00	6.2
2024-01-01	15	396.34	2	True	5.982272	0.013528	15	1	0	1	-7.071068e-01	-7.071068e-01	383.225000	14.594297	0	0.00	5.29	5.8
2024-01-01	16	393.32	2	True	5.974624	-0.007620	16	1	0	1	-8.660254e-01	-5.000000e-01	383.225000	14.594297	0	3.02	0.00	5.6
2024-01-01	17	385.62	2	True	5.954852	-0.019577	17	1	0	1	-9.659258e-01	-2.588190e-01	383.225000	14.594297	0	7.70	0.00	5.7
2024-01-01	18	380.09	2	True	5.940408	-0.014341	18	1	0	1	-1.000000e+00	-1.836970e-16	383.225000	14.594297	0	5.53	0.00	5.7
2024-01-01	19	374.34	2	True	5.925164	-0.015128	19	1	0	1	-9.659258e-01	2.588190e-01	383.225000	14.594297	0	5.75	0.00	5.7
2024-01-01	20	368.67	2	True	5.909902	-0.015147	20	1	0	1	-8.660254e-01	-5.000000e-01	383.225000	14.594297	0	5.67	0.00	5.7
2024-01-01	21	371.54	2	True	5.917657	0.007785	21	1	0	1	-7.071068e-01	7.071068e-01	383.225000	14.594297	0	0.00	2.87	5.4
2024-01-01	22	383.82	2	True	5.950174	0.033052	22	1	0	1	-5.000000e-01	-8.660254e-01	383.225000	14.594297	0	0.00	12.28	5.2
2024-01-01	23	376.77	2	True	5.931635	-0.018368	23	1	0	1	-2.588190e-01	9.659258e-01	383.225000	14.594297	0	7.05	0.00	5.2
2024-01-02	0	408.25	0	True	6.011880	0.083552	0	2	1	1	0.000000e+00	1.000000e+00	383.405000	14.884522	1	0.00	31.48	5.1
2024-01-02	1	388.65	0	True	5.962679	-0.048010	1	2	1	1	2.588190e-01	9.659258e-01	383.441667	14.896821	1	19.60	0.00	5.2
2024-01-02	2	372.39	0	True	5.919942	-0.041837	2	2	1	1	5.000000e-01	8.660254e-01	383.489167	14.858023	1	16.26	0.00	5.2
2024-01-02	3	335.36	0	True	5.815205	-0.099439	3	2	1	1	7.071068e-01	7.071068e-01	381.945833	17.709960	1	37.03	0.00	6.7
2024-01-02	4	276.33	0	True	5.621596	-0.176020	4	2	1	1	8.660254e-01	5.000000e-01	377.496667	27.891131	1	59.03	0.00	9.2
2024-01-02	5	173.24	0	True	5.154678	-0.373068	5	2	1	1	9.659258e-01	2.588190e-01	368.479583	50.005975	1	103.09	0.00	13
2024-01-02	6	111.72	0	True	4.715996	-0.355114	6	2	1	1	1.000000e+00	6.123234e-17	357.312917	72.327821	1	61.52	0.00	15
2024-01-02	7	-42.81	0	True	4.715996	-1.383190	7	2	1	1	9.659258e-01	-2.588190e-01	340.957917	109.135156	1	154.53	0.00	20
2024-01-02	8	109.34	0	True	4.694462	-3.554076	8	2	1	1	8.660254e-01	-5.000000e-01	330.781667	118.861180	1	0.00	152.15	20
2024-01-02	9	187.98	0	True	5.236336	0.719224	9	2	1	1	7.071068e-01	-7.071068e-01	322.691250	121.784956	1	0.00	78.64	20
2024-01-02	10	197.29	0	True	5.284675	0.049527	10	2	1	1	5.000000e-01	-8.660254e-01	314.565417	123.432826	1	0.00	9.31	20
2024-01-02	11	110.46	0	True	4.704653	-0.440114	11	2	1	1	2.588190e-01	-9.659258e-01	302.287083	128.580431	1	86.83	0.00	24
2024-01-02	12	-80.00	0	True	4.704653	-1.724244	12	2	1	1	1.224647e-16	-1.000000e+00	282.202500	148.436887	1	190.46	0.00	32
2024-01-02	13	-80.00	0	True	4.704653	0.000000	13	2	1	1	-2.588190e-01	-8.660254e-01	262.073333	163.337576	1	0.00	0.00	32
2024-01-02	14	-80.00	0	True	4.704653	0.000000	14	2	1	1	-5.000000e-01	-8.660254e-01	242.446250	175.047150	1	0.00	0.00	31
2024-01-02	15	-80.00	0	True	4.704653	0.000000	15	2	1	1	-7.071068e-01	-7.071068e-01	222.598750	183.633467	1	0.00	0.00	31
2024-01-02	16	-80.00	0	True	4.704653	0.000000	16	2	1	1	-8.660254e-01	-5.000000e-01	202.877083	189.813908	1	0.00	0.00	31
2024-01-02	17	-80.00	0	True	4.704653	0.000000	17	2	1	1	-9.659258e-01	-2.588190e-01	183.476250	194.071413	1	0.00	0.00	31
2024-01-02	18	-80.00	0	True	4.704653	0.000000	18	2	1	1	-1.836970e-16	-1.000000e+00	164.305833	196.513973	1	0.00	0.00	31

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-01-02	19	-84.95	0	True	4.704653	0.061875	19	2	1	1	-9.659258e-01	2.588190e-01	145.168750	197.531803	1	4.95	0.00	31
2024-01-02	20	-65.71	0	True	4.704653	-0.226486	20	2	1	1	-8.660254e-01	5.000000e-01	127.069583	196.057648	1	0.00	19.24	30
2024-01-02	21	-6.10	0	True	4.704653	-0.907168	21	2	1	1	-7.071068e-01	7.071068e-01	111.334583	190.664059	1	0.00	59.61	30
2024-01-02	22	290.29	0	True	5.670880	-48.588525	22	2	1	1	-5.000000e-01	8.660254e-01	107.437500	185.744830	1	0.00	296.39	30
2024-01-02	23	218.73	0	True	5.387838	-0.246512	23	2	1	1	-2.588190e-01	9.659258e-01	100.852500	178.439076	1	71.56	0.00	33
2024-01-03	0	282.19	0	True	5.642581	0.290129	0	3	2	1	0.000000e+00	1.000000e+00	95.600000	170.683985	2	0.00	63.46	33
2024-01-03	1	296.84	0	True	5.693193	0.051915	1	3	2	1	2.588190e-01	9.659258e-01	91.774583	164.756414	2	0.00	14.65	32
2024-01-03	2	284.18	0	True	5.649608	-0.042649	2	3	2	1	5.000000e-01	8.660254e-01	88.099167	159.111415	2	12.66	0.00	32
2024-01-03	3	321.04	0	True	5.771566	0.129707	3	3	2	1	7.071068e-01	7.071068e-01	87.502500	158.167927	2	0.00	36.86	31
2024-01-03	4	382.23	0	True	5.946023	0.190599	4	3	2	1	8.660254e-01	5.000000e-01	91.915000	164.994642	2	0.00	61.19	28
2024-01-03	5	461.31	0	True	6.134070	0.206891	5	3	2	1	9.659258e-01	2.588190e-01	103.917917	180.881364	2	0.00	79.08	24
2024-01-03	6	419.24	0	True	6.038444	-0.091197	6	3	2	1	1.000000e+00	6.123234e-17	116.731250	192.007965	2	42.07	0.00	23
2024-01-03	7	196.51	0	True	5.280713	-0.531271	7	3	2	1	9.659258e-01	-2.588190e-01	126.702917	189.560954	2	222.73	0.00	26
2024-01-03	8	-7.09	0	True	5.280713	-1.036080	8	3	2	1	8.660254e-01	-5.000000e-01	121.851667	191.504502	2	203.60	0.00	34
2024-01-03	9	-57.10	0	True	5.280713	7.053597	9	3	2	1	7.071068e-01	-7.071068e-01	111.640000	194.338284	2	50.01	0.00	36
2024-01-03	10	-25.55	0	True	5.280713	-0.552539	10	3	2	1	5.000000e-01	-8.660254e-01	102.355000	195.388752	2	0.00	31.55	36
2024-01-03	11	-26.05	0	True	5.280713	0.019569	11	3	2	1	2.588190e-01	-9.659258e-01	96.667083	197.121821	2	0.50	0.00	33
2024-01-03	12	-80.00	0	True	5.280713	2.071017	12	3	2	1	1.224647e-16	-1.000000e+00	96.667083	197.121821	2	53.95	0.00	27
2024-01-03	13	45.45	0	True	3.816613	-1.568125	13	3	2	1	-2.588190e-01	-9.659258e-01	101.894167	193.869911	2	0.00	125.45	27
2024-01-03	14	25.05	0	True	3.220874	-0.448845	14	3	2	1	-5.000000e-01	-8.660254e-01	106.271250	190.745357	2	20.40	0.00	28
2024-01-03	15	346.17	0	True	5.846930	12.819162	15	3	2	1	-7.071068e-01	-7.071068e-01	124.028333	192.479710	2	0.00	321.12	28
2024-01-03	16	460.43	0	True	6.132161	0.330069	16	3	2	1	-8.660254e-01	-5.000000e-01	146.546250	199.072115	2	0.00	114.26	28
2024-01-03	17	510.03	0	True	6.234470	0.107725	17	3	2	1	-9.659258e-01	-2.588190e-01	171.130833	206.184262	2	0.00	49.60	28
2024-01-03	18	510.03	0	True	6.234470	0.000000	18	3	2	1	-1.000000e+00	-1.836970e-16	195.715417	210.078159	2	0.00	0.00	28
2024-01-03	19	509.92	0	True	6.234254	-0.000216	19	3	2	1	-9.659258e-01	2.588190e-01	220.501667	210.616280	2	0.11	0.00	28
2024-01-03	20	503.90	0	True	6.222378	-0.011806	20	3	2	1	-8.660254e-01	5.000000e-01	244.235417	209.049663	2	6.02	0.00	28
2024-01-03	21	514.51	0	True	6.243215	0.021056	21	3	2	1	-7.071068e-01	7.071068e-01	265.927500	208.954742	2	0.00	10.61	28
2024-01-03	22	551.00	0	True	6.311735	0.070922	22	3	2	1	-5.000000e-01	8.660254e-01	276.790417	216.901968	2	0.00	36.49	28
2024-01-03	23	526.94	0	True	6.267087	-0.043666	23	3	2	1	-2.588190e-01	9.659258e-01	289.632500	222.370080	2	24.06	0.00	26
2024-01-04	0	423.05	0	True	6.047490	-0.197157	0	4	3	1	0.000000e+00	1.000000e+00	295.501667	224.017906	3	103.89	0.00	30
2024-01-04	1	431.91	0	True	6.068217	0.020943	1	4	3	1	2.588190e-01	9.659258e-01	301.129583	225.743004	3	0.00	8.86	30
2024-01-04	2	401.60	0	True	5.995457	-0.070177	2	4	3	1	5.000000e-01	8.660254e-01	306.022083	226.630357	3	30.31	0.00	31
2024-01-04	3	391.92	0	True	5.971058	-0.024104	3	4	3	1	7.071068e-01	7.071068e-01	308.975417	227.295432	3	9.68	0.00	31
2024-01-04	4	392.23	0	True	5.971848	0.000791	4	4	3	1	8.660254e-01	5.000000e-01	309.392083	227.444674	3	0.00	0.31	31
2024-01-04	5	395.38	0	True	5.979847	0.008031	5	4	3	1	9.659258e-01	2.588190e-01	306.645000	225.923091	3	0.00	3.15	31
2024-01-04	6	389.76	0	True	5.965531	-0.014214	6	4	3	1	1.000000e+00	6.123234e-17	305.416667	225.363749	3	5.62	0.00	30
2024-01-04	7	392.62	0	True	5.972842	0.007338	7	4	3	1	9.659258e-01	-2.588190e-01	313.587917	224.797894	3	0.00	2.86	21
2024-01-04	8	392.27	0	True	5.971950	-0.000891	8	4	3	1	8.660254e-01	-5.000000e-01	330.227917	214.576969	3	0.35	0.00	12
2024-01-04	9	391.99	0	True	5.971236	-0.000714	9	4	3	1	7.071068e-01	-7.071068e-01	348.940000	198.295297	3	0.28	0.00	10
2024-01-04	10	370.44	0	True	5.914691	-0.054976	10	4	3	1	5.000000e-01	-8.660254e-01	365.439583	181.547621	3	21.55	0.00	11
2024-01-04	11	227.25	0	True	5.426051	-0.386540	11	4	3	1	2.588190e-01	-9.659258e-01	375.993750	164.346967	3	143.19	0.00	17
2024-01-04	12	-18.60	0	True	5.426051	-1.081848	12	4	3	1	1.224647e-16	-1.000000e+00	378.552083	157.265371	3	245.85	0.00	25
2024-01-04	13	43.90	0	True	3.781914	-3.360215	13	4	3	1	-2.588190e-01	-9.659258e-01	378.487500	157.408365	3	0.00	62.50	25
2024-01-04	14	159.90	0	True	5.074549	2.642369	14	4	3	1	-5.000000e-01	-8.660254e-01	384.106250	146.255403	3	0.00	116.00	24

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-01-04	15	262.34	0	True	5.569641	0.640650	15	4	3	1	-7.071068e-01	-7.071068e-01	380.613333	148.189045	3	0.00	102.44	24
2024-01-04	16	340.43	0	True	5.830210	0.297667	16	4	3	1	-8.660254e-01	-5.000000e-01	375.613333	147.401233	3	0.00	78.09	24
2024-01-04	17	359.41	0	True	5.884464	0.055753	17	4	3	1	-9.659258e-01	-2.588190e-01	369.337500	144.609411	3	0.00	18.98	24
2024-01-04	18	382.45	0	True	5.946598	0.064105	18	4	3	1	-1.000000e+00	-1.836970e-16	364.021667	141.524717	3	0.00	23.04	24
2024-01-04	19	383.15	0	True	5.948427	0.001830	19	4	3	1	-9.659258e-01	2.588190e-01	358.739583	138.168549	3	0.00	0.70	24
2024-01-04	20	375.24	0	True	5.927566	-0.020645	20	4	3	1	-8.660254e-01	5.000000e-01	353.378750	134.745105	3	7.91	0.00	24
2024-01-04	21	372.22	0	True	5.919485	-0.008048	21	4	3	1	-7.071068e-01	7.071068e-01	347.450000	130.407673	3	3.02	0.00	24
2024-01-04	22	394.51	0	True	5.977644	0.059884	22	4	3	1	-5.000000e-01	8.660254e-01	340.929583	123.517886	3	0.00	22.29	24
2024-01-04	23	389.03	0	True	5.963656	-0.013891	23	4	3	1	-2.588190e-01	9.659258e-01	335.183333	117.551964	3	5.48	0.00	24
2024-01-05	0	453.13	0	True	6.116179	0.164769	0	5	4	1	0.000000e+00	1.000000e+00	336.436667	118.684427	4	0.00	64.10	19
2024-01-05	1	402.49	0	True	5.997670	-0.111756	1	5	4	1	2.588190e-01	9.659258e-01	335.210833	117.804124	4	50.64	0.00	21
2024-01-05	2	340.71	0	True	5.831032	-0.153494	2	5	4	1	5.000000e-01	8.660254e-01	332.673750	116.964859	4	61.78	0.00	23
2024-01-05	3	255.61	0	True	5.543653	-0.249773	3	5	4	1	7.071068e-01	7.071068e-01	326.994167	117.271966	4	85.10	0.00	26
2024-01-05	4	266.50	0	True	5.585374	0.042604	4	5	4	1	8.660254e-01	5.000000e-01	321.755417	117.039121	4	0.00	10.89	26
2024-01-05	5	310.50	0	True	5.738184	0.165103	5	5	4	1	9.659258e-01	2.588190e-01	318.218750	115.995408	4	0.00	44.00	26
2024-01-05	6	209.15	0	True	5.343052	-0.326409	6	5	4	1	1.000000e+00	6.123234e-17	310.693333	117.006535	4	101.35	0.00	30
2024-01-05	7	104.55	0	True	4.649665	-0.500120	7	5	4	1	9.659258e-01	-2.588190e-01	298.690417	122.865707	4	104.60	0.00	34
2024-01-05	8	117.69	0	True	4.768054	0.125681	8	5	4	1	8.660254e-01	-5.000000e-01	287.249583	126.503167	4	0.00	13.14	34
2024-01-05	9	76.77	0	True	4.340814	-0.347693	9	5	4	1	7.071068e-01	-7.071068e-01	274.115417	131.423829	4	40.92	0.00	36
2024-01-05	10	90.06	0	True	4.500476	0.173114	10	5	4	1	5.000000e-01	-8.660254e-01	262.432917	134.904726	4	0.00	13.29	35
2024-01-05	11	191.90	0	True	5.256974	1.130802	11	5	4	1	2.588190e-01	-9.659258e-01	260.960000	135.497239	4	0.00	101.84	29
2024-01-05	12	232.25	0	True	5.447814	0.210266	12	5	4	1	1.224647e-16	-1.000000e+00	271.412083	121.997346	4	0.00	40.35	19
2024-01-05	13	590.68	0	True	6.381274	1.543294	13	5	4	1	-2.588190e-01	-9.659258e-01	294.194583	128.542050	4	0.00	358.43	19
2024-01-05	14	711.71	0	True	6.567671	0.204899	14	5	4	1	-5.000000e-01	-8.660254e-01	317.186667	150.885383	4	0.00	121.03	19
2024-01-05	15	779.43	0	True	6.658563	0.095151	15	5	4	1	-7.071068e-01	-7.071068e-01	338.732083	177.316592	4	0.00	67.72	19
2024-01-05	16	795.96	0	True	6.679549	0.021208	16	5	4	1	-8.660254e-01	-5.000000e-01	357.712500	200.386077	4	0.00	16.53	19
2024-01-05	17	548.77	0	True	6.307679	-0.310556	17	5	4	1	-9.659258e-01	-2.588190e-01	365.602500	204.148429	4	247.19	0.00	29
2024-01-05	18	347.30	0	True	5.850189	-0.367130	18	5	4	1	-1.000000e+00	-1.836970e-16	364.137917	204.148394	4	201.47	0.00	37
2024-01-05	19	300.53	0	True	5.705548	-0.134667	19	5	4	1	-9.659258e-01	2.588190e-01	360.695417	204.510138	4	46.77	0.00	39
2024-01-05	20	369.78	0	True	5.912908	0.230426	20	5	4	1	-8.660254e-01	5.000000e-01	360.467917	204.496291	4	0.00	69.25	39
2024-01-05	21	336.21	0	True	5.817736	-0.090784	21	5	4	1	-7.071068e-01	7.071068e-01	358.967500	204.538417	4	33.57	0.00	40
2024-01-05	22	242.34	0	True	5.490342	-0.279200	22	5	4	1	-5.000000e-01	8.660254e-01	352.627083	205.743725	4	93.87	0.00	44
2024-01-05	23	93.59	0	True	4.538924	-0.613807	23	5	4	1	-2.588190e-01	9.659258e-01	340.317083	212.207776	4	148.75	0.00	50
2024-01-06	0	367.41	1	False	5.906478	2.925740	0	6	5	1	0.000000e+00	1.000000e+00	336.745417	210.944082	5	0.00	273.82	50
2024-01-06	1	290.13	1	False	5.670329	-0.210337	1	6	5	1	2.588190e-01	9.659258e-01	332.063750	210.668186	5	77.28	0.00	51
2024-01-06	2	310.28	1	False	5.737475	0.069452	2	6	5	1	5.000000e-01	8.660254e-01	330.795833	210.705455	5	0.00	20.15	49
2024-01-06	3	236.31	1	False	5.465145	-0.238398	3	6	5	1	7.071068e-01	7.071068e-01	329.991667	211.041443	5	73.97	0.00	48
2024-01-06	4	283.32	1	False	5.646577	0.198934	4	6	5	1	8.660254e-01	5.000000e-01	330.692500	210.849271	5	0.00	47.01	48
2024-01-06	5	342.86	1	False	5.837322	0.210151	5	6	5	1	9.659258e-01	2.588190e-01	332.040833	210.817995	5	0.00	59.54	48
2024-01-06	6	232.87	1	False	5.450480	-0.320801	6	6	5	1	1.000000e+00	6.123234e-17	333.029167	210.271716	5	109.99	0.00	49
2024-01-06	7	-23.54	1	False	5.450480	-1.101086	7	6	5	1	9.659258e-01	-2.588190e-01	327.692083	217.813412	5	256.41	0.00	55
2024-01-06	8	-80.00	1	False	5.450480	2.398471	8	6	5	1	8.660254e-01	-5.000000e-01	319.455000	229.523634	5	56.46	0.00	57
2024-01-06	9	-19.27	1	False	5.450480	-0.759125	9	6	5	1	7.071068e-01	-7.071068e-01	315.453333	234.717180	5	0.00	60.73	56
2024-01-06	10	-72.46	1	False	5.450480	2.760249	10	6	5	1	5.000000e-01	-8.660254e-01	308.681667	243.675981	5	53.19	0.00	58

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-01-06	11	-80.00	1	False	5.450480	0.104057	11	6	5	1	2.588190e-01	-9.659258e-01	297.352500	255.381105	5	7.54	0.00	58
2024-01-06	12	-80.00	1	False	5.450480	0.000000	12	6	5	1	1.224647e-16	-1.000000e+00	284.342083	266.551470	5	0.00	0.00	58
2024-01-06	13	-80.00	1	False	5.450480	0.000000	13	6	5	1	-2.588190e-01	-9.659258e-01	256.397083	268.190625	5	0.00	0.00	58
2024-01-06	14	-80.00	1	False	5.450480	0.000000	14	6	5	1	-5.000000e-01	-8.660254e-01	223.409167	258.258309	5	0.00	0.00	58
2024-01-06	15	148.73	1	False	5.002133	-2.859125	15	6	5	1	-7.071068e-01	-7.071068e-01	197.130000	229.733559	5	0.00	228.73	58
2024-01-06	16	458.38	1	False	6.127699	2.081961	16	6	5	1	-8.660254e-01	-5.000000e-01	183.064167	199.868275	5	0.00	309.65	58
2024-01-06	17	696.66	1	False	6.546297	0.519831	17	6	5	1	-9.659258e-01	-2.588190e-01	189.226250	213.451669	5	0.00	238.28	48
2024-01-06	18	750.21	1	False	6.620353	0.076867	18	6	5	1	-1.000000e+00	-1.836970e-16	206.014167	240.549062	5	0.00	53.55	39
2024-01-06	19	772.32	1	False	6.649399	0.029472	19	6	5	1	-9.659258e-01	2.588190e-01	225.672083	266.487884	5	0.00	22.11	37
2024-01-06	20	698.74	1	False	6.549279	-0.095271	20	6	5	1	-8.660254e-01	5.000000e-01	239.378750	282.217958	5	73.58	0.00	41
2024-01-06	21	649.62	1	False	6.476388	-0.070298	21	6	5	1	-7.071068e-01	7.071068e-01	252.437500	293.902475	5	49.12	0.00	41
2024-01-06	22	707.49	1	False	6.561723	0.089083	22	6	5	1	-5.000000e-01	8.660254e-01	271.818750	308.197066	5	0.00	57.87	37
2024-01-06	23	702.90	1	False	6.555215	-0.006488	23	6	5	1	-2.588190e-01	9.659258e-01	297.206667	317.822850	5	4.59	0.00	31
2024-01-07	0	409.19	1	False	6.014180	-0.417855	0	7	6	1	0.000000e+00	1.000000e+00	298.947500	318.338103	6	293.71	0.00	43
2024-01-07	1	430.02	1	False	6.063832	0.050905	1	7	6	1	2.588190e-01	9.659258e-01	304.776250	319.448388	6	0.00	20.83	40
2024-01-07	2	413.69	1	False	6.025117	-0.037975	2	7	6	1	5.000000e-01	8.660254e-01	309.085000	320.222315	6	16.33	0.00	41
2024-01-07	3	405.87	1	False	6.006033	-0.018903	3	7	6	1	7.071068e-01	7.071068e-01	316.150000	320.417310	6	7.82	0.00	38
2024-01-07	4	406.78	1	False	6.008272	0.002242	4	7	6	1	8.660254e-01	5.000000e-01	321.294167	320.858068	6	0.00	0.91	38
2024-01-07	5	406.15	1	False	6.006723	-0.001549	5	7	6	1	9.659258e-01	2.588190e-01	323.931250	321.302798	6	0.63	0.00	38
2024-01-07	6	390.90	1	False	5.968452	-0.037548	6	7	6	1	1.000000e+00	6.123234e-17	330.515833	320.974625	6	15.25	0.00	34
2024-01-07	7	368.95	1	False	5.910661	-0.056152	7	7	6	1	9.659258e-01	-2.588190e-01	346.869583	312.025033	6	21.95	0.00	25
2024-01-07	8	354.37	1	False	5.870342	-0.039518	8	7	6	1	8.660254e-01	-5.000000e-01	364.968333	298.492470	6	14.58	0.00	23
2024-01-07	9	374.11	1	False	5.924550	0.055704	9	7	6	1	7.071068e-01	-7.071068e-01	381.359167	287.057410	6	0.00	19.74	23
2024-01-07	10	383.62	1	False	5.949652	0.025420	10	7	6	1	5.000000e-01	-8.660254e-01	400.362500	270.316339	6	0.00	9.51	21
2024-01-07	11	418.93	1	False	6.037704	0.092044	11	7	6	1	2.588190e-01	-9.659258e-01	421.151250	250.204762	6	0.00	35.31	20
2024-01-07	12	447.49	1	False	6.103654	0.068174	12	7	6	1	1.224647e-16	-1.000000e+00	443.130000	226.293702	6	0.00	28.56	20
2024-01-07	13	456.62	1	False	6.123852	0.020403	13	7	6	1	-2.588190e-01	-9.659258e-01	465.489167	196.968538	6	0.00	9.13	20
2024-01-07	14	429.54	1	False	6.062715	-0.059305	14	7	6	1	-5.000000e-01	-8.660254e-01	486.720000	159.515280	6	27.08	0.00	21
2024-01-07	15	387.71	1	False	5.960258	-0.097383	15	7	6	1	-7.071068e-01	-7.071068e-01	496.677500	144.225663	6	41.83	0.00	23
2024-01-07	16	380.93	1	False	5.942616	-0.017487	16	7	6	1	-8.660254e-01	-5.000000e-01	493.450417	145.975700	6	6.78	0.00	23
2024-01-07	17	370.62	1	False	5.915177	-0.027065	17	7	6	1	-9.659258e-01	-2.588190e-01	479.865417	141.339667	6	10.31	0.00	24
2024-01-07	18	393.12	1	False	5.974115	0.060709	18	7	6	1	-1.000000e+00	-1.836970e-16	464.986667	129.982316	6	0.00	22.50	24
2024-01-07	19	389.31	1	False	5.964376	-0.009692	19	7	6	1	-9.659258e-01	2.588190e-01	449.027917	113.013096	6	3.81	0.00	24
2024-01-07	20	383.68	1	False	5.949809	-0.014461	20	7	6	1	-8.660254e-01	5.000000e-01	435.900417	100.332783	6	5.63	0.00	21
2024-01-07	21	380.79	1	False	5.942248	-0.007532	21	7	6	1	-7.071068e-01	-7.071068e-01	424.699167	89.899271	6	2.89	0.00	19
2024-01-07	22	392.13	1	False	5.971593	0.029780	22	7	6	1	-5.000000e-01	8.660254e-01	411.559167	66.864392	6	0.00	11.34	19
2024-01-07	23	384.51	1	False	5.951970	-0.019432	23	7	6	1	-2.588190e-01	9.659258e-01	398.292917	25.071910	6	7.62	0.00	19
2024-01-08	0	393.85	0	True	5.975970	0.024291	0	8	0	1	0.000000e+00	1.000000e+00	397.653750	24.977384	0	0.00	9.34	7.6
2024-01-08	1	425.40	0	True	6.053030	0.080107	1	8	0	1	2.588190e-01	9.659258e-01	397.461250	24.733708	0	0.00	31.55	7.6
2024-01-08	2	398.08	0	True	5.986653	-0.064222	2	8	0	1	5.000000e-01	8.660254e-01	396.810833	24.492459	0	27.32	0.00	8.0
2024-01-08	3	368.34	0	True	5.909006	-0.074709	3	8	0	1	7.071068e-01	7.071068e-01	395.247083	25.079946	0	29.74	0.00	8.5
2024-01-08	4	380.43	0	True	5.941302	0.032823	4	8	0	1	8.660254e-01	5.000000e-01	394.149167	25.129830	0	0.00	12.09	8.5
2024-01-08	5	390.63	0	True	5.967761	0.026812	5	8	0	1	9.659258e-01	2.588190e-01	393.502500	25.006973	0	0.00	10.20	8.5
2024-01-08	6	377.07	0	True	5.932431	-0.034713	6	8	0	1	1.000000e+00	6.123234e-17	392.926250	25.227922	0	13.56	0.00	8.5

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-01-08	7	340.34	0	True	5.829945	-0.097409	7	8	0	1	9.659258e-01	-2.588190e-01	391.734167	27.022255	0	36.73	0.00	9.4
2024-01-08	8	339.53	0	True	5.827562	-0.002380	8	8	0	1	8.660254e-01	-5.000000e-01	391.115833	28.064112	0	0.81	0.00	8.5
2024-01-08	9	336.65	0	True	5.819044	-0.008482	9	8	0	1	7.071068e-01	-7.071068e-01	389.555000	30.024288	0	2.88	0.00	9.0
2024-01-08	10	372.02	0	True	5.918948	0.105065	10	8	0	1	5.000000e-01	-8.660254e-01	389.071667	30.216736	0	0.00	35.37	9.0
2024-01-08	11	384.30	0	True	5.951423	0.033009	11	8	0	1	2.588190e-01	-9.659258e-01	387.628750	29.548381	0	0.00	12.28	9.0
2024-01-08	12	331.55	0	True	5.803779	-0.137263	12	8	0	1	1.224647e-16	-1.000000e+00	382.797917	28.804307	0	52.75	0.00	11
2024-01-08	13	370.07	0	True	5.913692	0.116182	13	8	0	1	-2.588190e-01	-9.659258e-01	379.191667	24.211931	0	0.00	38.52	11
2024-01-08	14	395.83	0	True	5.980985	0.069608	14	8	0	1	-5.000000e-01	-8.660254e-01	377.787083	22.044950	0	0.00	25.76	10
2024-01-08	15	411.22	0	True	6.019128	0.038880	15	8	0	1	-7.071068e-01	-7.071068e-01	378.766667	23.006428	0	0.00	15.39	8.2
2024-01-08	16	403.36	0	True	5.999829	-0.019114	16	8	0	1	-8.660254e-01	-5.000000e-01	379.701250	23.547354	0	7.86	0.00	8.4
2024-01-08	17	413.03	0	True	6.023520	0.023974	17	8	0	1	-9.659258e-01	-2.588190e-01	381.468333	24.411674	0	0.00	9.67	7.9
2024-01-08	18	437.30	0	True	6.080619	0.058761	18	8	0	1	-1.000000e+00	-1.836970e-16	383.309167	26.870439	0	0.00	24.27	7.9
2024-01-08	19	406.04	0	True	6.006452	-0.071484	19	8	0	1	-9.659258e-01	-2.588190e-01	384.006250	27.247250	0	31.26	0.00	9.1
2024-01-08	20	350.85	0	True	5.860359	-0.135923	20	8	0	1	-8.660254e-01	-5.000000e-01	382.638333	28.075838	0	55.19	0.00	11
2024-01-08	21	348.16	0	True	5.852662	-0.007667	21	8	0	1	-7.071068e-01	-7.071068e-01	381.278750	28.945817	0	2.69	0.00	11
2024-01-08	22	396.12	0	True	5.981717	0.137753	22	8	0	1	-5.000000e-01	-8.660254e-01	381.445000	29.022208	0	0.00	47.96	11
2024-01-08	23	362.04	0	True	5.891755	-0.086035	23	8	0	1	-2.588190e-01	-9.659258e-01	380.508750	29.280324	0	34.08	0.00	12
2024-01-09	0	468.08	0	True	6.148639	0.292896	0	9	1	1	0.000000e+00	1.000000e+00	383.601667	34.249663	1	0.00	106.04	12
2024-01-09	1	449.02	0	True	6.107067	-0.040720	1	9	1	1	2.588190e-01	9.659258e-01	384.585833	35.806921	1	19.06	0.00	13
2024-01-09	2	405.42	0	True	6.004924	-0.097100	2	9	1	1	5.000000e-01	8.660254e-01	384.891667	35.958215	1	43.60	0.00	13
2024-01-09	3	350.28	0	True	5.858733	-0.136007	3	9	1	1	7.071068e-01	7.071068e-01	384.139167	36.504475	1	55.14	0.00	14
2024-01-09	4	343.81	0	True	5.840089	-0.018471	4	9	1	1	8.660254e-01	5.000000e-01	382.613333	37.420101	1	6.47	0.00	15
2024-01-09	5	363.27	0	True	5.895146	0.056601	5	9	1	1	9.659258e-01	2.588190e-01	381.473333	37.581667	1	0.00	19.46	15
2024-01-09	6	332.64	0	True	5.807061	-0.084317	6	9	1	1	1.000000e+00	6.123234e-17	379.622083	38.879878	1	30.63	0.00	15
2024-01-09	7	199.81	0	True	5.297367	-0.399321	7	9	1	1	9.659258e-01	-2.588190e-01	373.766667	53.052179	1	132.83	0.00	19
2024-01-09	8	109.49	0	True	4.695833	-0.452029	8	9	1	1	8.660254e-01	-5.000000e-01	364.181667	75.526945	1	90.32	0.00	23
2024-01-09	9	84.61	0	True	4.438052	-0.227235	9	9	1	1	7.071068e-01	-7.071068e-01	353.680000	94.628526	1	24.88	0.00	24
2024-01-09	10	86.81	0	True	4.463722	0.026002	10	9	1	1	5.000000e-01	-8.660254e-01	341.796250	109.037032	1	0.00	2.20	24
2024-01-09	11	-48.76	0	True	4.463722	-1.561686	11	9	1	1	2.588190e-01	-9.659258e-01	323.752083	134.546277	1	135.57	0.00	30
2024-01-09	12	-80.00	0	True	4.463722	0.640689	12	9	1	1	1.224647e-16	-1.000000e+00	306.604167	157.736686	1	31.24	0.00	29
2024-01-09	13	5.09	0	True	1.627278	-1.063625	13	9	1	1	-2.588190e-01	-9.659258e-01	291.396667	168.573591	1	0.00	85.09	29
2024-01-09	14	-78.61	0	True	1.627278	-16.444008	14	9	1	1	-5.000000e-01	-8.660254e-01	271.628333	182.995842	1	83.70	0.00	32
2024-01-09	15	-26.30	0	True	1.627278	-0.665437	15	9	1	1	-7.071068e-01	-7.071068e-01	253.398333	190.138562	1	0.00	52.31	32
2024-01-09	16	152.43	0	True	5.026705	-6.795817	16	9	1	1	-8.660254e-01	-5.000000e-01	242.942917	188.425282	1	0.00	178.73	32
2024-01-09	17	297.99	0	True	5.697060	0.954930	17	9	1	1	-9.659258e-01	-2.588190e-01	238.149583	185.348454	1	0.00	145.56	32
2024-01-09	18	361.46	0	True	5.890151	0.212994	18	9	1	1	-1.836970e-16	-1.000000e+00	234.989583	182.429028	1	0.00	63.47	32
2024-01-09	19	413.13	0	True	6.023762	0.142948	19	9	1	1	-9.659258e-01	-2.588190e-01	235.285000	182.723564	1	0.00	51.67	31
2024-01-09	20	386.09	0	True	5.956071	-0.065452	20	9	1	1	-8.660254e-01	-5.000000e-01	236.753333	183.830836	1	27.04	0.00	29
2024-01-09	21	395.11	0	True	5.979164	0.023362	21	9	1	1	-7.071068e-01	-7.071068e-01	238.709583	185.311770	1	0.00	9.02	29
2024-01-09	22	456.73	0	True	6.124092	0.155957	22	9	1	1	-5.000000e-01	-8.660254e-01	241.235000	187.944510	1	0.00	61.62	29
2024-01-09	23	436.57	0	True	6.078949	-0.044140	23	9	1	1	-2.588190e-01	-9.659258e-01	244.340417	190.623994	1	20.16	0.00	29
2024-01-10	0	489.83	0	True	6.194058	0.121996	0	10	2	1	0.000000e+00	1.000000e+00	245.246667	191.782110	2	0.00	53.26	29
2024-01-10	1	532.83	0	True	6.278202	0.087786	1	10	2	1	2.588190e-01	9.659258e-01	248.738750	196.362200	2	0.00	43.00	28
2024-01-10	2	512.72	0	True	6.239730	-0.037742	2	10	2	1	5.000000e-01	8.660254e-01	253.209583	201.245468	2	20.11	0.00	27

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-01-10	3	474.05	0	True	6.161313	-0.075421	3	10	2	1	7.071068e-01	7.071068e-01	258.366667	205.384424	2	38.67	0.00	26
2024-01-10	4	481.66	0	True	6.177238	0.016053	4	10	2	1	8.660254e-01	5.000000e-01	264.110417	209.758773	2	0.00	7.61	26
2024-01-10	5	499.67	0	True	6.213948	0.037392	5	10	2	1	9.659258e-01	2.588190e-01	269.793750	214.359671	2	0.00	18.01	26
2024-01-10	6	403.43	0	True	6.000003	-0.192607	6	10	2	1	1.000000e+00	6.123234e-17	272.743333	215.744592	2	96.24	0.00	29
2024-01-10	7	184.58	0	True	5.218083	-0.542473	7	10	2	1	9.659258e-01	-2.588190e-01	272.108750	215.990701	2	218.85	0.00	32
2024-01-10	8	57.49	0	True	4.051611	-0.688536	8	10	2	1	8.660254e-01	-5.000000e-01	269.942083	217.944877	2	127.09	0.00	34
2024-01-10	9	-80.00	0	True	4.051611	-2.391546	9	10	2	1	7.071068e-01	-7.071068e-01	263.083333	226.454886	2	137.49	0.00	39
2024-01-10	10	-80.00	0	True	4.051611	0.000000	10	10	2	1	5.000000e-01	-8.660254e-01	256.132917	234.516732	2	0.00	0.00	39
2024-01-10	11	-80.00	0	True	4.051611	0.000000	11	10	2	1	2.588190e-01	-9.659258e-01	254.831250	236.362031	2	0.00	0.00	33
2024-01-10	12	-80.00	0	True	4.051611	0.000000	12	10	2	1	1.224647e-16	-1.000000e+00	254.831250	236.362031	2	0.00	0.00	32
2024-01-10	13	-69.56	0	True	4.051611	-0.130500	13	10	2	1	-2.588190e-01	-9.659258e-01	251.720833	240.250596	2	0.00	10.44	32
2024-01-10	14	97.27	0	True	4.577491	-2.398361	14	10	2	1	-5.000000e-01	-8.660254e-01	259.049167	232.286902	2	0.00	166.83	28
2024-01-10	15	267.78	0	True	5.590166	1.752956	15	10	2	1	-7.071068e-01	-7.071068e-01	271.302500	224.195599	2	0.00	170.51	28
2024-01-10	16	409.00	0	True	6.013715	0.527373	16	10	2	1	-8.660254e-01	-5.000000e-01	281.992917	224.397883	2	0.00	141.22	28
2024-01-10	17	523.71	0	True	6.260938	0.280465	17	10	2	1	-9.659258e-01	-2.588190e-01	291.397917	229.763562	2	0.00	114.71	28
2024-01-10	18	549.85	0	True	6.309646	0.049913	18	10	2	1	-1.000000e+00	-1.836970e-16	299.247500	235.409890	2	0.00	26.14	28
2024-01-10	19	544.21	0	True	6.299335	-0.010257	19	10	2	1	-9.659258e-01	2.588190e-01	304.709167	239.649314	2	5.64	0.00	28
2024-01-10	20	522.96	0	True	6.259505	-0.039047	20	10	2	1	-8.660254e-01	5.000000e-01	310.412083	243.271300	2	21.25	0.00	28
2024-01-10	21	541.43	0	True	6.294214	0.035318	21	10	2	1	-7.071068e-01	7.071068e-01	316.508750	247.286558	2	0.00	18.47	28
2024-01-10	22	539.39	0	True	6.290439	-0.003768	22	10	2	1	-5.000000e-01	8.660254e-01	319.952917	249.886419	2	2.04	0.00	28
2024-01-10	23	536.40	0	True	6.284880	-0.005543	23	10	2	1	-2.588190e-01	9.659258e-01	324.112500	252.726753	2	2.99	0.00	27
2024-01-11	0	613.88	0	True	6.419799	0.144444	0	11	3	1	0.000000e+00	1.000000e+00	329.281250	257.487053	3	0.00	77.48	27
2024-01-11	1	610.04	0	True	6.413525	-0.006255	1	11	3	1	2.588190e-01	9.659258e-01	332.498333	260.604263	3	3.84	0.00	28
2024-01-11	2	576.74	0	True	6.357392	-0.054587	2	11	3	1	5.000000e-01	8.660254e-01	335.165833	262.847183	3	33.30	0.00	28
2024-01-11	3	549.85	0	True	6.309646	-0.046624	3	11	3	1	7.071068e-01	7.071068e-01	338.324167	265.034849	3	26.89	0.00	28
2024-01-11	4	553.17	0	True	6.315665	0.006038	4	11	3	1	8.660254e-01	5.000000e-01	341.303750	267.110166	3	0.00	3.32	28
2024-01-11	5	564.85	0	True	6.336560	0.021115	5	11	3	1	9.659258e-01	2.588190e-01	344.019583	269.114197	3	0.00	11.68	28
2024-01-11	6	416.46	0	True	6.031790	-0.262707	6	11	3	1	1.000000e+00	6.123234e-17	344.562500	269.252372	3	148.39	0.00	30
2024-01-11	7	239.07	0	True	5.476756	-0.425947	7	11	3	1	9.659258e-01	-2.588190e-01	346.832917	268.071849	3	177.39	0.00	28
2024-01-11	8	130.67	0	True	4.872675	-0.453424	8	11	3	1	8.660254e-01	-5.000000e-01	349.882083	265.036652	3	108.40	0.00	27
2024-01-11	9	62.60	0	True	4.136765	-0.520931	9	11	3	1	7.071068e-01	-7.071068e-01	355.823750	256.439409	3	68.07	0.00	24
2024-01-11	10	46.16	0	True	3.832114	-0.262620	10	11	3	1	5.000000e-01	-8.660254e-01	361.080417	248.280437	3	16.44	0.00	25
2024-01-11	11	-3.40	0	True	3.832114	-1.073657	11	11	3	1	2.588190e-01	-9.659258e-01	364.272083	242.795548	3	49.56	0.00	27
2024-01-11	12	-59.38	0	True	3.832114	16.464706	12	11	3	1	1.224647e-16	-1.000000e+00	365.131250	241.186225	3	55.98	0.00	30
2024-01-11	13	25.87	0	True	3.253084	-1.435669	13	11	3	1	-2.588190e-01	-9.659258e-01	369.107500	234.399375	3	0.00	85.25	30
2024-01-11	14	99.26	0	True	4.597743	2.836877	14	11	3	1	-5.000000e-01	-8.660254e-01	369.190417	234.299365	3	0.00	73.39	30
2024-01-11	15	241.87	0	True	5.488400	1.436732	15	11	3	1	-7.071068e-01	-7.071068e-01	368.110833	234.846006	3	0.00	142.61	30
2024-01-11	16	392.91	0	True	5.973581	0.624468	16	11	3	1	-8.660254e-01	-5.000000e-01	367.440417	234.747149	3	0.00	151.04	30
2024-01-11	17	566.18	0	True	6.338912	0.440992	17	11	3	1	-9.659258e-01	-2.588190e-01	369.210000	236.132354	3	0.00	173.27	30
2024-01-11	18	600.02	0	True	6.396963	0.059769	18	11	3	1	-1.000000e+00	-1.836970e-16	371.300417	238.015602	3	0.00	33.84	30
2024-01-11	19	599.74	0	True	6.396496	-0.000467	19	11	3	1	-9.659258e-01	2.588190e-01	373.614167	240.030908	3	0.28	0.00	29
2024-01-11	20	547.15	0	True	6.304723	-0.087688	20	11	3	1	-8.660254e-01	5.000000e-01	374.622083	240.735050	3	52.59	0.00	31
2024-01-11	21	519.40	0	True	6.252674	-0.050717	21	11	3	1	-7.071068e-01	7.071068e-01	373.704167	240.112557	3	27.75	0.00	32
2024-01-11	22	508.81	0	True	6.232075	-0.020389	22	11	3	1	-5.000000e-01	8.660254e-01	372.430000	239.274787	3	10.59	0.00	32

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-01-11	23	452.70	0	True	6.115230	-0.110277	23	11	3	1	-2.588190e-01	9.659258e-01	368.942500	237.383468	3	56.11	0.00	34
2024-01-12	0	517.53	0	True	6.249067	0.143207	0	12	4	1	0.000000e+00	1.000000e+00	364.927917	233.849451	4	0.00	64.83	34
2024-01-12	1	511.00	0	True	6.236370	-0.012618	1	12	4	1	2.588190e-01	9.659258e-01	360.801250	230.181066	4	6.53	0.00	34
2024-01-12	2	502.06	0	True	6.218720	-0.017495	2	12	4	1	5.000000e-01	8.660254e-01	357.689583	227.625602	4	8.94	0.00	33
2024-01-12	3	488.22	0	True	6.190766	-0.027566	3	12	4	1	7.071068e-01	7.071068e-01	355.121667	225.703041	4	13.84	0.00	33
2024-01-12	4	485.70	0	True	6.185591	-0.005162	4	12	4	1	8.660254e-01	5.000000e-01	352.310417	223.538804	4	2.52	0.00	33
2024-01-12	5	469.69	0	True	6.152073	-0.032963	5	12	4	1	9.659258e-01	2.588190e-01	348.345417	220.427284	4	16.01	0.00	34
2024-01-12	6	369.25	0	True	5.911474	-0.213843	6	12	4	1	1.000000e+00	6.123234e-17	346.378333	220.003246	4	100.44	0.00	32
2024-01-12	7	201.55	0	True	5.306037	-0.454164	7	12	4	1	9.659258e-01	-2.588190e-01	344.815000	220.930282	4	167.70	0.00	31
2024-01-12	8	154.53	0	True	5.040388	-0.233292	8	12	4	1	8.660254e-01	-5.000000e-01	345.809167	219.976376	4	47.02	0.00	29
2024-01-12	9	133.16	0	True	4.891551	-0.138290	9	12	4	1	7.071068e-01	-7.071068e-01	348.749167	216.470274	4	21.37	0.00	27
2024-01-12	10	115.35	0	True	4.747971	-0.133749	10	12	4	1	5.000000e-01	-8.660254e-01	351.632083	212.693005	4	17.81	0.00	27
2024-01-12	11	113.07	0	True	4.728007	-0.019766	11	12	4	1	2.588190e-01	-9.659258e-01	356.485000	205.445443	4	2.28	0.00	25
2024-01-12	12	100.04	0	True	4.605570	-0.115238	12	12	4	1	1.224647e-16	-1.000000e+00	363.127500	193.653825	4	13.03	0.00	23
2024-01-12	13	156.18	0	True	5.051009	0.561176	13	12	4	1	-2.588190e-01	-9.659258e-01	368.557083	185.439385	4	0.00	56.14	23
2024-01-12	14	276.27	0	True	5.621379	0.768920	14	12	4	1	-5.000000e-01	-8.660254e-01	375.932500	177.618187	4	0.00	120.09	23
2024-01-12	15	418.93	0	True	6.037704	0.516379	15	12	4	1	-7.071068e-01	-7.071068e-01	383.310000	175.471891	4	0.00	142.66	23
2024-01-12	16	510.10	0	True	6.234607	0.217626	16	12	4	1	-8.660254e-01	-5.000000e-01	388.192917	177.370915	4	0.00	91.17	23
2024-01-12	17	505.84	0	True	6.226220	-0.008351	17	12	4	1	-9.659258e-01	-2.588190e-01	385.678750	175.152094	4	4.26	0.00	23
2024-01-12	18	528.10	0	True	6.269286	0.044006	18	12	4	1	-1.000000e+00	-1.836970e-16	382.682083	171.910746	4	0.00	22.26	23
2024-01-12	19	559.72	0	True	6.327437	0.059875	19	12	4	1	-9.659258e-01	2.588190e-01	381.014583	169.896075	4	0.00	31.62	23
2024-01-12	20	524.51	0	True	6.262464	-0.062906	20	12	4	1	-8.660254e-01	5.000000e-01	380.071250	168.993974	4	35.21	0.00	22
2024-01-12	21	506.43	0	True	6.227386	-0.034470	21	12	4	1	-7.071068e-01	7.071068e-01	379.530833	168.549203	4	18.08	0.00	22
2024-01-12	22	558.68	0	True	6.325577	0.103173	22	12	4	1	-5.000000e-01	8.660254e-01	381.608750	170.508304	4	0.00	52.25	22
2024-01-12	23	534.12	0	True	6.280621	-0.043961	23	12	4	1	-2.588190e-01	9.659258e-01	385.001250	172.779122	4	24.56	0.00	20
2024-01-13	0	555.22	1	False	6.319364	0.039504	0	13	5	1	0.000000e+00	1.000000e+00	386.571667	174.201500	5	0.00	21.10	20
2024-01-13	1	531.33	1	False	6.275383	-0.043028	1	13	5	1	2.588190e-01	9.659258e-01	387.418750	174.880964	5	23.89	0.00	21
2024-01-13	2	509.01	1	False	6.232468	-0.042008	2	13	5	1	5.000000e-01	8.660254e-01	387.708333	175.084686	5	22.32	0.00	22
2024-01-13	3	480.89	1	False	6.175639	-0.055244	3	13	5	1	7.071068e-01	7.071068e-01	387.402917	174.908035	5	28.12	0.00	22
2024-01-13	4	487.84	1	False	6.189987	0.014452	4	13	5	1	8.660254e-01	5.000000e-01	387.492083	174.960862	5	0.00	6.95	22
2024-01-13	5	495.07	1	False	6.204699	0.014820	5	13	5	1	9.659258e-01	2.588190e-01	388.549583	175.554977	5	0.00	7.23	21
2024-01-13	6	398.95	1	False	5.988836	-0.194154	6	13	5	1	1.000000e+00	6.123234e-17	389.787083	175.517692	5	96.12	0.00	21
2024-01-13	7	234.06	1	False	5.455577	-0.413310	7	13	5	1	9.659258e-01	-2.588190e-01	391.141667	174.121681	5	164.89	0.00	21
2024-01-13	8	121.09	1	False	4.796534	-0.482654	8	13	5	1	8.660254e-01	-5.000000e-01	389.748333	176.218553	5	112.97	0.00	24
2024-01-13	9	86.44	1	False	4.459451	-0.286151	9	13	5	1	7.071068e-01	-7.071068e-01	387.801667	179.405531	5	34.65	0.00	24
2024-01-13	10	77.58	1	False	4.351310	-0.102499	10	13	5	1	5.000000e-01	-8.660254e-01	386.227917	182.045630	5	8.86	0.00	24
2024-01-13	11	75.95	1	False	4.330075	-0.021011	11	13	5	1	2.588190e-01	-9.659258e-01	384.681250	184.606960	5	1.63	0.00	24
2024-01-13	12	55.40	1	False	4.014580	-0.270573	12	13	5	1	1.224647e-16	-1.000000e+00	382.821250	187.796867	5	20.55	0.00	24
2024-01-13	13	118.70	1	False	4.776599	1.142599	13	13	5	1	-2.588190e-01	-9.659258e-01	381.259583	189.907472	5	0.00	63.30	24
2024-01-13	14	245.20	1	False	5.502074	1.065712	14	13	5	1	-5.000000e-01	-8.660254e-01	379.965000	190.758290	5	0.00	126.50	24
2024-01-13	15	361.42	1	False	5.890041	0.473980	15	13	5	1	-7.071068e-01	-7.071068e-01	377.568750	190.608695	5	0.00	116.22	24
2024-01-13	16	392.37	1	False	5.972205	0.085634	16	13	5	1	-8.660254e-01	-5.000000e-01	372.663333	188.553481	5	0.00	30.95	24
2024-01-13	17	481.98	1	False	6.177903	0.228381	17	13	5	1	-9.659258e-01	-2.588190e-01	371.669167	187.882472	5	0.00	89.61	24
2024-01-13	18	579.71	1	False	6.362528	0.202768	18	13	5	1	-1.836970e-16	-1.000000e+00	373.819583	190.033788	5	0.00	97.73	24

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-01-13	19	551.54	1	False	6.312714	-0.048593	19	13	5	1	-9.659258e-01	2.588190e-01	373.478750	189.692901	5	28.17	0.00	25
2024-01-13	20	519.29	1	False	6.252462	-0.058473	20	13	5	1	-8.660254e-01	5.000000e-01	373.261250	189.515111	5	32.25	0.00	25
2024-01-13	21	550.89	1	False	6.311535	0.060852	21	13	5	1	-7.071068e-01	7.071068e-01	375.113750	191.084226	5	0.00	31.60	24
2024-01-13	22	627.26	1	False	6.441361	0.138630	22	13	5	1	-5.000000e-01	8.660254e-01	377.971250	194.432101	5	0.00	76.37	24
2024-01-13	23	560.69	1	False	6.329168	-0.106128	23	13	5	1	-2.588190e-01	9.659258e-01	379.078333	195.432926	5	66.57	0.00	26
2024-01-14	0	625.46	1	False	6.438487	0.115518	0	14	6	1	0.000000e+00	1.000000e+00	382.005000	198.684273	6	0.00	64.77	26
2024-01-14	1	609.16	1	False	6.412081	-0.026061	1	14	6	1	2.588190e-01	9.659258e-01	385.247917	201.837663	6	16.30	0.00	26
2024-01-14	2	529.57	1	False	6.272065	-0.130655	2	14	6	1	5.000000e-01	8.660254e-01	386.104583	202.428556	6	79.59	0.00	28
2024-01-14	3	504.49	1	False	6.223548	-0.047359	3	14	6	1	7.071068e-01	7.071068e-01	387.087917	202.965621	6	25.08	0.00	28
2024-01-14	4	524.81	1	False	6.263036	0.040278	4	14	6	1	8.660254e-01	5.000000e-01	388.628333	203.901664	6	0.00	20.32	28
2024-01-14	5	522.89	1	False	6.259371	-0.003658	5	14	6	1	9.659258e-01	2.588190e-01	389.787500	204.610930	6	1.92	0.00	28
2024-01-14	6	440.37	1	False	6.087615	-0.157815	6	14	6	1	1.000000e+00	6.123234e-17	391.513333	204.866097	6	82.52	0.00	28
2024-01-14	7	219.72	1	False	5.392354	-0.501056	7	14	6	1	9.659258e-01	-2.588190e-01	390.915833	205.365584	6	220.65	0.00	30
2024-01-14	8	62.05	1	False	4.127941	-0.717595	8	14	6	1	8.660254e-01	-5.000000e-01	388.455833	209.058662	6	157.67	0.00	32
2024-01-14	9	-30.62	1	False	4.127941	-1.493473	9	14	6	1	7.071068e-01	-7.071068e-01	383.578333	217.602258	6	92.67	0.00	34
2024-01-14	10	5.06	1	False	1.621366	-1.165251	10	14	6	1	5.000000e-01	-8.660254e-01	380.556667	222.484890	6	0.00	35.68	34
2024-01-14	11	96.76	1	False	4.572234	18.122530	11	14	6	1	2.588190e-01	-9.659258e-01	381.423750	221.283448	6	0.00	91.70	34
2024-01-14	12	93.46	1	False	4.537534	-0.034105	12	14	6	1	1.224647e-16	-1.000000e+00	383.009583	218.969688	6	3.30	0.00	33
2024-01-14	13	126.22	1	False	4.838026	0.350524	13	14	6	1	-2.588190e-01	-9.659258e-01	383.322917	218.580066	6	0.00	32.76	33
2024-01-14	14	189.20	1	False	5.242805	0.498970	14	14	6	1	-5.000000e-01	-8.660254e-01	380.989583	220.409869	6	0.00	62.98	33
2024-01-14	15	331.26	1	False	5.802904	0.750846	15	14	6	1	-7.071068e-01	-7.071068e-01	379.732917	220.612182	6	0.00	142.06	33
2024-01-14	16	401.87	1	False	5.996129	0.213156	16	14	6	1	-8.660254e-01	-5.000000e-01	380.128750	220.644362	6	0.00	70.61	33
2024-01-14	17	490.31	1	False	6.195038	0.220071	17	14	6	1	-9.659258e-01	-2.588190e-01	380.475833	220.818028	6	0.00	88.44	33
2024-01-14	18	551.69	1	False	6.312986	0.125186	18	14	6	1	-1.000000e+00	-1.836970e-16	379.308333	219.790529	6	0.00	61.38	33
2024-01-14	19	556.53	1	False	6.321721	0.008773	19	14	6	1	-9.659258e-01	-2.588190e-01	379.516250	219.962832	6	0.00	4.84	32
2024-01-14	20	548.47	1	False	6.307133	-0.014483	20	14	6	1	-8.660254e-01	-5.000000e-01	380.732083	220.847881	6	8.06	0.00	31
2024-01-14	21	566.78	1	False	6.339971	0.033384	21	14	6	1	-7.071068e-01	-7.071068e-01	381.394167	221.403299	6	0.00	18.31	31
2024-01-14	22	667.15	1	False	6.503015	0.177088	22	14	6	1	-5.000000e-01	-8.660254e-01	383.056250	223.469360	6	0.00	100.37	31
2024-01-14	23	651.73	1	False	6.479630	-0.023113	23	14	6	1	-2.588190e-01	-9.659258e-01	386.849583	227.354660	6	15.42	0.00	29
2024-01-15	0	825.20	0	True	6.715626	0.266169	0	15	0	1	0.000000e+00	1.000000e+00	395.172083	239.784965	0	0.00	173.47	29
2024-01-15	1	660.05	0	True	6.492316	-0.200133	1	15	0	1	2.588190e-01	9.659258e-01	397.292500	241.974545	0	165.15	0.00	35
2024-01-15	2	526.76	0	True	6.266745	-0.201939	2	15	0	1	5.000000e-01	8.660254e-01	397.175417	241.908428	0	133.29	0.00	37
2024-01-15	3	480.28	0	True	6.174369	-0.088238	3	15	0	1	7.071068e-01	7.071068e-01	396.166667	241.491592	0	46.48	0.00	38
2024-01-15	4	475.68	0	True	6.164745	-0.009578	4	15	0	1	8.660254e-01	5.000000e-01	394.119583	240.560129	0	4.60	0.00	38
2024-01-15	5	482.84	0	True	6.179685	0.015052	5	15	0	1	9.659258e-01	2.588190e-01	398.450833	239.765619	0	0.00	7.16	38
2024-01-15	6	373.44	0	True	5.922757	-0.226576	6	15	0	1	1.000000e+00	6.123234e-17	389.662083	239.573190	0	109.40	0.00	39
2024-01-15	7	160.47	0	True	5.078107	-0.570292	7	15	0	1	9.659258e-01	-2.588190e-01	387.193333	241.696417	0	212.97	0.00	39
2024-01-15	8	91.64	0	True	4.517868	-0.428928	8	15	0	1	8.660254e-01	-5.000000e-01	388.426250	240.035481	0	68.83	0.00	35
2024-01-15	9	88.29	0	True	4.480627	-0.036556	9	15	0	1	7.071068e-01	-7.071068e-01	393.380833	232.106104	0	3.35	0.00	32
2024-01-15	10	131.82	0	True	4.881437	0.493034	10	15	0	1	5.000000e-01	-8.660254e-01	398.662500	224.192861	0	0.00	43.53	32
2024-01-15	11	240.23	0	True	5.481597	0.822409	11	15	0	1	2.588190e-01	-9.659258e-01	404.640417	217.608961	0	0.00	108.41	32
2024-01-15	12	301.18	0	True	5.707708	0.253715	12	15	0	1	1.224647e-16	-1.000000e+00	413.295417	208.640232	0	0.00	60.95	31
2024-01-15	13	470.96	0	True	6.154773	0.563716	13	15	0	1	-2.588190e-01	-9.659258e-01	427.659583	199.691956	0	0.00	169.78	31
2024-01-15	14	586.22	0	True	6.373695	0.244734	14	15	0	1	-5.000000e-01	-8.660254e-01	444.202083	195.479222	0	0.00	115.26	31

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-01-15	15	768.42	0	True	6.644336	0.310805	15	15	0	1	-7.071068e-01	-7.071068e-01	462.417083	204.650006	0	0.00	182.20	31
2024-01-15	16	1034.78	0	True	6.941944	0.346633	16	15	0	1	-8.660254e-01	-5.000000e-01	488.788333	235.031923	0	0.00	266.36	31
2024-01-15	17	886.26	0	True	6.787010	-0.143528	17	15	0	1	-9.659258e-01	-2.588190e-01	505.286250	248.645825	0	148.52	0.00	38
2024-01-15	18	917.70	0	True	6.821871	0.035475	18	15	0	1	-1.000000e+00	-1.836970e-16	520.536667	262.456552	0	0.00	31.44	38
2024-01-15	19	856.35	0	True	6.752679	-0.066852	19	15	0	1	-9.659258e-01	2.588190e-01	533.029167	271.232992	0	61.35	0.00	40
2024-01-15	20	770.74	0	True	6.647351	-0.099971	20	15	0	1	-8.660254e-01	5.000000e-01	542.290417	275.543594	0	85.61	0.00	43
2024-01-15	21	756.57	0	True	6.628795	-0.018385	21	15	0	1	-7.071068e-01	7.071068e-01	550.198333	278.978993	0	14.17	0.00	44
2024-01-15	22	836.73	0	True	6.729501	0.105952	22	15	0	1	-5.000000e-01	8.660254e-01	557.264167	284.169108	0	0.00	80.16	44
2024-01-15	23	724.26	0	True	6.585150	-0.134416	23	15	0	1	-2.588190e-01	9.659258e-01	560.286250	285.599485	0	112.47	0.00	48
2024-01-16	0	618.48	0	True	6.427265	-0.146053	0	16	1	1	0.000000e+00	1.000000e+00	551.672917	280.331262	1	105.78	0.00	52
2024-01-16	1	464.00	0	True	6.139885	-0.249774	1	16	1	1	2.588190e-01	9.659258e-01	543.504167	279.891955	1	154.48	0.00	52
2024-01-16	2	414.16	0	True	6.026252	-0.107414	2	16	1	1	5.000000e-01	8.660254e-01	538.812500	281.125835	1	49.84	0.00	49
2024-01-16	3	404.28	0	True	6.002108	-0.023856	3	16	1	1	7.071068e-01	7.071068e-01	535.645833	282.239660	1	9.88	0.00	47
2024-01-16	4	397.00	0	True	5.983936	-0.018007	4	16	1	1	8.660254e-01	5.000000e-01	532.367500	283.420951	1	7.28	0.00	47
2024-01-16	5	392.05	0	True	5.971389	-0.012469	5	16	1	1	9.659258e-01	2.588190e-01	528.584583	284.713707	1	4.95	0.00	47
2024-01-16	6	388.92	0	True	5.963374	-0.007984	6	16	1	1	1.000000e+00	6.123234e-17	529.229583	284.364276	1	3.13	0.00	43
2024-01-16	7	391.83	0	True	5.970828	0.007482	7	16	1	1	9.659258e-01	-2.588190e-01	538.869583	275.090077	1	0.00	2.91	34
2024-01-16	8	399.58	0	True	5.990414	0.019779	8	16	1	1	8.660254e-01	-5.000000e-01	551.700417	260.096205	1	0.00	7.75	31
2024-01-16	9	413.91	0	True	6.025649	0.035863	9	16	1	1	7.071068e-01	-7.071068e-01	565.267917	242.789044	1	0.00	14.33	31
2024-01-16	10	411.73	0	True	6.020368	-0.005267	10	16	1	1	5.000000e-01	-8.660254e-01	576.930833	227.290485	1	2.18	0.00	31
2024-01-16	11	397.03	0	True	5.984012	-0.035703	11	16	1	1	2.588190e-01	-9.659258e-01	583.464167	219.304694	1	14.70	0.00	32
2024-01-16	12	380.29	0	True	5.940934	-0.042163	12	16	1	1	1.224647e-16	-1.000000e+00	586.760417	215.437799	1	16.74	0.00	32
2024-01-16	13	380.00	0	True	5.940171	-0.000763	13	16	1	1	-2.588190e-01	-9.659258e-01	582.970417	218.344028	1	0.29	0.00	32
2024-01-16	14	376.20	0	True	5.930121	-0.010000	14	16	1	1	-5.000000e-01	-8.660254e-01	574.219583	222.379448	1	3.80	0.00	33
2024-01-16	15	375.33	0	True	5.927806	-0.002313	15	16	1	1	-7.071068e-01	-7.071068e-01	557.840833	221.929795	1	0.87	0.00	33
2024-01-16	16	375.72	0	True	5.928844	0.001039	16	16	1	1	-8.660254e-01	-5.000000e-01	530.380000	200.044981	1	0.00	0.39	33
2024-01-16	17	379.84	0	True	5.939750	0.010966	17	16	1	1	-9.659258e-01	-2.588190e-01	509.279167	187.168803	1	0.00	4.12	26
2024-01-16	18	388.76	0	True	5.962962	0.023484	18	16	1	1	-1.836970e-16	-1.000000e+00	487.240000	167.045893	1	0.00	8.92	26
2024-01-16	19	389.66	0	True	5.965275	0.002315	19	16	1	1	-9.659258e-01	-2.588190e-01	467.794583	148.324597	1	0.00	0.90	24
2024-01-16	20	385.86	0	True	5.955475	-0.009752	20	16	1	1	-8.660254e-01	-5.000000e-01	451.757917	134.288696	1	3.80	0.00	21
2024-01-16	21	387.67	0	True	5.960154	0.004691	21	16	1	1	-7.071068e-01	-7.071068e-01	436.387083	118.008105	1	0.00	1.81	20
2024-01-16	22	404.33	0	True	6.002231	0.042975	22	16	1	1	-5.000000e-01	-8.660254e-01	418.370417	81.629809	1	0.00	16.66	20
2024-01-16	23	395.91	0	True	5.981187	-0.020825	23	16	1	1	-2.588190e-01	-9.659258e-01	404.689167	49.212312	1	8.42	0.00	16
2024-01-17	0	396.07	0	True	5.981591	0.000404	0	17	2	1	0.000000e+00	1.000000e+00	395.422083	18.660893	2	0.00	0.16	11
2024-01-17	1	391.37	0	True	5.969653	-0.011867	1	17	2	1	2.588190e-01	9.659258e-01	392.395833	11.615127	2	4.70	0.00	5.4
2024-01-17	2	391.99	0	True	5.971236	0.001584	2	17	2	1	5.000000e-01	8.660254e-01	391.472083	10.650502	2	0.00	0.62	3.2
2024-01-17	3	385.60	0	True	5.954801	-0.016301	3	17	2	1	7.071068e-01	7.071068e-01	390.693750	10.352195	2	6.39	0.00	3.2
2024-01-17	4	387.99	0	True	5.960980	0.006198	4	17	2	1	8.660254e-01	5.000000e-01	390.318333	10.276655	2	0.00	2.39	2.9
2024-01-17	5	389.81	0	True	5.965659	0.004691	5	17	2	1	9.659258e-01	2.588190e-01	390.225000	10.270414	2	0.00	1.82	2.7
2024-01-17	6	386.28	0	True	5.956562	-0.009056	6	17	2	1	1.000000e+00	6.123234e-17	390.115000	10.299097	2	3.53	0.00	2.7
2024-01-17	7	376.18	0	True	5.930068	-0.026147	7	17	2	1	9.659258e-01	-2.588190e-01	389.462917	10.674390	2	10.10	0.00	3.1
2024-01-17	8	373.79	0	True	5.923694	-0.006353	8	17	2	1	8.660254e-01	-5.000000e-01	388.388333	10.907220	2	2.39	0.00	3.2
2024-01-17	9	374.78	0	True	5.926339	0.002649	9	17	2	1	7.071068e-01	-7.071068e-01	386.757917	9.794152	2	0.00	0.99	3.2
2024-01-17	10	372.09	0	True	5.919136	-0.007178	10	17	2	1	8.660254e-01	-8.660254e-01	385.106250	8.678697	2	2.69	0.00	3.2

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-01-17	11	386.81	0	True	5.957934	0.039560	11	17	2	1	2.588190e-01	-9.659258e-01	384.680417	8.311150	2	0.00	14.72	2.6
2024-01-17	12	375.84	0	True	5.929164	-0.028360	12	17	2	1	1.224647e-16	-1.000000e+00	384.495000	8.461633	2	10.97	0.00	2.4
2024-01-17	13	384.55	0	True	5.952074	0.023175	13	17	2	1	-2.588190e-01	-9.659258e-01	384.684583	8.407340	2	0.00	8.71	2.4
2024-01-17	14	393.44	0	True	5.974929	0.023118	14	17	2	1	-5.000000e-01	-8.660254e-01	385.402917	8.387368	2	0.00	8.89	2.2
2024-01-17	15	397.12	0	True	5.984239	0.009353	15	17	2	1	-7.071068e-01	-7.071068e-01	386.310833	8.428847	2	0.00	3.68	2.2
2024-01-17	16	397.18	0	True	5.984390	0.000151	16	17	2	1	-8.660254e-01	-5.000000e-01	387.205000	8.394692	2	0.00	0.06	2.2
2024-01-17	17	393.82	0	True	5.975894	-0.008460	17	17	2	1	-9.659258e-01	-2.588190e-01	387.787500	8.346313	2	3.36	0.00	2.3
2024-01-17	18	397.04	0	True	5.984037	0.008176	18	17	2	1	-1.000000e+00	-1.836970e-16	388.132500	8.556736	2	0.00	3.22	2.2
2024-01-17	19	401.26	0	True	5.994610	0.010629	19	17	2	1	-9.659258e-01	2.588190e-01	388.615833	8.964663	2	0.00	4.22	2.2
2024-01-17	20	396.46	0	True	5.982575	-0.011962	20	17	2	1	-8.660254e-01	5.000000e-01	389.057500	9.083319	2	4.80	0.00	2.2
2024-01-17	21	401.09	0	True	5.994186	0.011678	21	17	2	1	-7.071068e-01	7.071068e-01	389.616667	9.401678	2	0.00	4.63	2.3
2024-01-17	22	418.49	0	True	6.036653	0.043382	22	17	2	1	-5.000000e-01	8.660254e-01	390.206667	10.717395	2	0.00	17.40	2.2
2024-01-17	23	397.15	0	True	5.984314	-0.050993	23	17	2	1	-2.588190e-01	9.659258e-01	390.258333	10.749027	2	21.34	0.00	2.9
2024-01-18	0	427.27	0	True	6.057416	0.075840	0	18	3	1	0.000000e+00	1.000000e+00	391.558333	13.109877	3	0.00	30.12	2.5
2024-01-18	1	399.33	0	True	5.989788	-0.065392	1	18	3	1	2.588190e-01	9.659258e-01	391.890000	13.205249	3	27.94	0.00	3.8
2024-01-18	2	369.01	0	True	5.910824	-0.075927	2	18	3	1	5.000000e-01	8.660254e-01	390.932500	14.006503	3	30.32	0.00	5.1
2024-01-18	3	352.64	0	True	5.865448	-0.044362	3	18	3	1	7.071068e-01	7.071068e-01	389.559167	16.022815	3	16.37	0.00	5.5
2024-01-18	4	347.97	0	True	5.852116	-0.013243	4	18	3	1	8.660254e-01	5.000000e-01	387.891667	18.136280	3	4.67	0.00	5.7
2024-01-18	5	356.37	0	True	5.875970	0.024140	5	18	3	1	9.659258e-01	2.588190e-01	386.498333	19.233812	3	0.00	8.40	5.7
2024-01-18	6	331.55	0	True	5.803779	-0.069647	6	18	3	1	1.000000e+00	6.123234e-17	384.217917	22.266248	3	24.82	0.00	6.6
2024-01-18	7	175.80	0	True	5.169347	-0.469763	7	18	3	1	9.659258e-01	-2.588190e-01	375.868750	48.050466	3	155.75	0.00	12
2024-01-18	8	67.92	0	True	4.218331	-0.613652	8	18	3	1	8.660254e-01	-5.000000e-01	363.124167	79.134836	3	107.88	0.00	17
2024-01-18	9	-54.10	0	True	4.218331	-1.796525	9	18	3	1	7.071068e-01	-7.071068e-01	345.254167	116.153847	3	122.02	0.00	22
2024-01-18	10	-82.46	0	True	4.218331	0.524214	10	18	3	1	5.000000e-01	-8.660254e-01	326.314583	145.051675	3	28.36	0.00	23
2024-01-18	11	-85.52	0	True	4.218331	0.037109	11	18	3	1	2.588190e-01	-9.659258e-01	306.634167	166.886073	3	3.06	0.00	23
2024-01-18	12	-49.72	0	True	4.218331	-0.418616	12	18	3	1	1.224647e-16	-1.000000e+00	288.902500	181.206712	3	0.00	35.80	22
2024-01-18	13	68.03	0	True	4.219949	-2.368262	13	18	3	1	-2.588190e-01	-9.659258e-01	275.714167	185.412221	3	0.00	117.75	22
2024-01-18	14	79.57	0	True	4.376637	0.169631	14	18	3	1	-5.000000e-01	-8.660254e-01	262.636250	187.801388	3	0.00	11.54	22
2024-01-18	15	177.72	0	True	5.180209	1.233505	15	18	3	1	-7.071068e-01	-7.071068e-01	253.494583	186.304393	3	0.00	98.15	22
2024-01-18	16	320.74	0	True	5.770631	0.804749	16	18	3	1	-8.660254e-01	-5.000000e-01	250.309583	184.384700	3	0.00	143.02	22
2024-01-18	17	396.01	0	True	5.981439	0.234676	17	18	3	1	-9.659258e-01	-2.588190e-01	250.400833	184.459336	3	0.00	75.27	22
2024-01-18	18	501.06	0	True	6.216726	0.265271	18	18	3	1	-1.000000e+00	-1.836970e-16	254.735000	189.215406	3	0.00	105.05	22
2024-01-18	19	522.02	0	True	6.257706	0.041831	19	18	3	1	-9.659258e-01	-2.588190e-01	259.766667	194.804348	3	0.00	20.96	22
2024-01-18	20	462.83	0	True	6.137360	-0.113386	20	18	3	1	-8.660254e-01	-5.000000e-01	262.532083	197.284499	3	59.19	0.00	25
2024-01-18	21	447.52	0	True	6.103721	-0.033079	21	18	3	1	-7.071068e-01	-7.071068e-01	264.466667	198.923123	3	15.31	0.00	25
2024-01-18	22	468.45	0	True	6.149429	0.046769	22	18	3	1	-5.000000e-01	-8.660254e-01	266.548333	200.857013	3	0.00	20.93	25
2024-01-18	23	353.18	0	True	5.866978	-0.246067	23	18	3	1	-2.588190e-01	-9.659258e-01	264.716250	199.811771	3	115.27	0.00	29
2024-01-19	0	418.00	0	True	6.035481	0.183532	0	19	4	1	0.000000e+00	1.000000e+00	264.330000	199.492586	4	0.00	64.82	29
2024-01-19	1	412.43	0	True	6.022066	-0.013325	1	19	4	1	2.588190e-01	9.659258e-01	264.875833	199.895535	4	5.57	0.00	28
2024-01-19	2	405.70	0	True	6.005614	-0.016318	2	19	4	1	5.000000e-01	-8.660254e-01	266.404583	200.864502	4	6.73	0.00	27
2024-01-19	3	400.65	0	True	5.993088	-0.012448	3	19	4	1	7.071068e-01	7.071068e-01	268.405000	201.996540	4	5.05	0.00	27
2024-01-19	4	401.41	0	True	5.994983	0.001897	4	19	4	1	8.660254e-01	5.000000e-01	270.631667	203.202683	4	0.00	0.76	27
2024-01-19	5	414.74	0	True	6.027652	0.033208	5	19	4	1	9.659258e-01	2.588190e-01	273.063750	204.617861	4	0.00	13.33	27
2024-01-19	6	386.96	0	True	5.958321	-0.066982	6	19	4	1	1.000000e+00	6.123234e-17	275.372500	205.616631	4	27.78	0.00	27

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-01-19	7	283.26	0	True	5.646365	-0.267986	7	19	4	1	9.659258e-01	-2.588190e-01	279.850000	204.521175	4	103.70	0.00	24
2024-01-19	8	256.84	0	True	5.548453	-0.093271	8	19	4	1	8.660254e-01	-5.000000e-01	287.721667	199.585763	4	26.42	0.00	21
2024-01-19	9	322.24	0	True	5.775297	0.254633	9	19	4	1	7.071068e-01	-7.071068e-01	303.402500	185.875263	4	0.00	65.40	16
2024-01-19	10	389.35	0	True	5.964479	0.208261	10	19	4	1	5.000000e-01	-8.660254e-01	323.061250	167.314208	4	0.00	67.11	15
2024-01-19	11	394.27	0	True	5.977036	0.012636	11	19	4	1	2.588190e-01	-9.659258e-01	343.052500	143.315320	4	0.00	4.92	15
2024-01-19	12	325.85	0	True	5.786437	-0.173536	12	19	4	1	1.224647e-16	-1.000000e+00	358.701250	116.572790	4	68.42	0.00	18
2024-01-19	13	389.12	0	True	5.963888	0.194169	13	19	4	1	-2.588190e-01	-9.659258e-01	372.080000	98.839284	4	0.00	63.27	18
2024-01-19	14	420.04	0	True	6.040350	0.079461	14	19	4	1	-5.000000e-01	-8.660254e-01	386.266250	77.065687	4	0.00	30.92	18
2024-01-19	15	442.03	0	True	6.091378	0.052352	15	19	4	1	-7.071068e-01	-7.071068e-01	397.279167	63.693217	4	0.00	21.99	18
2024-01-19	16	463.97	0	True	6.139820	0.049635	16	19	4	1	-8.660254e-01	-5.000000e-01	403.247083	62.915276	4	0.00	21.94	18
2024-01-19	17	448.44	0	True	6.105775	-0.033472	17	19	4	1	-9.659258e-01	-2.588190e-01	405.431667	63.560010	4	15.53	0.00	18
2024-01-19	18	457.94	0	True	6.126738	0.021185	18	19	4	1	-1.000000e+00	-1.836970e-16	403.635000	61.308910	4	0.00	9.50	18
2024-01-19	19	446.29	0	True	6.100969	-0.025440	19	19	4	1	-9.659258e-01	2.588190e-01	400.479583	56.728751	4	11.65	0.00	19
2024-01-19	20	419.92	0	True	6.040064	-0.059087	20	19	4	1	-8.660254e-01	5.000000e-01	398.691667	55.337350	4	26.37	0.00	17
2024-01-19	21	383.76	0	True	5.950017	-0.086112	21	19	4	1	-7.071068e-01	7.071068e-01	396.035000	54.414061	4	36.16	0.00	18
2024-01-19	22	388.47	0	True	5.962216	0.012273	22	19	4	1	-5.000000e-01	8.660254e-01	392.702500	52.189969	4	0.00	4.71	18
2024-01-19	23	373.39	0	True	5.922623	-0.038819	23	19	4	1	-2.588190e-01	9.659258e-01	393.544583	51.685151	4	15.08	0.00	14
2024-01-20	0	387.01	1	False	5.958451	0.036477	0	20	5	1	0.000000e+00	1.000000e+00	392.253333	51.434120	5	0.00	13.62	14
2024-01-20	1	354.08	1	False	5.869523	-0.085088	1	20	5	1	2.588190e-01	9.659258e-01	389.822083	51.816575	5	32.93	0.00	15
2024-01-20	2	342.81	1	False	5.837176	-0.031829	2	20	5	1	5.000000e-01	8.660254e-01	387.201667	52.563523	5	11.27	0.00	15
2024-01-20	3	318.50	1	False	5.763622	-0.070914	3	20	5	1	7.071068e-01	7.071068e-01	383.778750	54.295936	5	24.31	0.00	16
2024-01-20	4	342.44	1	False	5.836096	0.075165	4	20	5	1	8.660254e-01	5.000000e-01	381.321667	54.795373	5	0.00	23.94	16
2024-01-20	5	376.86	1	False	5.931874	0.100514	5	20	5	1	9.659258e-01	2.588190e-01	379.743333	54.334548	5	0.00	34.42	16
2024-01-20	6	373.39	1	False	5.922623	-0.009208	6	20	5	1	1.000000e+00	6.123234e-17	379.177917	54.326790	5	3.47	0.00	15
2024-01-20	7	326.59	1	False	5.788706	-0.125338	7	20	5	1	9.659258e-01	-2.588190e-01	380.983333	51.654882	5	46.80	0.00	13
2024-01-20	8	301.46	1	False	5.708637	-0.076947	8	20	5	1	8.660254e-01	-5.000000e-01	382.842500	47.639340	5	25.13	0.00	13
2024-01-20	9	174.15	1	False	5.159917	-0.422311	9	20	5	1	7.071068e-01	-7.071068e-01	376.672083	62.957810	5	127.31	0.00	18
2024-01-20	10	-52.50	1	False	5.159917	-1.301464	10	20	5	1	5.000000e-01	-8.660254e-01	358.261667	107.755375	5	226.65	0.00	27
2024-01-20	11	-81.16	1	False	5.159917	0.545905	11	20	5	1	2.588190e-01	-9.659258e-01	338.452083	139.787853	5	28.66	0.00	29
2024-01-20	12	-81.60	1	False	5.159917	0.005421	12	20	5	1	1.224647e-16	-1.000000e+00	321.475000	164.025772	5	0.44	0.00	26
2024-01-20	13	-84.18	1	False	5.159917	0.031618	13	20	5	1	-2.588190e-01	-9.659258e-01	301.754167	182.905143	5	2.58	0.00	26
2024-01-20	14	-82.30	1	False	5.159917	-0.022333	14	20	5	1	-5.000000e-01	-8.660254e-01	280.823333	196.981611	5	0.00	1.88	26
2024-01-20	15	-77.54	1	False	5.159917	-0.057837	15	20	5	1	-7.071068e-01	-7.071068e-01	259.174583	206.800578	5	0.00	4.76	26
2024-01-20	16	147.97	1	False	4.997010	-2.908305	16	20	5	1	-8.660254e-01	-5.000000e-01	246.007917	203.223335	5	0.00	225.51	26
2024-01-20	17	367.04	1	False	5.905471	1.480503	17	20	5	1	-9.659258e-01	-2.588190e-01	242.616250	200.357027	5	0.00	219.07	25
2024-01-20	18	396.05	1	False	5.981540	0.079038	18	20	5	1	-1.000000e+00	-1.836970e-16	240.037500	197.847722	5	0.00	29.01	25
2024-01-20	19	381.29	1	False	5.943560	-0.037268	19	20	5	1	-9.659258e-01	2.588190e-01	237.329167	195.330457	5	14.76	0.00	25
2024-01-20	20	308.40	1	False	5.731398	-0.191167	20	20	5	1	-8.660254e-01	5.000000e-01	232.682500	192.097707	5	72.89	0.00	27
2024-01-20	21	242.36	1	False	5.490424	-0.214137	21	20	5	1	-7.071068e-01	7.071068e-01	226.790833	189.412287	5	66.04	0.00	29
2024-01-20	22	315.03	1	False	5.752668	0.299843	22	20	5	1	-5.000000e-01	8.660254e-01	223.730833	187.267839	5	0.00	72.67	29
2024-01-20	23	202.49	1	False	5.310691	-0.357236	23	20	5	1	-2.588190e-01	9.659258e-01	216.610000	184.559282	5	112.54	0.00	33
2024-01-21	0	257.82	1	False	5.552262	0.273248	0	21	6	1	0.000000e+00	1.000000e+00	211.227083	181.227175	6	0.00	55.33	33
2024-01-21	1	259.13	1	False	5.557330	0.005081	1	21	6	1	2.588190e-01	9.659258e-01	207.270833	178.995717	6	0.00	1.31	31
2024-01-21	2	241.28	1	False	5.485958	-0.068884	2	21	6	1	5.000000e-01	8.660254e-01	203.040417	176.839890	6	17.85	0.00	32

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-01-21	3	143.91	1	False	4.969188	-0.403556	3	21	6	1	7.071068e-01	7.071068e-01	195.765833	175.469482	6	97.37	0.00	35
2024-01-21	4	139.15	1	False	4.935552	-0.033076	4	21	6	1	8.660254e-01	5.000000e-01	187.295417	172.970152	6	4.76	0.00	35
2024-01-21	5	215.41	1	False	5.372543	0.548042	5	21	6	1	9.659258e-01	2.588190e-01	180.568333	168.355098	6	0.00	76.26	35
2024-01-21	6	149.81	1	False	5.009368	-0.304536	6	21	6	1	1.000000e+00	6.123234e-17	171.252500	163.332436	6	65.60	0.00	37
2024-01-21	7	-27.19	1	False	5.009368	-1.181497	7	21	6	1	9.659258e-01	-2.588190e-01	156.511667	164.662609	6	177.00	0.00	43
2024-01-21	8	-80.00	1	False	5.009368	1.942258	8	21	6	1	8.660254e-01	-5.000000e-01	140.617500	168.430295	6	52.81	0.00	44
2024-01-21	9	-78.70	1	False	5.009368	-0.016250	9	21	6	1	7.071068e-01	-7.071068e-01	130.082083	174.055643	6	0.00	1.30	39
2024-01-21	10	-74.53	1	False	5.009368	-0.052986	10	21	6	1	5.000000e-01	-8.660254e-01	129.164167	175.115254	6	0.00	4.17	29
2024-01-21	11	46.65	1	False	3.842673	-1.625922	11	21	6	1	2.588190e-01	-9.659258e-01	134.489583	170.318728	6	0.00	121.18	28
2024-01-21	12	150.56	1	False	5.014362	2.227438	12	21	6	1	1.224647e-16	-1.000000e+00	144.162917	163.987351	6	0.00	103.91	28
2024-01-21	13	387.27	1	False	5.959122	1.572197	13	21	6	1	-2.588190e-01	-9.659258e-01	163.806667	163.682102	6	0.00	236.71	28
2024-01-21	14	409.21	1	False	6.014228	0.056653	14	21	6	1	-5.000000e-01	-8.660254e-01	184.286250	162.293412	6	0.00	21.94	28
2024-01-21	15	431.71	1	False	6.067754	0.054984	15	21	6	1	-7.071068e-01	-7.071068e-01	205.505000	159.845083	6	0.00	22.50	28
2024-01-21	16	442.80	1	False	6.093118	0.025689	16	21	6	1	-8.660254e-01	-5.000000e-01	217.789583	166.424959	6	0.00	11.09	28
2024-01-21	17	443.19	1	False	6.093999	0.000881	17	21	6	1	-9.659258e-01	-2.588190e-01	220.962500	170.079928	6	0.00	0.39	28
2024-01-21	18	452.02	1	False	6.113726	0.019924	18	21	6	1	-1.000000e+00	-1.836970e-16	223.294583	172.944650	6	0.00	8.83	28
2024-01-21	19	445.50	1	False	6.099197	-0.014424	19	21	6	1	-9.659258e-01	2.588190e-01	225.970000	175.965350	6	6.52	0.00	28
2024-01-21	20	444.66	1	False	6.097310	-0.001886	20	21	6	1	-8.660254e-01	5.000000e-01	231.647500	180.870419	6	0.84	0.00	25
2024-01-21	21	455.51	1	False	6.121418	0.024401	21	21	6	1	-7.071068e-01	7.071068e-01	240.528750	186.562860	6	0.00	10.85	22
2024-01-21	22	464.46	1	False	6.140875	0.019648	22	21	6	1	-5.000000e-01	8.660254e-01	246.755000	191.583277	6	0.00	8.95	22
2024-01-21	23	434.13	1	False	6.073344	-0.065302	23	21	6	1	-2.588190e-01	9.659258e-01	256.406667	195.059611	6	30.33	0.00	18
2024-01-22	0	415.28	0	True	6.028953	-0.043420	0	22	0	1	0.000000e+00	1.000000e+00	262.967500	197.738899	0	18.85	0.00	19
2024-01-22	1	396.61	0	True	5.982953	-0.044958	1	22	0	1	2.588190e-01	9.659258e-01	268.695833	199.605428	0	18.67	0.00	20
2024-01-22	2	374.84	0	True	5.926499	-0.054890	2	22	0	1	5.000000e-01	8.660254e-01	274.260833	200.666846	0	21.77	0.00	20
2024-01-22	3	378.96	0	True	5.937431	0.010991	3	22	0	1	7.071068e-01	7.071068e-01	284.054583	199.762225	0	0.00	4.12	16
2024-01-22	4	387.54	0	True	5.959819	0.022641	4	22	0	1	8.660254e-01	5.000000e-01	294.404167	198.357925	0	0.00	8.58	16
2024-01-22	5	394.43	0	True	5.977442	0.017779	5	22	0	1	9.659258e-01	2.588190e-01	301.863333	198.624036	0	0.00	6.89	16
2024-01-22	6	366.01	0	True	5.902661	-0.072053	6	22	0	1	1.000000e+00	6.123234e-17	310.871667	196.317362	0	28.42	0.00	14
2024-01-22	7	324.94	0	True	5.783641	-0.112210	7	22	0	1	9.659258e-01	-2.588190e-01	325.543750	182.634989	0	41.07	0.00	9.1
2024-01-22	8	364.67	0	True	5.898993	0.122269	8	22	0	1	8.660254e-01	-5.000000e-01	344.071667	160.975791	0	0.00	39.73	6.9
2024-01-22	9	397.62	0	True	5.985497	0.090356	9	22	0	1	7.071068e-01	-7.071068e-01	363.918333	133.625352	0	0.00	32.95	6.9
2024-01-22	10	411.43	0	True	6.019639	0.034732	10	22	0	1	5.000000e-01	-8.660254e-01	384.166667	95.749319	0	0.00	13.81	6.9
2024-01-22	11	416.82	0	True	6.032654	0.013101	11	22	0	1	2.588190e-01	-9.659258e-01	399.590417	63.349194	0	0.00	5.39	6.9
2024-01-22	12	407.25	0	True	6.009427	-0.022960	12	22	0	1	1.224647e-16	-1.000000e+00	410.285833	34.640315	0	9.57	0.00	7.2
2024-01-22	13	397.80	0	True	5.985949	-0.023204	13	22	0	1	-2.588190e-01	-9.659258e-01	410.724583	34.401990	0	9.45	0.00	7.1
2024-01-22	14	412.62	0	True	6.022527	0.037255	14	22	0	1	-5.000000e-01	-8.660254e-01	410.866667	34.402505	0	0.00	14.82	7.1
2024-01-22	15	413.96	0	True	6.025769	0.003248	15	22	0	1	-7.071068e-01	-7.071068e-01	410.127083	34.124605	0	0.00	1.34	7.1
2024-01-22	16	423.66	0	True	6.048931	0.023432	16	22	0	1	-8.660254e-01	-5.000000e-01	409.329583	33.546591	0	0.00	9.70	7.1
2024-01-22	17	434.45	0	True	6.074081	0.025469	17	22	0	1	-9.659258e-01	-2.588190e-01	408.965417	33.208774	0	0.00	10.79	7.1
2024-01-22	18	441.89	0	True	6.091061	0.017125	18	22	0	1	-1.836970e-16	-1.000000e+00	408.543333	32.698209	0	0.00	7.44	7.1
2024-01-22	19	456.42	0	True	6.123413	0.032881	19	22	0	1	-9.659258e-01	2.588190e-01	408.998333	33.305169	0	0.00	14.53	7.4
2024-01-22	20	440.11	0	True	6.087025	-0.035735	20	22	0	1	-8.660254e-01	5.000000e-01	408.808750	33.105698	0	16.31	0.00	8.1
2024-01-22	21	440.62	0	True	6.088183	0.001159	21	22	0	1	-7.071068e-01	7.071068e-01	408.188333	32.322705	0	0.00	0.51	8.1
2024-01-22	22	435.19	0	True	6.075783	-0.012324	22	22	0	1	-5.000000e-01	8.660254e-01	406.968750	30.614226	0	5.43	0.00	8.2

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-01-22	23	419.78	0	True	6.039731	-0.035410	23	22	0	1	-2.588190e-01	9.659258e-01	406.370833	30.197987	0	15.41	0.00	7.5
2024-01-23	0	476.10	0	True	6.165628	0.134166	0	23	1	1	0.000000e+00	1.000000e+00	408.905000	33.364117	1	0.00	56.32	6.9
2024-01-23	1	454.25	0	True	6.118648	-0.045894	1	23	1	1	2.588190e-01	9.659258e-01	411.306667	34.495967	1	21.85	0.00	7.0
2024-01-23	2	451.53	0	True	6.112642	-0.005988	2	23	1	1	5.000000e-01	8.660254e-01	414.502083	34.523081	1	2.72	0.00	6.2
2024-01-23	3	446.76	0	True	6.102022	-0.010564	3	23	1	1	7.071068e-01	7.071068e-01	417.327083	34.261266	1	4.77	0.00	6.4
2024-01-23	4	456.66	0	True	6.123939	0.022160	4	23	1	1	8.660254e-01	5.000000e-01	420.207083	34.552375	1	0.00	9.90	6.4
2024-01-23	5	455.01	0	True	6.120319	-0.003613	5	23	1	1	9.659258e-01	2.588190e-01	422.731250	34.799303	1	1.65	0.00	6.5
2024-01-23	6	419.38	0	True	6.038777	-0.078306	6	23	1	1	1.000000e+00	6.123234e-17	424.955000	32.656348	1	35.63	0.00	6.8
2024-01-23	7	347.54	0	True	5.850880	-0.171300	7	23	1	1	9.659258e-01	-2.588190e-01	425.896667	29.852429	1	71.84	0.00	8.1
2024-01-23	8	392.78	0	True	5.973250	0.130172	8	23	1	1	8.660254e-01	-5.000000e-01	427.067917	27.828620	1	0.00	45.24	8.1
2024-01-23	9	412.73	0	True	6.022794	0.050792	9	23	1	1	7.071068e-01	-7.071068e-01	427.697500	27.299324	1	0.00	19.95	8.1
2024-01-23	10	376.45	0	True	5.930785	-0.087903	10	23	1	1	5.000000e-01	-8.660254e-01	426.240000	29.081230	1	36.28	0.00	9.6
2024-01-23	11	401.48	0	True	5.995158	0.066490	11	23	1	1	2.588190e-01	-9.659258e-01	425.600833	29.463337	1	0.00	25.03	9.6
2024-01-23	12	380.90	0	True	5.942537	-0.051260	12	23	1	1	1.224647e-16	-1.000000e+00	424.502917	30.644178	1	20.58	0.00	10
2024-01-23	13	408.26	0	True	6.011904	0.071830	13	23	1	1	-2.588190e-01	-9.659258e-01	424.938750	30.320561	1	0.00	27.36	9.6
2024-01-23	14	418.47	0	True	6.036605	0.025009	14	23	1	1	-5.000000e-01	-8.660254e-01	425.182500	30.240633	1	0.00	10.21	9.6
2024-01-23	15	435.88	0	True	6.077367	0.041604	15	23	1	1	-7.071068e-01	-7.071068e-01	426.095833	30.217960	1	0.00	17.41	9.6
2024-01-23	16	472.65	0	True	6.158355	0.084358	16	23	1	1	-8.660254e-01	-5.000000e-01	428.137083	31.666217	1	0.00	36.77	9.6
2024-01-23	17	496.52	0	True	6.207624	0.050502	17	23	1	1	-9.659258e-01	-2.588190e-01	430.723333	34.602761	1	0.00	23.87	9.6
2024-01-23	18	503.41	0	True	6.221405	0.013877	18	23	1	1	-1.000000e+00	-1.836970e-16	433.286667	37.613617	1	0.00	6.89	9.6
2024-01-23	19	528.84	0	True	6.270686	0.050515	19	23	1	1	-9.659258e-01	2.588190e-01	436.304167	42.178089	1	0.00	25.43	9.6
2024-01-23	20	570.07	0	True	6.345759	0.077963	20	23	1	1	-8.660254e-01	5.000000e-01	441.719167	50.256679	1	0.00	41.23	9.6
2024-01-23	21	522.30	0	True	6.258242	-0.083797	21	23	1	1	-7.071068e-01	7.071068e-01	445.122500	52.876376	1	47.77	0.00	10
2024-01-23	22	525.96	0	True	6.265225	0.007007	22	23	1	1	-5.000000e-01	8.660254e-01	448.904583	55.324616	1	0.00	3.66	10
2024-01-23	23	493.40	0	True	6.201320	-0.061906	23	23	1	1	-2.588190e-01	9.659258e-01	451.972083	55.679391	1	32.56	0.00	11
2024-01-24	0	417.21	0	True	6.033590	-0.154418	0	24	2	1	0.000000e+00	1.000000e+00	449.518333	55.867163	2	76.19	0.00	14
2024-01-24	1	376.96	0	True	5.932139	-0.096474	1	24	2	1	2.588190e-01	9.659258e-01	446.297917	57.777548	2	40.25	0.00	15
2024-01-24	2	365.03	0	True	5.899980	-0.031648	2	24	2	1	5.000000e-01	8.660254e-01	442.693750	60.088694	2	11.93	0.00	15
2024-01-24	3	351.92	0	True	5.863404	-0.035915	3	24	2	1	7.071068e-01	7.071068e-01	438.742083	62.864083	2	13.11	0.00	16
2024-01-24	4	376.42	0	True	5.930706	0.069618	4	24	2	1	8.660254e-01	5.000000e-01	435.398750	63.993294	2	0.00	24.50	16
2024-01-24	5	376.16	0	True	5.930015	-0.000691	5	24	2	1	9.659258e-01	2.588190e-01	432.113333	64.959463	2	0.26	0.00	16
2024-01-24	6	360.32	0	True	5.886993	-0.042110	6	24	2	1	1.000000e+00	6.123234e-17	429.652500	66.561721	2	15.84	0.00	15
2024-01-24	7	327.37	0	True	5.791091	-0.091446	7	24	2	1	9.659258e-01	-2.588190e-01	428.812083	67.760107	2	32.95	0.00	13
2024-01-24	8	320.44	0	True	5.769695	-0.021169	8	24	2	1	8.660254e-01	-5.000000e-01	425.797917	70.965726	2	6.93	0.00	13
2024-01-24	9	323.22	0	True	5.778333	0.008676	9	24	2	1	7.071068e-01	-7.071068e-01	422.068333	73.970827	2	0.00	2.78	13
2024-01-24	10	320.75	0	True	5.770662	-0.007642	10	24	2	1	5.000000e-01	-8.660254e-01	419.747500	76.301409	2	2.47	0.00	12
2024-01-24	11	330.58	0	True	5.800849	0.030647	11	24	2	1	2.588190e-01	-9.659258e-01	416.793333	78.383535	2	0.00	9.83	12
2024-01-24	12	348.18	0	True	5.852720	0.053240	12	24	2	1	1.224647e-16	-1.000000e+00	415.430000	79.314003	2	0.00	17.60	11
2024-01-24	13	407.78	0	True	6.010728	0.171176	13	24	2	1	-2.588190e-01	-9.659258e-01	415.410000	79.315950	2	0.00	59.60	11
2024-01-24	14	465.09	0	True	6.142231	0.140541	14	24	2	1	-5.000000e-01	-8.660254e-01	417.352500	79.962393	2	0.00	57.31	11
2024-01-24	15	590.32	0	True	6.380665	0.269260	15	24	2	1	-7.071068e-01	-7.071068e-01	423.787500	87.387768	2	0.00	125.23	11
2024-01-24	16	616.72	0	True	6.424415	0.044722	16	24	2	1	-8.660254e-01	-5.000000e-01	429.790417	95.465193	2	0.00	26.40	11
2024-01-24	17	538.71	0	True	6.289177	-0.126492	17	24	2	1	-9.659258e-01	-2.588190e-01	431.548333	97.121471	2	78.01	0.00	14
2024-01-24	18	570.39	0	True	6.346320	0.058807	18	24	2	1	-1.836970e-16	-1.000000e+00	434.339167	100.190107	2	0.00	31.68	14

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-01-24	19	676.85	0	True	6.517450	0.186644	19	24	2	1	-9.659258e-01	2.588190e-01	440.506250	110.304643	2	0.00	106.46	14
2024-01-24	20	571.43	0	True	6.348142	-0.155751	20	24	2	1	-8.660254e-01	5.000000e-01	440.562917	110.374425	2	105.42	0.00	19
2024-01-24	21	478.23	0	True	6.170092	-0.163100	21	24	2	1	-7.071068e-01	7.071068e-01	438.726667	109.317000	2	93.20	0.00	21
2024-01-24	22	457.81	0	True	6.126454	-0.042699	22	24	2	1	-5.000000e-01	8.660254e-01	435.887083	107.827509	2	20.42	0.00	22
2024-01-24	23	362.39	0	True	5.892721	-0.208427	23	24	2	1	-2.588190e-01	9.659258e-01	430.428333	108.105159	2	95.42	0.00	24
2024-01-25	0	402.54	0	True	5.997794	0.110792	0	25	3	1	0.000000e+00	1.000000e+00	429.817083	108.224556	3	0.00	40.15	21
2024-01-25	1	398.23	0	True	5.987030	-0.010707	1	25	3	1	2.588190e-01	9.659258e-01	430.703333	107.859364	3	4.31	0.00	20
2024-01-25	2	405.15	0	True	6.004257	0.017377	2	25	3	1	5.000000e-01	8.660254e-01	432.375000	107.105534	3	0.00	6.92	19
2024-01-25	3	404.77	0	True	6.003319	-0.000938	3	25	3	1	7.071068e-01	7.071068e-01	434.577083	105.916157	3	0.38	0.00	18
2024-01-25	4	399.62	0	True	5.990514	-0.012723	4	25	3	1	8.660254e-01	5.000000e-01	435.543750	105.467215	3	5.15	0.00	19
2024-01-25	5	396.16	0	True	5.981818	-0.008658	5	25	3	1	9.659258e-01	2.588190e-01	436.377083	105.055814	3	3.46	0.00	19
2024-01-25	6	386.00	0	True	5.955837	-0.025646	6	25	3	1	1.000000e+00	6.123234e-17	437.447083	104.376064	3	10.16	0.00	19
2024-01-25	7	363.99	0	True	5.897126	-0.057021	7	25	3	1	9.659258e-01	-2.588190e-01	438.972917	102.954918	3	22.01	0.00	18
2024-01-25	8	346.03	0	True	5.846525	-0.049342	8	25	3	1	8.660254e-01	-5.000000e-01	440.039167	101.799995	3	17.96	0.00	19
2024-01-25	9	368.98	0	True	5.910742	0.066324	9	25	3	1	7.071068e-01	-7.071068e-01	441.945833	99.928221	3	0.00	22.95	19
2024-01-25	10	367.02	0	True	5.905416	-0.005312	10	25	3	1	5.000000e-01	-8.660254e-01	443.873750	97.914377	3	1.96	0.00	19
2024-01-25	11	365.38	0	True	5.900938	-0.004468	11	25	3	1	2.588190e-01	-9.659258e-01	445.323750	96.409795	3	1.64	0.00	19
2024-01-25	12	367.78	0	True	5.907485	0.006569	12	25	3	1	1.224647e-16	-1.000000e+00	446.140417	95.631001	3	0.00	2.40	19
2024-01-25	13	386.02	0	True	5.955889	0.049595	13	25	3	1	-2.588190e-01	-9.659258e-01	445.233750	96.112445	3	0.00	18.24	19
2024-01-25	14	399.61	0	True	5.990489	0.035205	14	25	3	1	-5.000000e-01	-8.660254e-01	442.505417	96.453064	3	0.00	13.59	19
2024-01-25	15	408.77	0	True	6.013153	0.022922	15	25	3	1	-7.071068e-01	-7.071068e-01	434.940833	91.340031	3	0.00	9.16	19
2024-01-25	16	421.27	0	True	6.043274	0.030580	16	25	3	1	-8.660254e-01	-5.000000e-01	426.797083	82.735976	3	0.00	12.50	19
2024-01-25	17	423.56	0	True	6.048695	0.005436	17	25	3	1	-9.659258e-01	-2.588190e-01	421.999167	79.228359	3	0.00	2.29	15
2024-01-25	18	429.36	0	True	6.062296	0.013693	18	25	3	1	-1.836970e-16	-1.000000e+00	416.122917	72.705383	3	0.00	5.80	15
2024-01-25	19	420.16	0	True	6.040636	-0.021427	19	25	3	1	-9.659258e-01	2.588190e-01	405.427500	47.030033	3	9.20	0.00	16
2024-01-25	20	406.82	0	True	6.008371	-0.031750	20	25	3	1	-8.660254e-01	5.000000e-01	398.568750	31.059579	3	13.34	0.00	12
2024-01-25	21	403.53	0	True	6.000251	-0.008087	21	25	3	1	-7.071068e-01	7.071068e-01	395.456250	26.072005	3	3.29	0.00	8.6
2024-01-25	22	412.81	0	True	6.022987	0.022997	22	25	3	1	-5.000000e-01	8.660254e-01	393.581250	22.806392	3	0.00	9.28	7.8
2024-01-25	23	400.19	0	True	5.991939	-0.030571	23	25	3	1	-2.588190e-01	9.659258e-01	395.156250	21.843585	3	12.62	0.00	4.3
2024-01-26	0	402.41	0	True	5.997471	0.005547	0	26	4	1	0.000000e+00	1.000000e+00	395.150833	21.841691	4	0.00	2.22	4.3
2024-01-26	1	397.48	0	True	5.985145	-0.012251	1	26	4	1	2.588190e-01	9.659258e-01	395.119583	21.837630	4	4.93	0.00	4.4
2024-01-26	2	392.14	0	True	5.971619	-0.013435	2	26	4	1	5.000000e-01	8.660254e-01	394.577500	21.739069	4	5.34	0.00	4.6
2024-01-26	3	397.76	0	True	5.985849	0.014332	3	26	4	1	7.071068e-01	7.071068e-01	394.285417	21.643051	4	0.00	5.62	4.6
2024-01-26	4	404.75	0	True	6.003270	0.017573	4	26	4	1	8.660254e-01	5.000000e-01	394.499167	21.723210	4	0.00	6.99	4.4
2024-01-26	5	407.31	0	True	6.009575	0.006325	5	26	4	1	9.659258e-01	2.588190e-01	394.963750	21.878946	4	0.00	2.56	4.2
2024-01-26	6	401.54	0	True	5.995307	-0.014166	6	26	4	1	1.000000e+00	6.123234e-17	395.611250	21.832033	4	5.77	0.00	4.0
2024-01-26	7	379.99	0	True	5.940145	-0.053668	7	26	4	1	9.659258e-01	-2.588190e-01	396.277917	21.054917	4	21.55	0.00	4.0
2024-01-26	8	379.67	0	True	5.939302	-0.000842	8	26	4	1	8.660254e-01	-5.000000e-01	397.679583	18.533093	4	0.32	0.00	3.2
2024-01-26	9	386.11	0	True	5.956122	0.016962	9	26	4	1	7.071068e-01	-7.071068e-01	398.393333	17.690454	4	0.00	6.44	3.2
2024-01-26	10	377.72	0	True	5.934153	-0.021730	10	26	4	1	5.000000e-01	-8.660254e-01	398.839167	16.986222	4	8.39	0.00	3.5
2024-01-26	11	324.25	0	True	5.781515	-0.141560	11	26	4	1	2.588190e-01	-9.659258e-01	397.125417	21.878887	4	53.47	0.00	5.7
2024-01-26	12	203.11	0	True	5.313748	-0.373601	12	26	4	1	1.224647e-16	-1.000000e+00	390.264167	45.041410	4	121.14	0.00	10
2024-01-26	13	152.20	0	True	5.025195	-0.250652	13	26	4	1	-2.588190e-01	-9.659258e-01	380.521667	66.279809	4	50.91	0.00	12
2024-01-26	14	297.30	0	True	5.694742	0.953351	14	26	4	1	-5.000000e-01	-8.660254e-01	376.258750	68.259302	4	0.00	145.10	12

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su	
2024-01-26	15	389.64	0	True	5.965223	0.310595	15	26	4	1	-7.071068e-01	-7.071068e-01	375.461667	67.974251	4	0.00	92.34	12	
2024-01-26	16	416.91	0	True	6.032870	0.069988	16	26	4	1	-8.660254e-01	-5.000000e-01	375.280000	67.852218	4	0.00	27.27	12	
2024-01-26	17	427.96	0	True	6.059030	0.026505	17	26	4	1	-9.659258e-01	-2.588190e-01	375.463333	67.994136	4	0.00	11.05	12	
2024-01-26	18	436.58	0	True	6.078972	0.020142	18	26	4	1	-1.000000e+00	-1.836970e-16	375.764167	68.258423	4	0.00	8.62	12	
2024-01-26	19	437.40	0	True	6.080848	0.001878	19	26	4	1	-9.659258e-01	2.588190e-01	376.482500	68.834232	4	0.00	0.82	12	
2024-01-26	20	425.02	0	True	6.052136	-0.028304	20	26	4	1	-8.660254e-01	5.000000e-01	377.240833	69.281784	4	12.38	0.00	12	
2024-01-26	21	419.93	0	True	6.040088	-0.011976	21	26	4	1	-7.071068e-01	7.071068e-01	377.924167	69.632340	4	5.09	0.00	12	
2024-01-26	22	433.75	0	True	6.072468	0.032910	22	26	4	1	-5.000000e-01	8.660254e-01	378.796667	70.217203	4	0.00	13.82	12	
2024-01-26	23	406.87	0	True	6.008494	-0.061971	23	26	4	1	-2.588190e-01	9.659258e-01	379.075000	70.318856	4	26.88	0.00	13	
2024-01-27	0	442.91	1	False	6.093367	0.088579	0	27	5	1	0.000000e+00	1.000000e+00	380.762500	71.381125	5	0.00	36.04	13	
2024-01-27	1	431.69	1	False	6.067708	-0.025332	1	27	5	1	2.588190e-01	9.659258e-01	382.187917	72.067742	5	11.22	0.00	13	
2024-01-27	2	425.78	1	False	6.053923	-0.013690	2	27	5	1	5.000000e-01	8.660254e-01	383.589583	72.594928	5	5.91	0.00	13	
2024-01-27	3	421.37	1	False	6.043511	-0.010357	3	27	5	1	7.071068e-01	7.071068e-01	384.573333	72.954386	5	4.41	0.00	13	
2024-01-27	4	405.13	1	False	6.004208	-0.038541	4	27	5	1	8.660254e-01	5.000000e-01	384.589167	72.958996	5	16.24	0.00	14	
2024-01-27	5	398.05	1	False	5.986578	-0.017476	5	27	5	1	9.659258e-01	2.588190e-01	384.203333	72.858031	5	7.08	0.00	14	
2024-01-27	6	366.69	1	False	5.904517	-0.078784	6	27	5	1	1.000000e+00	6.123234e-17	382.751250	72.844768	5	31.36	0.00	15	
2024-01-27	7	292.52	1	False	5.678533	-0.202269	7	27	5	1	9.659258e-01	-2.588190e-01	379.106667	75.140896	5	74.17	0.00	17	
2024-01-27	8	310.29	1	False	5.737507	0.060748	8	27	5	1	8.660254e-01	-5.000000e-01	376.215833	76.441622	5	0.00	17.77	17	
2024-01-27	9	329.01	1	False	5.796088	0.060331	9	27	5	1	7.071068e-01	-7.071068e-01	373.836667	77.006788	5	0.00	18.72	17	
2024-01-27	10	336.14	1	False	5.817528	0.021671	10	27	5	1	5.000000e-01	-8.660254e-01	372.104167	77.382439	5	0.00	7.13	17	
2024-01-27	11	382.30	1	False	5.946206	0.137324	11	27	5	1	2.588190e-01	-9.659258e-01	374.522917	76.726077	5	0.00	46.16	15	
2024-01-27	12	386.08	1	False	5.956045	0.009888	12	27	5	1	1.224647e-16	-1.000000e+00	382.146667	67.487438	5	0.00	3.78	10	
2024-01-27	13	408.18	1	False	6.011708	0.057242	13	27	5	1	-2.588190e-01	-9.659258e-01	392.812500	46.544404	5	0.00	22.10	8.1	
2024-01-27	14	418.68	1	False	6.037107	0.025724	14	27	5	1	-5.000000e-01	-8.660254e-01	397.870000	42.096879	5	0.00	10.50	8.1	
2024-01-27	15	432.96	1	False	6.070645	0.034107	15	27	5	1	-7.071068e-01	-7.071068e-01	399.675000	42.653695	5	0.00	14.28	8.1	
2024-01-27	16	434.00	1	False	6.073045	0.002402	16	27	5	1	-8.660254e-01	-5.000000e-01	400.387083	43.094315	5	0.00	1.04	8.1	
2024-01-27	17	423.57	1	False	6.048719	-0.024032	17	27	5	1	-9.659258e-01	-2.588190e-01	400.204167	42.981360	5	10.43	0.00	8.5	
2024-01-27	18	421.59	1	False	6.044033	-0.004675	18	27	5	1	-1.000000e+00	-1.836970e-16	399.579583	42.536392	5	1.98	0.00	8.6	
2024-01-27	19	427.10	1	False	6.057018	0.013070	19	27	5	1	-9.659258e-01	2.588190e-01	399.150417	42.188756	5	0.00	5.51	8.6	
2024-01-27	20	429.93	1	False	6.063622	0.006626	20	27	5	1	-8.660254e-01	5.000000e-01	399.355000	42.331322	5	0.00	2.83	8.1	
2024-01-27	21	415.31	1	False	6.029025	-0.034006	21	27	5	1	-7.071068e-01	-7.071068e-01	397.0168e-01	399.162500	42.244105	5	14.62	0.00	8.5
2024-01-27	22	439.97	1	False	6.086707	0.059377	22	27	5	1	-5.000000e-01	-8.660254e-01	399.421667	42.483924	5	0.00	24.66	8.5	
2024-01-27	23	390.74	1	False	5.968042	-0.111894	23	27	5	1	-2.588190e-01	-9.659258e-01	398.749583	42.488556	5	49.23	0.00	9.4	
2024-01-28	0	412.79	1	False	6.022939	0.056431	0	28	6	1	0.000000e+00	1.000000e+00	397.494583	41.562195	6	0.00	22.05	9.4	
2024-01-28	1	413.32	1	False	6.024222	0.001284	1	28	6	1	2.588190e-01	9.659258e-01	396.729167	41.071320	6	0.00	0.53	8.9	
2024-01-28	2	371.21	1	False	5.916768	-0.101882	2	28	6	1	5.000000e-01	8.660254e-01	394.455417	40.903293	6	42.11	0.00	10	
2024-01-28	3	334.66	1	False	5.813115	-0.098462	3	28	6	1	7.071068e-01	7.071068e-01	390.842500	42.230550	6	36.55	0.00	11	
2024-01-28	4	320.55	1	False	5.770038	-0.042162	4	28	6	1	8.660254e-01	5.000000e-01	387.318333	44.456855	6	14.11	0.00	11	
2024-01-28	5	333.19	1	False	5.808713	0.039432	5	28	6	1	9.659258e-01	2.588190e-01	384.615833	45.729307	6	0.00	12.64	11	
2024-01-28	6	329.92	1	False	5.798850	-0.009814	6	28	6	1	1.000000e+00	6.123234e-17	383.083750	46.955512	6	3.27	0.00	10	
2024-01-28	7	360.37	1	False	5.887131	0.092295	7	28	6	1	9.659258e-01	-2.588190e-01	385.910833	43.154508	6	0.00	30.45	7.1	
2024-01-28	8	360.19	1	False	5.886632	-0.000499	8	28	6	1	8.660254e-01	-5.000000e-01	387.990000	40.471389	6	0.18	0.00	7.1	
2024-01-28	9	376.58	1	False	5.931131	0.045504	9	28	6	1	7.071068e-01	-7.071068e-01	389.972083	38.577830	6	0.00	16.39	7.1	
2024-01-28	10	414.10	1	False	6.026107	0.099634	10	28	6	1	5.000000e-01	-8.660254e-01	393.220417	37.101945	6	0.00	37.52	7.1	

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-01-28	11	432.97	1	False	6.070668	0.045569	11	28	6	1	2.588190e-01	-9.659258e-01	395.331667	37.886872	6	0.00	18.87	7.1
2024-01-28	12	419.00	1	False	6.037871	-0.032266	12	28	6	1	1.224647e-16	-1.000000e+00	396.703333	38.132485	6	13.97	0.00	7.7
2024-01-28	13	421.30	1	False	6.043345	0.005489	13	28	6	1	-2.588190e-01	-9.659258e-01	397.250000	38.397293	6	0.00	2.30	7.7
2024-01-28	14	431.32	1	False	6.066850	0.023784	14	28	6	1	-5.000000e-01	-8.660254e-01	397.776667	38.788703	6	0.00	10.02	7.7
2024-01-28	15	444.09	1	False	6.096027	0.029607	15	28	6	1	-7.071068e-01	-7.071068e-01	398.240417	39.290920	6	0.00	12.77	7.7
2024-01-28	16	461.41	1	False	6.134287	0.039001	16	28	6	1	-8.660254e-01	-5.000000e-01	399.382500	40.746940	6	0.00	17.32	7.7
2024-01-28	17	475.00	1	False	6.163315	0.029453	17	28	6	1	-9.659258e-01	-2.588190e-01	401.525417	43.343904	6	0.00	13.59	7.7
2024-01-28	18	545.79	1	False	6.302234	0.149032	18	28	6	1	-1.000000e+00	-1.836970e-16	406.700417	52.327111	6	0.00	70.79	7.7
2024-01-28	19	557.31	1	False	6.323122	0.021107	19	28	6	1	-9.659258e-01	2.588190e-01	412.125833	60.626286	6	0.00	11.52	7.7
2024-01-28	20	504.80	1	False	6.224162	-0.094220	20	28	6	1	-8.660254e-01	5.000000e-01	415.245417	63.443066	6	52.51	0.00	9.4
2024-01-28	21	488.71	1	False	6.191769	-0.031874	21	28	6	1	-7.071068e-01	7.071068e-01	418.303750	65.191383	6	16.09	0.00	9.5
2024-01-28	22	506.69	1	False	6.227899	0.036791	22	28	6	1	-5.000000e-01	8.660254e-01	421.083750	67.535916	6	0.00	17.98	9.5
2024-01-28	23	441.99	1	False	6.091287	-0.127691	23	28	6	1	-2.588190e-01	9.659258e-01	423.219167	67.344729	6	64.70	0.00	10
2024-01-29	0	442.20	0	True	6.091762	0.000475	0	29	0	1	0.000000e+00	1.000000e+00	424.445483	67.414246	0	0.00	0.21	10
2024-01-29	1	418.31	0	True	6.036223	-0.054025	1	29	0	1	2.588190e-01	9.659258e-01	424.652500	67.386133	0	23.89	0.00	11
2024-01-29	2	411.44	0	True	6.019663	-0.016423	2	29	0	1	5.000000e-01	8.660254e-01	426.328750	66.493388	0	6.87	0.00	9.6
2024-01-29	3	395.03	0	True	5.978962	-0.039884	3	29	0	1	7.071068e-01	7.071068e-01	428.844167	63.968784	0	16.41	0.00	8.8
2024-01-29	4	386.96	0	True	5.958321	-0.020429	4	29	0	1	8.660254e-01	5.000000e-01	431.611250	60.418474	0	8.07	0.00	8.5
2024-01-29	5	394.67	0	True	5.978050	0.019925	5	29	0	1	9.659258e-01	2.588190e-01	434.172917	57.286253	0	0.00	7.71	8.5
2024-01-29	6	392.55	0	True	5.972664	-0.005372	6	29	0	1	1.000000e+00	6.123234e-17	436.782500	53.641239	0	2.12	0.00	8.5
2024-01-29	7	328.90	0	True	5.795754	-0.162145	7	29	0	1	9.659258e-01	-2.588190e-01	435.471250	55.926309	0	63.65	0.00	11
2024-01-29	8	303.32	0	True	5.714788	-0.077774	8	29	0	1	8.660254e-01	-5.000000e-01	433.101667	60.289239	0	25.58	0.00	12
2024-01-29	9	324.28	0	True	5.781607	0.069102	9	29	0	1	7.071068e-01	-7.071068e-01	430.922500	63.291496	0	0.00	20.96	12
2024-01-29	10	308.07	0	True	5.730327	-0.049988	10	29	0	1	5.000000e-01	-8.660254e-01	426.504583	68.039317	0	16.21	0.00	12
2024-01-29	11	316.82	0	True	5.758334	0.028403	11	29	0	1	2.588190e-01	-9.659258e-01	421.665000	71.597245	0	0.00	8.75	12
2024-01-29	12	340.17	0	True	5.829445	0.073701	12	29	0	1	1.224647e-16	-1.000000e+00	418.380417	73.507532	0	0.00	23.35	12
2024-01-29	13	409.25	0	True	6.014326	0.203075	13	29	0	1	-2.588190e-01	-9.659258e-01	417.878333	73.527873	0	0.00	69.08	12
2024-01-29	14	421.09	0	True	6.042847	0.028931	14	29	0	1	-5.000000e-01	-8.660254e-01	417.452083	73.476196	0	0.00	11.84	12
2024-01-29	15	452.78	0	True	6.115406	0.075257	15	29	0	1	-7.071068e-01	-7.071068e-01	417.814167	73.634414	0	0.00	31.69	12
2024-01-29	16	536.44	0	True	6.284955	0.184770	16	29	0	1	-8.660254e-01	-5.000000e-01	420.940417	77.078037	0	0.00	83.66	12
2024-01-29	17	877.63	0	True	6.777225	0.636026	17	29	0	1	-9.659258e-01	-2.588190e-01	437.716667	120.782209	0	0.00	341.19	12
2024-01-29	18	735.70	0	True	6.600822	-0.161720	18	29	0	1	-1.000000e+00	-1.836970e-16	445.629583	133.700402	0	141.93	0.00	18
2024-01-29	19	778.03	0	True	6.656765	0.057537	19	29	0	1	-9.659258e-01	2.588190e-01	454.826250	148.489639	0	0.00	42.33	18
2024-01-29	20	1047.69	0	True	6.954343	0.346593	20	29	0	1	-8.660254e-01	5.000000e-01	477.446667	191.543006	0	0.00	269.66	16
2024-01-29	21	1009.33	0	True	6.917042	-0.036614	21	29	0	1	-7.071068e-01	7.071068e-01	499.139167	220.209396	0	38.36	0.00	16
2024-01-29	22	635.06	0	True	6.453719	-0.370810	22	29	0	1	-5.000000e-01	8.660254e-01	504.487917	221.952887	0	374.27	0.00	32
2024-01-29	23	466.14	0	True	6.144486	-0.265991	23	29	0	1	-2.588190e-01	9.659258e-01	505.494167	221.711839	0	168.92	0.00	36
2024-01-30	0	478.54	0	True	6.170740	0.026601	0	30	1	1	0.000000e+00	1.000000e+00	507.008333	221.384631	1	0.00	12.40	36
2024-01-30	1	441.62	0	True	6.090450	-0.077151	1	30	1	1	2.588190e-01	9.659258e-01	507.979583	221.029425	1	36.92	0.00	37
2024-01-30	2	408.33	0	True	6.012076	-0.075382	2	30	1	1	5.000000e-01	8.660254e-01	507.850000	221.089388	1	33.29	0.00	38
2024-01-30	3	371.04	0	True	5.916310	-0.091323	3	30	1	1	7.071068e-01	7.071068e-01	506.850417	221.675100	1	37.29	0.00	39
2024-01-30	4	350.55	0	True	5.859503	-0.055223	4	30	1	1	8.660254e-01	5.000000e-01	505.333333	222.653701	1	20.49	0.00	39
2024-01-30	5	341.12	0	True	5.832234	-0.026901	5	30	1	1	9.659258e-01	2.588190e-01	503.102083	224.074675	1	9.43	0.00	40
2024-01-30	6	321.60	0	True	5.773309	-0.057223	6	30	1	1	1.000000e+00	6.123234e-17	500.145833	226.055888	1	19.52	0.00	41

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-01-30	7	191.82	0	True	5.256557	-0.403545	7	30	1	1	9.659258e-01	-2.588190e-01	494.434167	232.218582	1	129.78	0.00	43
2024-01-30	8	144.35	0	True	4.972241	-0.247472	8	30	1	1	8.660254e-01	-5.000000e-01	487.810417	240.042309	1	47.47	0.00	44
2024-01-30	9	127.02	0	True	4.844345	-0.120055	9	30	1	1	7.071068e-01	-7.071068e-01	479.591250	249.091684	1	17.33	0.00	45
2024-01-30	10	79.83	0	True	4.379899	-0.371516	10	30	1	1	5.000000e-01	-8.660254e-01	470.081250	260.041159	1	47.19	0.00	46
2024-01-30	11	118.67	0	True	4.776347	0.486534	11	30	1	1	2.588190e-01	-9.659258e-01	461.825000	268.138282	1	0.00	38.84	46
2024-01-30	12	206.27	0	True	5.329186	0.738182	12	30	1	1	1.224647e-16	-1.000000e+00	456.245833	272.142749	1	0.00	87.60	46
2024-01-30	13	290.01	0	True	5.669915	0.405973	13	30	1	1	-2.588190e-01	-9.659258e-01	451.277500	274.119291	1	0.00	83.74	46
2024-01-30	14	270.71	0	True	5.601048	-0.066549	14	30	1	1	-5.000000e-01	-8.660254e-01	445.011667	276.547264	1	19.30	0.00	47
2024-01-30	15	292.28	0	True	5.677712	0.079679	15	30	1	1	-7.071068e-01	-7.071068e-01	438.324167	278.286388	1	0.00	21.57	47
2024-01-30	16	383.34	0	True	5.948922	0.311551	16	30	1	1	-8.660254e-01	-5.000000e-01	431.945000	277.693615	1	0.00	91.06	47
2024-01-30	17	435.54	0	True	6.076587	0.136172	17	30	1	1	-9.659258e-01	-2.588190e-01	413.524583	261.005617	1	0.00	52.20	47
2024-01-30	18	464.21	0	True	6.140337	0.065826	18	30	1	1	-1.000000e+00	-1.836970e-16	402.212500	252.168968	1	0.00	28.67	41
2024-01-30	19	471.32	0	True	6.155537	0.015316	19	30	1	1	-9.659258e-01	2.588190e-01	389.432917	239.761544	1	0.00	7.11	41
2024-01-30	20	459.84	0	True	6.130879	-0.024357	20	30	1	1	-8.660254e-01	5.000000e-01	364.939167	195.539930	1	11.48	0.00	42
2024-01-30	21	451.89	0	True	6.113439	-0.017289	21	30	1	1	-7.071068e-01	7.071068e-01	341.712500	141.236512	1	7.95	0.00	40
2024-01-30	22	452.92	0	True	6.115716	0.002279	22	30	1	1	-5.000000e-01	8.660254e-01	334.123333	129.166284	1	0.00	1.03	25
2024-01-30	23	388.45	0	True	5.962164	-0.142343	23	30	1	1	-2.588190e-01	9.659258e-01	330.886250	126.663172	1	64.47	0.00	20
2024-01-31	0	409.73	0	True	6.015498	0.054782	0	31	2	1	0.000000e+00	1.000000e+00	328.019167	123.924817	2	0.00	21.28	20
2024-01-31	1	382.11	0	True	5.945709	-0.067410	1	31	2	1	2.588190e-01	9.659258e-01	325.539583	122.135419	2	27.62	0.00	20
2024-01-31	2	339.71	0	True	5.828092	-0.110963	2	31	2	1	5.000000e-01	8.660254e-01	322.680417	120.910090	2	42.40	0.00	20
2024-01-31	3	288.21	0	True	5.663689	-0.151600	3	31	2	1	7.071068e-01	7.071068e-01	319.229167	120.651571	2	51.50	0.00	21
2024-01-31	4	268.14	0	True	5.591509	-0.069637	4	31	2	1	8.660254e-01	5.000000e-01	315.795417	120.893876	2	20.07	0.00	21
2024-01-31	5	261.87	0	True	5.567848	-0.023383	5	31	2	1	9.659258e-01	2.588190e-01	312.493333	121.253865	2	6.27	0.00	21
2024-01-31	6	173.86	0	True	5.158250	-0.336083	6	31	2	1	1.000000e+00	6.123234e-17	306.337500	124.478792	2	88.01	0.00	24
2024-01-31	7	-38.00	0	True	5.158250	-1.218567	7	31	2	1	9.659258e-01	-2.588190e-01	296.761667	141.365644	2	211.86	0.00	27
2024-01-31	8	48.61	0	True	3.883829	-2.279211	8	31	2	1	8.660254e-01	-5.000000e-01	292.772500	147.088505	2	0.00	86.61	25
2024-01-31	9	134.41	0	True	4.900895	1.765069	9	31	2	1	7.071068e-01	-7.071068e-01	293.080417	146.733738	2	0.00	85.80	24
2024-01-31	10	153.30	0	True	5.032397	0.140540	10	31	2	1	5.000000e-01	-8.660254e-01	296.141667	142.805140	2	0.00	18.89	22
2024-01-31	11	244.09	0	True	5.497537	0.592237	11	31	2	1	2.588190e-01	-9.659258e-01	301.367500	138.250535	2	0.00	90.79	22
2024-01-31	12	270.10	0	True	5.598792	0.106559	12	31	2	1	1.224647e-16	-1.000000e+00	304.027083	136.949404	2	0.00	26.01	22
2024-01-31	13	299.54	0	True	5.702248	0.108997	13	31	2	1	-2.588190e-01	-9.659258e-01	304.424167	136.920808	2	0.00	29.44	22
2024-01-31	14	323.60	0	True	5.779508	0.080323	14	31	2	1	-5.000000e-01	-8.660254e-01	306.627917	136.780145	2	0.00	24.06	22
2024-01-31	15	390.26	0	True	5.966813	0.205995	15	31	2	1	-7.071068e-01	-7.071068e-01	310.710417	137.791753	2	0.00	66.66	22
2024-01-31	16	462.46	0	True	6.136560	0.185005	16	31	2	1	-8.660254e-01	-5.000000e-01	314.007083	140.524343	2	0.00	72.20	22
2024-01-31	17	508.71	0	True	6.231878	0.100009	17	31	2	1	-9.659258e-01	-2.588190e-01	317.055833	144.025812	2	0.00	46.25	22
2024-01-31	18	565.91	0	True	6.338435	0.112441	18	31	2	1	-1.000000e+00	-1.836970e-16	321.293333	149.919121	2	0.00	57.20	22
2024-01-31	19	562.88	0	True	6.333066	-0.005354	19	31	2	1	-9.659258e-01	-2.588190e-01	325.108333	154.982313	2	3.03	0.00	22
2024-01-31	20	540.40	0	True	6.292310	-0.039937	20	31	2	1	-8.660254e-01	-5.000000e-01	328.465000	158.851362	2	22.48	0.00	22
2024-01-31	21	548.84	0	True	6.307807	0.015618	21	31	2	1	-7.071068e-01	-7.071068e-01	332.504583	163.297027	2	0.00	8.44	22
2024-01-31	22	558.63	0	True	6.325487	0.017838	22	31	2	1	-5.000000e-01	-8.660254e-01	336.909167	168.042873	2	0.00	9.79	22
2024-01-31	23	502.35	0	True	6.219297	-0.100746	23	31	2	1	-2.588190e-01	-9.659258e-01	341.655000	171.141567	2	56.28	0.00	22
2024-02-01	0	-80.00	0	True	6.219297	-1.159252	0	1	3	2	0.000000e+00	1.000000e+00	321.249583	190.744834	3	582.35	0.00	46
2024-02-01	1	-80.00	0	True	6.219297	0.000000	1	1	3	2	2.588190e-01	9.659258e-01	301.995000	206.967978	3	0.00	0.00	45
2024-02-01	2	-80.00	0	True	6.219297	0.000000	2	1	3	2	5.000000e-01	8.660254e-01	284.507083	220.905254	3	0.00	0.00	43

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su	
2024-02-01	3	-80.00	0	True	6.219297	0.000000	3	1	3	2	7.071068e-01	7.071068e-01	269.165000	233.087277	3	0.00	0.00	41	
2024-02-01	4	-80.00	0	True	6.219297	0.000000	4	1	3	2	8.660254e-01	5.000000e-01	254.659167	243.743245	3	0.00	0.00	40	
2024-02-01	5	-80.00	0	True	6.219297	0.000000	5	1	3	2	9.659258e-01	2.588190e-01	240.414583	253.113024	3	0.00	0.00	40	
2024-02-01	6	-80.00	0	True	6.219297	0.000000	6	1	3	2	1.000000e+00	6.123234e-17	229.837083	261.190706	3	0.00	0.00	36	
2024-02-01	7	47.06	0	True	3.851423	-1.588250	7	1	3	2	9.659258e-01	-2.588190e-01	233.381250	257.955401	3	0.00	127.06	27	
2024-02-01	8	297.98	0	True	5.697026	5.331917	8	1	3	2	8.660254e-01	-5.000000e-01	243.771667	255.196793	3	0.00	250.92	27	
2024-02-01	9	306.63	0	True	5.725642	0.029029	9	1	3	2	7.071068e-01	-7.071068e-01	250.947500	254.408064	3	0.00	8.65	27	
2024-02-01	10	360.19	0	True	5.886632	0.174673	10	1	3	2	5.000000e-01	-8.660254e-01	259.567917	254.460645	3	0.00	53.56	27	
2024-02-01	11	342.75	0	True	5.837001	-0.048419	11	1	3	2	2.588190e-01	-9.659258e-01	263.678750	254.996093	3	17.44	0.00	28	
2024-02-01	12	271.79	0	True	5.605030	-0.207031	12	1	3	2	1.224647e-16	-1.000000e+00	263.749167	254.998177	3	70.96	0.00	31	
2024-02-01	13	26.78	0	True	3.287655	-0.901468	13	1	3	2	-2.588190e-01	-9.659258e-01	252.384167	259.374423	3	245.01	0.00	41	
2024-02-01	14	179.05	0	True	5.187665	5.685960	14	1	3	2	-5.000000e-01	-8.660254e-01	246.361250	259.327114	3	0.00	152.27	41	
2024-02-01	15	301.49	0	True	5.708737	0.683831	15	1	3	2	-7.071068e-01	-7.071068e-01	242.662500	257.814113	3	0.00	122.44	41	
2024-02-01	16	411.35	0	True	6.019444	0.364390	16	1	3	2	-8.660254e-01	-5.000000e-01	240.532917	256.125171	3	0.00	109.86	41	
2024-02-01	17	448.30	0	True	6.105463	0.089826	17	1	3	2	-9.659258e-01	-2.588190e-01	238.015833	253.660037	3	0.00	36.95	41	
2024-02-01	18	479.77	0	True	6.173307	0.070199	18	1	3	2	-1.000000e+00	-1.836970e-16	234.426667	249.392292	3	0.00	31.47	41	
2024-02-01	19	509.53	0	True	6.233489	0.062030	19	1	3	2	-9.659258e-01	-2.588190e-01	232.203750	246.559060	3	0.00	29.76	41	
2024-02-01	20	507.19	0	True	6.228886	-0.004592	20	1	3	2	-8.660254e-01	-5.000000e-01	230.820000	244.841392	3	2.34	0.00	40	
2024-02-01	21	482.90	0	True	6.179810	-0.047891	21	1	3	2	-7.071068e-01	-7.071068e-01	7.071068e-01	228.072500	241.464238	3	24.29	0.00	41
2024-02-01	22	460.50	0	True	6.132313	-0.046386	22	1	3	2	-5.000000e-01	-8.660254e-01	223.983750	236.401239	3	22.40	0.00	42	
2024-02-01	23	432.57	0	True	6.069744	-0.060651	23	1	3	2	-2.588190e-01	-9.659258e-01	9.659258e-01	221.076250	233.236689	3	27.93	0.00	41
2024-02-02	0	288.21	0	True	5.663689	-0.333726	0	2	4	2	0.000000e+00	1.000000e+00	236.418333	224.518426	4	144.36	0.00	23	
2024-02-02	1	284.60	0	True	5.651085	-0.012526	1	2	4	2	2.588190e-01	9.659258e-01	251.610000	214.279184	4	3.61	0.00	23	
2024-02-02	2	276.52	0	True	5.622283	-0.028391	2	2	4	2	5.000000e-01	8.660254e-01	266.465000	202.314573	4	8.08	0.00	23	
2024-02-02	3	271.22	0	True	5.602930	-0.019167	3	2	4	2	7.071068e-01	7.071068e-01	281.099167	188.386985	4	5.30	0.00	23	
2024-02-02	4	278.51	0	True	5.629454	0.026879	4	2	4	2	8.660254e-01	5.000000e-01	296.037083	172.011222	4	0.00	7.29	23	
2024-02-02	5	284.28	0	True	5.649960	0.020717	5	2	4	2	9.659258e-01	2.588190e-01	311.215417	152.333440	4	0.00	5.77	23	
2024-02-02	6	301.78	0	True	5.709698	0.061559	6	2	4	2	1.000000e+00	6.123234e-17	327.122917	127.636087	4	0.00	17.50	23	
2024-02-02	7	344.96	0	True	5.843428	0.143084	7	2	4	2	9.659258e-01	-2.588190e-01	339.535417	112.844173	4	0.00	43.18	23	
2024-02-02	8	374.94	0	True	5.926766	0.086909	8	2	4	2	8.660254e-01	-5.000000e-01	342.742083	112.705352	4	0.00	29.98	23	
2024-02-02	9	329.33	0	True	5.797060	-0.121646	9	2	4	2	7.071068e-01	-7.071068e-01	343.687917	112.484153	4	45.61	0.00	25	
2024-02-02	10	330.64	0	True	5.801030	0.003978	10	2	4	2	5.000000e-01	-8.660254e-01	342.456667	112.457392	4	0.00	1.31	25	
2024-02-02	11	347.87	0	True	5.851829	0.052111	11	2	4	2	2.588190e-01	-9.659258e-01	342.670000	112.462828	4	0.00	17.23	24	
2024-02-02	12	352.16	0	True	5.864086	0.012332	12	2	4	2	1.224647e-16	-1.000000e+00	346.018750	111.452537	4	0.00	4.29	22	
2024-02-02	13	381.97	0	True	5.945342	0.084649	13	2	4	2	-2.588190e-01	-9.659258e-01	360.818333	88.421130	4	0.00	29.81	11	
2024-02-02	14	370.00	0	True	5.913503	-0.031338	14	2	4	2	-5.000000e-01	-8.660254e-01	368.774583	79.494639	4	11.97	0.00	12	
2024-02-02	15	371.99	0	True	5.918867	0.005378	15	2	4	2	-7.071068e-01	-7.071068e-01	371.712083	78.192120	4	0.00	1.99	12	
2024-02-02	16	365.15	0	True	5.900308	-0.018388	16	2	4	2	-8.660254e-01	-5.000000e-01	369.787083	77.741248	4	6.84	0.00	12	
2024-02-02	17	375.83	0	True	5.929137	0.029248	17	2	4	2	-9.659258e-01	-2.588190e-01	366.767500	75.945789	4	0.00	10.68	12	
2024-02-02	18	374.48	0	True	5.925538	-0.003592	18	2	4	2	-1.000000e+00	-1.836970e-16	362.380417	72.076815	4	1.35	0.00	12	
2024-02-02	19	368.64	0	True	5.909821	-0.015595	19	2	4	2	-9.659258e-01	-2.588190e-01	356.510000	64.956724	4	5.84	0.00	12	
2024-02-02	20	367.90	0	True	5.907811	-0.002007	20	2	4	2	-8.660254e-01	-5.000000e-01	350.706250	56.592561	4	0.74	0.00	12	
2024-02-02	21	366.90	0	True	5.905089	-0.002718	21	2	4	2	-7.071068e-01	-7.071068e-01	7.071068e-01	345.872917	49.294543	4	1.00	0.00	11
2024-02-02	22	346.90	0	True	5.849037	-0.054511	22	2	4	2	-5.000000e-01	-8.660254e-01	341.139583	42.840897	4	20.00	0.00	11	

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-02-02	23	332.43	0	True	5.806429	-0.041712	23	2	4	2	-2.588190e-01	9.659258e-01	336.967083	38.170884	4	14.47	0.00	11
2024-02-03	0	352.60	1	False	5.865334	0.060674	0	3	5	2	0.000000e+00	1.000000e+00	339.650000	36.834388	5	0.00	20.17	5.2
2024-02-03	1	342.90	1	False	5.837439	-0.027510	1	3	5	2	2.588190e-01	9.659258e-01	342.079167	34.918662	5	9.70	0.00	5.4
2024-02-03	2	306.95	1	False	5.726685	-0.104841	2	3	5	2	5.000000e-01	8.660254e-01	343.347083	32.930540	5	35.95	0.00	6.6
2024-02-03	3	290.85	1	False	5.672808	-0.052452	3	3	5	2	7.071068e-01	7.071068e-01	344.165000	31.262731	5	16.10	0.00	7.0
2024-02-03	4	273.82	1	False	5.612471	-0.058553	4	3	5	2	8.660254e-01	5.000000e-01	343.969583	31.702534	5	17.03	0.00	7.7
2024-02-03	5	268.79	1	False	5.593930	-0.018370	5	3	5	2	9.659258e-01	2.588190e-01	343.324167	33.097544	5	5.03	0.00	7.9
2024-02-03	6	293.56	1	False	5.682082	0.092154	6	3	5	2	1.000000e+00	6.123234e-17	342.981667	33.585084	5	0.00	24.77	7.9
2024-02-03	7	343.41	1	False	5.838925	0.169812	7	3	5	2	9.659258e-01	-2.588190e-01	342.917083	33.582604	5	0.00	49.85	7.9
2024-02-03	8	363.59	1	False	5.896027	0.058764	8	3	5	2	8.660254e-01	-5.000000e-01	342.444167	33.189662	5	0.00	20.18	7.9
2024-02-03	9	359.98	1	False	5.886048	-0.009929	9	3	5	2	7.071068e-01	-7.071068e-01	343.721250	33.252732	5	3.61	0.00	6.2
2024-02-03	10	356.50	1	False	5.876334	-0.009667	10	3	5	2	5.000000e-01	-8.660254e-01	344.798750	33.229393	5	3.48	0.00	6.2
2024-02-03	11	341.85	1	False	5.834372	-0.041094	11	3	5	2	2.588190e-01	-9.659258e-01	344.547917	33.227923	5	14.65	0.00	6.9
2024-02-03	12	298.09	1	False	5.697395	-0.128009	12	3	5	2	1.224647e-16	-1.000000e+00	342.295000	34.498117	5	43.76	0.00	8.8
2024-02-03	13	138.98	1	False	4.934330	-0.533765	13	3	5	2	-2.588190e-01	-9.659258e-01	332.170417	53.028078	5	159.11	0.00	15
2024-02-03	14	149.37	1	False	5.006426	0.074759	14	3	5	2	-5.000000e-01	-8.660254e-01	322.977500	64.143912	5	0.00	10.39	14
2024-02-03	15	300.53	1	False	5.705548	1.011984	15	3	5	2	-7.071068e-01	-7.071068e-01	320.000000	63.424398	5	0.00	151.16	14
2024-02-03	16	340.54	1	False	5.830533	0.133131	16	3	5	2	-8.660254e-01	-5.000000e-01	318.974583	62.859118	5	0.00	40.01	14
2024-02-03	17	366.00	1	False	5.902633	0.074764	17	3	5	2	-9.659258e-01	-2.588190e-01	318.565000	62.503567	5	0.00	25.46	14
2024-02-03	18	371.76	1	False	5.918248	0.015738	18	3	5	2	-1.000000e+00	-1.836970e-16	318.451667	62.400153	5	0.00	5.76	14
2024-02-03	19	367.50	1	False	5.906723	-0.011459	19	3	5	2	-9.659258e-01	2.588190e-01	318.404167	62.360709	5	4.26	0.00	14
2024-02-03	20	368.17	1	False	5.908545	0.001823	20	3	5	2	-8.660254e-01	5.000000e-01	318.415417	62.370050	5	0.00	0.67	14
2024-02-03	21	358.98	1	False	5.883267	-0.024961	21	3	5	2	-7.071068e-01	7.071068e-01	318.085417	62.122827	5	9.19	0.00	14
2024-02-03	22	351.16	1	False	5.861242	-0.021784	22	3	5	2	-5.000000e-01	8.660254e-01	318.262917	62.214754	5	7.82	0.00	14
2024-02-03	23	332.28	1	False	5.805978	-0.053765	23	3	5	2	-2.588190e-01	9.659258e-01	318.256667	62.213277	5	18.88	0.00	14
2024-02-04	0	182.66	0	False	5.207627	-0.450283	0	4	6	2	0.000000e+00	1.000000e+00	311.175833	67.574431	6	149.62	0.00	20
2024-02-04	1	147.73	0	False	4.995386	-0.191230	1	4	6	2	2.588190e-01	9.659258e-01	303.043750	74.933584	6	34.93	0.00	21
2024-02-04	2	138.59	0	False	4.931520	-0.061870	2	4	6	2	5.000000e-01	8.660254e-01	296.028750	82.090803	6	9.14	0.00	20
2024-02-04	3	159.05	0	False	5.069219	0.147630	3	4	6	2	7.071068e-01	7.071068e-01	290.537083	86.729779	6	0.00	20.46	20
2024-02-04	4	132.36	0	False	4.885525	-0.167809	4	4	6	2	8.660254e-01	5.000000e-01	284.642917	92.528255	6	26.69	0.00	20
2024-02-04	5	150.72	0	False	5.015424	0.138713	5	4	6	2	9.659258e-01	2.588190e-01	279.723333	96.462917	6	0.00	18.36	20
2024-02-04	6	187.04	0	False	5.231322	0.240977	6	4	6	2	1.000000e+00	6.123234e-17	275.285000	98.232897	6	0.00	36.32	20
2024-02-04	7	285.35	0	False	5.653716	0.525609	7	4	6	2	9.659258e-01	-2.588190e-01	272.865833	97.191648	6	0.00	98.31	20
2024-02-04	8	294.27	0	False	5.684498	0.031260	8	4	6	2	8.660254e-01	-5.000000e-01	269.977500	95.391647	6	0.00	8.92	20
2024-02-04	9	325.47	0	False	5.785270	0.106025	9	4	6	2	7.071068e-01	-7.071068e-01	268.539583	94.228992	6	0.00	31.20	20
2024-02-04	10	354.75	0	False	5.871413	0.089962	10	4	6	2	5.000000e-01	-8.660254e-01	268.466667	94.158618	6	0.00	29.28	19
2024-02-04	11	376.10	0	False	5.929855	0.060183	11	4	6	2	2.588190e-01	-9.659258e-01	269.893750	95.568183	6	0.00	21.35	19
2024-02-04	12	381.41	0	False	5.943875	0.014119	12	4	6	2	1.224647e-16	-1.000000e+00	273.365417	98.116384	6	0.00	5.31	17
2024-02-04	13	387.87	0	False	5.960670	0.016937	13	4	6	2	-2.588190e-01	-9.659258e-01	283.735833	96.433743	6	0.00	6.46	10
2024-02-04	14	380.89	0	False	5.942511	-0.017996	14	4	6	2	-5.000000e-01	-8.660254e-01	293.382500	93.956303	6	6.98	0.00	11
2024-02-04	15	395.53	0	False	5.980227	0.038436	15	4	6	2	-7.071068e-01	-7.071068e-01	297.340833	96.243821	6	0.00	14.64	11
2024-02-04	16	386.91	0	False	5.958192	-0.021794	16	4	6	2	-8.660254e-01	-5.000000e-01	299.272917	97.604561	6	8.62	0.00	11
2024-02-04	17	387.41	0	False	5.959484	0.001292	17	4	6	2	-9.659258e-01	-2.588190e-01	300.165000	98.336047	6	0.00	0.50	11
2024-02-04	18	382.69	0	False	5.947225	-0.012183	18	4	6	2	-1.836970e-16	-1.000000e+00	300.620417	98.706648	6	4.72	0.00	11

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-02-04	19	368.42	0	False	5.909224	-0.037289	19	4	6	2	-9.659258e-01	2.588190e-01	300.658750	98.733925	6	14.27	0.00	12
2024-02-04	20	369.18	0	False	5.911284	0.002063	20	4	6	2	-8.660254e-01	5.000000e-01	300.700833	98.764162	6	0.00	0.76	12
2024-02-04	21	353.38	0	False	5.867544	-0.042798	21	4	6	2	-7.071068e-01	7.071068e-01	300.467500	98.627009	6	15.80	0.00	12
2024-02-04	22	335.48	0	False	5.815562	-0.050654	22	4	6	2	-5.000000e-01	8.660254e-01	299.814167	98.328089	6	17.90	0.00	12
2024-02-04	23	293.48	0	False	5.681809	-0.125194	23	4	6	2	-2.588190e-01	9.659258e-01	298.197500	98.089769	6	42.00	0.00	13
2024-02-05	0	289.75	0	True	5.669018	-0.012710	0	5	0	2	0.000000e+00	1.000000e+00	302.659583	94.992326	0	3.73	0.00	7.6
2024-02-05	1	260.39	0	True	5.562181	-0.101329	1	5	0	2	2.588190e-01	9.659258e-01	307.353750	89.636019	0	29.36	0.00	7.4
2024-02-05	2	228.97	0	True	5.433591	-0.120665	2	5	0	2	5.000000e-01	8.660254e-01	311.119583	83.956153	0	31.42	0.00	8.2
2024-02-05	3	-21.23	0	True	5.433591	-1.092720	3	5	0	2	7.071068e-01	7.071068e-01	303.607917	103.859332	0	250.20	0.00	18
2024-02-05	4	-32.50	0	True	5.433591	0.530853	4	5	0	2	8.660254e-01	5.000000e-01	296.738750	119.892295	0	11.27	0.00	18
2024-02-05	5	211.40	0	True	5.353752	-7.504615	5	5	0	2	9.659258e-01	2.588190e-01	299.267083	117.290709	0	0.00	243.90	18
2024-02-05	6	264.61	0	True	5.578257	0.251703	6	5	0	2	1.000000e+00	6.123234e-17	302.499167	115.112237	0	0.00	53.21	18
2024-02-05	7	319.99	0	True	5.768290	0.209289	7	5	0	2	9.659258e-01	-2.588190e-01	303.942500	115.105030	0	0.00	55.38	18
2024-02-05	8	353.10	0	True	5.866751	0.103472	8	5	0	2	8.660254e-01	-5.000000e-01	306.393750	115.515773	0	0.00	33.11	18
2024-02-05	9	373.53	0	True	5.922998	0.057859	9	5	0	2	7.071068e-01	-7.071068e-01	308.396250	116.274916	0	0.00	20.43	18
2024-02-05	10	363.02	0	True	5.894458	-0.028137	10	5	0	2	5.000000e-01	-8.660254e-01	308.740833	116.430409	0	10.51	0.00	18
2024-02-05	11	281.30	0	True	5.639422	-0.225112	11	5	0	2	2.588190e-01	-9.659258e-01	304.790833	115.651314	0	81.72	0.00	22
2024-02-05	12	-80.00	0	True	5.639422	-1.284394	12	5	0	2	1.224647e-16	1.000000e+00	285.565417	138.462504	0	361.30	0.00	37
2024-02-05	13	-80.00	0	True	5.639422	0.000000	13	5	0	2	-2.588190e-01	-9.659258e-01	266.070833	155.340273	0	0.00	0.00	37
2024-02-05	14	-80.00	0	True	5.639422	0.000000	14	5	0	2	-5.000000e-01	-8.660254e-01	246.867083	168.462946	0	0.00	0.00	36
2024-02-05	15	239.68	0	True	5.479305	-3.996000	15	5	0	2	-7.071068e-01	-7.071068e-01	240.373333	165.460295	0	0.00	319.68	36
2024-02-05	16	290.18	0	True	5.670501	0.210698	16	5	0	2	-8.660254e-01	-5.000000e-01	236.342917	162.893852	0	0.00	50.50	36
2024-02-05	17	372.94	0	True	5.921418	0.285202	17	5	0	2	-9.659258e-01	-2.588190e-01	235.740000	162.336224	0	0.00	82.76	36
2024-02-05	18	388.97	0	True	5.963502	0.042983	18	5	0	2	-1.000000e+00	-1.836970e-16	236.001667	162.588254	0	0.00	16.03	36
2024-02-05	19	381.39	0	True	5.943822	-0.019487	19	5	0	2	-9.659258e-01	2.588190e-01	236.542083	163.068373	0	7.58	0.00	35
2024-02-05	20	381.00	0	True	5.942799	-0.001023	20	5	0	2	-8.660254e-01	5.000000e-01	237.034583	163.503652	0	0.39	0.00	35
2024-02-05	21	372.89	0	True	5.921283	-0.021286	21	5	0	2	-7.071068e-01	7.071068e-01	237.847500	164.154460	0	8.11	0.00	35
2024-02-05	22	370.22	0	True	5.914097	-0.007160	22	5	0	2	-5.000000e-01	8.660254e-01	239.295000	165.202627	0	2.67	0.00	35
2024-02-05	23	359.00	0	True	5.883322	-0.030306	23	5	0	2	-2.588190e-01	9.659258e-01	242.025000	166.671806	0	11.22	0.00	33
2024-02-06	0	369.36	0	True	5.911772	0.028858	0	6	1	2	0.000000e+00	1.000000e+00	245.342083	168.445675	1	0.00	10.36	33
2024-02-06	1	355.39	0	True	5.873216	-0.037822	1	6	1	2	2.588190e-01	9.659258e-01	249.300417	169.924383	1	13.97	0.00	32
2024-02-06	2	325.89	0	True	5.786560	-0.083007	2	6	1	2	5.000000e-01	8.660254e-01	253.338750	170.570660	1	29.50	0.00	32
2024-02-06	3	313.61	0	True	5.748150	-0.037681	3	6	1	2	7.071068e-01	7.071068e-01	267.290417	160.534853	1	12.28	0.00	22
2024-02-06	4	321.03	0	True	5.771535	0.023660	4	6	1	2	8.660254e-01	5.000000e-01	282.020833	147.522895	1	0.00	7.42	22
2024-02-06	5	324.85	0	True	5.783364	0.011899	5	6	1	2	9.659258e-01	2.588190e-01	286.747917	146.978237	1	0.00	3.82	22
2024-02-06	6	351.51	0	True	5.862238	0.082069	6	6	1	2	1.000000e+00	6.123234e-17	290.368750	147.478700	1	0.00	26.66	22
2024-02-06	7	390.44	0	True	5.967274	0.110751	7	6	1	2	9.659258e-01	-2.588190e-01	293.304167	148.789211	1	0.00	38.93	22
2024-02-06	8	387.83	0	True	5.960567	-0.006685	8	6	1	2	8.660254e-01	-5.000000e-01	294.751250	149.562930	1	2.61	0.00	22
2024-02-06	9	163.24	0	True	5.095222	-0.579094	9	6	1	2	7.071068e-01	-7.071068e-01	285.989167	150.900939	1	224.59	0.00	31
2024-02-06	10	-80.00	0	True	5.095222	-1.490076	10	6	1	2	5.000000e-01	-8.660254e-01	267.530000	167.276352	1	243.24	0.00	41
2024-02-06	11	-80.00	0	True	5.095222	0.000000	11	6	1	2	2.588190e-01	-9.659258e-01	252.475833	181.625523	1	0.00	0.00	38
2024-02-06	12	-80.00	0	True	5.095222	0.000000	12	6	1	2	1.224647e-16	1.000000e+00	252.475833	181.625523	1	0.00	0.00	23
2024-02-06	13	-80.00	0	True	5.095222	0.000000	13	6	1	2	-2.588190e-01	-9.659258e-01	252.475833	181.625523	1	0.00	0.00	23
2024-02-06	14	-80.00	0	True	5.095222	0.000000	14	6	1	2	-5.000000e-01	-8.660254e-01	252.475833	181.625523	1	0.00	0.00	23

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-02-06	15	108.25	0	True	4.684443	-2.353125	15	6	1	2	-7.071068e-01	-7.071068e-01	246.999583	183.994060	1	0.00	188.25	23
2024-02-06	16	378.50	0	True	5.936216	2.496536	16	6	1	2	-8.660254e-01	-5.000000e-01	250.679583	185.769904	1	0.00	270.25	23
2024-02-06	17	412.33	0	True	6.021824	0.089379	17	6	1	2	-9.659258e-01	-2.588190e-01	252.320833	187.066498	1	0.00	33.83	23
2024-02-06	18	419.54	0	True	6.039159	0.017486	18	6	1	2	-1.000000e+00	-1.836970e-16	253.594583	188.138412	1	0.00	7.21	23
2024-02-06	19	412.02	0	True	6.021072	-0.017924	19	6	1	2	-9.659258e-01	2.588190e-01	254.870833	189.144215	1	7.52	0.00	23
2024-02-06	20	416.94	0	True	6.032942	0.011941	20	6	1	2	-8.660254e-01	5.000000e-01	256.368333	190.324815	1	0.00	4.92	23
2024-02-06	21	415.50	0	True	6.029483	-0.003454	21	6	1	2	-7.071068e-01	7.071068e-01	258.143750	191.653134	1	1.44	0.00	22
2024-02-06	22	412.32	0	True	6.021800	-0.007653	22	6	1	2	-5.000000e-01	8.660254e-01	259.897917	192.912081	1	3.18	0.00	22
2024-02-06	23	394.35	0	True	5.977239	-0.043583	23	6	1	2	-2.588190e-01	9.659258e-01	261.370833	193.834387	1	17.97	0.00	23
2024-02-07	0	346.62	0	True	5.848229	-0.121035	0	7	2	2	0.000000e+00	1.000000e+00	260.423333	193.338509	2	47.73	0.00	25
2024-02-07	1	335.07	0	True	5.814339	-0.033322	1	7	2	2	2.588190e-01	9.659258e-01	259.576667	192.948649	2	11.55	0.00	25
2024-02-07	2	325.82	0	True	5.786345	-0.027606	2	7	2	2	5.000000e-01	8.660254e-01	259.573750	192.947604	2	9.25	0.00	24
2024-02-07	3	317.21	0	True	5.759564	-0.026426	3	7	2	2	7.071068e-01	7.071068e-01	259.723750	192.992833	2	8.61	0.00	24
2024-02-07	4	300.70	0	True	5.706113	-0.052048	4	7	2	2	8.660254e-01	5.000000e-01	258.876667	192.756520	2	16.51	0.00	24
2024-02-07	5	287.00	0	True	5.659482	-0.045560	5	7	2	2	9.659258e-01	2.588190e-01	257.299583	192.347680	2	13.70	0.00	25
2024-02-07	6	309.19	0	True	5.733956	0.077317	6	7	2	2	1.000000e+00	6.123234e-17	255.536250	191.639140	2	0.00	22.19	25
2024-02-07	7	345.55	0	True	5.845137	0.117598	7	7	2	2	9.659258e-01	-2.588190e-01	253.665833	190.480784	2	0.00	36.36	25
2024-02-07	8	219.28	0	True	5.390349	-0.365417	8	7	2	2	8.660254e-01	-5.000000e-01	246.642917	188.415132	2	126.27	0.00	30
2024-02-07	9	-80.00	0	True	5.390349	-1.364830	9	7	2	2	7.071068e-01	-7.071068e-01	236.507917	199.322803	2	299.28	0.00	33
2024-02-07	10	-80.00	0	True	5.390349	0.000000	10	7	2	2	5.000000e-01	-8.660254e-01	236.507917	199.322803	2	0.00	0.00	23
2024-02-07	11	-80.00	0	True	5.390349	0.000000	11	7	2	2	2.588190e-01	-9.659258e-01	236.507917	199.322803	2	0.00	0.00	23
2024-02-07	12	-80.00	0	True	5.390349	0.000000	12	7	2	2	1.224647e-16	-1.000000e+00	236.507917	199.322803	2	0.00	0.00	23
2024-02-07	13	-80.00	0	True	5.390349	0.000000	13	7	2	2	-2.588190e-01	-9.659258e-01	236.507917	199.322803	2	0.00	0.00	23
2024-02-07	14	-80.00	0	True	5.390349	0.000000	14	7	2	2	-5.000000e-01	-8.660254e-01	236.507917	199.322803	2	0.00	0.00	23
2024-02-07	15	161.33	0	True	5.083452	-3.016625	15	7	2	2	-7.071068e-01	-7.071068e-01	238.719583	198.128698	2	0.00	241.33	23
2024-02-07	16	332.71	0	True	5.807271	1.062295	16	7	2	2	-8.660254e-01	-5.000000e-01	236.811667	196.941045	2	0.00	171.38	23
2024-02-07	17	401.82	0	True	5.996004	0.207718	17	7	2	2	-9.659258e-01	-2.588190e-01	236.373750	196.545082	2	0.00	69.11	23
2024-02-07	18	410.76	0	True	6.018009	0.022249	18	7	2	2	-1.000000e+00	-1.836970e-16	236.007917	196.197192	2	0.00	8.94	23
2024-02-07	19	394.38	0	True	5.977315	-0.039877	19	7	2	2	-9.659258e-01	2.588190e-01	235.272917	195.541086	2	16.38	0.00	23
2024-02-07	20	412.69	0	True	6.022697	0.046427	20	7	2	2	-8.660254e-01	5.000000e-01	235.095833	195.371264	2	0.00	18.31	23
2024-02-07	21	400.08	0	True	5.991665	-0.030556	21	7	2	2	-7.071068e-01	7.071068e-01	234.453333	194.776641	2	12.61	0.00	24
2024-02-07	22	380.31	0	True	5.940987	-0.049415	22	7	2	2	-5.000000e-01	8.660254e-01	233.119583	193.611841	2	19.77	0.00	24
2024-02-07	23	356.62	0	True	5.876671	-0.062291	23	7	2	2	-2.588190e-01	9.659258e-01	231.547500	192.395124	2	23.69	0.00	25
2024-02-08	0	383.42	0	True	5.949131	0.075150	0	8	3	2	0.000000e+00	1.000000e+00	233.080833	193.495588	3	0.00	26.80	23
2024-02-08	1	372.93	0	True	5.921391	-0.027359	1	8	3	2	2.588190e-01	9.659258e-01	234.658333	194.514865	3	10.49	0.00	23
2024-02-08	2	361.25	0	True	5.889570	-0.031320	2	8	3	2	5.000000e-01	8.660254e-01	236.134583	195.369377	3	11.68	0.00	23
2024-02-08	3	354.25	0	True	5.870003	-0.019377	3	8	3	2	7.071068e-01	7.071068e-01	237.677917	196.182293	3	7.00	0.00	23
2024-02-08	4	352.38	0	True	5.864710	-0.005279	4	8	3	2	8.660254e-01	5.000000e-01	239.831250	197.185172	3	1.87	0.00	22
2024-02-08	5	355.97	0	True	5.874846	0.010188	5	8	3	2	9.659258e-01	2.588190e-01	242.705000	198.401320	3	0.00	3.59	22
2024-02-08	6	367.69	0	True	5.907240	0.032924	6	8	3	2	1.000000e+00	6.123234e-17	245.142500	199.609328	3	0.00	11.72	22
2024-02-08	7	391.35	0	True	5.969602	0.064348	7	8	3	2	9.659258e-01	-2.588190e-01	247.050833	200.826217	3	0.00	23.66	22
2024-02-08	8	365.56	0	True	5.901430	-0.065900	8	8	3	2	8.660254e-01	-5.000000e-01	253.145833	202.162066	3	25.79	0.00	17
2024-02-08	9	-7.05	0	True	5.901430	-1.019285	9	8	3	2	7.071068e-01	-7.071068e-01	256.185417	197.428304	3	372.61	0.00	20
2024-02-08	10	-80.00	0	True	5.901430	10.347518	10	8	3	2	5.000000e-01	-8.660254e-01	256.185417	197.428304	3	72.95	0.00	23

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-02-08	11	-80.00	0	True	5.901430	0.000000	11	8	3	2	2.588190e-01	-9.659258e-01	256.185417	197.428304	3	0.00	0.00	23
2024-02-08	12	-80.00	0	True	5.901430	0.000000	12	8	3	2	1.224647e-16	-1.000000e+00	256.185417	197.428304	3	0.00	0.00	23
2024-02-08	13	-80.00	0	True	5.901430	0.000000	13	8	3	2	-2.588190e-01	-9.659258e-01	256.185417	197.428304	3	0.00	0.00	23
2024-02-08	14	-80.00	0	True	5.901430	0.000000	14	8	3	2	-5.000000e-01	-8.660254e-01	256.185417	197.428304	3	0.00	0.00	23
2024-02-08	15	155.05	0	True	5.043748	-2.938125	15	8	3	2	-7.071068e-01	-7.071068e-01	255.923750	197.563605	3	0.00	235.05	23
2024-02-08	16	342.50	0	True	5.836272	1.208965	16	8	3	2	-8.660254e-01	-5.000000e-01	256.331667	197.739070	3	0.00	187.45	23
2024-02-08	17	393.81	0	True	5.975869	0.149810	17	8	3	2	-9.659258e-01	-2.588190e-01	255.997917	197.489436	3	0.00	51.31	23
2024-02-08	18	409.92	0	True	6.015962	0.040908	18	8	3	2	-1.000000e+00	-1.836970e-16	255.962917	197.460888	3	0.00	16.11	23
2024-02-08	19	420.00	0	True	6.040255	0.024590	19	8	3	2	-9.659258e-01	2.588190e-01	257.030417	198.309155	3	0.00	10.08	23
2024-02-08	20	635.83	0	True	6.454931	0.513881	20	8	3	2	-8.660254e-01	5.000000e-01	266.327917	210.764092	3	0.00	215.83	23
2024-02-08	21	493.85	0	True	6.202232	-0.223299	21	8	3	2	-7.071068e-01	7.071068e-01	270.235000	214.192606	3	141.98	0.00	28
2024-02-08	22	416.60	0	True	6.032127	-0.156424	22	8	3	2	-5.000000e-01	8.660254e-01	271.747083	215.129506	3	77.25	0.00	31
2024-02-08	23	386.19	0	True	5.956329	-0.072996	23	8	3	2	-2.588190e-01	9.659258e-01	272.979167	215.720586	3	30.41	0.00	31
2024-02-09	0	359.10	0	True	5.883601	-0.070147	0	9	4	2	0.000000e+00	1.000000e+00	271.965833	215.235818	4	27.09	0.00	32
2024-02-09	1	318.80	0	True	5.764564	-0.112225	1	9	4	2	2.588190e-01	9.659258e-01	269.710417	214.413873	4	40.30	0.00	33
2024-02-09	2	262.15	0	True	5.568917	-0.177698	2	9	4	2	5.000000e-01	8.660254e-01	265.581250	213.526759	4	56.65	0.00	35
2024-02-09	3	229.19	0	True	5.434551	-0.125730	3	9	4	2	7.071068e-01	7.071068e-01	260.370417	212.793539	4	32.96	0.00	36
2024-02-09	4	197.61	0	True	5.286295	-0.137790	4	9	4	2	8.660254e-01	5.000000e-01	253.921667	212.228354	4	31.58	0.00	37
2024-02-09	5	241.38	0	True	5.486372	0.221497	5	9	4	2	9.659258e-01	2.588190e-01	249.147083	211.118803	4	0.00	43.77	37
2024-02-09	6	290.21	0	True	5.670605	0.202295	6	9	4	2	1.000000e+00	6.123234e-17	245.918750	209.815657	4	0.00	48.83	37
2024-02-09	7	346.74	0	True	5.848575	0.194790	7	9	4	2	9.659258e-01	-2.588190e-01	244.060000	208.665719	4	0.00	56.53	37
2024-02-09	8	210.69	0	True	5.350388	-0.392369	8	9	4	2	8.660254e-01	-5.000000e-01	237.607083	207.134039	4	136.05	0.00	42
2024-02-09	9	-80.00	0	True	5.350388	-1.379705	9	9	4	2	7.071068e-01	-7.071068e-01	234.567500	211.372242	4	290.69	0.00	39
2024-02-09	10	-80.00	0	True	5.350388	0.000000	10	9	4	2	5.000000e-01	-8.660254e-01	234.567500	211.372242	4	0.00	0.00	36
2024-02-09	11	-80.00	0	True	5.350388	0.000000	11	9	4	2	2.588190e-01	-9.659258e-01	234.567500	211.372242	4	0.00	0.00	36
2024-02-09	12	-80.00	0	True	5.350388	0.000000	12	9	4	2	1.224647e-16	-1.000000e+00	234.567500	211.372242	4	0.00	0.00	36
2024-02-09	13	-80.00	0	True	5.350388	0.000000	13	9	4	2	-2.588190e-01	-9.659258e-01	234.567500	211.372242	4	0.00	0.00	36
2024-02-09	14	-80.00	0	True	5.350388	0.000000	14	9	4	2	-5.000000e-01	-8.660254e-01	234.567500	211.372242	4	0.00	0.00	36
2024-02-09	15	-70.00	0	True	5.350388	-0.125000	15	9	4	2	-7.071068e-01	-7.071068e-01	225.190417	219.874192	4	0.00	10.00	36
2024-02-09	16	298.85	0	True	5.699942	-5.269286	16	9	4	2	-8.660254e-01	-5.000000e-01	223.371667	219.040595	4	0.00	368.85	36
2024-02-09	17	407.82	0	True	6.010826	0.364631	17	9	4	2	-9.659258e-01	-2.588190e-01	223.955417	219.532683	4	0.00	108.97	36
2024-02-09	18	416.88	0	True	6.032798	0.022216	18	9	4	2	-1.000000e+00	-1.836970e-16	224.245417	219.793463	4	0.00	9.06	36
2024-02-09	19	408.24	0	True	6.011855	-0.020725	19	9	4	2	-9.659258e-01	2.588190e-01	223.755417	219.350743	4	8.64	0.00	36
2024-02-09	20	467.34	0	True	6.147057	0.144768	20	9	4	2	-8.660254e-01	5.000000e-01	216.735000	207.990837	4	0.00	59.10	36
2024-02-09	21	512.99	0	True	6.240256	0.097680	21	9	4	2	-7.071068e-01	7.071068e-01	217.532500	209.133135	4	0.00	45.65	30
2024-02-09	22	607.67	0	True	6.409632	0.184565	22	9	4	2	-5.000000e-01	8.660254e-01	225.493750	220.375333	4	0.00	94.68	27
2024-02-09	23	467.49	0	True	6.147378	-0.230684	23	9	4	2	-2.588190e-01	9.659258e-01	228.881250	223.554789	4	140.18	0.00	31
2024-02-10	0	400.52	2	False	5.992764	-0.143254	0	10	5	2	0.000000e+00	1.000000e+00	230.607083	224.760410	5	66.97	0.00	33
2024-02-10	1	335.83	2	False	5.816605	-0.161515	1	10	5	2	2.588190e-01	9.659258e-01	231.316667	225.077605	5	64.69	0.00	34
2024-02-10	2	288.56	2	False	5.664903	-0.140756	2	10	5	2	5.000000e-01	8.660254e-01	232.417083	225.299355	5	47.27	0.00	34
2024-02-10	3	250.73	2	False	5.524377	-0.131099	3	10	5	2	7.071068e-01	7.071068e-01	233.314583	225.328842	5	37.83	0.00	34
2024-02-10	4	242.38	2	False	5.490507	-0.033303	4	10	5	2	8.660254e-01	5.000000e-01	235.180000	225.205689	5	8.35	0.00	33
2024-02-10	5	304.79	2	False	5.719623	0.257488	5	10	5	2	9.659258e-01	2.588190e-01	237.822083	225.653104	5	0.00	62.41	33
2024-02-10	6	369.54	2	False	5.912259	0.212441	6	10	5	2	1.000000e+00	6.123234e-17	241.127500	227.030675	5	0.00	64.75	33

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-02-10	7	380.22	2	False	5.940750	0.028901	7	10	5	2	9.659258e-01	-2.588190e-01	242.522500	227.809355	5	0.00	10.68	33
2024-02-10	8	185.81	2	False	5.224725	-0.511309	8	10	5	2	8.660254e-01	-5.000000e-01	241.485833	228.017024	5	194.41	0.00	35
2024-02-10	9	-80.00	2	False	5.224725	-1.430547	9	10	5	2	7.071068e-01	-7.071068e-01	241.485833	228.017024	5	265.81	0.00	34
2024-02-10	10	-80.00	2	False	5.224725	0.000000	10	10	5	2	5.000000e-01	-8.660254e-01	241.485833	228.017024	5	0.00	0.00	34
2024-02-10	11	-80.00	2	False	5.224725	0.000000	11	10	5	2	2.588190e-01	-9.659258e-01	241.485833	228.017024	5	0.00	0.00	34
2024-02-10	12	-80.00	2	False	5.224725	0.000000	12	10	5	2	1.224647e-16	-1.000000e+00	241.485833	228.017024	5	0.00	0.00	34
2024-02-10	13	-80.00	2	False	5.224725	0.000000	13	10	5	2	-2.588190e-01	-9.659258e-01	241.485833	228.017024	5	0.00	0.00	34
2024-02-10	14	-80.00	2	False	5.224725	0.000000	14	10	5	2	-5.000000e-01	-8.660254e-01	241.485833	228.017024	5	0.00	0.00	34
2024-02-10	15	91.47	2	False	4.516011	-2.143375	15	10	5	2	-7.071068e-01	-7.071068e-01	248.213750	220.691160	5	0.00	171.47	34
2024-02-10	16	308.40	2	False	5.731398	2.371597	16	10	5	2	-8.660254e-01	-5.000000e-01	248.611667	220.795014	5	0.00	216.93	34
2024-02-10	17	490.42	2	False	6.195262	0.590208	17	10	5	2	-9.659258e-01	-2.588190e-01	252.053333	224.005025	5	0.00	182.02	34
2024-02-10	18	468.41	2	False	6.149344	-0.044880	18	10	5	2	-1.000000e+00	-1.836970e-16	254.200417	225.892579	5	22.01	0.00	35
2024-02-10	19	376.34	2	False	5.930493	-0.196559	19	10	5	2	-9.659258e-01	2.588190e-01	252.871250	225.039030	5	92.07	0.00	39
2024-02-10	20	359.08	2	False	5.883545	-0.045863	20	10	5	2	-8.660254e-01	5.000000e-01	248.360417	221.612089	5	17.26	0.00	39
2024-02-10	21	367.41	2	False	5.906478	0.023198	21	10	5	2	-7.071068e-01	7.071068e-01	242.294583	215.974539	5	0.00	8.33	39
2024-02-10	22	336.91	2	False	5.819816	-0.083014	22	10	5	2	-5.000000e-01	8.660254e-01	231.012917	202.724196	5	30.50	0.00	41
2024-02-10	23	307.07	2	False	5.727076	-0.088570	23	10	5	2	-2.588190e-01	9.659258e-01	224.328750	197.156337	5	29.84	0.00	36
2024-02-11	0	354.78	2	False	5.871498	0.155372	0	11	6	2	0.000000e+00	1.000000e+00	222.422917	195.593999	6	0.00	47.71	33
2024-02-11	1	322.66	2	False	5.776599	-0.090535	1	11	6	2	2.588190e-01	9.659258e-01	221.874167	195.280218	6	32.12	0.00	32
2024-02-11	2	-1.23	2	False	5.776599	-1.003812	2	11	6	2	5.000000e-01	8.660254e-01	209.799583	199.882546	6	323.89	0.00	43
2024-02-11	3	-80.00	2	False	5.776599	64.040650	3	11	6	2	7.071068e-01	7.071068e-01	196.019167	208.167015	6	78.77	0.00	45
2024-02-11	4	-80.00	2	False	5.776599	0.000000	4	11	6	2	8.660254e-01	5.000000e-01	182.586667	215.323571	6	0.00	0.00	45
2024-02-11	5	-80.00	2	False	5.776599	0.000000	5	11	6	2	9.659258e-01	2.588190e-01	166.553750	220.101392	6	0.00	0.00	45
2024-02-11	6	67.88	2	False	4.217741	-1.848500	6	11	6	2	1.000000e+00	6.123234e-17	153.984583	216.590959	6	0.00	147.88	45
2024-02-11	7	272.93	2	False	5.609215	3.020772	7	11	6	2	9.659258e-01	-2.588190e-01	149.514167	212.792378	6	0.00	205.05	45
2024-02-11	8	-60.00	2	False	5.609215	-1.219837	8	11	6	2	8.660254e-01	-5.000000e-01	139.272083	216.846460	6	332.93	0.00	51
2024-02-11	9	-80.00	2	False	5.609215	0.333333	9	11	6	2	7.071068e-01	-7.071068e-01	139.272083	216.846460	6	20.00	0.00	40
2024-02-11	10	-80.00	2	False	5.609215	0.000000	10	11	6	2	5.000000e-01	-8.660254e-01	139.272083	216.846460	6	0.00	0.00	40
2024-02-11	11	-80.00	2	False	5.609215	0.000000	11	11	6	2	2.588190e-01	-9.659258e-01	139.272083	216.846460	6	0.00	0.00	40
2024-02-11	12	-80.00	2	False	5.609215	0.000000	12	11	6	2	1.224647e-16	-1.000000e+00	139.272083	216.846460	6	0.00	0.00	40
2024-02-11	13	-80.00	2	False	5.609215	0.000000	13	11	6	2	-2.588190e-01	-9.659258e-01	139.272083	216.846460	6	0.00	0.00	40
2024-02-11	14	-80.00	2	False	5.609215	0.000000	14	11	6	2	-5.000000e-01	-8.660254e-01	139.272083	216.846460	6	0.00	0.00	40
2024-02-11	15	-95.00	2	False	5.609215	0.187500	15	11	6	2	-7.071068e-01	-7.071068e-01	131.502500	221.915033	6	15.00	0.00	41
2024-02-11	16	265.29	2	False	5.580824	-3.792526	16	11	6	2	-8.660254e-01	-5.000000e-01	129.706250	220.591440	6	0.00	360.29	41
2024-02-11	17	484.99	2	False	6.184128	0.828150	17	11	6	2	-9.659258e-01	-2.588190e-01	129.480000	220.207839	6	0.00	219.70	41
2024-02-11	18	506.83	2	False	6.228176	0.045032	18	11	6	2	-1.836970e-16	-1.000000e+00	131.080833	222.902035	6	0.00	21.84	40
2024-02-11	19	395.31	2	False	5.979670	-0.220034	19	11	6	2	-9.659258e-01	-2.588190e-01	131.871250	223.841199	6	111.52	0.00	41
2024-02-11	20	249.90	2	False	5.521061	-0.367838	20	11	6	2	-8.660254e-01	-5.000000e-01	127.322083	220.101023	6	145.41	0.00	46
2024-02-11	21	297.01	2	False	5.693766	0.188515	21	11	6	2	-7.071068e-01	7.071068e-01	124.388750	217.212365	6	0.00	47.11	46
2024-02-11	22	-80.00	2	False	5.693766	-1.269351	22	11	6	2	-5.000000e-01	-8.660254e-01	107.017500	216.145592	6	377.01	0.00	61
2024-02-11	23	-80.00	2	False	5.693766	0.000000	23	11	6	2	-2.588190e-01	-9.659258e-01	90.889583	215.007280	6	0.00	0.00	59
2024-02-12	0	-80.00	2	True	5.693766	0.000000	0	12	0	2	0.000000e+00	1.000000e+00	72.773750	210.065797	0	0.00	0.00	59
2024-02-12	1	-80.00	2	True	5.693766	0.000000	1	12	0	2	2.588190e-01	9.659258e-01	55.996250	205.265126	0	0.00	0.00	58
2024-02-12	2	-80.00	2	True	5.693766	0.000000	2	12	0	2	5.000000e-01	8.660254e-01	52.714167	206.843604	0	0.00	0.00	45

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-02-12	3	-80.00	2	True	5.693766	0.000000	3	12	0	2	7.071068e-01	7.071068e-01	52.714167	206.843604	0	0.00	0.00	41
2024-02-12	4	-80.00	2	True	5.693766	0.000000	4	12	0	2	8.660254e-01	5.000000e-01	52.714167	206.843604	0	0.00	0.00	41
2024-02-12	5	-80.00	2	True	5.693766	0.000000	5	12	0	2	9.659258e-01	2.588190e-01	52.714167	206.843604	0	0.00	0.00	41
2024-02-12	6	-85.00	2	True	5.693766	0.062500	6	12	0	2	1.000000e+00	6.123234e-17	46.344167	208.701962	0	5.00	0.00	41
2024-02-12	7	256.26	2	True	5.546193	-4.014824	7	12	0	2	9.659258e-01	-2.588190e-01	45.649583	207.941426	0	0.00	341.26	41
2024-02-12	8	-80.00	2	True	5.546193	-1.312183	8	12	0	2	8.660254e-01	-5.000000e-01	44.816250	208.422747	0	336.26	0.00	42
2024-02-12	9	-80.00	2	True	5.546193	0.000000	9	12	0	2	7.071068e-01	-7.071068e-01	44.816250	208.422747	0	0.00	0.00	41
2024-02-12	10	-80.00	2	True	5.546193	0.000000	10	12	0	2	5.000000e-01	-8.660254e-01	44.816250	208.422747	0	0.00	0.00	41
2024-02-12	11	-80.00	2	True	5.546193	0.000000	11	12	0	2	2.588190e-01	-9.659258e-01	44.816250	208.422747	0	0.00	0.00	41
2024-02-12	12	-80.00	2	True	5.546193	0.000000	12	12	0	2	1.224647e-16	-1.000000e+00	44.816250	208.422747	0	0.00	0.00	41
2024-02-12	13	-80.00	2	True	5.546193	0.000000	13	12	0	2	-2.588190e-01	-9.659258e-01	44.816250	208.422747	0	0.00	0.00	41
2024-02-12	14	-80.00	2	True	5.546193	0.000000	14	12	0	2	-5.000000e-01	-8.660254e-01	44.816250	208.422747	0	0.00	0.00	41
2024-02-12	15	-80.00	2	True	5.546193	0.000000	15	12	0	2	-7.071068e-01	-7.071068e-01	45.441250	208.007326	0	0.00	0.00	40
2024-02-12	16	-65.30	2	True	5.546193	-0.183750	16	12	0	2	-8.660254e-01	-5.000000e-01	31.666667	203.717463	0	0.00	14.70	40
2024-02-12	17	272.02	2	True	5.605876	-5.165697	17	12	0	2	-9.659258e-01	-2.588190e-01	22.792917	187.070824	0	0.00	337.32	40
2024-02-12	18	1.71	2	True	0.536493	-0.993714	18	12	0	2	-1.000000e+00	-1.836970e-16	1.746250	156.096102	0	270.31	0.00	51
2024-02-12	19	-80.00	2	True	0.536493	-47.783626	19	12	0	2	-9.659258e-01	2.588190e-01	-18.058333	132.335961	0	81.71	0.00	50
2024-02-12	20	-80.00	2	True	0.536493	0.000000	20	12	0	2	-8.660254e-01	5.000000e-01	-31.804167	119.835921	0	0.00	0.00	44
2024-02-12	21	-80.00	2	True	0.536493	0.000000	21	12	0	2	-7.071068e-01	7.071068e-01	-47.512917	97.485033	0	0.00	0.00	44
2024-02-12	22	-80.00	2	True	0.536493	0.000000	22	12	0	2	-5.000000e-01	8.660254e-01	-47.512917	97.485033	0	0.00	0.00	28
2024-02-12	23	-80.00	2	True	0.536493	0.000000	23	12	0	2	-2.588190e-01	9.659258e-01	-47.512917	97.485033	0	0.00	0.00	28
2024-02-13	0	-80.00	2	True	0.536493	0.000000	0	13	1	2	0.000000e+00	1.000000e+00	-47.512917	97.485033	1	0.00	0.00	28
2024-02-13	1	-80.00	2	True	0.536493	0.000000	1	13	1	2	2.588190e-01	9.659258e-01	-47.512917	97.485033	1	0.00	0.00	28
2024-02-13	2	-80.00	2	True	0.536493	0.000000	2	13	1	2	5.000000e-01	8.660254e-01	-47.512917	97.485033	1	0.00	0.00	28
2024-02-13	3	-80.00	2	True	0.536493	0.000000	3	13	1	2	7.071068e-01	7.071068e-01	-47.512917	97.485033	1	0.00	0.00	28
2024-02-13	4	-80.00	2	True	0.536493	0.000000	4	13	1	2	8.660254e-01	5.000000e-01	-47.512917	97.485033	1	0.00	0.00	28
2024-02-13	5	-80.00	2	True	0.536493	0.000000	5	13	1	2	9.659258e-01	2.588190e-01	-47.512917	97.485033	1	0.00	0.00	28
2024-02-13	6	-80.00	2	True	0.536493	0.000000	6	13	1	2	1.000000e+00	6.123234e-17	-47.304583	97.406748	1	0.00	0.00	28
2024-02-13	7	117.01	2	True	4.762259	-2.462625	7	13	1	2	9.659258e-01	-2.588190e-01	-53.106667	81.364879	1	0.00	197.01	28
2024-02-13	8	-80.00	2	True	4.762259	-1.683702	8	13	1	2	8.660254e-01	-5.000000e-01	-53.106667	81.364879	1	197.01	0.00	22
2024-02-13	9	-80.00	2	True	4.762259	0.000000	9	13	1	2	7.071068e-01	-7.071068e-01	-53.106667	81.364879	1	0.00	0.00	22
2024-02-13	10	-80.00	2	True	4.762259	0.000000	10	13	1	2	5.000000e-01	-8.660254e-01	-53.106667	81.364879	1	0.00	0.00	22
2024-02-13	11	-80.00	2	True	4.762259	0.000000	11	13	1	2	2.588190e-01	-9.659258e-01	-53.106667	81.364879	1	0.00	0.00	22
2024-02-13	12	-80.00	2	True	4.762259	0.000000	12	13	1	2	1.224647e-16	-1.000000e+00	-53.106667	81.364879	1	0.00	0.00	22
2024-02-13	13	-80.00	2	True	4.762259	0.000000	13	13	1	2	-2.588190e-01	-9.659258e-01	-53.106667	81.364879	1	0.00	0.00	22
2024-02-13	14	-80.00	2	True	4.762259	0.000000	14	13	1	2	-5.000000e-01	-8.660254e-01	-53.106667	81.364879	1	0.00	0.00	22
2024-02-13	15	-80.00	2	True	4.762259	0.000000	15	13	1	2	-7.071068e-01	-7.071068e-01	-53.106667	81.364879	1	0.00	0.00	22
2024-02-13	16	120.42	2	True	4.790986	-2.505250	16	13	1	2	-8.660254e-01	-5.000000e-01	-45.368333	88.659403	1	0.00	200.42	22
2024-02-13	17	648.34	2	True	6.474415	4.383989	17	13	1	2	-9.659258e-01	-2.588190e-01	-29.688333	155.393815	1	0.00	527.92	22
2024-02-13	18	580.08	2	True	6.363166	-0.105284	18	13	1	2	-1.000000e+00	-1.836970e-16	-5.589583	199.159106	1	68.26	0.00	14
2024-02-13	19	515.24	2	True	6.244633	-0.111778	19	13	1	2	-9.659258e-01	-2.588190e-01	19.212083	224.890663	1	64.84	0.00	13
2024-02-13	20	527.30	2	True	6.267770	0.023407	20	13	1	2	-8.660254e-01	5.000000e-01	44.516250	246.381351	1	0.00	12.06	13
2024-02-13	21	505.29	2	True	6.225133	-0.041741	21	13	1	2	-7.071068e-01	-7.071068e-01	6.090333	261.992478	1	22.01	0.00	14
2024-02-13	22	484.01	2	True	6.182106	-0.042114	22	13	1	2	-5.000000e-01	-8.660254e-01	92.403750	273.114741	1	21.28	0.00	15

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-02-13	23	424.77	2	True	6.051548	-0.122394	23	13	1	2	-2.588190e-01	9.659258e-01	113.435833	278.640810	1	59.24	0.00	18
2024-02-14	0	297.96	2	True	5.696959	-0.298538	0	14	2	2	0.000000e+00	1.000000e+00	129.184167	277.912688	2	126.81	0.00	23
2024-02-14	1	361.10	2	True	5.889155	0.211908	1	14	2	2	2.588190e-01	9.659258e-01	147.563333	278.062827	2	0.00	63.14	23
2024-02-14	2	350.57	2	True	5.859560	-0.029161	2	14	2	2	5.000000e-01	8.660254e-01	165.503750	276.628581	2	10.53	0.00	23
2024-02-14	3	458.56	2	True	6.128091	0.308041	3	14	2	2	7.071068e-01	7.071068e-01	187.943750	277.689390	2	0.00	107.99	23
2024-02-14	4	560.27	2	True	6.328419	0.221803	4	14	2	2	8.660254e-01	5.000000e-01	214.621667	281.557319	2	0.00	101.71	23
2024-02-14	5	796.50	2	True	6.680227	0.421636	5	14	2	2	9.659258e-01	2.588190e-01	251.142500	298.043184	2	0.00	236.23	23
2024-02-14	6	854.19	2	True	6.750154	0.072429	6	14	2	2	1.000000e+00	6.123234e-17	290.067083	313.516658	2	0.00	57.69	23
2024-02-14	7	919.34	2	True	6.823656	0.076271	7	14	2	2	9.659258e-01	-2.588190e-01	323.497500	336.215860	2	0.00	65.15	23
2024-02-14	8	390.75	2	True	5.968068	-0.574967	8	14	2	2	8.660254e-01	-5.000000e-01	343.112083	325.203917	2	528.59	0.00	37
2024-02-14	9	-80.00	2	True	5.968068	-1.204734	9	14	2	2	7.071068e-01	-7.071068e-01	343.112083	325.203917	2	470.75	0.00	57
2024-02-14	10	-80.00	2	True	5.968068	0.000000	10	14	2	2	5.000000e-01	-8.660254e-01	343.112083	325.203917	2	0.00	0.00	57
2024-02-14	11	-80.00	2	True	5.968068	0.000000	11	14	2	2	2.588190e-01	-9.659258e-01	343.112083	325.203917	2	0.00	0.00	57
2024-02-14	12	-80.00	2	True	5.968068	0.000000	12	14	2	2	1.224647e-16	-1.000000e+00	343.112083	325.203917	2	0.00	0.00	57
2024-02-14	13	-80.00	2	True	5.968068	0.000000	13	14	2	2	-2.588190e-01	-9.659258e-01	343.112083	325.203917	2	0.00	0.00	57
2024-02-14	14	-80.00	2	True	5.968068	0.000000	14	14	2	2	-5.000000e-01	-8.660254e-01	343.112083	325.203917	2	0.00	0.00	57
2024-02-14	15	-85.00	2	True	5.968068	0.062500	15	14	2	2	-7.071068e-01	-7.071068e-01	342.903750	325.488234	2	5.00	0.00	57
2024-02-14	16	-80.00	2	True	5.968068	-0.058824	16	14	2	2	-8.660254e-01	-5.000000e-01	334.552917	333.906683	2	0.00	5.00	57
2024-02-14	17	296.71	2	True	5.692755	-4.708875	17	14	2	2	-9.659258e-01	-2.588190e-01	319.901667	327.186452	2	0.00	376.71	57
2024-02-14	18	111.50	2	True	4.714025	-0.624212	18	14	2	2	-1.000000e+00	-1.836970e-16	300.377500	324.959012	2	185.21	0.00	62
2024-02-14	19	-80.00	2	True	4.714025	-1.717489	19	14	2	2	-9.659258e-01	2.588190e-01	275.575833	330.514781	2	191.50	0.00	67
2024-02-14	20	-77.85	2	True	4.714025	-0.026875	20	14	2	2	-8.660254e-01	5.000000e-01	250.361250	333.545292	2	0.00	2.15	67
2024-02-14	21	-68.60	2	True	4.714025	-0.118818	21	14	2	2	-7.071068e-01	7.071068e-01	226.449167	335.042589	2	0.00	9.25	66
2024-02-14	22	-80.00	2	True	4.714025	0.166181	22	14	2	2	-5.000000e-01	8.660254e-01	202.948750	335.970390	2	11.40	0.00	66
2024-02-14	23	-80.00	2	True	4.714025	0.000000	23	14	2	2	-2.588190e-01	9.659258e-01	181.916667	337.277420	2	0.00	0.00	63
2024-02-15	0	-80.00	2	True	4.714025	0.000000	0	15	3	2	0.000000e+00	1.000000e+00	166.168333	340.432678	3	0.00	0.00	58
2024-02-15	1	-80.00	2	True	4.714025	0.000000	1	15	3	2	2.588190e-01	9.659258e-01	147.789167	341.356936	3	0.00	0.00	58
2024-02-15	2	-80.00	2	True	4.714025	0.000000	2	15	3	2	5.000000e-01	8.660254e-01	129.848750	341.550687	3	0.00	0.00	58
2024-02-15	3	-80.00	2	True	4.714025	0.000000	3	15	3	2	7.071068e-01	7.071068e-01	107.408750	336.672217	3	0.00	0.00	58
2024-02-15	4	-80.00	2	True	4.714025	0.000000	4	15	3	2	8.660254e-01	5.000000e-01	80.730833	324.370014	3	0.00	0.00	58
2024-02-15	5	-80.00	2	True	4.714025	0.000000	5	15	3	2	9.659258e-01	2.588190e-01	44.210000	287.528012	3	0.00	0.00	58
2024-02-15	6	163.81	2	True	5.098707	-3.047625	6	15	3	2	1.000000e+00	6.123234e-17	15.444167	232.176979	3	0.00	243.81	58
2024-02-15	7	432.55	2	True	6.069698	1.640559	7	15	3	2	9.659258e-01	-2.588190e-01	-4.838750	159.744023	3	0.00	268.74	58
2024-02-15	8	368.36	2	True	5.909061	-0.148399	8	15	3	2	8.660254e-01	-5.000000e-01	-5.771667	157.381214	3	64.19	0.00	38
2024-02-15	9	10.15	2	True	2.317474	-0.972445	9	15	3	2	7.071068e-01	-7.071068e-01	-2.015417	156.606472	3	358.21	0.00	33
2024-02-15	10	-80.00	2	True	2.317474	-8.881773	10	15	3	2	5.000000e-01	-8.660254e-01	-2.015417	156.606472	3	90.15	0.00	37
2024-02-15	11	-80.00	2	True	2.317474	0.000000	11	15	3	2	2.588190e-01	-9.659258e-01	-2.015417	156.606472	3	0.00	0.00	37
2024-02-15	12	-80.00	2	True	2.317474	0.000000	12	15	3	2	1.224647e-16	-1.000000e+00	-2.015417	156.606472	3	0.00	0.00	37
2024-02-15	13	-80.00	2	True	2.317474	0.000000	13	15	3	2	-2.588190e-01	-9.659258e-01	-2.015417	156.606472	3	0.00	0.00	37
2024-02-15	14	-80.00	2	True	2.317474	0.000000	14	15	3	2	-5.000000e-01	-8.660254e-01	-2.015417	156.606472	3	0.00	0.00	37
2024-02-15	15	-85.00	2	True	2.317474	0.062500	15	15	3	2	-7.071068e-01	-7.071068e-01	-2.015417	156.606472	3	5.00	0.00	37
2024-02-15	16	172.55	2	True	5.150687	-3.030000	16	15	3	2	-8.660254e-01	-5.000000e-01	8.507500	159.594926	3	0.00	257.55	37
2024-02-15	17	725.13	2	True	6.586351	3.202434	17	15	3	2	-9.659258e-01	-2.588190e-01	26.358333	209.415533	3	0.00	552.58	37
2024-02-15	18	820.26	2	True	6.709621	0.131190	18	15	3	2	-1.836970e-16	-1.000000e+00	55.890000	264.637717	3	0.00	95.13	30

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-02-15	19	508.57	2	True	6.231603	-0.379989	19	15	3	2	-9.659258e-01	2.588190e-01	80.413750	278.410155	3	311.69	0.00	35
2024-02-15	20	389.35	2	True	5.964479	-0.234422	20	15	3	2	-8.660254e-01	5.000000e-01	99.880417	283.156148	3	119.22	0.00	39
2024-02-15	21	177.36	2	True	5.178182	-0.544472	21	15	3	2	-7.071068e-01	7.071068e-01	110.128750	281.237719	3	211.99	0.00	48
2024-02-15	22	110.87	2	True	4.708358	-0.374887	22	15	3	2	-5.000000e-01	8.660254e-01	118.081667	278.310953	3	66.49	0.00	51
2024-02-15	23	-80.00	2	True	4.708358	-1.721566	23	15	3	2	-2.588190e-01	9.659258e-01	118.081667	278.310953	3	190.87	0.00	59
2024-02-16	0	-80.00	2	True	4.708358	0.000000	0	16	4	2	0.000000e+00	1.000000e+00	118.081667	278.310953	4	0.00	0.00	59
2024-02-16	1	-80.00	2	True	4.708358	0.000000	1	16	4	2	2.588190e-01	9.659258e-01	118.081667	278.310953	4	0.00	0.00	59
2024-02-16	2	-80.00	2	True	4.708358	0.000000	2	16	4	2	5.000000e-01	8.660254e-01	118.081667	278.310953	4	0.00	0.00	59
2024-02-16	3	-80.00	2	True	4.708358	0.000000	3	16	4	2	7.071068e-01	7.071068e-01	118.081667	278.310953	4	0.00	0.00	59
2024-02-16	4	-80.00	2	True	4.708358	0.000000	4	16	4	2	8.660254e-01	5.000000e-01	118.081667	278.310953	4	0.00	0.00	59
2024-02-16	5	-80.00	2	True	4.708358	0.000000	5	16	4	2	9.659258e-01	2.588190e-01	118.081667	278.310953	4	0.00	0.00	59
2024-02-16	6	-80.00	2	True	4.708358	0.000000	6	16	4	2	1.000000e+00	6.123234e-17	107.922917	281.005891	4	0.00	0.00	59
2024-02-16	7	-80.00	2	True	4.708358	0.000000	7	16	4	2	9.659258e-01	-2.588190e-01	86.566667	274.667015	4	0.00	0.00	59
2024-02-16	8	-80.00	2	True	4.708358	0.000000	8	16	4	2	8.660254e-01	-5.000000e-01	67.885000	269.873251	4	0.00	0.00	56
2024-02-16	9	-80.00	2	True	4.708358	0.000000	9	16	4	2	7.071068e-01	-7.071068e-01	64.128750	271.335198	4	0.00	0.00	41
2024-02-16	10	-80.00	2	True	4.708358	0.000000	10	16	4	2	5.000000e-01	-8.660254e-01	64.128750	271.335198	4	0.00	0.00	37
2024-02-16	11	-80.00	2	True	4.708358	0.000000	11	16	4	2	2.588190e-01	-9.659258e-01	64.128750	271.335198	4	0.00	0.00	37
2024-02-16	12	-80.00	2	True	4.708358	0.000000	12	16	4	2	1.224647e-16	-1.000000e+00	64.128750	271.335198	4	0.00	0.00	37
2024-02-16	13	-80.00	2	True	4.708358	0.000000	13	16	4	2	-2.588190e-01	-9.659258e-01	64.128750	271.335198	4	0.00	0.00	37
2024-02-16	14	-80.00	2	True	4.708358	0.000000	14	16	4	2	-5.000000e-01	-8.660254e-01	64.128750	271.335198	4	0.00	0.00	37
2024-02-16	15	-80.00	2	True	4.708358	0.000000	15	16	4	2	-7.071068e-01	-7.071068e-01	64.337083	271.217611	4	0.00	0.00	37
2024-02-16	16	-80.00	2	True	4.708358	0.000000	16	16	4	2	-8.660254e-01	-5.000000e-01	53.814167	271.735360	4	0.00	0.00	37
2024-02-16	17	307.95	2	True	5.729937	-4.849375	17	16	4	2	-9.659258e-01	-2.588190e-01	36.431667	238.198937	4	0.00	387.95	37
2024-02-16	18	-34.16	2	True	5.729937	-1.110927	18	16	4	2	-1.000000e+00	-1.836970e-16	0.830833	170.059981	4	342.11	0.00	51
2024-02-16	19	-80.00	2	True	5.729937	1.341920	19	16	4	2	-9.659258e-01	2.588190e-01	-23.692917	131.788657	4	45.84	0.00	40
2024-02-16	20	-80.00	2	True	5.729937	0.000000	20	16	4	2	-8.660254e-01	5.000000e-01	-43.249167	98.434941	4	0.00	0.00	35
2024-02-16	21	-80.00	2	True	5.729937	0.000000	21	16	4	2	-7.071068e-01	7.071068e-01	-53.972500	86.672679	4	0.00	0.00	26
2024-02-16	22	-80.00	2	True	5.729937	0.000000	22	16	4	2	-5.000000e-01	8.660254e-01	-61.925417	79.335812	4	0.00	0.00	24
2024-02-16	23	-80.00	2	True	5.729937	0.000000	23	16	4	2	-2.588190e-01	9.659258e-01	-61.925417	79.335812	4	0.00	0.00	16
2024-02-17	0	-80.00	2	False	5.729937	0.000000	0	17	5	2	0.000000e+00	1.000000e+00	-61.925417	79.335812	5	0.00	0.00	16
2024-02-17	1	-80.00	2	False	5.729937	0.000000	1	17	5	2	2.588190e-01	9.659258e-01	-61.925417	79.335812	5	0.00	0.00	16
2024-02-17	2	-80.00	2	False	5.729937	0.000000	2	17	5	2	5.000000e-01	8.660254e-01	-61.925417	79.335812	5	0.00	0.00	16
2024-02-17	3	-80.00	2	False	5.729937	0.000000	3	17	5	2	7.071068e-01	7.071068e-01	-61.925417	79.335812	5	0.00	0.00	16
2024-02-17	4	-80.00	2	False	5.729937	0.000000	4	17	5	2	8.660254e-01	5.000000e-01	-61.925417	79.335812	5	0.00	0.00	16
2024-02-17	5	-80.00	2	False	5.729937	0.000000	5	17	5	2	9.659258e-01	2.588190e-01	-61.925417	79.335812	5	0.00	0.00	16
2024-02-17	6	-80.00	2	False	5.729937	0.000000	6	17	5	2	1.000000e+00	6.123234e-17	-61.925417	79.335812	5	0.00	0.00	16
2024-02-17	7	-80.00	2	False	5.729937	0.000000	7	17	5	2	9.659258e-01	-2.588190e-01	-61.925417	79.335812	5	0.00	0.00	16
2024-02-17	8	-80.00	2	False	5.729937	0.000000	8	17	5	2	8.660254e-01	-5.000000e-01	-61.925417	79.335812	5	0.00	0.00	16
2024-02-17	9	-80.00	2	False	5.729937	0.000000	9	17	5	2	7.071068e-01	-7.071068e-01	-61.925417	79.335812	5	0.00	0.00	16
2024-02-17	10	-80.00	2	False	5.729937	0.000000	10	17	5	2	5.000000e-01	-8.660254e-01	-61.925417	79.335812	5	0.00	0.00	16
2024-02-17	11	-80.00	2	False	5.729937	0.000000	11	17	5	2	2.588190e-01	-9.659258e-01	-61.925417	79.335812	5	0.00	0.00	16
2024-02-17	12	-80.00	2	False	5.729937	0.000000	12	17	5	2	1.224647e-16	-1.000000e+00	-61.925417	79.335812	5	0.00	0.00	16
2024-02-17	13	-80.00	2	False	5.729937	0.000000	13	17	5	2	-2.588190e-01	-9.659258e-01	-61.925417	79.335812	5	0.00	0.00	16
2024-02-17	14	-80.00	2	False	5.729937	0.000000	14	17	5	2	-5.000000e-01	-8.660254e-01	-61.925417	79.335812	5	0.00	0.00	16

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su	
2024-02-17	15	-80.00	2	False	5.729937	0.000000	15	17	5	2	-7.071068e-01	-7.071068e-01	-61.925417	79.335812	5	0.00	0.00	16	
2024-02-17	16	79.44	2	False	4.375002	-1.993000	16	17	5	2	-8.660254e-01	-5.000000e-01	-55.282083	84.278063	5	0.00	159.44	16	
2024-02-17	17	301.21	2	False	5.707808	2.791667	17	17	5	2	-9.659258e-01	-2.588190e-01	-55.562917	83.016860	5	0.00	221.77	16	
2024-02-17	18	189.54	2	False	5.244600	-0.370738	18	17	5	2	-1.000000e+00	-1.836970e-16	-46.242083	96.918537	5	111.67	0.00	6.5	
2024-02-17	19	80.36	2	False	4.386517	-0.576026	19	17	5	2	-9.659258e-01	2.588190e-01	-39.560417	99.969709	5	109.18	0.00	9.2	
2024-02-17	20	-80.00	2	False	4.386517	-1.995520	20	17	5	2	-8.660254e-01	5.000000e-01	-39.560417	99.969709	5	160.36	0.00	15	
2024-02-17	21	-80.00	2	False	4.386517	0.000000	21	17	5	2	-7.071068e-01	7.071068e-01	-39.560417	99.969709	5	0.00	0.00	15	
2024-02-17	22	-80.00	2	False	4.386517	0.000000	22	17	5	2	-5.000000e-01	8.660254e-01	-39.560417	99.969709	5	0.00	0.00	15	
2024-02-17	23	-80.00	2	False	4.386517	0.000000	23	17	5	2	-2.588190e-01	9.659258e-01	-39.560417	99.969709	5	0.00	0.00	15	
2024-02-18	0	-80.00	0	False	4.386517	0.000000	0	18	6	2	0.000000e+00	1.000000e+00	-39.560417	99.969709	6	0.00	0.00	15	
2024-02-18	1	-80.00	0	False	4.386517	0.000000	1	18	6	2	2.588190e-01	9.659258e-01	-39.560417	99.969709	6	0.00	0.00	15	
2024-02-18	2	-80.00	0	False	4.386517	0.000000	2	18	6	2	5.000000e-01	8.660254e-01	-39.560417	99.969709	6	0.00	0.00	15	
2024-02-18	3	-80.00	0	False	4.386517	0.000000	3	18	6	2	7.071068e-01	7.071068e-01	-39.560417	99.969709	6	0.00	0.00	15	
2024-02-18	4	-80.00	0	False	4.386517	0.000000	4	18	6	2	8.660254e-01	5.000000e-01	-39.560417	99.969709	6	0.00	0.00	15	
2024-02-18	5	-80.00	0	False	4.386517	0.000000	5	18	6	2	9.659258e-01	2.588190e-01	-39.560417	99.969709	6	0.00	0.00	15	
2024-02-18	6	-39.50	0	False	4.386517	-0.506250	6	18	6	2	1.000000e+00	6.123234e-17	-37.872917	99.598538	6	0.00	40.50	15	
2024-02-18	7	191.94	0	False	5.257183	-5.859241	7	18	6	2	9.659258e-01	-2.588190e-01	-26.542083	109.567323	6	0.00	231.44	15	
2024-02-18	8	363.15	0	False	5.894816	0.891997	8	18	6	2	8.660254e-01	-5.000000e-01	-8.077500	134.638736	6	0.00	171.21	15	
2024-02-18	9	398.74	0	False	5.988310	0.098004	9	18	6	2	7.071068e-01	-7.071068e-01	11.870000	157.108730	6	0.00	35.59	15	
2024-02-18	10	431.17	0	False	6.066502	0.081331	10	18	6	2	5.000000e-01	-8.660254e-01	33.168750	177.445353	6	0.00	32.43	15	
2024-02-18	11	422.57	0	False	6.046355	-0.019946	11	18	6	2	2.588190e-01	-9.659258e-01	54.109167	192.523265	6	8.60	0.00	16	
2024-02-18	12	396.12	0	False	5.981717	-0.062593	12	18	6	2	1.224647e-16	-1.000000e+00	73.947500	202.381526	6	26.45	0.00	17	
2024-02-18	13	408.90	0	False	6.013471	0.032263	13	18	6	2	-2.588190e-01	-9.659258e-01	94.318333	210.648536	6	0.00	12.78	17	
2024-02-18	14	439.79	0	False	6.086297	0.075544	14	18	6	2	-5.000000e-01	-8.660254e-01	115.976250	218.520793	6	0.00	30.89	17	
2024-02-18	15	491.56	0	False	6.197584	0.117715	15	18	6	2	-7.071068e-01	-7.071068e-01	139.791250	227.206620	6	0.00	51.77	17	
2024-02-18	16	429.90	0	False	6.063553	-0.125437	16	18	6	2	-8.660254e-01	-5.000000e-01	154.393750	234.310156	6	61.66	0.00	19	
2024-02-18	17	424.71	0	False	6.051407	-0.012073	17	18	6	2	-9.659258e-01	-2.588190e-01	159.539583	238.984181	6	5.19	0.00	20	
2024-02-18	18	308.69	0	False	5.732338	-0.273175	18	18	6	2	-1.000000e+00	-1.836970e-16	164.504167	240.864690	6	116.02	0.00	20	
2024-02-18	19	254.67	0	False	5.539969	-0.174998	19	18	6	2	-9.659258e-01	-2.588190e-01	2.588190e-01	171.767083	240.845162	6	54.02	0.00	18
2024-02-18	20	322.05	0	False	5.774707	0.264578	20	18	6	2	-8.660254e-01	-5.000000e-01	188.519167	236.515477	6	0.00	67.38	11	
2024-02-18	21	194.20	0	False	5.268889	-0.396988	21	18	6	2	-7.071068e-01	-7.071068e-01	7.071068e-01	199.944167	229.499183	6	127.85	0.00	16
2024-02-18	22	-55.54	0	False	5.268889	-1.285994	22	18	6	2	-5.000000e-01	-8.660254e-01	8.660254e-01	200.963333	228.252875	6	249.74	0.00	27
2024-02-18	23	-42.86	0	False	5.268889	-0.228304	23	18	6	2	-2.588190e-01	-9.659258e-01	9.659258e-01	202.510833	226.383435	6	0.00	12.68	27
2024-02-19	0	-80.00	0	True	5.268889	0.866542	0	19	0	2	0.000000e+00	1.000000e+00	1.000000e+00	202.510833	226.383435	0	37.14	0.00	28
2024-02-19	1	-80.00	0	True	5.268889	0.000000	1	19	0	2	2.588190e-01	9.659258e-01	9.659258e-01	202.510833	226.383435	0	0.00	0.00	28
2024-02-19	2	-80.00	0	True	5.268889	0.000000	2	19	0	2	5.000000e-01	8.660254e-01	8.660254e-01	202.510833	226.383435	0	0.00	0.00	28
2024-02-19	3	-80.00	0	True	5.268889	0.000000	3	19	0	2	7.071068e-01	7.071068e-01	7.071068e-01	202.510833	226.383435	0	0.00	0.00	28
2024-02-19	4	-80.00	0	True	5.268889	0.000000	4	19	0	2	8.660254e-01	5.000000e-01	5.000000e-01	202.510833	226.383435	0	0.00	0.00	28
2024-02-19	5	-80.00	0	True	5.268889	0.000000	5	19	0	2	9.659258e-01	2.588190e-01	2.588190e-01	202.510833	226.383435	0	0.00	0.00	28
2024-02-19	6	-80.00	0	True	5.268889	0.000000	6	19	0	2	1.000000e+00	6.123234e-17	6.123234e-17	200.823333	228.407755	0	0.00	0.00	28
2024-02-19	7	42.00	0	True	3.737670	-1.525000	7	19	0	2	9.659258e-01	-2.588190e-01	-2.588190e-01	194.575833	230.700402	0	0.00	122.00	28
2024-02-19	8	40.40	0	True	3.698830	-0.038095	8	19	0	2	8.660254e-01	-5.000000e-01	-5.000000e-01	181.127917	229.851953	0	1.60	0.00	28
2024-02-19	9	13.48	0	True	2.601207	-0.666337	9	19	0	2	7.071068e-01	-7.071068e-01	-7.071068e-01	165.075417	227.433754	0	26.92	0.00	29
2024-02-19	10	-80.00	0	True	2.601207	-6.934718	10	19	0	2	5.000000e-01	-8.660254e-01	-8.660254e-01	143.776667	225.356619	0	93.48	0.00	33

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su	
2024-02-19	11	-80.00	0	True	2.601207	0.000000	11	19	0	2	2.588190e-01	-9.659258e-01	122.836250	221.643582	0	0.00	0.00	33	
2024-02-19	12	-80.00	0	True	2.601207	0.000000	12	19	0	2	1.224647e-16	-1.000000e+00	102.997917	217.386481	0	0.00	0.00	32	
2024-02-19	13	-80.00	0	True	2.601207	0.000000	13	19	0	2	-2.588190e-01	-9.659258e-01	82.627083	210.264962	0	0.00	0.00	32	
2024-02-19	14	-80.00	0	True	2.601207	0.000000	14	19	0	2	-5.000000e-01	-8.660254e-01	60.969167	198.306503	0	0.00	0.00	32	
2024-02-19	15	-80.00	0	True	2.601207	0.000000	15	19	0	2	-7.071068e-01	-7.071068e-01	37.154167	177.584999	0	0.00	0.00	32	
2024-02-19	16	125.72	0	True	4.834057	-2.571500	16	19	0	2	-8.660254e-01	-5.000000e-01	24.480000	158.124514	0	0.00	205.72	29	
2024-02-19	17	254.11	0	True	5.537767	1.021238	17	19	0	2	-9.659258e-01	-2.588190e-01	17.371667	142.403365	0	0.00	128.39	29	
2024-02-19	18	157.14	0	True	5.057137	-0.381606	18	19	0	2	-1.000000e+00	-1.836970e-16	11.057083	131.896264	0	96.97	0.00	28	
2024-02-19	19	184.72	0	True	5.218841	0.175512	19	19	0	2	-9.659258e-01	2.588190e-01	8.142500	126.959433	0	0.00	27.58	26	
2024-02-19	20	204.61	0	True	5.321106	0.107676	20	19	0	2	-8.660254e-01	5.000000e-01	3.249167	116.136526	0	0.00	19.89	26	
2024-02-19	21	186.05	0	True	5.226015	-0.090709	21	19	0	2	-7.071068e-01	7.071068e-01	2.909583	115.564416	0	18.56	0.00	21	
2024-02-19	22	155.25	0	True	5.045037	-0.165547	22	19	0	2	-5.000000e-01	8.660254e-01	11.692500	118.891252	0	30.80	0.00	12	
2024-02-19	23	123.02	0	True	4.812347	-0.207601	23	19	0	2	-2.588190e-01	9.659258e-01	18.604167	120.394156	0	32.23	0.00	14	
2024-02-20	0	-61.50	0	True	4.812347	-1.499919	0	20	1	2	0.000000e+00	1.000000e+00	19.375000	119.793110	1	184.52	0.00	20	
2024-02-20	1	-80.00	0	True	4.812347	0.300813	1	20	1	2	2.588190e-01	9.659258e-01	19.375000	119.793110	1	18.50	0.00	20	
2024-02-20	2	6.67	0	True	1.897620	-1.083375	2	20	1	2	5.000000e-01	8.660254e-01	22.986250	117.959461	1	0.00	86.67	20	
2024-02-20	3	98.92	0	True	4.594311	13.830585	3	20	1	2	7.071068e-01	7.071068e-01	30.441250	116.816078	1	0.00	92.25	20	
2024-02-20	4	97.50	0	True	4.579852	-0.014355	4	20	1	2	8.660254e-01	5.000000e-01	37.837083	115.126538	1	1.42	0.00	21	
2024-02-20	5	-80.00	0	True	4.579852	-1.820513	5	20	1	2	9.659258e-01	2.588190e-01	37.837083	115.126538	1	177.50	0.00	28	
2024-02-20	6	-80.00	0	True	4.579852	0.000000	6	20	1	2	1.000000e+00	6.123234e-17	37.837083	115.126538	1	0.00	0.00	28	
2024-02-20	7	127.03	0	True	4.844423	-2.587875	7	20	1	2	9.659258e-01	-2.588190e-01	41.380000	116.559659	1	0.00	207.03	28	
2024-02-20	8	278.20	0	True	5.628340	1.190034	8	20	1	2	8.660254e-01	-5.000000e-01	51.288333	126.182769	1	0.00	151.17	28	
2024-02-20	9	309.70	0	True	5.735604	0.113228	9	20	1	2	7.071068e-01	-7.071068e-01	63.630833	136.397616	1	0.00	31.50	27	
2024-02-20	10	357.80	0	True	5.879974	0.155312	10	20	1	2	5.000000e-01	-8.660254e-01	81.872500	145.335983	1	0.00	48.10	23	
2024-02-20	11	400.62	0	True	5.993013	0.119676	11	20	1	2	2.588190e-01	-9.659258e-01	101.898333	154.861937	1	0.00	42.82	23	
2024-02-20	12	329.88	0	True	5.798729	-0.176576	12	20	1	2	1.224647e-16	-1.000000e+00	118.976667	156.521928	1	70.74	0.00	26	
2024-02-20	13	321.10	0	True	5.771753	-0.026616	13	20	1	2	-2.588190e-01	-9.659258e-01	135.689167	155.764365	1	8.78	0.00	26	
2024-02-20	14	371.95	0	True	5.918759	0.158362	14	20	1	2	-5.000000e-01	-8.660254e-01	154.520417	155.874105	1	0.00	50.85	26	
2024-02-20	15	371.37	0	True	5.917199	-0.001559	15	20	1	2	-7.071068e-01	-7.071068e-01	173.327500	153.560625	1	0.58	0.00	26	
2024-02-20	16	340.99	0	True	5.831853	-0.081805	16	20	1	2	-8.660254e-01	-5.000000e-01	182.297083	156.909454	1	30.38	0.00	27	
2024-02-20	17	335.69	0	True	5.816188	-0.015543	17	20	1	2	-9.659258e-01	-2.588190e-01	185.696250	159.396723	1	5.30	0.00	28	
2024-02-20	18	265.88	0	True	5.583045	-0.207960	18	20	1	2	-1.836970e-16	1.000000e+00	190.227083	160.093661	1	69.81	0.00	27	
2024-02-20	19	210.88	0	True	5.351289	-0.206860	19	20	1	2	-9.659258e-01	-2.588190e-01	258.8190e-01	191.317083	160.143583	1	55.00	0.00	29
2024-02-20	20	183.85	0	True	5.214120	-0.128177	20	20	1	2	-8.660254e-01	5.000000e-01	190.452083	160.124726	1	27.03	0.00	30	
2024-02-20	21	108.88	0	True	4.690246	-0.407778	21	20	1	2	-7.071068e-01	7.071068e-01	187.236667	160.989445	1	74.97	0.00	32	
2024-02-20	22	-51.60	0	True	4.690246	-1.473916	22	20	1	2	-5.000000e-01	-8.660254e-01	178.617917	168.153896	1	160.48	0.00	38	
2024-02-20	23	-80.00	0	True	4.690246	0.550388	23	20	1	2	-2.588190e-01	9.659258e-01	170.158750	175.996118	1	28.40	0.00	38	
2024-02-21	0	-80.00	0	True	4.690246	0.000000	0	21	2	2	0.000000e+00	1.000000e+00	169.387917	177.091960	2	0.00	0.00	30	
2024-02-21	1	7.17	0	True	1.969906	-1.089625	1	21	2	2	2.588190e-01	9.659258e-01	173.020000	172.591456	2	0.00	87.17	29	
2024-02-21	2	22.01	0	True	3.091497	2.069735	2	21	2	2	5.000000e-01	8.660254e-01	173.659167	171.975926	2	0.00	14.84	29	
2024-02-21	3	119.60	0	True	4.784153	4.433894	3	21	2	2	7.071068e-01	7.071068e-01	174.520833	171.636645	2	0.00	97.59	29	
2024-02-21	4	-80.00	0	True	4.784153	-1.668896	4	21	2	2	8.660254e-01	5.000000e-01	167.125000	178.775552	2	199.60	0.00	37	
2024-02-21	5	-80.00	0	True	4.784153	0.000000	5	21	2	2	9.659258e-01	2.588190e-01	167.125000	178.775552	2	0.00	0.00	30	
2024-02-21	6	35.48	0	True	3.568969	-1.443500	6	21	2	2	1.000000e+00	6.123234e-17	171.936667	173.305466	2	0.00	115.48	30	

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-02-21	7	208.59	0	True	5.340371	4.879087	7	21	2	2	9.659258e-01	-2.588190e-01	175.335000	173.186220	2	0.00	173.11	30
2024-02-21	8	289.25	0	True	5.667291	0.386692	8	21	2	2	8.660254e-01	-5.000000e-01	175.795417	173.486006	2	0.00	80.66	30
2024-02-21	9	339.75	0	True	5.828210	0.174589	9	21	2	2	7.071068e-01	-7.071068e-01	177.047500	174.599306	2	0.00	50.50	30
2024-02-21	10	365.40	0	True	5.900993	0.075497	10	21	2	2	5.000000e-01	-8.660254e-01	177.364167	174.947930	2	0.00	25.65	30
2024-02-21	11	394.18	0	True	5.976808	0.078763	11	21	2	2	2.588190e-01	-9.659258e-01	177.095833	174.595198	2	0.00	28.78	30
2024-02-21	12	387.89	0	True	5.960722	-0.015957	12	21	2	2	1.224647e-16	-1.000000e+00	179.512917	177.184634	2	6.29	0.00	27
2024-02-21	13	394.46	0	True	5.977518	0.016938	13	21	2	2	-2.588190e-01	-9.659258e-01	182.569583	180.338110	2	0.00	6.57	27
2024-02-21	14	408.77	0	True	6.013153	0.036277	14	21	2	2	-5.000000e-01	-8.660254e-01	184.103750	182.166596	2	0.00	14.31	27
2024-02-21	15	395.14	0	True	5.979240	-0.033344	15	21	2	2	-7.071068e-01	-7.071068e-01	185.094167	183.290158	2	13.63	0.00	27
2024-02-21	16	347.19	0	True	5.849872	-0.121349	16	21	2	2	-8.660254e-01	-5.000000e-01	185.352500	183.523655	2	47.95	0.00	28
2024-02-21	17	295.14	0	True	5.687450	-0.149918	17	21	2	2	-9.659258e-01	-2.588190e-01	183.662917	182.261739	2	52.05	0.00	30
2024-02-21	18	284.46	0	True	5.650593	-0.036186	18	21	2	2	-1.000000e+00	-1.836970e-16	184.437083	182.665158	2	10.68	0.00	28
2024-02-21	19	280.19	0	True	5.635468	-0.015011	19	21	2	2	-9.659258e-01	2.588190e-01	187.325000	183.646649	2	4.27	0.00	26
2024-02-21	20	282.16	0	True	5.642474	0.007031	20	21	2	2	-8.660254e-01	5.000000e-01	191.421250	184.659382	2	0.00	1.97	24
2024-02-21	21	231.30	0	True	5.443716	-0.180252	21	21	2	2	-7.071068e-01	7.071068e-01	196.522083	183.969730	2	50.86	0.00	23
2024-02-21	22	31.93	0	True	3.463546	-0.861954	22	21	2	2	-5.000000e-01	8.660254e-01	200.002500	179.814770	2	199.37	0.00	25
2024-02-21	23	-80.00	0	True	3.463546	-3.505481	23	21	2	2	-2.588190e-01	9.659258e-01	200.002500	179.814770	2	111.93	0.00	29
2024-02-22	0	84.61	0	True	4.438052	-2.057625	0	22	3	2	0.000000e+00	1.000000e+00	206.861250	171.622956	3	0.00	164.61	29
2024-02-22	1	18.59	0	True	2.922624	-0.780286	1	22	3	2	2.588190e-01	9.659258e-01	207.337083	171.060138	3	66.02	0.00	31
2024-02-22	2	183.63	0	True	5.212923	8.877891	2	22	3	2	5.000000e-01	8.660254e-01	214.071250	166.569433	3	0.00	165.04	31
2024-02-22	3	192.76	0	True	5.261446	0.049720	3	22	3	2	7.071068e-01	7.071068e-01	217.119583	165.430924	3	0.00	9.13	31
2024-02-22	4	159.18	0	True	5.070036	-0.174206	4	22	3	2	8.660254e-01	5.000000e-01	227.085417	153.529959	3	33.58	0.00	24
2024-02-22	5	184.25	0	True	5.216294	0.157495	5	22	3	2	9.659258e-01	2.588190e-01	238.095833	139.372386	3	0.00	25.07	24
2024-02-22	6	186.80	0	True	5.230039	0.013840	6	22	3	2	1.000000e+00	6.123234e-17	244.400833	133.088927	3	0.00	2.55	24
2024-02-22	7	198.65	0	True	5.291544	0.063437	7	22	3	2	9.659258e-01	-2.588190e-01	243.986667	133.220616	3	0.00	11.85	24
2024-02-22	8	337.69	0	True	5.822128	0.699924	8	22	3	2	8.660254e-01	-5.000000e-01	246.005000	134.298762	3	0.00	139.04	24
2024-02-22	9	506.12	0	True	6.226774	0.498771	9	22	3	2	7.071068e-01	-7.071068e-01	252.937083	143.337549	3	0.00	168.43	24
2024-02-22	10	428.33	0	True	6.059894	-0.153699	10	22	3	2	5.000000e-01	-8.660254e-01	255.559167	146.034508	3	77.79	0.00	28
2024-02-22	11	338.10	0	True	5.823342	-0.210655	11	22	3	2	2.588190e-01	-9.659258e-01	253.222500	144.156617	3	90.23	0.00	31
2024-02-22	12	146.58	0	True	4.987571	-0.566460	12	22	3	2	1.224647e-16	-1.000000e+00	243.167917	142.764173	3	191.52	0.00	39
2024-02-22	13	-60.00	0	True	4.987571	-1.409333	13	22	3	2	-2.588190e-01	-9.659258e-01	224.232083	151.685160	3	206.58	0.00	48
2024-02-22	14	-80.00	0	True	4.987571	0.333333	14	22	3	2	-5.000000e-01	-8.660254e-01	203.866667	158.490410	3	20.00	0.00	49
2024-02-22	15	121.33	0	True	4.798514	-2.516625	15	22	3	2	-7.071068e-01	-7.071068e-01	192.457917	153.912005	3	0.00	201.33	48
2024-02-22	16	281.29	0	True	5.639386	1.318388	16	22	3	2	-8.660254e-01	-5.000000e-01	189.712083	151.602023	3	0.00	159.96	46
2024-02-22	17	414.58	0	True	6.027266	0.473853	17	22	3	2	-9.659258e-01	-2.588190e-01	194.688750	157.075046	3	0.00	133.29	44
2024-02-22	18	475.47	0	True	6.164304	0.146872	18	22	3	2	-1.000000e+00	-1.836970e-16	202.647500	166.384592	3	0.00	60.89	43
2024-02-22	19	473.90	0	True	6.160996	-0.003302	19	22	3	2	-9.659258e-01	-2.588190e-01	210.718750	174.795500	3	1.57	0.00	43
2024-02-22	20	456.99	0	True	6.124662	-0.035683	20	22	3	2	-8.660254e-01	-5.000000e-01	218.003333	181.419745	3	16.91	0.00	44
2024-02-22	21	352.70	0	True	5.865618	-0.228211	21	22	3	2	-7.071068e-01	-7.071068e-01	223.061667	183.487254	3	104.29	0.00	46
2024-02-22	22	245.08	0	True	5.501585	-0.305132	22	22	3	2	-5.000000e-01	-8.660254e-01	231.942917	178.935818	3	107.62	0.00	42
2024-02-22	23	208.92	0	True	5.341951	-0.147544	23	22	3	2	-2.588190e-01	-9.659258e-01	243.981250	166.310105	3	36.16	0.00	39
2024-02-23	0	121.56	0	True	4.800408	-0.418150	0	23	4	2	0.000000e+00	1.000000e+00	245.520833	164.935963	4	87.36	0.00	43
2024-02-23	1	62.88	0	True	4.141228	-0.482725	1	23	4	2	2.588190e-01	9.659258e-01	247.366250	162.516540	4	58.68	0.00	43
2024-02-23	2	104.15	0	True	4.645832	0.656330	2	23	4	2	5.000000e-01	8.660254e-01	244.054583	164.667354	4	0.00	41.27	43

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su	
2024-02-23	3	216.98	0	True	5.379805	1.083341	3	23	4	2	7.071068e-01	7.071068e-01	245.063750	164.413347	4	0.00	112.83	43	
2024-02-23	4	249.03	0	True	5.517573	0.147709	4	23	4	2	8.660254e-01	5.000000e-01	248.807500	163.392506	4	0.00	32.05	41	
2024-02-23	5	229.50	0	True	5.435903	-0.078424	5	23	4	2	9.659258e-01	2.588190e-01	250.692917	162.875433	4	19.53	0.00	42	
2024-02-23	6	257.42	0	True	5.550709	0.121656	6	23	4	2	1.000000e+00	6.123234e-17	253.635417	162.307880	4	0.00	27.92	42	
2024-02-23	7	331.89	0	True	5.804804	0.289294	7	23	4	2	9.659258e-01	-2.588190e-01	259.187083	162.623756	4	0.00	74.47	42	
2024-02-23	8	339.99	0	True	5.828916	0.024406	8	23	4	2	8.660254e-01	-5.000000e-01	259.282917	162.672699	4	0.00	8.10	42	
2024-02-23	9	239.22	0	True	5.477384	-0.296391	9	23	4	2	7.071068e-01	-7.071068e-01	248.162083	153.953859	4	100.77	0.00	46	
2024-02-23	10	-0.19	0	True	5.477384	-1.000794	10	23	4	2	5.000000e-01	-8.660254e-01	230.307083	156.969706	4	239.41	0.00	53	
2024-02-23	11	-80.00	0	True	5.477384	420.052632	11	23	4	2	2.588190e-01	-9.659258e-01	212.886250	167.344446	4	79.81	0.00	52	
2024-02-23	12	-80.00	0	True	5.477384	0.000000	12	23	4	2	1.224647e-16	1.000000e+00	203.445417	177.340559	4	0.00	0.00	44	
2024-02-23	13	-80.00	0	True	5.477384	0.000000	13	23	4	2	-2.588190e-01	-9.659258e-01	202.612083	178.674302	4	0.00	0.00	36	
2024-02-23	14	9.89	0	True	2.291524	-1.123625	14	23	4	2	-5.000000e-01	-8.660254e-01	206.357500	173.355526	4	0.00	89.89	35	
2024-02-23	15	285.08	0	True	5.652770	27.825076	15	23	4	2	-7.071068e-01	-7.071068e-01	213.180417	173.085740	4	0.00	275.19	35	
2024-02-23	16	366.44	0	True	5.903835	0.285394	16	23	4	2	-8.660254e-01	-5.000000e-01	216.728333	175.399788	4	0.00	81.36	35	
2024-02-23	17	404.50	0	True	6.002652	0.103864	17	23	4	2	-9.659258e-01	-2.588190e-01	216.308333	174.916831	4	0.00	38.06	35	
2024-02-23	18	417.00	0	True	6.033086	0.030902	18	23	4	2	-1.000000e+00	-1.836970e-16	213.872083	171.524568	4	0.00	12.50	35	
2024-02-23	19	402.10	0	True	5.996701	-0.035731	19	23	4	2	-9.659258e-01	2.588190e-01	210.880417	167.367859	4	14.90	0.00	36	
2024-02-23	20	400.91	0	True	5.993737	-0.002959	20	23	4	2	-8.660254e-01	5.000000e-01	208.543750	164.142870	4	1.19	0.00	35	
2024-02-23	21	399.77	0	True	5.990889	-0.002844	21	23	4	2	-7.071068e-01	7.071068e-01	210.505000	166.208410	4	1.14	0.00	31	
2024-02-23	22	399.98	0	True	5.991415	0.000525	22	23	4	2	-5.000000e-01	8.660254e-01	216.959167	170.559949	4	0.00	0.21	26	
2024-02-23	23	379.95	0	True	5.940040	-0.050078	23	23	4	2	-2.588190e-01	9.659258e-01	224.085417	173.752522	4	20.03	0.00	25	
2024-02-24	0	348.21	1	False	5.852806	-0.083537	0	24	5	2	0.000000e+00	1.000000e+00	233.529167	174.096877	5	31.74	0.00	23	
2024-02-24	1	335.31	1	False	5.815055	-0.037047	1	24	5	2	2.588190e-01	9.659258e-01	244.880417	171.346255	5	12.90	0.00	21	
2024-02-24	2	324.89	1	False	5.783487	-0.031076	2	24	5	2	5.000000e-01	8.660254e-01	254.077917	169.376815	5	10.42	0.00	22	
2024-02-24	3	330.90	1	False	5.801816	0.018499	3	24	5	2	7.071068e-01	7.071068e-01	258.824583	169.887465	5	0.00	6.01	22	
2024-02-24	4	324.80	1	False	5.783210	-0.018435	4	24	5	2	8.660254e-01	5.000000e-01	261.981667	170.400790	5	6.10	0.00	22	
2024-02-24	5	329.87	1	False	5.798699	0.015610	5	24	5	2	9.659258e-01	2.588190e-01	258.8190e-01	266.163750	170.800148	5	0.00	5.07	21
2024-02-24	6	344.16	1	False	5.841107	0.043320	6	24	5	2	1.000000e+00	6.123234e-17	269.777917	171.523272	5	0.00	14.29	21	
2024-02-24	7	383.80	1	False	5.950122	0.115179	7	24	5	2	9.659258e-01	-2.588190e-01	271.940833	172.664062	5	0.00	39.64	21	
2024-02-24	8	488.45	1	False	6.191237	0.272668	8	24	5	2	8.660254e-01	-5.000000e-01	278.126667	177.791204	5	0.00	104.65	21	
2024-02-24	9	709.38	1	False	6.564391	0.452308	9	24	5	2	7.071068e-01	-7.071068e-01	297.716667	198.064401	5	0.00	220.93	17	
2024-02-24	10	1152.25	1	False	7.049472	0.624306	10	24	5	2	5.000000e-01	-8.660254e-01	345.735000	254.389230	5	0.00	442.87	7.4	
2024-02-24	11	1137.69	1	False	7.036755	-0.012636	11	24	5	2	2.588190e-01	-9.659258e-01	396.472083	285.335778	5	14.56	0.00	4.7	
2024-02-24	12	466.55	1	False	6.145365	-0.589915	12	24	5	2	1.224647e-16	-1.000000e+00	419.245000	266.867364	5	671.14	0.00	32	
2024-02-24	13	401.92	1	False	5.996253	-0.138527	13	24	5	2	-2.588190e-01	-9.659258e-01	439.325000	244.895364	5	64.63	0.00	35	
2024-02-24	14	323.56	1	False	5.779385	-0.194964	14	24	5	2	-5.000000e-01	-8.660254e-01	452.394583	228.823416	5	78.36	0.00	38	
2024-02-24	15	331.25	1	False	5.802873	0.023767	15	24	5	2	-7.071068e-01	-7.071068e-01	454.318333	227.546135	5	0.00	7.69	38	
2024-02-24	16	360.78	1	False	5.888268	0.089147	16	24	5	2	-8.660254e-01	-5.000000e-01	454.082500	227.644086	5	0.00	29.53	38	
2024-02-24	17	399.05	1	False	5.989087	0.106076	17	24	5	2	-9.659258e-01	-2.588190e-01	453.855417	227.698408	5	0.00	38.27	38	
2024-02-24	18	402.98	1	False	5.998887	0.009848	18	24	5	2	-1.000000e+00	-1.836970e-16	453.271250	227.815027	5	0.00	3.93	38	
2024-02-24	19	384.15	1	False	5.951033	-0.046727	19	24	5	2	-9.659258e-01	2.588190e-01	452.523333	228.019700	5	18.83	0.00	38	
2024-02-24	20	387.00	1	False	5.958425	0.007419	20	24	5	2	-8.660254e-01	5.000000e-01	451.943750	228.174221	5	0.00	2.85	38	
2024-02-24	21	376.18	1	False	5.930068	-0.027959	21	24	5	2	-7.071068e-01	7.071068e-01	450.960833	228.459376	5	10.82	0.00	39	
2024-02-24	22	369.75	1	False	5.912827	-0.017093	22	24	5	2	-5.000000e-01	8.660254e-01	449.701250	228.835698	5	6.43	0.00	39	

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-02-24	23	339.15	1	False	5.826442	-0.082759	23	24	5	2	-2.588190e-01	9.659258e-01	448.001250	229.526909	5	30.60	0.00	39
2024-02-25	0	270.04	1	False	5.598570	-0.203774	0	25	6	2	0.000000e+00	1.000000e+00	444.744167	231.550272	6	69.11	0.00	41
2024-02-25	1	170.50	1	False	5.138735	-0.368612	1	25	6	2	2.588190e-01	9.659258e-01	437.877083	237.309138	6	99.54	0.00	45
2024-02-25	2	158.06	1	False	5.062975	-0.072962	2	25	6	2	5.000000e-01	8.660254e-01	430.925833	243.134536	6	12.44	0.00	45
2024-02-25	3	152.12	1	False	5.024670	-0.037581	3	25	6	2	7.071068e-01	7.071068e-01	423.476667	249.000351	6	5.94	0.00	45
2024-02-25	4	167.87	1	False	5.123190	0.103537	4	25	6	2	8.660254e-01	5.000000e-01	416.937917	253.720025	6	0.00	15.75	45
2024-02-25	5	192.69	1	False	5.261083	0.147853	5	25	6	2	9.659258e-01	2.588190e-01	411.222083	257.286914	6	0.00	24.82	45
2024-02-25	6	255.14	1	False	5.541812	0.324096	6	25	6	2	1.000000e+00	6.123234e-17	407.512917	258.932163	6	0.00	62.45	45
2024-02-25	7	414.00	1	False	6.025866	0.622639	7	25	6	2	9.659258e-01	-2.588190e-01	408.771250	258.885292	6	0.00	158.86	45
2024-02-25	8	342.01	1	False	5.834840	-0.173889	8	25	6	2	8.660254e-01	-5.000000e-01	402.669583	258.651310	6	71.99	0.00	48
2024-02-25	9	-42.04	1	False	5.834840	-1.122920	9	25	6	2	7.071068e-01	-7.071068e-01	371.360417	265.303805	6	384.05	0.00	64
2024-02-25	10	-80.00	1	False	5.834840	0.902950	10	25	6	2	5.000000e-01	-8.660254e-01	320.016667	223.563030	6	37.96	0.00	65
2024-02-25	11	-80.00	1	False	5.834840	0.000000	11	25	6	2	2.588190e-01	-9.659258e-01	269.279583	158.689122	6	0.00	0.00	65
2024-02-25	12	-80.00	1	False	5.834840	0.000000	12	25	6	2	1.224647e-16	-1.000000e+00	246.506667	168.087133	6	0.00	0.00	37
2024-02-25	13	-80.00	1	False	5.834840	0.000000	13	25	6	2	-2.588190e-01	-9.659258e-01	226.426667	177.249748	6	0.00	0.00	34
2024-02-25	14	-80.00	1	False	5.834840	0.000000	14	25	6	2	-5.000000e-01	-8.660254e-01	209.611667	186.533414	6	0.00	0.00	31
2024-02-25	15	31.13	1	False	3.438172	-1.389125	15	25	6	2	-7.071068e-01	-7.071068e-01	197.106667	188.077835	6	0.00	111.13	31
2024-02-25	16	305.45	1	False	5.721786	8.812078	16	25	6	2	-8.660254e-01	-5.000000e-01	194.801250	186.315186	6	0.00	274.32	31
2024-02-25	17	558.36	1	False	6.325004	0.827991	17	25	6	2	-9.659258e-01	-2.588190e-01	201.439167	196.469595	6	0.00	252.91	31
2024-02-25	18	585.33	1	False	6.372176	0.048302	18	25	6	2	-1.000000e+00	-1.836970e-16	209.037083	207.801633	6	0.00	26.97	31
2024-02-25	19	505.18	1	False	6.224915	-0.136931	19	25	6	2	-9.659258e-01	2.588190e-01	214.080000	213.623061	6	80.15	0.00	33
2024-02-25	20	535.84	1	False	6.283836	0.060691	20	25	6	2	-8.660254e-01	5.000000e-01	220.281667	220.897949	6	0.00	30.66	33
2024-02-25	21	445.22	1	False	6.098569	-0.169118	21	25	6	2	-7.071068e-01	7.071068e-01	223.158333	223.451206	6	90.62	0.00	37
2024-02-25	22	328.83	1	False	5.795541	-0.261421	22	25	6	2	-5.000000e-01	8.660254e-01	221.453333	222.437853	6	116.39	0.00	41
2024-02-25	23	260.62	1	False	5.563063	-0.207432	23	25	6	2	-2.588190e-01	9.659258e-01	218.181250	221.205426	6	68.21	0.00	43
2024-02-26	0	163.80	0	True	5.098646	-0.371499	0	26	0	2	0.000000e+00	1.000000e+00	213.754583	221.185544	0	96.82	0.00	44
2024-02-26	1	162.41	0	True	5.090124	-0.008486	1	26	0	2	2.588190e-01	9.659258e-01	213.417500	221.260481	0	1.39	0.00	40
2024-02-26	2	82.50	0	True	4.412798	-0.492026	2	26	0	2	5.000000e-01	8.660254e-01	210.269167	222.615838	0	79.91	0.00	43
2024-02-26	3	40.78	0	True	3.708192	-0.505697	3	26	0	2	7.071068e-01	7.071068e-01	205.630000	225.027379	0	41.72	0.00	44
2024-02-26	4	33.72	0	True	3.518091	-0.173124	4	26	0	2	8.660254e-01	5.000000e-01	200.040417	227.656853	0	7.06	0.00	44
2024-02-26	5	32.13	0	True	3.469790	-0.047153	5	26	0	2	9.659258e-01	2.588190e-01	193.350417	230.226874	0	1.59	0.00	44
2024-02-26	6	63.04	0	True	4.143769	0.962029	6	26	0	2	1.000000e+00	6.123234e-17	185.346250	231.321982	0	0.00	30.91	44
2024-02-26	7	129.22	0	True	4.861516	1.049810	7	26	0	2	9.659258e-01	-2.588190e-01	173.480417	226.333270	0	0.00	66.18	44
2024-02-26	8	18.39	0	True	2.911807	-0.857685	8	26	0	2	8.660254e-01	-5.000000e-01	159.996250	225.494847	0	110.83	0.00	46
2024-02-26	9	-80.00	0	True	2.911807	-5.350190	9	26	0	2	7.071068e-01	-7.071068e-01	158.414583	227.100994	0	98.39	0.00	34
2024-02-26	10	-60.00	0	True	2.911807	-0.250000	10	26	0	2	5.000000e-01	-8.660254e-01	159.247917	226.223107	0	0.00	20.00	33
2024-02-26	11	-80.00	0	True	2.911807	0.333333	11	26	0	2	2.588190e-01	-9.659258e-01	159.247917	226.223107	0	20.00	0.00	33
2024-02-26	12	-80.00	0	True	2.911807	0.000000	12	26	0	2	1.224647e-16	-1.000000e+00	159.247917	226.223107	0	0.00	0.00	33
2024-02-26	13	-80.00	0	True	2.911807	0.000000	13	26	0	2	-2.588190e-01	-9.659258e-01	159.247917	226.223107	0	0.00	0.00	33
2024-02-26	14	-80.00	0	True	2.911807	0.000000	14	26	0	2	-5.000000e-01	-8.660254e-01	159.247917	226.223107	0	0.00	0.00	33
2024-02-26	15	26.12	0	True	3.262701	-1.326500	15	26	0	2	-7.071068e-01	-7.071068e-01	159.039167	226.348746	0	0.00	106.12	33
2024-02-26	16	275.66	0	True	5.619168	9.553599	16	26	0	2	-8.660254e-01	-5.000000e-01	157.797917	225.591365	0	0.00	249.54	33
2024-02-26	17	450.29	0	True	6.109892	0.633498	17	26	0	2	-9.659258e-01	-2.588190e-01	153.295000	218.205993	0	0.00	174.63	33
2024-02-26	18	447.48	0	True	6.103632	-0.006240	18	26	0	2	-1.836970e-16	-1.000000e+00	147.551250	207.910670	0	2.81	0.00	33

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-02-26	19	434.34	0	True	6.073828	-0.029364	19	26	0	2	-9.659258e-01	2.588190e-01	144.599583	203.058981	0	13.14	0.00	31
2024-02-26	20	453.12	0	True	6.116157	0.043238	20	26	0	2	-8.660254e-01	5.000000e-01	141.152917	196.732937	0	0.00	18.78	31
2024-02-26	21	437.97	0	True	6.082150	-0.033435	21	26	0	2	-7.071068e-01	7.071068e-01	140.850833	196.250718	0	15.15	0.00	28
2024-02-26	22	429.97	0	True	6.063715	-0.018266	22	26	0	2	-5.000000e-01	8.660254e-01	145.065000	201.479034	0	8.00	0.00	23
2024-02-26	23	413.78	0	True	6.025334	-0.037654	23	26	0	2	-2.588190e-01	9.659258e-01	151.446667	207.629980	0	16.19	0.00	21
2024-02-27	0	341.90	0	True	5.834518	-0.173716	0	27	1	2	0.000000e+00	1.000000e+00	158.867500	211.241981	1	71.88	0.00	20
2024-02-27	1	335.23	0	True	5.814817	-0.019509	1	27	1	2	2.588190e-01	9.659258e-01	166.068333	214.291527	1	6.67	0.00	20
2024-02-27	2	322.10	0	True	5.774862	-0.039167	2	27	1	2	5.000000e-01	8.660254e-01	176.051667	215.804859	1	13.13	0.00	17
2024-02-27	3	322.90	0	True	5.777343	0.002484	3	27	1	2	7.071068e-01	7.071068e-01	187.806667	215.799791	1	0.00	0.80	16
2024-02-27	4	347.00	0	True	5.849325	0.074636	4	27	1	2	8.660254e-01	5.000000e-01	200.860000	215.548856	1	0.00	24.10	15
2024-02-27	5	363.32	0	True	5.895284	0.047032	5	27	1	2	9.659258e-01	2.588190e-01	214.659583	214.877444	1	0.00	16.32	15
2024-02-27	6	378.56	0	True	5.936375	0.041946	6	27	1	2	1.000000e+00	6.123234e-17	227.806250	214.849804	1	0.00	15.24	15
2024-02-27	7	384.76	0	True	5.952620	0.016378	7	27	1	2	9.659258e-01	-2.588190e-01	238.453750	216.080143	1	0.00	6.20	15
2024-02-27	8	320.92	0	True	5.771192	-0.165922	8	27	1	2	8.660254e-01	-5.000000e-01	251.059167	211.459068	1	63.84	0.00	13
2024-02-27	9	2.92	0	True	1.071584	-0.990901	9	27	1	2	7.071068e-01	-7.071068e-01	254.514167	206.432424	1	318.00	0.00	22
2024-02-27	10	-80.00	0	True	1.071584	-28.397260	10	27	1	2	5.000000e-01	-8.660254e-01	253.680833	207.793151	1	82.92	0.00	26
2024-02-27	11	-51.35	0	True	1.071584	-0.358125	11	27	1	2	2.588190e-01	-9.659258e-01	254.874583	205.866204	1	0.00	28.65	25
2024-02-27	12	-58.50	0	True	1.071584	0.139241	12	27	1	2	1.224647e-16	-1.000000e+00	255.770417	204.387095	1	7.15	0.00	25
2024-02-27	13	62.70	0	True	4.138361	-2.071795	13	27	1	2	-2.588190e-01	-9.659258e-01	261.716250	196.102223	1	0.00	121.20	25
2024-02-27	14	29.89	0	True	3.397524	-0.523285	14	27	1	2	-5.000000e-01	-8.660254e-01	266.295000	188.928344	1	32.81	0.00	27
2024-02-27	15	94.53	0	True	4.548917	2.162596	15	27	1	2	-7.071068e-01	-7.071068e-01	269.145417	185.634555	1	0.00	64.64	27
2024-02-27	16	311.59	0	True	5.741688	2.296202	16	27	1	2	-8.660254e-01	-5.000000e-01	270.642500	185.834152	1	0.00	217.06	27
2024-02-27	17	395.34	0	True	5.979746	0.268783	17	27	1	2	-9.659258e-01	-2.588190e-01	268.352917	183.852501	1	0.00	83.75	27
2024-02-27	18	404.95	0	True	6.003764	0.024308	18	27	1	2	-1.000000e+00	-1.836970e-16	266.580833	182.248869	1	0.00	9.61	27
2024-02-27	19	383.72	0	True	5.949913	-0.052426	19	27	1	2	-9.659258e-01	-2.588190e-01	264.471667	180.507574	1	21.23	0.00	27
2024-02-27	20	384.45	0	True	5.951814	0.001902	20	27	1	2	-8.660254e-01	-5.000000e-01	261.610417	177.912871	1	0.00	0.73	27
2024-02-27	21	364.63	0	True	5.898883	-0.051554	21	27	1	2	-7.071068e-01	-7.071068e-01	258.554583	175.363595	1	19.82	0.00	27
2024-02-27	22	363.12	0	True	5.894733	-0.004141	22	27	1	2	-5.000000e-01	-8.660254e-01	255.769167	173.038002	1	1.51	0.00	27
2024-02-27	23	352.48	0	True	5.864994	-0.029302	23	27	1	2	-2.588190e-01	-9.659258e-01	253.215000	171.045181	1	10.64	0.00	27
2024-02-28	0	306.76	0	True	5.726066	-0.129709	0	28	2	2	0.000000e+00	1.000000e+00	251.750833	170.402214	2	45.72	0.00	25
2024-02-28	1	304.85	0	True	5.719820	-0.006226	1	28	2	2	2.588190e-01	9.659258e-01	250.485000	169.867125	2	1.91	0.00	25
2024-02-28	2	319.76	0	True	5.767571	0.048909	2	28	2	2	5.000000e-01	8.660254e-01	250.387500	169.824899	2	0.00	14.91	25
2024-02-28	3	330.77	0	True	5.801423	0.034432	3	28	2	2	7.071068e-01	7.071068e-01	250.715417	169.978530	2	0.00	11.01	25
2024-02-28	4	339.78	0	True	5.828298	0.027239	4	28	2	2	8.660254e-01	5.000000e-01	250.414583	169.807016	2	0.00	9.01	25
2024-02-28	5	341.25	0	True	5.832615	0.004326	5	28	2	2	9.659258e-01	2.588190e-01	249.495000	169.227769	2	0.00	1.47	25
2024-02-28	6	358.50	0	True	5.881929	0.050549	6	28	2	2	1.000000e+00	6.123234e-17	248.659167	168.611003	2	0.00	17.25	25
2024-02-28	7	396.89	0	True	5.983659	0.107085	7	28	2	2	9.659258e-01	-2.588190e-01	249.164583	169.054304	2	0.00	38.39	25
2024-02-28	8	466.00	0	True	6.144186	0.174129	8	28	2	2	8.660254e-01	-5.000000e-01	255.209583	174.245826	2	0.00	69.11	22
2024-02-28	9	351.18	0	True	5.861299	-0.246395	9	28	2	2	7.071068e-01	-7.071068e-01	269.720417	166.658167	2	114.82	0.00	14
2024-02-28	10	344.12	0	True	5.840990	-0.020104	10	28	2	2	5.000000e-01	-8.660254e-01	287.392083	149.573269	2	7.06	0.00	10
2024-02-28	11	310.98	0	True	5.739729	-0.096304	11	28	2	2	2.588190e-01	-9.659258e-01	302.489167	131.032656	2	33.14	0.00	12
2024-02-28	12	244.31	0	True	5.498438	-0.214387	12	28	2	2	1.224647e-16	-1.000000e+00	315.106250	107.167254	2	66.67	0.00	14
2024-02-28	13	284.80	0	True	5.651787	0.165732	13	28	2	2	-2.588190e-01	-9.659258e-01	324.360417	93.088334	2	0.00	40.49	14
2024-02-28	14	250.01	0	True	5.521501	-0.122156	14	28	2	2	-5.000000e-01	-8.660254e-01	333.532083	71.048472	2	34.79	0.00	14

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-02-28	15	291.88	0	True	5.676343	0.167473	15	28	2	2	-7.071068e-01	-7.071068e-01	341.755000	50.687221	2	0.00	41.87	14
2024-02-28	16	307.39	0	True	5.728117	0.053138	16	28	2	2	-8.660254e-01	-5.000000e-01	341.580000	50.803013	2	0.00	15.51	14
2024-02-28	17	328.07	0	True	5.793227	0.067276	17	28	2	2	-9.659258e-01	-2.588190e-01	338.777083	49.548216	2	0.00	20.68	14
2024-02-28	18	321.64	0	True	5.773433	-0.019599	18	28	2	2	-1.000000e+00	-1.836970e-16	335.305833	47.590292	2	6.43	0.00	15
2024-02-28	19	287.93	0	True	5.662717	-0.104807	19	28	2	2	-9.659258e-01	2.588190e-01	331.314583	47.369703	2	33.71	0.00	15
2024-02-28	20	295.19	0	True	5.687619	0.025214	20	28	2	2	-8.660254e-01	5.000000e-01	327.595417	46.512776	2	0.00	7.26	15
2024-02-28	21	294.24	0	True	5.684396	-0.003218	21	28	2	2	-7.071068e-01	7.071068e-01	324.662500	46.294735	2	0.95	0.00	14
2024-02-28	22	277.97	0	True	5.627513	-0.055295	22	28	2	2	-5.000000e-01	8.660254e-01	321.114583	46.481770	2	16.27	0.00	15
2024-02-28	23	242.83	0	True	5.492362	-0.126417	23	28	2	2	-2.588190e-01	9.659258e-01	316.545833	48.605102	2	35.14	0.00	16
2024-02-29	0	73.43	0	True	4.296333	-0.697607	0	29	3	2	0.000000e+00	1.000000e+00	306.823750	69.494316	3	169.40	0.00	21
2024-02-29	1	58.46	0	True	4.068343	-0.203868	1	29	3	2	2.588190e-01	9.659258e-01	296.557500	86.030514	3	14.97	0.00	22
2024-02-29	2	56.62	0	True	4.036362	-0.031475	2	29	3	2	5.000000e-01	8.660254e-01	285.593333	98.769664	3	1.84	0.00	22
2024-02-29	3	58.00	0	True	4.060443	0.024373	3	29	3	2	7.071068e-01	7.071068e-01	274.227917	108.554318	3	0.00	1.38	22
2024-02-29	4	25.00	0	True	3.218876	-0.568966	4	29	3	2	8.660254e-01	5.000000e-01	261.112083	118.820617	3	33.00	0.00	23
2024-02-29	5	-58.50	0	True	3.218876	-3.340000	5	29	3	2	9.659258e-01	2.588190e-01	244.455833	134.130575	3	83.50	0.00	27
2024-02-29	6	75.85	0	True	4.328758	-2.296581	6	29	3	2	1.000000e+00	6.123234e-17	232.678750	136.076437	3	0.00	134.35	27
2024-02-29	7	251.33	0	True	5.526767	2.313514	7	29	3	2	9.659258e-01	-2.588190e-01	226.613750	131.609771	3	0.00	175.48	27
2024-02-29	8	311.75	0	True	5.742202	0.240401	8	29	3	2	8.660254e-01	-5.000000e-01	220.186667	122.888614	3	0.00	60.42	27
2024-02-29	9	58.73	0	True	4.072951	-0.811612	9	29	3	2	7.071068e-01	-7.071068e-01	208.001250	123.830606	3	253.02	0.00	32
2024-02-29	10	-29.58	0	True	4.072951	-1.503661	10	29	3	2	5.000000e-01	-8.660254e-01	192.430417	129.342846	3	88.31	0.00	36
2024-02-29	11	-49.25	0	True	4.072951	0.664976	11	29	3	2	2.588190e-01	-9.659258e-01	177.420833	135.731300	3	19.67	0.00	35
2024-02-29	12	-29.25	0	True	4.072951	-0.406091	12	29	3	2	1.224647e-16	-1.000000e+00	166.022500	141.244348	3	0.00	20.00	32
2024-02-29	13	75.75	0	True	4.327438	-3.589744	13	29	3	2	-2.588190e-01	-9.659258e-01	157.312083	140.041816	3	0.00	105.00	32
2024-02-29	14	93.88	0	True	4.542017	0.239340	14	29	3	2	-5.000000e-01	-8.660254e-01	150.806667	139.172144	3	0.00	18.13	31
2024-02-29	15	208.37	0	True	5.339315	1.219536	15	29	3	2	-7.071068e-01	-7.071068e-01	147.327083	136.510175	3	0.00	114.49	31
2024-02-29	16	304.12	0	True	5.717422	0.459519	16	29	3	2	-8.660254e-01	-5.000000e-01	147.190833	136.345003	3	0.00	95.75	31
2024-02-29	17	381.62	0	True	5.944425	0.254834	17	29	3	2	-9.659258e-01	-2.588190e-01	149.422083	139.827433	3	0.00	77.50	31
2024-02-29	18	418.25	0	True	6.036079	0.095986	18	29	3	2	-1.000000e+00	-1.836970e-16	153.447500	146.244271	3	0.00	36.63	31
2024-02-29	19	411.69	0	True	6.020271	-0.015684	19	29	3	2	-9.659258e-01	2.588190e-01	158.604167	153.208490	3	6.56	0.00	30
2024-02-29	20	430.25	0	True	6.064366	0.045082	20	29	3	2	-8.660254e-01	5.000000e-01	164.231667	160.738929	3	0.00	18.56	30
2024-02-29	21	398.37	0	True	5.987381	-0.074096	21	29	3	2	-7.071068e-01	7.071068e-01	168.570417	165.728677	3	31.88	0.00	31
2024-02-29	22	382.71	0	True	5.947278	-0.039310	22	29	3	2	-5.000000e-01	8.660254e-01	172.934583	170.057313	3	15.66	0.00	31
2024-02-29	23	397.84	0	True	5.986050	0.039534	23	29	3	2	-2.588190e-01	9.659258e-01	179.393333	175.678086	3	0.00	15.13	29
2024-03-01	0	350.70	0	True	5.859931	-0.118490	0	1	4	3	0.000000e+00	1.000000e+00	190.946250	177.514070	4	47.14	0.00	24
2024-03-01	1	275.25	0	True	5.617680	-0.215141	1	1	4	3	2.588190e-01	9.659258e-01	199.979167	175.988501	4	75.45	0.00	27
2024-03-01	2	191.20	0	True	5.253320	-0.305359	2	1	4	3	5.000000e-01	8.660254e-01	205.586667	173.346282	4	84.05	0.00	30
2024-03-01	3	143.76	0	True	4.968145	-0.248117	3	1	4	3	7.071068e-01	7.071068e-01	209.160000	171.040261	4	47.44	0.00	32
2024-03-01	4	134.74	0	True	4.903347	-0.062743	4	1	4	3	8.660254e-01	5.000000e-01	213.732500	167.329586	4	9.02	0.00	31
2024-03-01	5	231.67	0	True	5.445314	0.719385	5	1	4	3	9.659258e-01	2.588190e-01	225.822917	156.966394	4	0.00	96.93	28
2024-03-01	6	380.80	0	True	5.942274	0.643717	6	1	4	3	1.000000e+00	6.123234e-17	238.529167	156.640765	4	0.00	149.13	28
2024-03-01	7	418.04	0	True	6.035577	0.097794	7	1	4	3	9.659258e-01	-2.588190e-01	245.475417	160.872329	4	0.00	37.24	28
2024-03-01	8	405.23	0	True	6.004455	-0.030643	8	1	4	3	8.660254e-01	-5.000000e-01	249.370417	163.654321	4	12.81	0.00	28
2024-03-01	9	267.69	0	True	5.589830	-0.339412	9	1	4	3	7.071068e-01	-7.071068e-01	258.077083	158.549874	4	137.54	0.00	23
2024-03-01	10	134.01	0	True	4.897914	-0.499384	10	1	4	3	5.000000e-01	-8.660254e-01	264.893333	148.866209	4	133.68	0.00	25

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-03-01	11	23.59	0	True	3.160823	-0.823968	11	1	4	3	2.588190e-01	-9.659258e-01	267.928333	142.802175	4	110.42	0.00	29
2024-03-01	12	-90.00	0	True	3.160823	-4.815176	12	1	4	3	1.224647e-16	-1.000000e+00	265.397083	148.714866	4	113.59	0.00	34
2024-03-01	13	-80.00	0	True	3.160823	-0.111111	13	1	4	3	-2.588190e-01	-9.659258e-01	258.907500	160.297677	4	0.00	10.00	34
2024-03-01	14	-65.00	0	True	3.160823	-0.187500	14	1	4	3	-5.000000e-01	-8.660254e-01	252.287500	170.373394	4	0.00	15.00	34
2024-03-01	15	96.25	0	True	4.566949	-2.480769	15	1	4	3	-7.071068e-01	-7.071068e-01	247.615833	173.144613	4	0.00	161.25	34
2024-03-01	16	332.59	0	True	5.806911	2.455481	16	1	4	3	-8.660254e-01	-5.000000e-01	248.802083	173.645369	4	0.00	236.34	34
2024-03-01	17	402.41	0	True	5.997471	0.209928	17	1	4	3	-9.659258e-01	-2.588190e-01	249.668333	174.387027	4	0.00	69.82	34
2024-03-01	18	418.11	0	True	6.035745	0.039015	18	1	4	3	-1.000000e+00	-1.836970e-16	249.662500	174.381145	4	0.00	15.70	34
2024-03-01	19	410.73	0	True	6.017936	-0.017651	19	1	4	3	-9.659258e-01	2.588190e-01	249.622500	174.342469	4	7.38	0.00	34
2024-03-01	20	389.58	0	True	5.965069	-0.051494	20	1	4	3	-8.660254e-01	5.000000e-01	247.927917	172.700382	4	21.15	0.00	35
2024-03-01	21	300.10	0	True	5.704116	-0.229683	21	1	4	3	-7.071068e-01	7.071068e-01	243.833333	170.124180	4	89.48	0.00	37
2024-03-01	22	222.19	0	True	5.403533	-0.259613	22	1	4	3	-5.000000e-01	8.660254e-01	237.145000	167.563036	4	77.91	0.00	40
2024-03-01	23	140.40	0	True	4.944495	-0.368108	23	1	4	3	-2.588190e-01	9.659258e-01	226.418333	165.050028	4	81.79	0.00	43
2024-03-02	0	55.65	1	False	4.019082	-0.603632	0	2	5	3	0.000000e+00	1.000000e+00	214.124583	166.373518	5	84.75	0.00	45
2024-03-02	1	-6.08	1	False	4.019082	-1.109254	1	2	5	3	2.588190e-01	9.659258e-01	202.402500	171.704924	5	61.73	0.00	44
2024-03-02	2	-88.82	1	False	4.019082	13.608553	2	2	5	3	5.000000e-01	8.660254e-01	190.735000	181.720913	5	82.74	0.00	44
2024-03-02	3	-82.12	1	False	4.019082	-0.075433	3	2	5	3	7.071068e-01	7.071068e-01	181.323333	189.923848	5	0.00	6.70	42
2024-03-02	4	-86.19	1	False	4.019082	0.049562	4	2	5	3	8.660254e-01	5.000000e-01	172.117917	197.483537	5	4.07	0.00	42
2024-03-02	5	-42.22	1	False	4.019082	-0.510152	5	2	5	3	9.659258e-01	2.588190e-01	160.705833	201.759955	5	0.00	43.97	42
2024-03-02	6	93.94	1	False	4.542656	-3.225012	6	2	5	3	1.000000e+00	6.123234e-17	148.753333	196.585015	5	0.00	136.16	42
2024-03-02	7	268.08	1	False	5.591285	1.853736	7	2	5	3	9.659258e-01	-2.588190e-01	142.505000	189.924117	5	0.00	174.14	42
2024-03-02	8	105.89	1	False	4.662401	-0.605006	8	2	5	3	8.660254e-01	-5.000000e-01	130.032500	181.565610	5	162.19	0.00	48
2024-03-02	9	-85.00	1	False	4.662401	-1.802720	9	2	5	3	7.071068e-01	-7.071068e-01	115.337083	184.193434	5	190.89	0.00	50
2024-03-02	10	-90.00	1	False	4.662401	0.058824	10	2	5	3	5.000000e-01	-8.660254e-01	106.003333	188.823575	5	5.00	0.00	45
2024-03-02	11	-85.00	1	False	4.662401	-0.055556	11	2	5	3	2.588190e-01	-9.659258e-01	101.478750	192.155832	5	0.00	5.00	40
2024-03-02	12	-100.00	1	False	4.662401	0.176471	12	2	5	3	1.224647e-16	-1.000000e+00	101.062083	192.599413	5	15.00	0.00	36
2024-03-02	13	-80.00	1	False	4.662401	-0.200000	13	2	5	3	-2.588190e-01	-9.659258e-01	101.062083	192.599413	5	0.00	20.00	36
2024-03-02	14	-85.00	1	False	4.662401	0.062500	14	2	5	3	-5.000000e-01	-8.660254e-01	100.228750	193.390806	5	5.00	0.00	37
2024-03-02	15	128.91	1	False	4.859114	-2.516588	15	2	5	3	-7.071068e-01	-7.071068e-01	101.589583	193.476482	5	0.00	213.91	37
2024-03-02	16	429.15	1	False	6.061807	2.329067	16	2	5	3	-8.660254e-01	-5.000000e-01	105.612917	199.402212	5	0.00	300.24	37
2024-03-02	17	539.61	1	False	6.290847	0.257393	17	2	5	3	-9.659258e-01	-2.588190e-01	111.329583	209.967824	5	0.00	110.46	37
2024-03-02	18	552.08	1	False	6.313693	0.023109	18	2	5	3	-1.000000e+00	-1.836970e-16	116.911667	220.018584	5	0.00	12.47	37
2024-03-02	19	540.20	1	False	6.291939	-0.021519	19	2	5	3	-9.659258e-01	2.588190e-01	122.306250	228.942127	5	11.88	0.00	37
2024-03-02	20	545.07	1	False	6.300914	0.009015	20	2	5	3	-8.660254e-01	5.000000e-01	128.785000	238.821381	5	0.00	4.87	36
2024-03-02	21	501.07	1	False	6.216746	-0.080724	21	2	5	3	-7.071068e-01	-7.071068e-01	137.158750	248.419737	5	44.00	0.00	34
2024-03-02	22	464.09	1	False	6.140078	-0.073802	22	2	5	3	-5.000000e-01	8.660254e-01	147.237917	256.786156	5	36.98	0.00	32
2024-03-02	23	423.68	1	False	6.048978	-0.087074	23	2	5	3	-2.588190e-01	9.659258e-01	159.041250	262.896062	5	40.41	0.00	31
2024-03-03	0	248.63	1	False	5.515966	-0.413166	0	3	6	3	0.000000e+00	1.000000e+00	167.082083	262.547262	6	175.05	0.00	34
2024-03-03	1	207.79	1	False	5.336528	-0.164260	1	3	6	3	2.588190e-01	9.659258e-01	175.993333	260.031826	6	40.84	0.00	33
2024-03-03	2	190.19	1	False	5.248024	-0.084701	2	3	6	3	5.000000e-01	8.660254e-01	187.618750	253.841143	6	17.60	0.00	31
2024-03-03	3	193.43	1	False	5.264916	0.017036	3	3	6	3	7.071068e-01	7.071068e-01	199.100000	247.256566	6	0.00	3.24	31
2024-03-03	4	267.69	1	False	5.589830	0.383911	4	3	6	3	8.660254e-01	5.000000e-01	213.845000	239.947445	6	0.00	74.26	31
2024-03-03	5	353.94	1	False	5.869127	0.322201	5	3	6	3	9.659258e-01	2.588190e-01	230.351667	235.144535	6	0.00	86.25	31
2024-03-03	6	390.37	1	False	5.967095	0.102927	6	3	6	3	1.000000e+00	6.123234e-17	242.702917	235.452788	6	0.00	36.43	31

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su	
2024-03-03	7	404.69	1	False	6.003121	0.036683	7	3	6	3	9.659258e-01	-2.588190e-01	248.395000	237.733187	6	0.00	14.32	31	
2024-03-03	8	314.23	1	False	5.750125	-0.223529	8	3	6	3	8.660254e-01	-5.000000e-01	257.075833	236.101542	6	90.46	0.00	28	
2024-03-03	9	-84.62	1	False	5.750125	-1.269293	9	3	6	3	7.071068e-01	-7.071068e-01	257.091667	236.077616	6	398.85	0.00	36	
2024-03-03	10	-85.00	1	False	5.750125	0.004491	10	3	6	3	5.000000e-01	-8.660254e-01	257.300000	235.759990	6	0.38	0.00	36	
2024-03-03	11	-40.59	1	False	5.750125	-0.522471	11	3	6	3	2.588190e-01	-9.659258e-01	259.150417	233.116016	6	0.00	44.41	36	
2024-03-03	12	-100.00	1	False	5.750125	1.463661	12	3	6	3	1.224647e-16	1.000000e+00	259.150417	233.116016	6	59.41	0.00	38	
2024-03-03	13	-85.00	1	False	5.750125	-0.150000	13	3	6	3	-2.588190e-01	-9.659258e-01	258.942083	233.434306	6	0.00	15.00	38	
2024-03-03	14	-45.87	1	False	5.750125	-0.460353	14	3	6	3	-5.000000e-01	-8.660254e-01	260.572500	231.052100	6	0.00	39.13	38	
2024-03-03	15	240.18	1	False	5.481389	-6.236102	15	3	6	3	-7.071068e-01	-7.071068e-01	265.208750	229.405815	6	0.00	286.05	38	
2024-03-03	16	388.63	1	False	5.962628	0.618078	16	3	6	3	-8.660254e-01	-5.000000e-01	263.520417	228.293223	6	0.00	148.45	38	
2024-03-03	17	401.85	1	False	5.996079	0.034017	17	3	6	3	-9.659258e-01	-2.588190e-01	257.780417	222.713325	6	0.00	13.22	38	
2024-03-03	18	399.15	1	False	5.989337	-0.006719	18	3	6	3	-1.000000e+00	-1.836970e-16	251.408333	216.013970	6	2.70	0.00	38	
2024-03-03	19	380.92	1	False	5.942589	-0.045672	19	3	6	3	-9.659258e-01	2.588190e-01	244.771667	209.091447	6	18.23	0.00	38	
2024-03-03	20	385.64	1	False	5.954904	0.012391	20	3	6	3	-8.660254e-01	5.000000e-01	238.128750	201.531968	6	0.00	4.72	38	
2024-03-03	21	357.14	1	False	5.878128	-0.073903	21	3	6	3	-7.071068e-01	7.071068e-01	232.131667	195.416000	6	28.50	0.00	37	
2024-03-03	22	367.87	1	False	5.907730	0.030044	22	3	6	3	-5.000000e-01	8.660254e-01	228.122500	191.395898	6	0.00	10.73	36	
2024-03-03	23	341.20	1	False	5.832469	-0.072498	23	3	6	3	-2.588190e-01	9.659258e-01	224.685833	188.449658	6	26.67	0.00	35	
2024-03-04	0	268.06	0	True	5.591211	-0.214361	0	4	0	3	0.000000e+00	1.000000e+00	225.495417	188.598672	0	73.14	0.00	31	
2024-03-04	1	271.33	0	True	5.603336	0.012199	1	4	0	3	2.588190e-01	9.659258e-01	228.142917	188.785209	0	0.00	3.27	29	
2024-03-04	2	280.50	0	True	5.636574	0.033796	2	4	0	3	5.000000e-01	8.660254e-01	231.905833	188.895839	0	0.00	9.17	29	
2024-03-04	3	283.55	0	True	5.647388	0.010873	3	4	0	3	7.071068e-01	7.071068e-01	235.660833	188.993444	0	0.00	3.05	29	
2024-03-04	4	283.74	0	True	5.648058	0.000670	4	4	0	3	8.660254e-01	5.000000e-01	236.329583	189.140046	0	0.00	0.19	29	
2024-03-04	5	280.63	0	True	5.637037	-0.010961	5	4	0	3	9.659258e-01	2.588190e-01	233.275000	187.744901	0	3.11	0.00	29	
2024-03-04	6	293.83	0	True	5.683001	0.047037	6	4	0	3	1.000000e+00	6.123234e-17	229.252500	185.250375	0	0.00	13.20	29	
2024-03-04	7	309.81	0	True	5.735959	0.054385	7	4	0	3	9.659258e-01	-2.588190e-01	225.299167	182.333096	0	0.00	15.98	29	
2024-03-04	8	339.47	0	True	5.827386	0.095736	8	4	0	3	8.660254e-01	-5.000000e-01	226.350833	182.940116	0	0.00	29.66	25	
2024-03-04	9	333.03	0	True	5.808233	-0.018971	9	4	0	3	7.071068e-01	-7.071068e-01	243.752917	171.585013	0	6.44	0.00	9.1	
2024-03-04	10	881.08	0	True	6.781148	1.645648	10	4	0	3	5.000000e-01	-8.660254e-01	284.006250	201.771715	0	0.00	548.05	90	
2024-03-04	11	1355.53	0	True	7.211948	0.538487	11	4	0	3	2.588190e-01	-9.659258e-01	342.177917	287.262777	0	0.00	474.45	90	
2024-03-04	12	1424.31	0	True	7.261443	0.050740	12	4	0	3	1.224647e-16	1.000000e+00	405.690833	347.452401	0	0.00	68.78	66	
2024-03-04	13	1300.00	0	True	7.170120	-0.087277	13	4	0	3	-2.588190e-01	-9.659258e-01	463.399167	376.235257	0	124.31	0.00	11	
2024-03-04	14	1300.00	0	True	7.170120	0.000000	14	4	0	3	-5.000000e-01	-8.660254e-01	519.477083	396.769047	0	0.00	0.00	11	
2024-03-04	15	1300.00	0	True	7.170120	0.000000	15	4	0	3	-7.071068e-01	-7.071068e-01	563.636250	422.477113	0	0.00	0.00	11	
2024-03-04	16	810.63	0	True	6.697812	-0.376438	16	4	0	3	-8.660254e-01	-5.000000e-01	581.219583	423.656830	0	489.37	0.00	32	
2024-03-04	17	330.34	0	True	5.800122	-0.592490	17	4	0	3	-9.659258e-01	-2.588190e-01	578.240000	425.221761	0	480.29	0.00	52	
2024-03-04	18	326.75	0	True	5.789195	-0.010868	18	4	0	3	-1.000000e+00	-1.836970e-16	575.223333	426.801407	0	3.59	0.00	52	
2024-03-04	19	296.87	0	True	5.693294	-0.091446	19	4	0	3	-9.659258e-01	-2.588190e-01	528.88190e-01	571.721250	428.805195	0	29.88	0.00	52
2024-03-04	20	289.35	0	True	5.667637	-0.025331	20	4	0	3	-8.660254e-01	5.000000e-01	567.709167	431.066451	0	7.52	0.00	53	
2024-03-04	21	281.94	0	True	5.641694	-0.025609	21	4	0	3	-7.071068e-01	7.071068e-01	564.575833	432.932848	0	7.41	0.00	52	
2024-03-04	22	279.50	0	True	5.633002	-0.008654	22	4	0	3	-5.000000e-01	8.660254e-01	560.893750	435.049184	0	2.44	0.00	52	
2024-03-04	23	276.29	0	True	5.621451	-0.011485	23	4	0	3	-2.588190e-01	9.659258e-01	558.189167	436.673076	0	3.21	0.00	51	
2024-03-05	0	319.23	0	True	5.765912	0.155416	0	5	1	3	0.000000e+00	1.000000e+00	560.321250	435.317729	1	0.00	42.94	48	
2024-03-05	1	319.08	0	True	5.765442	-0.000470	1	5	1	3	2.588190e-01	9.659258e-01	562.310833	434.046756	1	0.15	0.00	48	
2024-03-05	2	320.33	0	True	5.769352	0.003918	2	5	1	3	5.000000e-01	8.660254e-01	563.970417	432.997277	1	0.00	1.25	48	

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-03-05	3	311.52	0	True	5.741464	-0.027503	3	5	1	3	7.071068e-01	7.071068e-01	565.135833	432.246697	1	8.81	0.00	48
2024-03-05	4	307.45	0	True	5.728312	-0.013065	4	5	1	3	8.660254e-01	5.000000e-01	566.123750	431.602208	1	4.07	0.00	48
2024-03-05	5	303.97	0	True	5.716929	-0.011319	5	5	1	3	9.659258e-01	2.588190e-01	567.096250	430.956768	1	3.48	0.00	48
2024-03-05	6	315.18	0	True	5.753144	0.036879	6	5	1	3	1.000000e+00	6.123234e-17	567.985833	430.389827	1	0.00	11.21	48
2024-03-05	7	329.44	0	True	5.797394	0.045244	7	5	1	3	9.659258e-01	-2.588190e-01	568.803750	429.896225	1	0.00	14.26	48
2024-03-05	8	334.78	0	True	5.813474	0.016209	8	5	1	3	8.660254e-01	-5.000000e-01	568.608333	430.006057	1	0.00	5.34	48
2024-03-05	9	329.53	0	True	5.797667	-0.015682	9	5	1	3	7.071068e-01	-7.071068e-01	568.462500	430.090011	1	5.25	0.00	48
2024-03-05	10	350.21	0	True	5.858533	0.062756	10	5	1	3	5.000000e-01	-8.660254e-01	546.342917	426.952926	1	0.00	20.68	48
2024-03-05	11	393.84	0	True	5.975945	0.124582	11	5	1	3	2.588190e-01	-9.659258e-01	506.272500	391.351089	1	0.00	43.63	48
2024-03-05	12	355.91	0	True	5.874678	-0.096308	12	5	1	3	1.224647e-16	-1.000000e+00	461.755833	339.746385	1	37.93	0.00	50
2024-03-05	13	360.14	0	True	5.886493	0.011885	13	5	1	3	-2.588190e-01	-9.659258e-01	422.595000	289.354734	1	0.00	4.23	45
2024-03-05	14	354.01	0	True	5.869325	-0.017021	14	5	1	3	-5.000000e-01	-8.660254e-01	383.178750	220.993677	1	6.13	0.00	45
2024-03-05	15	342.15	0	True	5.835249	-0.033502	15	5	1	3	-7.071068e-01	-7.071068e-01	343.268333	103.456078	1	11.86	0.00	45
2024-03-05	16	328.56	0	True	5.794719	-0.039719	16	5	1	3	-8.660254e-01	-5.000000e-01	323.182083	28.191203	1	13.59	0.00	26
2024-03-05	17	322.50	0	True	5.776103	-0.018444	17	5	1	3	-9.659258e-01	-2.588190e-01	322.855417	28.150047	1	6.06	0.00	6.2
2024-03-05	18	333.34	0	True	5.809163	0.033612	18	5	1	3	-1.000000e+00	-1.836970e-16	323.130000	28.221737	1	0.00	10.84	6.1
2024-03-05	19	324.31	0	True	5.781700	-0.027089	19	5	1	3	-9.659258e-01	2.588190e-01	324.273333	27.661903	1	9.03	0.00	5.2
2024-03-05	20	325.50	0	True	5.785362	0.003669	20	5	1	3	-8.660254e-01	5.000000e-01	325.779583	26.643030	1	0.00	1.19	4.9
2024-03-05	21	308.22	0	True	5.730814	-0.053088	21	5	1	3	-7.071068e-01	7.071068e-01	326.874583	25.267463	1	17.28	0.00	5.2
2024-03-05	22	273.00	0	True	5.609472	-0.114269	22	5	1	3	-5.000000e-01	8.660254e-01	326.603750	25.825995	1	35.22	0.00	6.7
2024-03-05	23	255.88	0	True	5.544709	-0.062711	23	5	1	3	-2.588190e-01	9.659258e-01	325.753333	27.814295	1	17.12	0.00	7.2
2024-03-06	0	196.21	0	True	5.279186	-0.233195	0	6	2	3	0.000000e+00	1.000000e+00	320.627500	38.392677	2	59.67	0.00	9.8
2024-03-06	1	145.21	0	True	4.978181	-0.259926	1	6	2	3	2.588190e-01	9.659258e-01	313.382917	52.507240	2	51.00	0.00	11
2024-03-06	2	118.78	0	True	4.777273	-0.182012	2	6	2	3	5.000000e-01	8.660254e-01	304.985000	65.786436	2	26.43	0.00	13
2024-03-06	3	123.72	0	True	4.818021	0.041589	3	6	2	3	7.071068e-01	7.071068e-01	297.160000	75.436535	2	0.00	4.94	12
2024-03-06	4	175.36	0	True	5.166841	0.417394	4	6	2	3	8.660254e-01	5.000000e-01	291.656250	79.369196	2	0.00	51.64	12
2024-03-06	5	246.35	0	True	5.506753	0.404824	5	6	2	3	9.659258e-01	2.588190e-01	289.255417	79.850536	2	0.00	70.99	12
2024-03-06	6	334.98	0	True	5.814071	0.359773	6	6	2	3	1.000000e+00	6.123234e-17	290.080417	80.231405	2	0.00	88.63	12
2024-03-06	7	376.19	0	True	5.930094	0.123022	7	6	2	3	9.659258e-01	-2.588190e-01	292.028333	81.781103	2	0.00	41.21	12
2024-03-06	8	364.34	0	True	5.898087	-0.031500	8	6	2	3	8.660254e-01	-5.000000e-01	293.260000	82.670716	2	11.85	0.00	12
2024-03-06	9	184.57	0	True	5.218029	-0.493413	9	6	2	3	7.071068e-01	-7.071068e-01	287.220000	85.163457	2	179.77	0.00	20
2024-03-06	10	79.08	0	True	4.370460	-0.571545	10	6	2	3	5.000000e-01	-8.660254e-01	275.922917	93.971844	2	105.49	0.00	24
2024-03-06	11	-58.60	0	True	4.370460	-1.741022	11	6	2	3	2.588190e-01	-9.659258e-01	257.071250	112.786479	2	137.68	0.00	30
2024-03-06	12	-60.84	0	True	4.370460	0.038225	12	6	2	3	1.224647e-16	-1.000000e+00	239.706667	127.967377	2	2.24	0.00	28
2024-03-06	13	-21.38	0	True	4.370460	-0.648586	13	6	2	3	-2.588190e-01	-9.659258e-01	223.810000	135.812707	2	0.00	39.46	28
2024-03-06	14	-52.45	0	True	4.370460	1.453227	14	6	2	3	-5.000000e-01	-8.660254e-01	206.874167	143.968734	2	31.07	0.00	29
2024-03-06	15	137.89	0	True	4.926456	-3.628980	15	6	2	3	-7.071068e-01	-7.071068e-01	198.363333	141.642808	2	0.00	190.34	29
2024-03-06	16	344.17	0	True	5.841136	1.495975	16	6	2	3	-8.660254e-01	-5.000000e-01	199.013750	142.300969	2	0.00	206.28	28
2024-03-06	17	418.62	0	True	6.036964	0.216318	17	6	2	3	-9.659258e-01	-2.588190e-01	203.018750	147.195981	2	0.00	74.45	28
2024-03-06	18	425.44	0	True	6.053124	0.016292	18	6	2	3	-1.000000e+00	-1.836970e-16	206.856250	151.867685	2	0.00	6.82	28
2024-03-06	19	402.25	0	True	5.997074	-0.054508	19	6	2	3	-9.659258e-01	2.588190e-01	210.103750	155.283399	2	23.19	0.00	29
2024-03-06	20	409.65	0	True	6.015303	0.018397	20	6	2	3	-8.660254e-01	5.000000e-01	213.610000	158.909988	2	0.00	7.40	29
2024-03-06	21	402.55	0	True	5.997819	-0.017332	21	6	2	3	-7.071068e-01	7.071068e-01	217.540417	162.478273	2	7.10	0.00	28
2024-03-06	22	404.90	0	True	6.003640	0.005838	22	6	2	3	-5.000000e-01	8.660254e-01	223.036250	166.613886	2	0.00	2.35	27

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-03-06	23	408.60	0	True	6.012737	0.009138	23	6	2	3	-2.588190e-01	9.659258e-01	229.399583	170.786886	2	0.00	3.70	26
2024-03-07	0	337.10	0	True	5.820380	-0.174988	0	7	3	3	0.000000e+00	1.000000e+00	235.270000	172.013452	3	71.50	0.00	26
2024-03-07	1	331.10	0	True	5.802420	-0.017799	1	7	3	3	2.588190e-01	9.659258e-01	243.015417	171.967037	3	6.00	0.00	25
2024-03-07	2	329.69	0	True	5.798153	-0.004259	2	7	3	3	5.000000e-01	8.660254e-01	251.803333	170.726811	3	1.41	0.00	24
2024-03-07	3	334.78	0	True	5.813474	0.015439	3	7	3	3	7.071068e-01	7.071068e-01	260.597500	169.272035	3	0.00	5.09	24
2024-03-07	4	339.22	0	True	5.826649	0.013262	4	7	3	3	8.660254e-01	5.000000e-01	267.425000	168.988913	3	0.00	4.44	24
2024-03-07	5	340.03	0	True	5.829034	0.002388	5	7	3	3	9.659258e-01	2.588190e-01	271.328333	169.561901	3	0.00	0.81	24
2024-03-07	6	356.24	0	True	5.875605	0.047672	6	7	3	3	1.000000e+00	6.123234e-17	272.214167	169.963948	3	0.00	16.21	24
2024-03-07	7	365.05	0	True	5.900034	0.024731	7	7	3	3	9.659258e-01	-2.588190e-01	271.750000	169.682626	3	0.00	8.81	24
2024-03-07	8	351.49	0	True	5.862181	-0.037146	8	7	3	3	8.660254e-01	-5.000000e-01	271.214583	169.397799	3	13.56	0.00	24
2024-03-07	9	274.94	0	True	5.616553	-0.217787	9	7	3	3	7.071068e-01	-7.071068e-01	274.980000	168.389487	3	76.55	0.00	19
2024-03-07	10	148.96	0	True	5.003678	-0.458209	10	7	3	3	5.000000e-01	-8.660254e-01	277.891667	165.433056	3	125.98	0.00	20
2024-03-07	11	147.17	0	True	4.991588	-0.012017	11	7	3	3	2.588190e-01	-9.659258e-01	286.465417	152.024526	3	1.79	0.00	15
2024-03-07	12	135.28	0	True	4.907347	-0.080791	12	7	3	3	1.224647e-16	-1.000000e+00	294.637083	137.080879	3	11.89	0.00	15
2024-03-07	13	294.90	0	True	5.686636	1.179923	13	7	3	3	-2.588190e-01	-9.659258e-01	307.815417	119.448384	3	0.00	159.62	15
2024-03-07	14	324.78	0	True	5.783148	0.101322	14	7	3	3	-5.000000e-01	-8.660254e-01	323.533333	91.539831	3	0.00	29.88	14
2024-03-07	15	338.71	0	True	5.825144	0.042891	15	7	3	3	-7.071068e-01	-7.071068e-01	331.900833	82.571697	3	0.00	13.93	14
2024-03-07	16	346.22	0	True	5.847074	0.022172	16	7	3	3	-8.660254e-01	-5.000000e-01	331.986250	82.586000	3	0.00	7.51	14
2024-03-07	17	351.56	0	True	5.862380	0.015424	17	7	3	3	-9.659258e-01	-2.588190e-01	329.192083	80.638926	3	0.00	5.34	14
2024-03-07	18	352.44	0	True	5.864880	0.002503	18	7	3	3	-1.000000e+00	-1.836970e-16	326.150417	78.190236	3	0.00	0.88	14
2024-03-07	19	340.35	0	True	5.829974	-0.034304	19	7	3	3	-9.659258e-01	2.588190e-01	323.571250	76.575121	3	12.09	0.00	13
2024-03-07	20	336.12	0	True	5.817468	-0.012428	20	7	3	3	-8.660254e-01	5.000000e-01	320.507500	74.422084	3	4.23	0.00	13
2024-03-07	21	322.70	0	True	5.776723	-0.039926	21	7	3	3	-7.071068e-01	7.071068e-01	317.180417	72.350908	3	13.42	0.00	14
2024-03-07	22	301.96	0	True	5.710295	-0.064270	22	7	3	3	-5.000000e-01	8.660254e-01	312.891250	69.935514	3	20.74	0.00	14
2024-03-07	23	268.19	0	True	5.591696	-0.111836	23	7	3	3	-2.588190e-01	9.659258e-01	307.040833	67.408240	3	33.77	0.00	16
2024-03-08	0	143.99	0	True	4.969744	-0.463105	0	8	4	3	0.000000e+00	1.000000e+00	298.994583	74.785850	4	124.20	0.00	18
2024-03-08	1	108.27	0	True	4.684628	-0.248073	1	8	4	3	2.588190e-01	9.659258e-01	289.710000	83.903014	4	35.72	0.00	19
2024-03-08	2	144.11	0	True	4.970577	0.331024	2	8	4	3	5.000000e-01	8.660254e-01	281.977500	88.484689	4	0.00	35.84	19
2024-03-08	3	211.95	0	True	5.356350	0.470752	3	8	4	3	7.071068e-01	7.071068e-01	276.859583	88.849296	4	0.00	67.84	19
2024-03-08	4	267.19	0	True	5.587960	0.260628	4	8	4	3	8.660254e-01	5.000000e-01	273.858333	87.862303	4	0.00	55.24	19
2024-03-08	5	346.68	0	True	5.848402	0.297504	5	8	4	3	9.659258e-01	2.588190e-01	274.135417	88.090246	4	0.00	79.49	19
2024-03-08	6	404.53	0	True	6.002726	0.166869	6	8	4	3	1.000000e+00	6.123234e-17	276.147500	90.563915	4	0.00	57.85	19
2024-03-08	7	416.70	0	True	6.032367	0.030084	7	8	4	3	9.659258e-01	-2.588190e-01	278.299583	93.339520	4	0.00	12.17	19
2024-03-08	8	308.18	0	True	5.730684	-0.260427	8	8	4	3	8.660254e-01	-5.000000e-01	276.495000	92.275571	4	108.52	0.00	23
2024-03-08	9	78.89	0	True	4.368054	-0.744013	9	8	4	3	7.071068e-01	-7.071068e-01	268.326250	100.711339	4	229.29	0.00	30
2024-03-08	10	2.39	0	True	0.871293	-0.969705	10	8	4	3	5.000000e-01	-8.660254e-01	262.219167	112.068006	4	76.50	0.00	28
2024-03-08	11	-77.85	0	True	0.871293	-33.573222	11	8	4	3	2.588190e-01	-9.659258e-01	252.843333	130.077477	4	80.24	0.00	31
2024-03-08	12	-90.00	0	True	0.871293	0.156069	12	8	4	3	1.224647e-16	-1.000000e+00	243.456667	146.074614	4	12.15	0.00	31
2024-03-08	13	-85.00	0	True	0.871293	-0.055556	13	8	4	3	-2.588190e-01	-9.659258e-01	227.627500	160.162024	4	0.00	5.00	31
2024-03-08	14	-90.00	0	True	0.871293	0.058824	14	8	4	3	-5.000000e-01	-8.660254e-01	210.345000	171.219829	4	5.00	0.00	31
2024-03-08	15	108.37	0	True	4.685551	-2.204111	15	8	4	3	-7.071068e-01	-7.071068e-01	200.747500	170.164105	4	0.00	198.37	31
2024-03-08	16	291.15	0	True	5.673839	1.686629	16	8	4	3	-8.660254e-01	-5.000000e-01	198.452917	168.480153	4	0.00	182.78	31
2024-03-08	17	426.95	0	True	6.056667	0.466426	17	8	4	3	-9.659258e-01	-2.588190e-01	201.594167	172.122333	4	0.00	135.80	31
2024-03-08	18	453.32	0	True	6.116598	0.061764	18	8	4	3	-1.836970e-16	-1.000000e+00	205.797500	177.125311	4	0.00	26.37	31

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-03-08	19	436.46	0	True	6.078697	-0.037192	19	8	4	3	-9.659258e-01	2.588190e-01	209.802083	181.336053	4	16.86	0.00	31
2024-03-08	20	445.78	0	True	6.099826	0.021354	20	8	4	3	-8.660254e-01	5.000000e-01	214.371250	185.979415	4	0.00	9.32	31
2024-03-08	21	434.14	0	True	6.073367	-0.026112	21	8	4	3	-7.071068e-01	7.071068e-01	219.014583	190.146124	4	11.64	0.00	31
2024-03-08	22	432.07	0	True	6.068588	-0.004768	22	8	4	3	-5.000000e-01	8.660254e-01	224.435833	194.420535	4	2.07	0.00	30
2024-03-08	23	430.31	0	True	6.064506	-0.004073	23	8	4	3	-2.588190e-01	9.659258e-01	231.190833	198.774457	4	1.76	0.00	29
2024-03-09	0	445.50	1	False	6.099197	0.035300	0	9	5	3	0.000000e+00	1.000000e+00	243.753750	202.516358	5	0.00	15.19	24
2024-03-09	1	433.10	1	False	6.070969	-0.027834	1	9	5	3	2.588190e-01	9.659258e-01	257.288333	203.917700	5	12.40	0.00	23
2024-03-09	2	429.31	1	False	6.062179	-0.008751	2	9	5	3	5.000000e-01	8.660254e-01	269.171667	205.340528	5	3.79	0.00	23
2024-03-09	3	414.44	1	False	6.026928	-0.034637	3	9	5	3	7.071068e-01	7.071068e-01	277.608750	207.040113	5	14.87	0.00	23
2024-03-09	4	413.75	1	False	6.025262	-0.001665	4	9	5	3	8.660254e-01	5.000000e-01	283.715417	208.872739	5	0.69	0.00	23
2024-03-09	5	441.00	1	False	6.089045	0.065861	5	9	5	3	9.659258e-01	2.588190e-01	287.645417	210.985587	5	0.00	27.25	23
2024-03-09	6	462.12	1	False	6.135825	0.047891	6	9	5	3	1.000000e+00	6.123234e-17	290.045000	212.693318	5	0.00	21.12	23
2024-03-09	7	441.93	1	False	6.091151	-0.043690	7	9	5	3	9.659258e-01	-2.588190e-01	291.096250	213.407686	5	20.19	0.00	24
2024-03-09	8	200.99	1	False	5.303255	-0.545199	8	9	5	3	8.660254e-01	-5.000000e-01	286.630000	214.154950	5	240.94	0.00	30
2024-03-09	9	-90.00	1	False	5.303255	-1.447783	9	9	5	3	7.071068e-01	-7.071068e-01	279.592917	223.834142	5	290.99	0.00	32
2024-03-09	10	-80.00	1	False	5.303255	-0.111111	10	9	5	3	5.000000e-01	-8.660254e-01	276.160000	228.846104	5	0.00	10.00	29
2024-03-09	11	-59.05	1	False	5.303255	-0.261875	11	9	5	3	2.588190e-01	-9.659258e-01	276.943333	227.610493	5	0.00	20.95	26
2024-03-09	12	-95.00	1	False	5.303255	0.608806	12	9	5	3	1.224647e-16	-1.000000e+00	276.735000	227.962977	5	35.95	0.00	27
2024-03-09	13	-24.51	1	False	5.303255	-0.742000	13	9	5	3	-2.588190e-01	-9.659258e-01	279.255417	224.091171	5	0.00	70.49	27
2024-03-09	14	-62.19	1	False	5.303255	1.537332	14	9	5	3	-5.000000e-01	-8.660254e-01	280.414167	222.162377	5	37.68	0.00	28
2024-03-09	15	73.56	1	False	4.298101	-2.182827	15	9	5	3	-7.071068e-01	-7.071068e-01	278.963750	223.444357	5	0.00	135.75	28
2024-03-09	16	274.70	1	False	5.615680	2.734367	16	9	5	3	-8.660254e-01	-5.000000e-01	278.278333	223.430581	5	0.00	201.14	28
2024-03-09	17	372.76	1	False	5.920935	0.356971	17	9	5	3	-9.659258e-01	-2.588190e-01	276.020417	222.132875	5	0.00	98.06	28
2024-03-09	18	395.22	1	False	5.979443	0.060253	18	9	5	3	-1.000000e+00	-1.836970e-16	273.599583	220.426669	5	0.00	22.46	28
2024-03-09	19	286.62	1	False	5.658157	-0.274784	19	9	5	3	-9.659258e-01	2.588190e-01	267.356250	217.718664	5	108.60	0.00	32
2024-03-09	20	273.39	1	False	5.610899	-0.046159	20	9	5	3	-8.660254e-01	5.000000e-01	260.173333	214.394567	5	13.23	0.00	33
2024-03-09	21	194.16	1	False	5.268683	-0.289806	21	9	5	3	-7.071068e-01	7.071068e-01	250.174167	211.504903	5	79.23	0.00	35
2024-03-09	22	225.17	1	False	5.416856	0.159714	22	9	5	3	-5.000000e-01	8.660254e-01	241.553333	207.955359	5	0.00	31.01	35
2024-03-09	23	248.43	1	False	5.515161	0.103300	23	9	5	3	-2.588190e-01	9.659258e-01	233.975000	204.055063	5	0.00	23.26	35
2024-03-10	0	334.68	1	False	5.813175	0.347180	0	10	6	3	0.000000e+00	1.000000e+00	229.357500	200.279342	6	0.00	86.25	35
2024-03-10	1	291.05	1	False	5.673495	-0.130363	1	10	6	3	2.588190e-01	9.659258e-01	223.438750	196.050785	6	43.63	0.00	37
2024-03-10	2	325.40	1	False	5.785055	0.118021	2	10	6	3	5.000000e-01	8.660254e-01	219.109167	192.420416	6	0.00	34.35	36
2024-03-10	3	320.31	1	False	5.769289	-0.015642	3	10	6	3	7.071068e-01	7.071068e-01	215.187083	189.198247	6	5.09	0.00	36
2024-03-10	4	284.73	1	False	5.651541	-0.111080	4	10	6	3	8.660254e-01	5.000000e-01	209.811250	185.099604	6	35.58	0.00	37
2024-03-10	5	282.87	1	False	5.644987	-0.006533	5	10	6	3	9.659258e-01	2.588190e-01	203.222500	179.233916	6	1.86	0.00	38
2024-03-10	6	356.00	1	False	5.874931	0.258529	6	10	6	3	1.000000e+00	6.123234e-17	198.800833	173.795751	6	0.00	73.13	38
2024-03-10	7	321.65	1	False	5.773464	-0.096489	7	10	6	3	9.659258e-01	-2.588190e-01	193.789167	168.121523	6	34.35	0.00	38
2024-03-10	8	5.00	1	False	1.609438	-0.984455	8	10	6	3	8.660254e-01	-5.000000e-01	185.622917	172.460514	6	316.65	0.00	41
2024-03-10	9	-85.00	1	False	1.609438	-18.000000	9	10	6	3	7.071068e-01	-7.071068e-01	185.831250	172.115759	6	90.00	0.00	33
2024-03-10	10	-85.00	1	False	1.609438	0.000000	10	10	6	3	5.000000e-01	-8.660254e-01	185.622917	172.454211	6	0.00	0.00	33
2024-03-10	11	-85.00	1	False	1.609438	0.000000	11	10	6	3	2.588190e-01	-9.659258e-01	184.541667	174.128180	6	0.00	0.00	33
2024-03-10	12	-100.00	1	False	1.609438	0.176471	12	10	6	3	1.224647e-16	-1.000000e+00	184.333333	174.479812	6	15.00	0.00	32
2024-03-10	13	-85.00	1	False	1.609438	-0.150000	13	10	6	3	-2.588190e-01	-9.659258e-01	181.812917	178.028595	6	0.00	15.00	32
2024-03-10	14	-80.00	1	False	1.609438	-0.058824	14	10	6	3	-5.000000e-01	-8.660254e-01	181.070833	179.123654	6	0.00	5.00	30

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-03-10	15	204.11	1	False	5.318659	-3.551375	15	10	6	3	-7.071068e-01	-7.071068e-01	186.510417	177.693386	6	0.00	284.11	30
2024-03-10	16	384.35	1	False	5.951554	0.883053	16	10	6	3	-8.660254e-01	-5.000000e-01	191.079167	181.429797	6	0.00	180.24	30
2024-03-10	17	410.88	1	False	6.018301	0.069026	17	10	6	3	-9.659258e-01	-2.588190e-01	192.667500	183.247240	6	0.00	26.53	30
2024-03-10	18	380.22	1	False	5.940750	-0.074620	18	10	6	3	-1.000000e+00	-1.836970e-16	192.042500	182.550615	6	30.66	0.00	32
2024-03-10	19	201.06	1	False	5.303603	-0.471201	19	10	6	3	-9.659258e-01	2.588190e-01	188.477500	181.455482	6	179.16	0.00	35
2024-03-10	20	163.73	1	False	5.098219	-0.185666	20	10	6	3	-8.660254e-01	5.000000e-01	183.908333	180.603019	6	37.33	0.00	36
2024-03-10	21	-72.36	1	False	5.098219	-1.441947	21	10	6	3	-7.071068e-01	7.071068e-01	172.803333	187.988208	6	236.09	0.00	42
2024-03-10	22	-48.03	1	False	5.098219	-0.336235	22	10	6	3	-5.000000e-01	8.660254e-01	161.420000	192.887125	6	0.00	24.33	42
2024-03-10	23	-53.00	1	False	5.098219	0.103477	23	10	6	3	-2.588190e-01	9.659258e-01	148.860417	196.750178	6	4.97	0.00	42
2024-03-11	0	65.27	0	True	4.178533	-2.231509	0	11	0	3	0.000000e+00	1.000000e+00	137.635000	193.343437	0	0.00	118.27	42
2024-03-11	1	94.75	0	True	4.551242	0.451662	1	11	0	3	2.588190e-01	9.659258e-01	129.455833	190.705343	0	0.00	29.48	41
2024-03-11	2	82.14	0	True	4.408425	-0.133087	2	11	0	3	5.000000e-01	8.660254e-01	119.320000	186.250786	0	12.61	0.00	41
2024-03-11	3	62.00	0	True	4.127134	-0.245191	3	11	0	3	7.071068e-01	7.071068e-01	108.557083	181.534953	0	20.14	0.00	42
2024-03-11	4	115.98	0	True	4.753418	0.870645	4	11	0	3	8.660254e-01	5.000000e-01	101.525833	177.640977	0	0.00	53.98	40
2024-03-11	5	353.07	0	True	5.866666	2.044232	5	11	0	3	9.659258e-01	2.588190e-01	104.450833	181.297103	0	0.00	237.09	40
2024-03-11	6	545.45	0	True	6.301611	0.544878	6	11	0	3	1.000000e+00	6.123234e-17	112.344583	196.234833	0	0.00	192.38	40
2024-03-11	7	577.85	0	True	6.359314	0.059400	7	11	0	3	9.659258e-01	-2.588190e-01	123.019583	214.256867	0	0.00	32.40	39
2024-03-11	8	565.67	0	True	6.338011	-0.021078	8	11	0	3	8.660254e-01	-5.000000e-01	146.380833	230.759704	0	12.18	0.00	26
2024-03-11	9	165.10	0	True	5.106551	-0.708134	9	11	0	3	7.071068e-01	-7.071068e-01	156.801667	225.442368	0	400.57	0.00	39
2024-03-11	10	113.54	0	True	4.732155	-0.312296	10	11	0	3	5.000000e-01	-8.660254e-01	165.074167	219.754716	0	51.56	0.00	41
2024-03-11	11	-20.87	0	True	4.732155	-1.183812	11	11	0	3	2.588190e-01	-9.659258e-01	167.746250	216.953801	0	134.41	0.00	47
2024-03-11	12	41.34	0	True	3.721831	-2.980834	12	11	0	3	1.224647e-16	-1.000000e+00	173.635417	211.212236	0	0.00	62.21	46
2024-03-11	13	91.88	0	True	4.520483	1.222545	13	11	0	3	-2.588190e-01	-9.659258e-01	181.005417	204.783243	0	0.00	50.54	46
2024-03-11	14	83.69	0	True	4.427119	-0.089138	14	11	0	3	-5.000000e-01	-8.660254e-01	187.825833	198.336790	0	8.19	0.00	46
2024-03-11	15	294.63	0	True	5.685720	2.520492	15	11	0	3	-7.071068e-01	-7.071068e-01	191.597500	199.517095	0	0.00	210.94	46
2024-03-11	16	439.77	0	True	6.086252	0.492618	16	11	0	3	-8.660254e-01	-5.000000e-01	193.906667	202.148324	0	0.00	145.14	46
2024-03-11	17	452.69	0	True	6.115208	0.029379	17	11	0	3	-9.659258e-01	-2.588190e-01	195.648750	204.268502	0	0.00	12.92	46
2024-03-11	18	465.74	0	True	6.143628	0.028828	18	11	0	3	-1.836970e-16	-1.000000e+00	199.212083	208.333687	0	0.00	13.05	45
2024-03-11	19	410.42	0	True	6.017181	-0.118779	19	11	0	3	-9.659258e-01	-2.588190e-01	207.935417	212.750756	0	55.32	0.00	40
2024-03-11	20	459.10	0	True	6.129268	0.118610	20	11	0	3	-8.660254e-01	-5.000000e-01	220.242500	218.546654	0	0.00	48.68	39
2024-03-11	21	314.25	0	True	5.750189	-0.315509	21	11	0	3	-7.071068e-01	-7.071068e-01	236.351250	210.127715	0	144.85	0.00	35
2024-03-11	22	246.49	0	True	5.507321	-0.215625	22	11	0	3	-5.000000e-01	-8.660254e-01	248.622917	201.208301	0	67.76	0.00	38
2024-03-11	23	156.69	0	True	5.054269	-0.364315	23	11	0	3	-2.588190e-01	-9.659258e-01	257.360000	191.877808	0	89.80	0.00	41
2024-03-12	0	142.71	0	True	4.960815	-0.089221	0	12	1	3	0.000000e+00	1.000000e+00	260.586667	189.138703	1	13.98	0.00	42
2024-03-12	1	161.32	0	True	5.083390	0.130404	1	12	1	3	2.588190e-01	9.659258e-01	263.360417	187.077844	1	0.00	18.61	42
2024-03-12	2	261.99	0	True	5.568306	0.624039	2	12	1	3	5.000000e-01	8.660254e-01	270.854167	183.062123	1	0.00	100.67	41
2024-03-12	3	276.83	0	True	5.623404	0.056643	3	12	1	3	7.071068e-01	7.071068e-01	279.805417	177.575788	1	0.00	14.84	40
2024-03-12	4	277.11	0	True	5.624415	0.001011	4	12	1	3	8.660254e-01	5.000000e-01	286.519167	174.125068	1	0.00	0.28	40
2024-03-12	5	366.35	0	True	5.903589	0.322038	5	12	1	3	9.659258e-01	2.588190e-01	287.072500	174.366680	1	0.00	89.24	40
2024-03-12	6	407.58	0	True	6.010237	0.112543	6	12	1	3	1.000000e+00	6.123234e-17	281.327917	167.624985	1	0.00	41.23	40
2024-03-12	7	409.10	0	True	6.013960	0.003729	7	12	1	3	9.659258e-01	-2.588190e-01	274.296667	157.903514	1	0.00	1.52	40
2024-03-12	8	315.21	0	True	5.753239	-0.229504	8	12	1	3	8.660254e-01	-5.000000e-01	263.860833	145.607077	1	93.89	0.00	44
2024-03-12	9	-44.74	0	True	5.753239	-1.141937	9	12	1	3	7.071068e-01	-7.071068e-01	255.117500	157.601417	1	359.95	0.00	42
2024-03-12	10	-61.00	0	True	5.753239	0.363433	10	12	1	3	5.000000e-01	-8.660254e-01	247.845000	168.096180	1	16.26	0.00	41

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-03-12	11	-85.00	0	True	5.753239	0.393443	11	12	1	3	2.588190e-01	-9.659258e-01	245.172917	172.991854	1	24.00	0.00	36
2024-03-12	12	-100.00	0	True	5.753239	0.176471	12	12	1	3	1.224647e-16	-1.000000e+00	239.283750	182.383529	1	15.00	0.00	37
2024-03-12	13	-80.00	0	True	5.753239	-0.200000	13	12	1	3	-2.588190e-01	-9.659258e-01	232.122083	191.566720	1	0.00	20.00	37
2024-03-12	14	-76.95	0	True	5.753239	-0.038125	14	12	1	3	-5.000000e-01	-8.660254e-01	225.428750	199.615700	1	0.00	3.05	36
2024-03-12	15	110.08	0	True	4.701207	-2.430539	15	12	1	3	-7.071068e-01	-7.071068e-01	217.739167	200.387152	1	0.00	187.03	36
2024-03-12	16	351.87	0	True	5.863262	2.196493	16	12	1	3	-8.660254e-01	-5.000000e-01	214.076667	196.926018	1	0.00	241.79	36
2024-03-12	17	416.92	0	True	6.032894	0.184869	17	12	1	3	-9.659258e-01	-2.588190e-01	212.586250	195.169100	1	0.00	65.05	36
2024-03-12	18	462.68	0	True	6.137036	0.109757	18	12	1	3	-1.000000e+00	-1.836970e-16	212.458750	194.997453	1	0.00	45.76	36
2024-03-12	19	431.12	0	True	6.066386	-0.068211	19	12	1	3	-9.659258e-01	2.588190e-01	213.321250	195.954563	1	31.56	0.00	35
2024-03-12	20	420.81	0	True	6.042181	-0.023914	20	12	1	3	-8.660254e-01	5.000000e-01	211.725833	194.012739	1	10.31	0.00	36
2024-03-12	21	382.22	0	True	5.945996	-0.091704	21	12	1	3	-7.071068e-01	7.071068e-01	214.557917	196.059690	1	38.59	0.00	31
2024-03-12	22	362.58	0	True	5.893245	-0.051384	22	12	1	3	-5.000000e-01	8.660254e-01	219.395000	198.301000	1	19.64	0.00	29
2024-03-12	23	351.88	0	True	5.863290	-0.029511	23	12	1	3	-2.588190e-01	9.659258e-01	227.527917	199.615770	1	10.70	0.00	26
2024-03-13	0	294.87	0	True	5.686535	-0.162015	0	13	2	3	0.000000e+00	1.000000e+00	233.867917	199.220728	2	57.01	0.00	28
2024-03-13	1	208.49	0	True	5.339891	-0.292943	1	13	2	3	2.588190e-01	9.659258e-01	235.833333	198.705900	2	86.38	0.00	31
2024-03-13	2	173.19	0	True	5.154389	-0.169313	2	13	2	3	5.000000e-01	8.660254e-01	232.133333	199.024169	2	35.30	0.00	33
2024-03-13	3	163.24	0	True	5.095222	-0.057451	3	13	2	3	7.071068e-01	7.071068e-01	227.400417	199.265514	2	9.95	0.00	33
2024-03-13	4	127.97	0	True	4.851796	-0.216062	4	13	2	3	8.660254e-01	5.000000e-01	221.186250	199.972142	2	35.27	0.00	35
2024-03-13	5	244.21	0	True	5.498029	0.908338	5	13	2	3	9.659258e-01	2.588190e-01	216.097083	197.657995	2	0.00	116.24	35
2024-03-13	6	332.65	0	True	5.807091	0.362147	6	13	2	3	1.000000e+00	6.123234e-17	212.975000	195.076869	2	0.00	88.44	35
2024-03-13	7	327.36	0	True	5.791060	-0.015903	7	13	2	3	9.659258e-01	-2.588190e-01	209.569167	192.196137	2	5.29	0.00	35
2024-03-13	8	234.79	0	True	5.458691	-0.282777	8	13	2	3	8.660254e-01	-5.000000e-01	206.218333	190.971407	2	92.57	0.00	35
2024-03-13	9	-65.89	0	True	5.458691	-1.280634	9	13	2	3	7.071068e-01	-7.071068e-01	205.337083	192.224509	2	300.68	0.00	32
2024-03-13	10	-13.93	0	True	5.458691	-0.788587	10	13	2	3	5.000000e-01	-8.660254e-01	207.298333	189.611309	2	0.00	51.96	32
2024-03-13	11	42.82	0	True	3.757005	-4.073941	11	13	2	3	2.588190e-01	-9.659258e-01	212.624167	182.713886	2	0.00	56.75	31
2024-03-13	12	-7.54	0	True	3.757005	-1.176086	12	13	2	3	1.224647e-16	-1.000000e+00	216.476667	176.711822	2	50.36	0.00	32
2024-03-13	13	215.44	0	True	5.372682	-29.572944	13	13	2	3	-2.588190e-01	-9.659258e-01	228.786667	165.067622	2	0.00	222.98	32
2024-03-13	14	358.74	0	True	5.882598	0.665150	14	13	2	3	-5.000000e-01	-8.660254e-01	246.940417	153.536840	2	0.00	143.30	32
2024-03-13	15	407.78	0	True	6.010728	0.136701	15	13	2	3	-7.071068e-01	-7.071068e-01	259.344583	154.023966	2	0.00	49.04	32
2024-03-13	16	434.80	0	True	6.074886	0.066261	16	13	2	3	-8.660254e-01	-5.000000e-01	262.800000	157.089684	2	0.00	27.02	32
2024-03-13	17	431.15	0	True	6.066456	-0.008395	17	13	2	3	-9.659258e-01	-2.588190e-01	263.392917	157.722264	2	3.65	0.00	32
2024-03-13	18	422.70	0	True	6.046663	-0.019599	18	13	2	3	-1.000000e+00	-1.836970e-16	261.727083	155.724394	2	8.45	0.00	33
2024-03-13	19	382.38	0	True	5.946415	-0.095387	19	13	2	3	-9.659258e-01	2.588190e-01	259.696250	153.724228	2	40.32	0.00	33
2024-03-13	20	380.44	0	True	5.941328	-0.005073	20	13	2	3	-8.660254e-01	5.000000e-01	258.014167	152.096892	2	1.94	0.00	33
2024-03-13	21	332.32	0	True	5.806098	-0.126485	21	13	2	3	-7.071068e-01	-7.071068e-01	255.935000	150.659450	2	48.12	0.00	33
2024-03-13	22	354.26	0	True	5.870031	0.066021	22	13	2	3	-5.000000e-01	8.660254e-01	255.588333	150.412761	2	0.00	21.94	32
2024-03-13	23	353.99	0	True	5.869269	-0.000762	23	13	2	3	-2.588190e-01	9.659258e-01	255.676250	150.472096	2	0.27	0.00	32
2024-03-14	0	393.81	0	True	5.975869	0.112489	0	14	3	3	0.000000e+00	1.000000e+00	259.798750	152.927873	3	0.00	39.82	29
2024-03-14	1	399.43	0	True	5.990039	0.014271	1	14	3	3	2.588190e-01	9.659258e-01	267.754583	155.093899	3	0.00	5.62	26
2024-03-14	2	394.62	0	True	5.977923	-0.012042	2	14	3	3	5.000000e-01	8.660254e-01	276.980833	155.808426	3	4.81	0.00	25
2024-03-14	3	407.81	0	True	6.010801	0.033425	3	14	3	3	7.071068e-01	7.071068e-01	287.171250	156.043630	3	0.00	13.19	24
2024-03-14	4	430.04	0	True	6.063878	0.054511	4	14	3	3	8.660254e-01	5.000000e-01	299.757500	154.821867	3	0.00	22.23	23
2024-03-14	5	466.18	0	True	6.144572	0.084039	5	14	3	3	9.659258e-01	2.588190e-01	309.006250	157.957565	3	0.00	36.14	23
2024-03-14	6	547.70	0	True	6.305728	0.174868	6	14	3	3	1.000000e+00	6.123234e-17	317.966667	165.286624	3	0.00	81.52	23

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-03-14	7	518.09	0	True	6.250149	-0.054062	7	14	3	3	9.659258e-01	-2.588190e-01	325.913750	170.268041	3	29.61	0.00	24
2024-03-14	8	406.64	0	True	6.007928	-0.215117	8	14	3	3	8.660254e-01	-5.000000e-01	333.074167	169.882364	3	111.45	0.00	24
2024-03-14	9	100.12	0	True	4.606369	-0.753787	9	14	3	3	7.071068e-01	-7.071068e-01	339.991250	155.720951	3	306.52	0.00	25
2024-03-14	10	44.23	0	True	3.789403	-0.558230	10	14	3	3	5.000000e-01	-8.660254e-01	342.414583	150.333088	3	55.89	0.00	27
2024-03-14	11	-39.92	0	True	3.789403	-1.902555	11	14	3	3	2.588190e-01	-9.659258e-01	338.967083	158.242856	3	84.15	0.00	31
2024-03-14	12	-61.00	0	True	3.789403	0.528056	12	14	3	3	1.224647e-16	-1.000000e+00	336.739583	163.617510	3	21.08	0.00	29
2024-03-14	13	-43.87	0	True	3.789403	-0.280820	13	14	3	3	-2.588190e-01	-9.659258e-01	325.935000	179.743076	3	0.00	17.13	29
2024-03-14	14	-55.70	0	True	3.789403	0.269660	14	14	3	3	-5.000000e-01	-8.660254e-01	308.666667	195.657932	3	11.83	0.00	30
2024-03-14	15	91.04	0	True	4.511299	-2.634470	15	14	3	3	-7.071068e-01	-7.071068e-01	295.469167	199.329784	3	0.00	146.74	30
2024-03-14	16	337.76	0	True	5.822336	2.710018	16	14	3	3	-8.660254e-01	-5.000000e-01	291.425833	197.355055	3	0.00	246.72	30
2024-03-14	17	381.10	0	True	5.943062	0.128316	17	14	3	3	-9.659258e-01	-2.588190e-01	289.340417	196.074703	3	0.00	43.34	30
2024-03-14	18	381.00	0	True	5.942799	-0.000262	18	14	3	3	-1.000000e+00	-1.836970e-16	287.602917	195.023510	3	0.10	0.00	29
2024-03-14	19	178.43	0	True	5.184196	-0.531680	19	14	3	3	-9.659258e-01	-2.588190e-01	279.105000	195.157548	3	202.57	0.00	36
2024-03-14	20	85.95	0	True	4.453766	-0.518298	20	14	3	3	-8.660254e-01	-5.000000e-01	266.834583	197.749879	3	92.48	0.00	40
2024-03-14	21	10.12	0	True	2.314514	-0.882257	21	14	3	3	-7.071068e-01	-7.071068e-01	253.409583	203.950531	3	75.83	0.00	41
2024-03-14	22	-70.80	0	True	2.314514	-7.996047	22	14	3	3	-5.000000e-01	-8.660254e-01	235.698750	213.064260	3	80.92	0.00	44
2024-03-14	23	-51.25	0	True	2.314514	-0.276130	23	14	3	3	-2.588190e-01	-9.659258e-01	218.813750	219.249808	3	0.00	19.55	44
2024-03-15	0	-0.32	0	True	2.314514	-0.993756	0	15	4	3	0.000000e+00	1.000000e+00	202.391667	220.330235	4	0.00	50.93	44
2024-03-15	1	94.78	0	True	4.551558	-297.187500	1	15	4	3	2.588190e-01	9.659258e-01	189.697917	217.238948	4	0.00	95.10	44
2024-03-15	2	111.26	0	True	4.711870	0.173876	2	15	4	3	5.000000e-01	8.660254e-01	177.891250	213.281546	4	0.00	16.48	44
2024-03-15	3	86.82	0	True	4.463837	-0.219666	3	15	4	3	7.071068e-01	7.071068e-01	164.516667	208.241670	4	24.44	0.00	45
2024-03-15	4	147.01	0	True	4.990501	0.693273	4	15	4	3	8.660254e-01	5.000000e-01	152.723750	200.418229	4	0.00	60.19	45
2024-03-15	5	372.36	0	True	5.919861	1.532889	5	15	4	3	9.659258e-01	2.588190e-01	148.814583	194.876799	4	0.00	225.35	45
2024-03-15	6	396.36	0	True	5.982323	0.064454	6	15	4	3	1.000000e+00	6.123234e-17	142.508750	183.526455	4	0.00	24.00	45
2024-03-15	7	322.34	0	True	5.775607	-0.186749	7	15	4	3	9.659258e-01	-2.588190e-01	134.352500	169.957346	4	74.02	0.00	47
2024-03-15	8	90.70	0	True	4.507557	-0.718620	8	15	4	3	8.660254e-01	-5.000000e-01	121.188333	159.887523	4	231.64	0.00	52
2024-03-15	9	-90.00	0	True	4.507557	-1.992282	9	15	4	3	7.071068e-01	-7.071068e-01	113.266667	165.585001	4	180.70	0.00	47
2024-03-15	10	-85.00	0	True	4.507557	-0.055556	10	15	4	3	5.000000e-01	-8.660254e-01	107.882083	169.970687	4	0.00	5.00	44
2024-03-15	11	-85.00	0	True	4.507557	0.000000	11	15	4	3	2.588190e-01	-9.659258e-01	106.003750	171.913041	4	0.00	0.00	41
2024-03-15	12	-100.00	0	True	4.507557	0.176471	12	15	4	3	1.224647e-16	-1.000000e+00	104.378750	173.734940	4	15.00	0.00	41
2024-03-15	13	-85.00	0	True	4.507557	-0.150000	13	15	4	3	-2.588190e-01	-9.659258e-01	102.665000	175.455210	4	0.00	15.00	41
2024-03-15	14	-87.38	0	True	4.507557	0.028000	14	15	4	3	-5.000000e-01	-8.660254e-01	101.345000	176.812357	4	2.38	0.00	40
2024-03-15	15	47.55	0	True	3.861782	-1.544175	15	15	4	3	-7.071068e-01	-7.071068e-01	99.532917	177.145104	4	0.00	134.93	40
2024-03-15	16	340.90	0	True	5.831589	6.169295	16	15	4	3	-8.660254e-01	-5.000000e-01	99.663750	177.329763	4	0.00	293.35	40
2024-03-15	17	395.50	0	True	5.980151	0.160164	17	15	4	3	-9.659258e-01	-2.588190e-01	100.263750	178.344868	4	0.00	54.60	40
2024-03-15	18	403.82	0	True	6.000969	0.021037	18	15	4	3	-1.836970e-16	-1.000000e+00	101.214583	179.960186	4	0.00	8.32	40
2024-03-15	19	239.38	0	True	5.478052	-0.407211	19	15	4	3	-9.659258e-01	-2.588190e-01	103.754167	181.520516	4	164.44	0.00	39
2024-03-15	20	116.06	0	True	4.754107	-0.515164	20	15	4	3	-8.660254e-01	-5.000000e-01	105.008750	181.496163	4	123.32	0.00	40
2024-03-15	21	45.51	0	True	3.817932	-0.607875	21	15	4	3	-7.071068e-01	-7.071068e-01	106.483333	180.834269	4	70.55	0.00	40
2024-03-15	22	127.39	0	True	4.847253	1.799165	22	15	4	3	-5.000000e-01	-8.660254e-01	114.741250	176.868267	4	0.00	81.88	36
2024-03-15	23	232.84	0	True	5.450352	0.827773	23	15	4	3	-2.588190e-01	-9.659258e-01	126.578333	174.770191	4	0.00	105.45	36
2024-03-16	0	162.28	1	False	5.089323	-0.303041	0	16	5	3	0.000000e+00	1.000000e+00	133.353333	172.777321	5	70.56	0.00	39
2024-03-16	1	101.74	1	False	4.622421	-0.373059	1	16	5	3	2.588190e-01	9.659258e-01	133.643333	172.715592	5	60.54	0.00	42
2024-03-16	2	110.67	1	False	4.706553	0.087773	2	16	5	3	5.000000e-01	8.660254e-01	133.618750	172.718959	5	0.00	8.93	42

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su	
2024-03-16	3	117.28	1	False	4.764564	0.059727	3	16	5	3	7.071068e-01	7.071068e-01	134.887917	172.471858	5	0.00	6.61	41	
2024-03-16	4	143.81	1	False	4.968493	0.226211	4	16	5	3	8.660254e-01	5.000000e-01	134.754583	172.463316	5	0.00	26.53	41	
2024-03-16	5	217.50	1	False	5.382199	0.512412	5	16	5	3	9.659258e-01	2.588190e-01	128.302083	165.961484	5	0.00	73.69	41	
2024-03-16	6	275.86	1	False	5.619893	0.268322	6	16	5	3	1.000000e+00	6.123234e-17	123.281250	159.183680	5	0.00	58.36	41	
2024-03-16	7	321.04	1	False	5.771566	0.163779	7	16	5	3	9.659258e-01	-2.588190e-01	123.227083	159.113205	5	0.00	45.18	38	
2024-03-16	8	307.29	1	False	5.727792	-0.042830	8	16	5	3	8.660254e-01	-5.000000e-01	132.251667	163.275945	5	13.75	0.00	29	
2024-03-16	9	201.56	1	False	5.306087	-0.344072	9	16	5	3	7.071068e-01	-7.071068e-01	144.400000	156.736231	5	105.73	0.00	26	
2024-03-16	10	146.17	1	False	4.984770	-0.274807	10	16	5	3	5.000000e-01	-8.660254e-01	154.032083	148.934737	5	55.39	0.00	28	
2024-03-16	11	45.17	1	False	3.810433	-0.690976	11	16	5	3	2.588190e-01	-9.659258e-01	159.455833	142.063120	5	101.00	0.00	32	
2024-03-16	12	-18.18	1	False	3.810433	-1.402480	12	16	5	3	1.224647e-16	-1.000000e+00	162.865000	136.436419	5	63.35	0.00	34	
2024-03-16	13	108.56	1	False	4.687303	-6.971397	13	16	5	3	-2.588190e-01	-9.659258e-01	170.930000	126.507180	5	0.00	126.74	34	
2024-03-16	14	192.34	1	False	5.259265	0.771739	14	16	5	3	-5.000000e-01	-8.660254e-01	182.585000	113.935093	5	0.00	83.78	34	
2024-03-16	15	315.74	1	False	5.754919	0.641572	15	16	5	3	-7.071068e-01	-7.071068e-01	193.759583	113.265102	5	0.00	123.40	34	
2024-03-16	16	406.84	1	False	6.008420	0.288529	16	16	5	3	-8.660254e-01	-5.000000e-01	196.507083	117.702353	5	0.00	91.10	34	
2024-03-16	17	398.63	1	False	5.988034	-0.020180	17	16	5	3	-9.659258e-01	-2.588190e-01	196.637500	117.933934	5	8.21	0.00	34	
2024-03-16	18	387.15	1	False	5.958812	-0.028799	18	16	5	3	-1.000000e+00	-1.836970e-16	195.942917	116.703328	5	11.48	0.00	35	
2024-03-16	19	348.98	1	False	5.855015	-0.098592	19	16	5	3	-9.659258e-01	-2.588190e-01	200.509583	120.557654	5	38.17	0.00	30	
2024-03-16	20	345.57	1	False	5.845195	-0.009771	20	16	5	3	-8.660254e-01	-5.000000e-01	210.072500	122.652107	5	3.41	0.00	25	
2024-03-16	21	282.21	1	False	5.642651	-0.183349	21	16	5	3	-7.071068e-01	-7.071068e-01	7.071068e-01	219.935000	118.282998	5	63.36	0.00	24
2024-03-16	22	293.00	1	False	5.680173	0.038234	22	16	5	3	-5.000000e-01	-8.660254e-01	226.835417	117.477305	5	0.00	10.79	24	
2024-03-16	23	136.59	1	False	4.916984	-0.533823	23	16	5	3	-2.588190e-01	-9.659258e-01	222.825000	118.897704	5	156.41	0.00	31	
2024-03-17	0	-73.90	1	False	4.916984	-1.541035	0	17	6	3	0.000000e+00	1.000000e+00	212.984167	133.057538	6	210.49	0.00	37	
2024-03-17	1	-80.00	1	False	4.916984	0.082544	1	17	6	3	2.588190e-01	9.659258e-01	205.411667	144.355739	6	6.10	0.00	34	
2024-03-17	2	-89.14	1	False	4.916984	0.114250	2	17	6	3	5.000000e-01	8.660254e-01	197.086250	155.396901	6	9.14	0.00	35	
2024-03-17	3	-80.00	1	False	4.916984	-0.102535	3	17	6	3	7.071068e-01	7.071068e-01	7.071068e-01	188.866250	164.738876	6	0.00	9.14	35
2024-03-17	4	-85.00	1	False	4.916984	0.062500	4	17	6	3	8.660254e-01	5.000000e-01	179.332500	173.829736	6	5.00	0.00	35	
2024-03-17	5	-85.00	1	False	4.916984	0.000000	5	17	6	3	9.659258e-01	2.588190e-01	166.728333	181.729377	6	0.00	0.00	35	
2024-03-17	6	-69.59	1	False	4.916984	-0.181294	6	17	6	3	1.000000e+00	6.123234e-17	152.334583	186.332141	6	0.00	15.41	35	
2024-03-17	7	-85.00	1	False	4.916984	0.221440	7	17	6	3	9.659258e-01	-2.588190e-01	135.416250	188.765901	6	15.41	0.00	36	
2024-03-17	8	-80.00	1	False	4.916984	-0.058824	8	17	6	3	8.660254e-01	-5.000000e-01	119.279167	189.984307	6	0.00	5.00	35	
2024-03-17	9	-85.00	1	False	4.916984	0.062500	9	17	6	3	7.071068e-01	-7.071068e-01	107.339167	193.559469	6	5.00	0.00	31	
2024-03-17	10	-80.00	1	False	4.916984	-0.058824	10	17	6	3	5.000000e-01	-8.660254e-01	97.915417	197.060786	6	0.00	5.00	29	
2024-03-17	11	-75.88	1	False	4.916984	-0.051500	11	17	6	3	2.588190e-01	-9.659258e-01	92.871667	199.996755	6	0.00	4.12	24	
2024-03-17	12	-100.00	1	False	4.916984	0.317870	12	17	6	3	1.224647e-16	-1.000000e+00	89.462500	202.651791	6	24.12	0.00	23	
2024-03-17	13	-89.66	1	False	4.916984	-0.103400	13	17	6	3	-2.588190e-01	-9.659258e-01	81.203333	205.853604	6	0.00	10.34	23	
2024-03-17	14	-98.05	1	False	4.916984	0.093576	14	17	6	3	-5.000000e-01	-8.660254e-01	69.103750	207.564347	6	8.39	0.00	23	
2024-03-17	15	-1.94	1	False	4.916984	-0.980214	15	17	6	3	-7.071068e-01	-7.071068e-01	55.867083	201.183541	6	0.00	96.11	23	
2024-03-17	16	341.17	1	False	5.832381	-176.860825	16	17	6	3	-8.660254e-01	-5.000000e-01	53.130833	196.596792	6	0.00	343.11	23	
2024-03-17	17	500.28	1	False	6.215168	0.466366	17	17	6	3	-9.659258e-01	-2.588190e-01	57.366250	205.267486	6	0.00	159.11	23	
2024-03-17	18	545.23	1	False	6.301208	0.089850	18	17	6	3	-1.000000e+00	-1.836970e-16	63.952917	218.424351	6	0.00	44.95	22	
2024-03-17	19	508.40	1	False	6.231269	-0.067549	19	17	6	3	-9.659258e-01	2.588190e-01	70.595417	229.606976	6	36.83	0.00	22	
2024-03-17	20	562.92	1	False	6.333138	0.107238	20	17	6	3	-8.660254e-01	5.000000e-01	79.651667	244.713627	6	0.00	54.52	22	
2024-03-17	21	513.20	1	False	6.240666	-0.088325	21	17	6	3	-7.071068e-01	7.071068e-01	7.071068e-01	89.276250	257.248024	6	49.72	0.00	21
2024-03-17	22	541.06	1	False	6.293530	0.054287	22	17	6	3	-5.000000e-01	8.660254e-01	99.612083	270.434581	6	0.00	27.86	21	

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-03-17	23	650.88	1	False	6.478325	0.202972	23	17	6	3	-2.588190e-01	9.659258e-01	121.040833	292.931970	6	0.00	109.82	15
2024-03-18	0	616.50	0	True	6.424058	-0.052821	0	18	0	3	0.000000e+00	1.000000e+00	149.807500	306.539419	0	34.38	0.00	8.0
2024-03-18	1	537.64	0	True	6.287189	-0.127916	1	18	0	3	2.588190e-01	9.659258e-01	175.542500	312.280194	0	78.86	0.00	11
2024-03-18	2	466.19	0	True	6.144593	-0.132896	2	18	0	3	5.000000e-01	8.660254e-01	198.681250	312.389434	0	71.45	0.00	13
2024-03-18	3	409.82	0	True	6.015718	-0.120916	3	18	0	3	7.071068e-01	7.071068e-01	219.090417	309.376945	0	56.37	0.00	16
2024-03-18	4	410.50	0	True	6.017376	0.001659	4	18	0	3	8.660254e-01	5.000000e-01	239.736250	304.699481	0	0.00	0.68	15
2024-03-18	5	437.64	0	True	6.081397	0.066114	5	18	0	3	9.659258e-01	2.588190e-01	261.512917	299.106765	0	0.00	27.14	15
2024-03-18	6	520.52	0	True	6.254828	0.189379	6	18	0	3	1.000000e+00	6.123234e-17	286.100833	294.930917	0	0.00	82.88	15
2024-03-18	7	521.75	0	True	6.257189	0.002363	7	18	0	3	9.659258e-01	-2.588190e-01	311.382083	287.652641	0	0.00	1.23	15
2024-03-18	8	527.27	0	True	6.267713	0.010580	8	18	0	3	8.660254e-01	-5.000000e-01	336.685000	278.284724	0	0.00	5.52	15
2024-03-18	9	458.12	0	True	6.127131	-0.131147	9	18	0	3	7.071068e-01	-7.071068e-01	359.315000	264.230822	0	69.15	0.00	17
2024-03-18	10	476.63	0	True	6.166741	0.040404	10	18	0	3	5.000000e-01	-8.660254e-01	382.507917	247.918955	0	0.00	18.51	17
2024-03-18	11	319.14	0	True	5.765630	-0.330424	11	18	0	3	2.588190e-01	-9.659258e-01	398.967083	228.517139	0	157.49	0.00	24
2024-03-18	12	101.77	0	True	4.622715	-0.681112	12	18	0	3	1.224647e-16	-1.000000e+00	407.374167	212.513280	0	217.37	0.00	32
2024-03-18	13	140.24	0	True	4.943355	0.378009	13	18	0	3	-2.588190e-01	-9.659258e-01	416.953333	193.462614	0	0.00	38.47	32
2024-03-18	14	-89.14	0	True	4.943355	-1.635625	14	18	0	3	-5.000000e-01	-8.660254e-01	417.324583	192.437199	0	229.38	0.00	41
2024-03-18	15	-86.06	0	True	4.943355	-0.034552	15	18	0	3	-7.071068e-01	-7.071068e-01	413.819583	200.981953	0	0.00	3.08	41
2024-03-18	16	253.45	0	True	5.535167	-3.945038	16	18	0	3	-8.660254e-01	-5.000000e-01	410.164583	203.146549	0	0.00	339.51	41
2024-03-18	17	235.16	0	True	5.460266	-0.072164	17	18	0	3	-9.659258e-01	-2.588190e-01	399.117917	205.230845	0	18.29	0.00	42
2024-03-18	18	320.76	0	True	5.770693	0.364007	18	18	0	3	-1.000000e+00	-1.836970e-16	389.765000	203.389203	0	0.00	85.60	42
2024-03-18	19	176.16	0	True	5.171393	-0.450804	19	18	0	3	-9.659258e-01	-2.588190e-01	375.921667	206.249995	0	144.60	0.00	46
2024-03-18	20	143.38	0	True	4.965498	-0.186081	20	18	0	3	-8.660254e-01	-5.000000e-01	358.440833	207.487216	0	32.78	0.00	48
2024-03-18	21	-54.54	0	True	4.965498	-1.380388	21	18	0	3	-7.071068e-01	-7.071068e-01	334.785000	221.000112	0	197.92	0.00	54
2024-03-18	22	-42.51	0	True	4.965498	-0.220572	22	18	0	3	-5.000000e-01	8.660254e-01	310.469583	229.266935	0	0.00	12.03	54
2024-03-18	23	-24.31	0	True	4.965498	-0.428135	23	18	0	3	-2.588190e-01	9.659258e-01	282.336667	227.095037	0	0.00	18.20	54
2024-03-19	0	-77.78	0	True	4.965498	2.199506	0	19	1	3	0.000000e+00	1.000000e+00	253.408333	226.897228	1	53.47	0.00	55
2024-03-19	1	-80.00	0	True	4.965498	0.028542	1	19	1	3	2.588190e-01	9.659258e-01	227.673333	228.280206	1	2.22	0.00	52
2024-03-19	2	-80.00	0	True	4.965498	0.000000	2	19	1	3	5.000000e-01	8.660254e-01	204.915417	230.680953	1	0.00	0.00	49
2024-03-19	3	-80.00	0	True	4.965498	0.000000	3	19	1	3	7.071068e-01	7.071068e-01	184.506250	233.415959	1	0.00	0.00	46
2024-03-19	4	-77.93	0	True	4.965498	-0.025875	4	19	1	3	8.660254e-01	5.000000e-01	164.155000	234.146803	1	0.00	2.07	46
2024-03-19	5	3.72	0	True	1.313724	-1.047735	5	19	1	3	9.659258e-01	2.588190e-01	146.075000	228.803005	1	0.00	81.65	46
2024-03-19	6	199.36	0	True	5.295112	52.591398	6	19	1	3	1.000000e+00	6.123234e-17	132.693333	214.921758	1	0.00	195.64	46
2024-03-19	7	210.60	0	True	5.349961	0.056380	7	19	1	3	9.659258e-01	-2.588190e-01	119.728750	199.245507	1	0.00	11.24	46
2024-03-19	8	-49.48	0	True	5.349961	-1.234948	8	19	1	3	8.660254e-01	-5.000000e-01	95.697500	181.988230	1	260.08	0.00	57
2024-03-19	9	-90.00	0	True	5.349961	0.818917	9	19	1	3	7.071068e-01	-7.071068e-01	72.859167	168.415739	1	40.52	0.00	56
2024-03-19	10	-80.00	0	True	5.349961	-0.111111	10	19	1	3	5.000000e-01	-8.660254e-01	49.666250	147.411576	1	0.00	10.00	56
2024-03-19	11	-85.00	0	True	5.349961	0.062500	11	19	1	3	2.588190e-01	-9.659258e-01	32.827083	138.078033	1	5.00	0.00	50
2024-03-19	12	-100.00	0	True	5.349961	0.176471	12	19	1	3	1.224647e-16	1.000000e+00	24.420000	139.829260	1	15.00	0.00	41
2024-03-19	13	-80.00	0	True	5.349961	-0.200000	13	19	1	3	-2.588190e-01	-9.659258e-01	15.243333	139.122920	1	0.00	20.00	41
2024-03-19	14	-100.00	0	True	5.349961	0.250000	14	19	1	3	-5.000000e-01	-8.660254e-01	14.790833	139.494355	1	20.00	0.00	32
2024-03-19	15	-100.00	0	True	5.349961	0.000000	15	19	1	3	-7.071068e-01	-7.071068e-01	14.210000	139.960783	1	0.00	0.00	32
2024-03-19	16	115.52	0	True	4.749444	-2.155200	16	19	1	3	-8.660254e-01	-5.000000e-01	8.462917	132.334017	1	0.00	215.52	32
2024-03-19	17	481.43	0	True	6.176761	3.167503	17	19	1	3	-9.659258e-01	-2.588190e-01	18.724167	157.778322	1	0.00	365.91	32
2024-03-19	18	580.15	0	True	6.363287	0.205056	18	19	1	3	-1.836970e-16	1.000000e+00	29.532083	185.768888	1	0.00	98.72	32

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su	
2024-03-19	19	504.25	0	True	6.223072	-0.130828	19	19	1	3	-9.659258e-01	2.588190e-01	43.202500	207.794219	1	75.90	0.00	29	
2024-03-19	20	442.75	0	True	6.093005	-0.121963	20	19	1	3	-8.660254e-01	5.000000e-01	55.676250	222.532115	1	61.50	0.00	30	
2024-03-19	21	239.60	0	True	5.478971	-0.458837	21	19	1	3	-7.071068e-01	7.071068e-01	67.932083	224.290947	1	203.15	0.00	30	
2024-03-19	22	73.19	0	True	4.293059	-0.694533	22	19	1	3	-5.000000e-01	8.660254e-01	72.752917	223.053930	1	166.41	0.00	37	
2024-03-19	23	104.71	0	True	4.651195	0.430660	23	19	1	3	-2.588190e-01	9.659258e-01	78.128750	222.165893	1	0.00	31.52	37	
2024-03-20	0	336.00	0	True	5.817111	2.208863	0	20	2	3	0.000000e+00	1.000000e+00	95.369583	225.570086	2	0.00	231.29	35	
2024-03-20	1	360.50	0	True	5.887492	0.072917	1	20	2	3	2.588190e-01	9.659258e-01	113.723750	228.581401	2	0.00	24.50	35	
2024-03-20	2	378.25	0	True	5.935555	0.049237	2	20	2	3	5.000000e-01	8.660254e-01	132.817500	230.823953	2	0.00	17.75	35	
2024-03-20	3	384.50	0	True	5.951944	0.016523	3	20	2	3	7.071068e-01	7.071068e-01	152.171667	231.675919	2	0.00	6.25	35	
2024-03-20	4	371.66	0	True	5.917979	-0.033394	4	20	2	3	8.660254e-01	5.000000e-01	170.904583	230.434565	2	12.84	0.00	35	
2024-03-20	5	372.26	0	True	5.919593	0.001614	5	20	2	3	9.659258e-01	2.588190e-01	186.260417	231.087798	2	0.00	0.60	35	
2024-03-20	6	387.95	0	True	5.960876	0.042148	6	20	2	3	1.000000e+00	6.123234e-17	194.118333	234.730306	2	0.00	15.69	35	
2024-03-20	7	336.57	0	True	5.818806	-0.132440	7	20	2	3	9.659258e-01	-2.588190e-01	199.367083	236.516470	2	51.38	0.00	37	
2024-03-20	8	119.08	0	True	4.779796	-0.646195	8	20	2	3	8.660254e-01	-5.000000e-01	206.390417	231.249745	2	217.49	0.00	36	
2024-03-20	9	-95.00	0	True	4.779796	-1.797783	9	20	2	3	7.071068e-01	-7.071068e-01	206.182083	231.530455	2	214.08	0.00	43	
2024-03-20	10	-80.00	0	True	4.779796	-0.157895	10	20	2	3	5.000000e-01	-8.660254e-01	206.182083	231.530455	2	0.00	15.00	43	
2024-03-20	11	-48.00	0	True	4.779796	-0.400000	11	20	2	3	2.588190e-01	-9.659258e-01	207.723750	229.622618	2	0.00	32.00	43	
2024-03-20	12	-90.00	0	True	4.779796	0.875000	12	20	2	3	1.224647e-16	-1.000000e+00	208.140417	229.048308	2	42.00	0.00	44	
2024-03-20	13	-38.77	0	True	4.779796	-0.569222	13	20	2	3	-2.588190e-01	-9.659258e-01	209.858333	226.938122	2	0.00	51.23	44	
2024-03-20	14	-54.71	0	True	4.779796	0.411143	14	20	2	3	-5.000000e-01	-8.660254e-01	211.745417	224.423871	2	15.94	0.00	44	
2024-03-20	15	113.69	0	True	4.733475	-3.078048	15	20	2	3	-7.071068e-01	-7.071068e-01	220.649167	215.582802	2	0.00	168.40	44	
2024-03-20	16	326.69	0	True	5.789012	1.873516	16	20	2	3	-8.660254e-01	-5.000000e-01	229.447917	215.414788	2	0.00	213.00	44	
2024-03-20	17	388.45	0	True	5.962164	0.189048	17	20	2	3	-9.659258e-01	-2.588190e-01	225.573750	211.486219	2	0.00	61.76	44	
2024-03-20	18	399.50	0	True	5.990214	0.028446	18	20	2	3	-1.000000e+00	-1.836970e-16	218.046667	201.286507	2	0.00	11.05	44	
2024-03-20	19	378.10	0	True	5.935159	-0.053567	19	20	2	3	-9.659258e-01	-2.588190e-01	2.588190e-01	212.790417	195.037965	2	21.40	0.00	41
2024-03-20	20	381.49	0	True	5.944085	0.008966	20	20	2	3	-8.660254e-01	-5.000000e-01	5.000000e-01	210.237917	192.278936	2	0.00	3.39	39
2024-03-20	21	355.89	0	True	5.874622	-0.067105	21	20	2	3	-7.071068e-01	-7.071068e-01	7.071068e-01	215.083333	194.503412	2	25.60	0.00	31
2024-03-20	22	345.85	0	True	5.846005	-0.028211	22	20	2	3	-5.000000e-01	-8.660254e-01	226.444167	193.816905	2	10.04	0.00	25	
2024-03-20	23	340.85	0	True	5.831442	-0.014457	23	20	2	3	-2.588190e-01	-9.659258e-01	9.659258e-01	236.283333	193.361669	2	5.00	0.00	25
2024-03-21	0	351.24	0	True	5.861470	0.030483	0	21	3	3	0.000000e+00	1.000000e+00	236.918333	193.728053	3	0.00	10.39	25	
2024-03-21	1	315.85	0	True	5.755267	-0.100757	1	21	3	3	2.588190e-01	9.659258e-01	235.057917	192.701341	3	35.39	0.00	27	
2024-03-21	2	332.05	0	True	5.805286	0.051290	2	21	3	3	5.000000e-01	8.660254e-01	233.132917	191.435324	3	0.00	16.20	27	
2024-03-21	3	368.65	0	True	5.909848	0.110224	3	21	3	3	7.071068e-01	7.071068e-01	232.472500	190.917070	3	0.00	36.60	27	
2024-03-21	4	381.61	0	True	5.944399	0.035155	4	21	3	3	8.660254e-01	5.000000e-01	232.887083	191.242987	3	0.00	12.96	26	
2024-03-21	5	407.48	0	True	6.009992	0.067792	5	21	3	3	9.659258e-01	2.588190e-01	234.354583	192.490026	3	0.00	25.87	26	
2024-03-21	6	480.62	0	True	6.175077	0.179493	6	21	3	3	1.000000e+00	6.123234e-17	238.215833	196.590804	3	0.00	73.14	26	
2024-03-21	7	240.02	0	True	5.480722	-0.500603	7	21	3	3	9.659258e-01	-2.588190e-01	234.192917	195.475342	3	240.60	0.00	34	
2024-03-21	8	-80.00	0	True	5.480722	-1.333306	8	21	3	3	8.660254e-01	-5.000000e-01	225.897917	204.584292	3	320.02	0.00	38	
2024-03-21	9	-80.00	0	True	5.480722	0.000000	9	21	3	3	7.071068e-01	-7.071068e-01	226.522917	203.581790	3	0.00	0.00	29	
2024-03-21	10	-85.00	0	True	5.480722	0.062500	10	21	3	3	5.000000e-01	-8.660254e-01	226.314583	203.911397	3	5.00	0.00	30	
2024-03-21	11	-85.00	0	True	5.480722	0.000000	11	21	3	3	2.588190e-01	-9.659258e-01	224.772917	206.202514	3	0.00	0.00	30	
2024-03-21	12	-95.00	0	True	5.480722	0.117647	12	21	3	3	1.224647e-16	-1.000000e+00	224.564583	206.536622	3	10.00	0.00	28	
2024-03-21	13	-80.00	0	True	5.480722	-0.157895	13	21	3	3	-2.588190e-01	-9.659258e-01	222.846667	208.979228	3	0.00	15.00	28	
2024-03-21	14	-95.00	0	True	5.480722	0.187500	14	21	3	3	-5.000000e-01	-8.660254e-01	221.167917	211.452993	3	15.00	0.00	28	

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su	
2024-03-21	15	12.02	0	True	2.486572	-1.126526	15	21	3	3	-7.071068e-01	-7.071068e-01	216.931667	214.693423	3	0.00	107.02	28	
2024-03-21	16	238.85	0	True	5.475836	18.871048	16	21	3	3	-8.660254e-01	-5.000000e-01	213.271667	213.486294	3	0.00	226.83	28	
2024-03-21	17	186.78	0	True	5.229931	-0.218003	17	21	3	3	-9.659258e-01	-2.588190e-01	204.868750	210.235571	3	52.07	0.00	30	
2024-03-21	18	212.11	0	True	5.357105	0.135614	18	21	3	3	-1.000000e+00	-1.836970e-16	197.060833	206.132595	3	0.00	25.33	30	
2024-03-21	19	-31.80	0	True	5.357105	-1.149922	19	21	3	3	-9.659258e-01	2.588190e-01	179.981667	207.457300	3	243.91	0.00	40	
2024-03-21	20	-80.00	0	True	5.357105	1.515723	20	21	3	3	-8.660254e-01	5.000000e-01	160.752917	209.346520	3	48.20	0.00	42	
2024-03-21	21	-80.00	0	True	5.357105	0.000000	21	21	3	3	-7.071068e-01	7.071068e-01	142.590833	210.585521	3	0.00	0.00	41	
2024-03-21	22	-80.00	0	True	5.357105	0.000000	22	21	3	3	-5.000000e-01	8.660254e-01	124.847083	210.655317	3	0.00	0.00	40	
2024-03-21	23	-80.00	0	True	5.357105	0.000000	23	21	3	3	-2.588190e-01	9.659258e-01	107.311667	209.405528	3	0.00	0.00	40	
2024-03-22	0	-7.42	0	True	5.357105	-0.907250	0	22	4	3	0.000000e+00	1.000000e+00	92.367500	203.968025	4	0.00	72.58	40	
2024-03-22	1	32.54	0	True	3.482470	-5.385445	1	22	4	3	2.588190e-01	9.659258e-01	80.562917	198.599282	4	0.00	39.96	38	
2024-03-22	2	34.54	0	True	3.542118	0.061463	2	22	4	3	5.000000e-01	8.660254e-01	68.166667	191.372942	4	0.00	2.00	38	
2024-03-22	3	152.89	0	True	5.029719	3.426462	3	22	4	3	7.071068e-01	7.071068e-01	59.176667	181.454389	4	0.00	118.35	38	
2024-03-22	4	207.07	0	True	5.333057	0.354372	4	22	4	3	8.660254e-01	5.000000e-01	51.904167	171.176344	4	0.00	54.18	38	
2024-03-22	5	268.33	0	True	5.592218	0.295842	5	22	4	3	9.659258e-01	2.588190e-01	46.106250	160.641381	4	0.00	61.26	38	
2024-03-22	6	274.39	0	True	5.614550	0.022584	6	22	4	3	1.000000e+00	6.123234e-17	37.513333	140.661354	4	0.00	6.06	38	
2024-03-22	7	159.61	0	True	5.072733	-0.418310	7	22	4	3	9.659258e-01	-2.588190e-01	34.162917	136.524949	4	114.78	0.00	33	
2024-03-22	8	317.89	0	True	5.761705	0.991667	8	22	4	3	8.660254e-01	-5.000000e-01	50.741667	145.896000	4	0.00	158.28	20	
2024-03-22	9	275.44	0	True	5.618370	-0.133537	9	22	4	3	7.071068e-01	-7.071068e-01	65.551667	150.029225	4	42.45	0.00	22	
2024-03-22	10	212.21	0	True	5.357576	-0.229560	10	22	4	3	5.000000e-01	-8.660254e-01	77.935417	149.326599	4	63.23	0.00	24	
2024-03-22	11	99.59	0	True	4.601062	-0.530701	11	22	4	3	2.588190e-01	-9.659258e-01	85.626667	145.268149	4	112.62	0.00	29	
2024-03-22	12	-30.61	0	True	4.601062	-1.307360	12	22	4	3	1.224647e-16	-1.000000e+00	88.309583	142.352505	4	130.20	0.00	34	
2024-03-22	13	-73.33	0	True	4.601062	1.395622	13	22	4	3	-2.588190e-01	-9.659258e-01	88.587500	142.015738	4	42.72	0.00	36	
2024-03-22	14	-85.00	0	True	4.601062	0.159144	14	22	4	3	-5.000000e-01	-8.660254e-01	89.004167	141.467294	4	11.67	0.00	35	
2024-03-22	15	202.66	0	True	5.311530	-3.384235	15	22	4	3	-7.071068e-01	-7.071068e-01	96.947500	142.306415	4	0.00	287.66	35	
2024-03-22	16	355.17	0	True	5.872597	0.752541	16	22	4	3	-8.660254e-01	-5.000000e-01	101.794167	149.164986	4	0.00	152.51	35	
2024-03-22	17	414.72	0	True	6.027604	0.167666	17	22	4	3	-9.659258e-01	-2.588190e-01	111.291667	161.553540	4	0.00	59.55	33	
2024-03-22	18	435.13	0	True	6.075645	0.049214	18	22	4	3	-1.000000e+00	-1.836970e-16	120.584167	173.571697	4	0.00	20.41	33	
2024-03-22	19	398.21	0	True	5.986980	-0.084848	19	22	4	3	-9.659258e-01	-2.588190e-01	2.588190e-01	138.501250	179.258706	4	36.92	0.00	25
2024-03-22	20	422.89	0	True	6.047112	0.061977	20	22	4	3	-8.660254e-01	-5.000000e-01	159.455000	181.978434	4	0.00	24.68	23	
2024-03-22	21	434.91	0	True	6.075139	0.028423	21	22	4	3	-7.071068e-01	-7.071068e-01	7.071068e-01	180.909583	182.870950	4	0.00	12.02	23
2024-03-22	22	597.05	0	True	6.392001	0.372813	22	22	4	3	-5.000000e-01	-8.660254e-01	209.120000	192.823439	4	0.00	162.14	23	
2024-03-22	23	561.14	0	True	6.329970	-0.060146	23	22	4	3	-2.588190e-01	-9.659258e-01	235.834167	195.421550	4	35.91	0.00	24	
2024-03-23	0	375.94	1	False	5.929430	-0.330042	0	23	5	3	0.000000e+00	1.000000e+00	251.807500	190.273706	5	185.20	0.00	32	
2024-03-23	1	363.51	1	False	5.895807	-0.033064	1	23	5	3	2.588190e-01	9.659258e-01	265.597917	185.628066	5	12.43	0.00	32	
2024-03-23	2	353.69	1	False	5.868421	-0.027014	2	23	5	3	5.000000e-01	8.660254e-01	278.895833	179.692652	5	9.82	0.00	33	
2024-03-23	3	354.50	1	False	5.870708	0.002290	3	23	5	3	7.071068e-01	7.071068e-01	287.296250	178.252660	5	0.00	0.81	33	
2024-03-23	4	360.67	1	False	5.887963	0.017405	4	23	5	3	8.660254e-01	5.000000e-01	293.696250	178.004233	5	0.00	6.17	33	
2024-03-23	5	363.80	1	False	5.896604	0.008678	5	23	5	3	9.659258e-01	2.588190e-01	297.674167	178.478836	5	0.00	3.13	33	
2024-03-23	6	366.50	1	False	5.903999	0.007422	6	23	5	3	1.000000e+00	6.123234e-17	301.512083	178.946107	5	0.00	2.70	33	
2024-03-23	7	347.52	1	False	5.850822	-0.051787	7	23	5	3	9.659258e-01	-2.588190e-01	309.341667	176.562414	5	18.98	0.00	29	
2024-03-23	8	259.33	1	False	5.558101	-0.253770	8	23	5	3	8.660254e-01	-5.000000e-01	306.901667	176.843555	5	88.19	0.00	32	
2024-03-23	9	50.67	1	False	3.925334	-0.804612	9	23	5	3	7.071068e-01	-7.071068e-01	297.536250	184.373623	5	208.66	0.00	39	
2024-03-23	10	72.48	1	False	4.283311	0.430432	10	23	5	3	5.000000e-01	-8.660254e-01	291.714167	189.324862	5	0.00	21.81	37	

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su	
2024-03-23	11	88.89	1	False	4.487400	0.226407	11	23	5	3	2.588190e-01	-9.659258e-01	291.268333	189.808938	5	0.00	16.41	32	
2024-03-23	12	154.03	1	False	5.037147	0.732816	12	23	5	3	1.224647e-16	-1.000000e+00	298.961667	179.666256	5	0.00	65.14	27	
2024-03-23	13	311.17	1	False	5.740339	1.020191	13	23	5	3	-2.588190e-01	-9.659258e-01	314.982500	161.221844	5	0.00	157.14	25	
2024-03-23	14	310.11	1	False	5.736927	-0.003406	14	23	5	3	-5.000000e-01	-8.660254e-01	331.445417	136.948131	5	1.06	0.00	24	
2024-03-23	15	348.48	1	False	5.853581	0.123730	15	23	5	3	-7.071068e-01	-7.071068e-01	337.521250	134.193031	5	0.00	38.37	24	
2024-03-23	16	344.87	1	False	5.843168	-0.010359	16	23	5	3	-8.660254e-01	-5.000000e-01	337.092083	134.150598	5	3.61	0.00	25	
2024-03-23	17	306.39	1	False	5.724859	-0.111578	17	23	5	3	-9.659258e-01	-2.588190e-01	332.578333	133.244521	5	38.48	0.00	26	
2024-03-23	18	301.04	1	False	5.707243	-0.017461	18	23	5	3	-1.000000e+00	-1.836970e-16	326.991250	131.558056	5	5.35	0.00	26	
2024-03-23	19	273.50	1	False	5.611302	-0.091483	19	23	5	3	-9.659258e-01	2.588190e-01	321.795000	131.084803	5	27.54	0.00	26	
2024-03-23	20	271.90	1	False	5.605434	-0.005850	20	23	5	3	-8.660254e-01	5.000000e-01	315.503750	129.637217	5	1.60	0.00	26	
2024-03-23	21	273.30	1	False	5.610570	0.005149	21	23	5	3	-7.071068e-01	7.071068e-01	308.770000	127.342169	5	0.00	1.40	26	
2024-03-23	22	292.42	1	False	5.678191	0.069960	22	23	5	3	-5.000000e-01	8.660254e-01	296.077083	111.562805	5	0.00	19.12	26	
2024-03-23	23	294.13	1	False	5.684022	0.005848	23	23	5	3	-2.588190e-01	9.659258e-01	284.951667	96.242179	5	0.00	1.71	25	
2024-03-24	0	373.73	1	False	5.923534	0.270629	0	24	6	3	0.000000e+00	1.000000e+00	284.859583	96.152352	6	0.00	79.60	17	
2024-03-24	1	367.38	1	False	5.906397	-0.016991	1	24	6	3	2.588190e-01	9.659258e-01	285.020833	96.293128	6	6.35	0.00	17	
2024-03-24	2	367.10	1	False	5.905634	-0.000762	2	24	6	3	5.000000e-01	8.660254e-01	285.579583	96.746749	6	0.28	0.00	16	
2024-03-24	3	365.31	1	False	5.900746	-0.004876	3	24	6	3	7.071068e-01	7.071068e-01	286.030000	97.106064	6	1.79	0.00	16	
2024-03-24	4	369.46	1	False	5.912042	0.011360	4	24	6	3	8.660254e-01	5.000000e-01	286.396250	97.415902	6	0.00	4.15	16	
2024-03-24	5	370.66	1	False	5.915285	0.003248	5	24	6	3	9.659258e-01	2.588190e-01	286.682083	97.662643	6	0.00	1.20	16	
2024-03-24	6	350.94	1	False	5.860615	-0.053202	6	24	6	3	1.000000e+00	6.123234e-17	286.033750	97.160088	6	19.72	0.00	17	
2024-03-24	7	312.10	1	False	5.743324	-0.110674	7	24	6	3	9.659258e-01	-2.588190e-01	284.557917	96.451952	6	38.84	0.00	18	
2024-03-24	8	148.78	1	False	5.002469	-0.523294	8	24	6	3	8.660254e-01	-5.000000e-01	279.951667	100.273212	6	163.32	0.00	21	
2024-03-24	9	-85.00	1	False	5.002469	-1.571313	9	24	6	3	7.071068e-01	-7.071068e-01	274.298750	116.303800	6	233.78	0.00	22	
2024-03-24	10	25.45	1	False	3.236716	-1.299412	10	24	6	3	5.000000e-01	-8.660254e-01	272.339167	120.183543	6	0.00	110.45	22	
2024-03-24	11	29.26	1	False	3.376221	0.149705	11	24	6	3	2.588190e-01	-9.659258e-01	269.854583	124.673428	6	0.00	3.81	22	
2024-03-24	12	-68.88	1	False	3.376221	-3.354067	12	24	6	3	1.224647e-16	-1.000000e+00	260.566667	140.921667	6	98.14	0.00	26	
2024-03-24	13	213.75	1	False	5.364807	-4.103223	13	24	6	3	-2.588190e-01	-9.659258e-01	256.507500	140.803708	6	0.00	282.63	26	
2024-03-24	14	272.20	1	False	5.606537	0.273450	14	24	6	3	-5.000000e-01	-8.660254e-01	254.927917	140.388263	6	0.00	58.45	26	
2024-03-24	15	299.08	1	False	5.700711	0.098751	15	24	6	3	-7.071068e-01	-7.071068e-01	252.869583	139.315034	6	0.00	26.88	26	
2024-03-24	16	332.00	1	False	5.805135	0.110071	16	24	6	3	-8.660254e-01	-5.000000e-01	252.333333	138.969852	6	0.00	32.92	26	
2024-03-24	17	334.85	1	False	5.813683	0.008584	17	24	6	3	-9.659258e-01	-2.588190e-01	253.519167	139.571298	6	0.00	2.85	24	
2024-03-24	18	318.60	1	False	5.763936	-0.048529	18	24	6	3	-1.000000e+00	-1.836970e-16	254.250833	139.876937	6	16.25	0.00	25	
2024-03-24	19	193.59	1	False	5.265743	-0.392373	19	24	6	3	-9.659258e-01	-2.588190e-01	258.8190e-01	250.921250	140.349093	6	125.01	0.00	29
2024-03-24	20	188.75	1	False	5.240423	-0.025001	20	24	6	3	-8.660254e-01	-5.000000e-01	247.456667	140.834167	6	4.84	0.00	29	
2024-03-24	21	-54.50	1	False	5.240423	-1.288742	21	24	6	3	-7.071068e-01	-7.071068e-01	233.798333	153.540929	6	243.25	0.00	39	
2024-03-24	22	-81.20	1	False	5.240423	0.489908	22	24	6	3	-5.000000e-01	-8.660254e-01	218.230833	165.790846	6	26.70	0.00	40	
2024-03-24	23	-33.81	1	False	5.240423	-0.583621	23	24	6	3	-2.588190e-01	-9.659258e-01	204.566667	172.636182	6	0.00	47.39	40	
2024-03-25	0	-53.50	0	True	5.240423	0.582372	0	25	0	3	0.000000e+00	1.000000e+00	186.765417	176.419919	0	19.69	0.00	41	
2024-03-25	1	37.58	0	True	3.626472	-1.702430	1	25	0	3	2.588190e-01	9.659258e-01	173.023750	174.574561	0	0.00	91.08	41	
2024-03-25	2	178.91	0	True	5.186883	3.760777	2	25	0	3	5.000000e-01	8.660254e-01	165.182500	169.634876	0	0.00	141.33	41	
2024-03-25	3	302.31	0	True	5.711453	0.689732	3	25	0	3	7.071068e-01	7.071068e-01	162.557500	166.868257	0	0.00	123.40	41	
2024-03-25	4	246.69	0	True	5.508132	-0.183983	4	25	0	3	8.660254e-01	5.000000e-01	157.442083	162.062383	0	55.62	0.00	43	
2024-03-25	5	284.08	0	True	5.649256	0.151567	5	25	0	3	9.659258e-01	2.588190e-01	153.834583	158.023101	0	0.00	37.39	43	
2024-03-25	6	313.61	0	True	5.748150	0.103950	6	25	0	3	1.000000e+00	6.123234e-17	152.279167	156.171517	0	0.00	29.53	42	

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su	
2024-03-25	7	345.30	0	True	5.844414	0.101049	7	25	0	3	9.659258e-01	-2.588190e-01	153.662500	157.787405	0	0.00	31.69	41	
2024-03-25	8	369.69	0	True	5.912665	0.070634	8	25	0	3	8.660254e-01	-5.000000e-01	162.867083	163.818372	0	0.00	24.39	34	
2024-03-25	9	363.84	0	True	5.896714	-0.015824	9	25	0	3	7.071068e-01	-7.071068e-01	181.568750	159.863600	0	5.85	0.00	24	
2024-03-25	10	369.58	0	True	5.912367	0.015776	10	25	0	3	5.000000e-01	-8.660254e-01	195.907500	160.682958	0	0.00	5.74	24	
2024-03-25	11	374.05	0	True	5.924389	0.012095	11	25	0	3	2.588190e-01	-9.659258e-01	210.273750	160.548966	0	0.00	4.47	24	
2024-03-25	12	337.08	0	True	5.820320	-0.098837	12	25	0	3	1.224647e-16	-1.000000e+00	227.188750	150.958318	0	36.97	0.00	22	
2024-03-25	13	348.35	0	True	5.853208	0.033434	13	25	0	3	-2.588190e-01	-9.659258e-01	232.797083	152.924830	0	0.00	11.27	22	
2024-03-25	14	356.33	0	True	5.875857	0.022908	14	25	0	3	-5.000000e-01	-8.660254e-01	236.302500	154.819806	0	0.00	7.98	22	
2024-03-25	15	360.65	0	True	5.887908	0.012124	15	25	0	3	-7.071068e-01	-7.071068e-01	238.867917	156.407258	0	0.00	4.32	22	
2024-03-25	16	357.79	0	True	5.879946	-0.007930	16	25	0	3	-8.660254e-01	-5.000000e-01	239.942500	157.161708	0	2.86	0.00	22	
2024-03-25	17	349.97	0	True	5.857847	-0.021856	17	25	0	3	-9.659258e-01	-2.588190e-01	240.572500	157.588423	0	7.82	0.00	22	
2024-03-25	18	357.19	0	True	5.878268	0.020630	18	25	0	3	-1.000000e+00	-1.836970e-16	242.180417	158.612716	0	0.00	7.22	22	
2024-03-25	19	350.97	0	True	5.860701	-0.017414	19	25	0	3	-9.659258e-01	2.588190e-01	248.737917	159.765586	0	6.22	0.00	17	
2024-03-25	20	354.00	0	True	5.869297	0.008633	20	25	0	3	-8.660254e-01	5.000000e-01	255.623333	160.626453	0	0.00	3.03	16	
2024-03-25	21	340.52	0	True	5.830474	-0.038079	21	25	0	3	-7.071068e-01	7.071068e-01	272.082500	147.139239	0	13.48	0.00	7.1	
2024-03-25	22	340.58	0	True	5.830650	0.000176	22	25	0	3	-5.000000e-01	8.660254e-01	289.656667	126.906321	0	0.00	0.06	6.1	
2024-03-25	23	343.24	0	True	5.838430	0.007810	23	25	0	3	-2.588190e-01	9.659258e-01	305.367083	106.880024	0	0.00	2.66	6.1	
2024-03-26	0	398.81	0	True	5.988485	0.161898	0	26	1	3	0.000000e+00	1.000000e+00	324.213333	76.373925	1	0.00	55.57	5.1	
2024-03-26	1	389.35	0	True	5.964479	-0.023721	1	26	1	3	2.588190e-01	9.659258e-01	338.870417	47.129171	1	9.46	0.00	5.1	
2024-03-26	2	380.75	0	True	5.942143	-0.022088	2	26	1	3	5.000000e-01	8.660254e-01	347.280417	33.333455	1	8.60	0.00	6.1	
2024-03-26	3	375.55	0	True	5.928392	-0.013657	3	26	1	3	7.071068e-01	7.071068e-01	350.332083	32.376232	1	5.20	0.00	6.1	
2024-03-26	4	384.92	0	True	5.953036	0.024950	4	26	1	3	8.660254e-01	5.000000e-01	356.091667	24.466094	1	0.00	9.37	4.0	
2024-03-26	5	404.21	0	True	6.001935	0.050114	5	26	1	3	9.659258e-01	2.588190e-01	361.097083	21.157748	1	0.00	19.29	4.0	
2024-03-26	6	424.39	0	True	6.050653	0.049925	6	26	1	3	1.000000e+00	6.123234e-17	365.712917	22.395249	1	0.00	20.18	4.0	
2024-03-26	7	375.62	0	True	5.928578	-0.114918	7	26	1	3	9.659258e-01	-2.588190e-01	366.976250	22.046142	1	48.77	0.00	6.0	
2024-03-26	8	212.68	0	True	5.359789	-0.433789	8	26	1	3	8.660254e-01	-5.000000e-01	360.434167	38.420749	1	162.94	0.00	12	
2024-03-26	9	-90.00	0	True	5.359789	-1.423171	9	26	1	3	7.071068e-01	-7.071068e-01	341.524167	99.618569	1	302.68	0.00	25	
2024-03-26	10	-80.00	0	True	5.359789	-0.111111	10	26	1	3	5.000000e-01	-8.660254e-01	322.791667	131.334704	1	0.00	10.00	25	
2024-03-26	11	-80.00	0	True	5.359789	0.000000	11	26	1	3	2.588190e-01	-9.659258e-01	303.872917	154.321256	1	0.00	0.00	25	
2024-03-26	12	-95.00	0	True	5.359789	0.187500	12	26	1	3	1.224647e-16	-1.000000e+00	285.869583	174.201803	1	15.00	0.00	24	
2024-03-26	13	-85.58	0	True	5.359789	-0.099158	13	26	1	3	-2.588190e-01	-9.659258e-01	267.789167	189.299569	1	0.00	9.42	24	
2024-03-26	14	-95.00	0	True	5.359789	0.110072	14	26	1	3	-5.000000e-01	-8.660254e-01	248.983750	202.106146	1	9.42	0.00	24	
2024-03-26	15	81.40	0	True	4.399375	-1.856842	15	26	1	3	-7.071068e-01	-7.071068e-01	237.348333	203.431897	1	0.00	176.40	24	
2024-03-26	16	207.85	0	True	5.336817	1.553440	16	26	1	3	-8.660254e-01	-5.000000e-01	231.100833	201.868613	1	0.00	126.45	24	
2024-03-26	17	247.18	0	True	5.510117	0.189223	17	26	1	3	-9.659258e-01	-2.588190e-01	226.817917	200.321477	1	0.00	39.33	24	
2024-03-26	18	300.07	0	True	5.704016	0.213974	18	26	1	3	-1.836970e-16	-1.000000e+00	224.437917	199.040417	1	0.00	52.89	24	
2024-03-26	19	222.83	0	True	5.406409	-0.257407	19	26	1	3	-9.659258e-01	-2.588190e-01	258.8190e-01	219.098750	197.208901	1	77.24	0.00	27
2024-03-26	20	186.13	0	True	5.226445	-0.164700	20	26	1	3	-8.660254e-01	-5.000000e-01	212.104167	195.182799	1	36.70	0.00	28	
2024-03-26	21	56.80	0	True	4.039536	-0.694837	21	26	1	3	-7.071068e-01	-7.071068e-01	200.282500	195.658331	1	129.33	0.00	33	
2024-03-26	22	136.87	0	True	4.919032	1.409683	22	26	1	3	-5.000000e-01	-8.660254e-01	191.794583	193.716386	1	0.00	80.07	33	
2024-03-26	23	167.90	0	True	5.123369	0.226711	23	26	1	3	-2.588190e-01	-9.659258e-01	184.488750	191.044396	1	0.00	31.03	33	
2024-03-27	0	254.75	0	True	5.540283	0.517272	0	27	2	3	0.000000e+00	1.000000e+00	178.486250	186.220000	2	0.00	86.85	33	
2024-03-27	1	248.03	0	True	5.513550	-0.026379	1	27	2	3	2.588190e-01	9.659258e-01	172.597917	181.435353	2	6.72	0.00	33	
2024-03-27	2	235.25	0	True	5.460649	-0.051526	2	27	2	3	5.000000e-01	8.660254e-01	166.535417	176.542643	2	12.78	0.00	33	

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-03-27	3	294.46	0	True	5.685143	0.251690	3	27	2	3	7.071068e-01	7.071068e-01	163.156667	173.111126	2	0.00	59.21	33
2024-03-27	4	317.31	0	True	5.759879	0.077600	4	27	2	3	8.660254e-01	5.000000e-01	160.339583	169.865092	2	0.00	22.85	33
2024-03-27	5	244.53	0	True	5.499338	-0.229366	5	27	2	3	9.659258e-01	2.588190e-01	153.686250	162.881429	2	72.78	0.00	36
2024-03-27	6	252.18	0	True	5.530143	0.031285	6	27	2	3	1.000000e+00	6.123234e-17	146.510833	153.988015	2	0.00	7.65	36
2024-03-27	7	131.49	0	True	4.878931	-0.478587	7	27	2	3	9.659258e-01	-2.588190e-01	136.338750	146.054547	2	120.69	0.00	39
2024-03-27	8	66.63	0	True	4.199155	-0.493269	8	27	2	3	8.660254e-01	-5.000000e-01	130.253333	145.777817	2	64.86	0.00	35
2024-03-27	9	5.07	0	True	1.623341	-0.923908	9	27	2	3	7.071068e-01	-7.071068e-01	134.214583	140.737142	2	61.56	0.00	25
2024-03-27	10	174.35	0	True	5.161065	33.388560	10	27	2	3	5.000000e-01	-8.660254e-01	144.812500	133.284116	2	0.00	169.28	25
2024-03-27	11	14.22	0	True	2.654649	-0.918440	11	27	2	3	2.588190e-01	-9.659258e-01	148.738333	127.642661	2	160.13	0.00	31
2024-03-27	12	9.18	0	True	2.217027	-0.354430	12	27	2	3	1.224647e-16	-1.000000e+00	153.079167	120.568734	2	5.04	0.00	31
2024-03-27	13	229.60	0	True	5.436339	24.010893	13	27	2	3	-2.588190e-01	-9.659258e-01	166.211667	110.158974	2	0.00	220.42	31
2024-03-27	14	222.67	0	True	5.405691	-0.030183	14	27	2	3	-5.000000e-01	-8.660254e-01	179.447917	95.520596	2	6.93	0.00	31
2024-03-27	15	208.52	0	True	5.340035	-0.063547	15	27	2	3	-7.071068e-01	-7.071068e-01	184.744583	93.347112	2	14.15	0.00	32
2024-03-27	16	211.19	0	True	5.352758	0.012805	16	27	2	3	-8.660254e-01	-5.000000e-01	184.883750	93.385539	2	0.00	2.67	32
2024-03-27	17	319.15	0	True	5.765661	0.511198	17	27	2	3	-9.659258e-01	-2.588190e-01	187.882500	96.574039	2	0.00	107.96	32
2024-03-27	18	353.33	0	True	5.867402	0.107097	18	27	2	3	-1.000000e+00	-1.836970e-16	190.101667	99.821402	2	0.00	34.18	32
2024-03-27	19	260.47	0	True	5.562488	-0.262814	19	27	2	3	-9.659258e-01	2.588190e-01	191.670000	100.650214	2	92.86	0.00	32
2024-03-27	20	277.30	0	True	5.625100	0.064614	20	27	2	3	-8.660254e-01	5.000000e-01	195.468750	102.141458	2	0.00	16.83	31
2024-03-27	21	217.01	0	True	5.379943	-0.217418	21	27	2	3	-7.071068e-01	7.071068e-01	202.144167	97.828981	2	60.29	0.00	28
2024-03-27	22	325.95	0	True	5.786744	0.502005	22	27	2	3	-5.000000e-01	8.660254e-01	210.022500	99.934598	2	0.00	108.94	28
2024-03-27	23	340.20	0	True	5.829534	0.043718	23	27	2	3	-2.588190e-01	9.659258e-01	217.201667	102.921278	2	0.00	14.25	28
2024-03-28	0	254.54	0	True	5.539458	-0.251793	0	28	3	3	0.000000e+00	1.000000e+00	217.192917	102.917956	3	85.66	0.00	31
2024-03-28	1	279.33	0	True	5.632394	0.097391	1	28	3	3	2.588190e-01	9.659258e-01	218.497083	103.522251	3	0.00	24.79	31
2024-03-28	2	352.52	0	True	5.865107	0.262020	2	28	3	3	5.000000e-01	8.660254e-01	223.383333	107.054673	3	0.00	73.19	31
2024-03-28	3	371.19	0	True	5.916714	0.052962	3	28	3	3	7.071068e-01	7.071068e-01	226.580417	110.364175	3	0.00	18.67	31
2024-03-28	4	461.37	0	True	6.134200	0.242948	4	28	3	3	8.660254e-01	5.000000e-01	232.582917	119.086258	3	0.00	90.18	31
2024-03-28	5	692.98	0	True	6.541001	0.502005	5	28	3	3	9.659258e-01	2.588190e-01	251.268333	151.746157	3	0.00	231.61	28
2024-03-28	6	841.75	0	True	6.735483	0.214682	6	28	3	3	1.000000e+00	6.123234e-17	275.833750	193.795427	3	0.00	148.77	28
2024-03-28	7	728.89	0	True	6.591523	-0.134078	7	28	3	3	9.659258e-01	-2.588190e-01	300.725417	211.963688	3	112.86	0.00	27
2024-03-28	8	917.21	0	True	6.821336	0.258365	8	28	3	3	8.660254e-01	-5.000000e-01	336.166250	240.331766	3	0.00	188.32	24
2024-03-28	9	288.77	0	True	5.665631	-0.685165	9	28	3	3	7.071068e-01	-7.071068e-01	347.987083	230.097648	3	628.44	0.00	48
2024-03-28	10	-41.21	0	True	5.665631	-1.142709	10	28	3	3	5.000000e-01	-8.660254e-01	339.005417	241.113520	3	329.98	0.00	62
2024-03-28	11	-79.00	0	True	5.665631	0.917010	11	28	3	3	2.588190e-01	-9.659258e-01	335.121250	247.245931	3	37.79	0.00	57
2024-03-28	12	-85.50	0	True	5.665631	0.082278	12	28	3	3	1.224647e-16	-1.000000e+00	331.176250	253.352623	3	6.50	0.00	57
2024-03-28	13	-84.50	0	True	5.665631	-0.011696	13	28	3	3	-2.588190e-01	-9.659258e-01	318.088750	266.594621	3	0.00	1.00	57
2024-03-28	14	-75.50	0	True	5.665631	-0.106509	14	28	3	3	-5.000000e-01	-8.660254e-01	305.665000	277.940789	3	0.00	9.00	57
2024-03-28	15	134.31	0	True	4.900151	-2.778940	15	28	3	3	-7.071068e-01	-7.071068e-01	302.572917	279.477059	3	0.00	209.81	56
2024-03-28	16	340.60	0	True	5.830709	1.535924	16	28	3	3	-8.660254e-01	-5.000000e-01	307.965000	278.885066	3	0.00	206.29	56
2024-03-28	17	392.41	0	True	5.972307	0.152114	17	28	3	3	-9.659258e-01	-2.588190e-01	311.017500	279.413242	3	0.00	51.81	56
2024-03-28	18	457.70	0	True	6.126214	0.166382	18	28	3	3	-1.000000e+00	-1.836970e-16	315.366250	280.908619	3	0.00	65.29	56
2024-03-28	19	393.06	0	True	5.973962	-0.141228	19	28	3	3	-9.659258e-01	2.588190e-01	320.890833	281.085800	3	64.64	0.00	55
2024-03-28	20	365.20	0	True	5.900445	-0.070880	20	28	3	3	-8.660254e-01	5.000000e-01	324.553333	281.065784	3	27.86	0.00	56
2024-03-28	21	213.88	0	True	5.365415	-0.414348	21	28	3	3	-7.071068e-01	7.071068e-01	324.422917	281.118576	3	151.32	0.00	60
2024-03-28	22	23.50	0	True	3.157000	-0.890125	22	28	3	3	-5.000000e-01	-8.660254e-01	311.820833	287.748139	3	190.38	0.00	68

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-03-28	23	-61.50	0	True	3.157000	-3.617021	23	28	3	3	-2.588190e-01	9.659258e-01	295.083333	297.541843	3	85.00	0.00	71
2024-03-29	0	-24.50	0	True	3.157000	-0.601626	0	29	4	3	0.000000e+00	1.000000e+00	283.456667	304.563969	4	0.00	37.00	68
2024-03-29	1	75.77	0	True	4.327702	-4.092653	1	29	4	3	2.588190e-01	9.659258e-01	274.975000	307.504122	4	0.00	100.27	68
2024-03-29	2	83.06	0	True	4.419563	0.096212	2	29	4	3	5.000000e-01	8.660254e-01	263.747500	309.462706	4	0.00	7.29	68
2024-03-29	3	77.40	0	True	4.348987	-0.068144	3	29	4	3	7.071068e-01	7.071068e-01	251.506250	310.835478	4	5.66	0.00	68
2024-03-29	4	250.14	0	True	5.522021	2.231783	4	29	4	3	8.660254e-01	5.000000e-01	242.705000	307.608585	4	0.00	172.74	68
2024-03-29	5	374.25	0	True	5.924924	0.496162	5	29	4	3	9.659258e-01	2.588190e-01	229.424583	293.898356	4	0.00	124.11	68
2024-03-29	6	378.21	0	True	5.935450	0.010581	6	29	4	3	1.000000e+00	6.123234e-17	210.110417	265.796211	4	0.00	3.96	68
2024-03-29	7	309.69	0	True	5.735572	-0.181169	7	29	4	3	9.659258e-01	-2.588190e-01	192.643750	243.020594	4	68.52	0.00	66
2024-03-29	8	46.28	0	True	3.834710	-0.850560	8	29	4	3	8.660254e-01	-5.000000e-01	156.355000	189.183410	4	263.41	0.00	77
2024-03-29	9	-93.50	0	True	3.834710	-3.020311	9	29	4	3	7.071068e-01	-7.071068e-01	140.427083	193.591161	4	139.78	0.00	57
2024-03-29	10	-80.00	0	True	3.834710	-0.144385	10	29	4	3	5.000000e-01	-8.660254e-01	138.810833	195.327678	4	0.00	13.50	43
2024-03-29	11	-85.00	0	True	3.834710	0.062500	11	29	4	3	2.588190e-01	-9.659258e-01	138.560833	195.622193	4	5.00	0.00	42
2024-03-29	12	-100.00	0	True	3.834710	0.176471	12	29	4	3	1.224647e-16	-1.000000e+00	137.956667	196.365257	4	15.00	0.00	42
2024-03-29	13	-85.00	0	True	3.834710	-0.150000	13	29	4	3	-2.588190e-01	-9.659258e-01	137.935833	196.389909	4	0.00	15.00	42
2024-03-29	14	-90.00	0	True	3.834710	0.058824	14	29	4	3	-5.000000e-01	-8.660254e-01	137.331667	197.096098	4	5.00	0.00	42
2024-03-29	15	40.08	0	True	3.690877	-1.445333	15	29	4	3	-7.071068e-01	-7.071068e-01	133.405417	198.094931	4	0.00	130.08	42
2024-03-29	16	320.18	0	True	5.768883	6.988523	16	29	4	3	-8.660254e-01	-5.000000e-01	132.554583	197.208190	4	0.00	280.10	42
2024-03-29	17	396.07	0	True	5.981591	0.237023	17	29	4	3	-9.659258e-01	-2.588190e-01	132.707083	197.419173	4	0.00	75.89	42
2024-03-29	18	416.25	0	True	6.031286	0.050951	18	29	4	3	-1.000000e+00	-1.836970e-16	130.980000	194.613797	4	0.00	20.18	42
2024-03-29	19	378.29	0	True	5.935661	-0.091195	19	29	4	3	-9.659258e-01	-2.588190e-01	130.364583	193.770529	4	37.96	0.00	41
2024-03-29	20	319.65	0	True	5.767227	-0.155013	20	29	4	3	-8.660254e-01	-5.000000e-01	128.466667	191.581094	4	58.64	0.00	42
2024-03-29	21	40.15	0	True	3.692622	-0.874394	21	29	4	3	-7.071068e-01	-7.071068e-01	121.227917	191.495609	4	279.50	0.00	48
2024-03-29	22	-3.27	0	True	3.692622	-1.081445	22	29	4	3	-5.000000e-01	-8.660254e-01	120.112500	192.166390	4	43.42	0.00	41
2024-03-29	23	10.40	0	True	2.341806	-4.180428	23	29	4	3	-2.588190e-01	-9.659258e-01	123.108333	189.757342	4	0.00	13.67	38
2024-03-30	0	36.85	1	False	3.606856	2.543269	0	30	5	3	0.000000e+00	1.000000e+00	125.664583	188.088321	5	0.00	26.45	38
2024-03-30	1	140.12	1	False	4.942499	2.802442	1	30	5	3	2.588190e-01	9.659258e-01	128.345833	187.804585	5	0.00	103.27	38
2024-03-30	2	237.45	1	False	5.469957	0.694619	2	30	5	3	5.000000e-01	8.660254e-01	134.778750	188.827350	5	0.00	97.33	38
2024-03-30	3	336.14	1	False	5.817528	0.415624	3	30	5	3	7.071068e-01	7.071068e-01	145.559583	192.754322	5	0.00	98.69	38
2024-03-30	4	363.97	1	False	5.897071	0.082793	4	30	5	3	8.660254e-01	5.000000e-01	150.302500	196.797559	5	0.00	27.83	38
2024-03-30	5	377.24	1	False	5.932882	0.036459	5	30	5	3	9.659258e-01	2.588190e-01	150.427083	196.946384	5	0.00	13.27	38
2024-03-30	6	393.02	1	False	5.973861	0.041830	6	30	5	3	1.000000e+00	6.123234e-17	151.044167	197.712827	5	0.00	15.78	38
2024-03-30	7	210.57	1	False	5.349818	-0.464226	7	30	5	3	9.659258e-01	-2.588190e-01	146.914167	195.275033	5	182.45	0.00	42
2024-03-30	8	-80.00	1	False	5.349818	-1.379921	8	30	5	3	8.660254e-01	-5.000000e-01	141.652500	199.754430	5	290.57	0.00	44
2024-03-30	9	-89.58	1	False	5.349818	0.119750	9	30	5	3	7.071068e-01	-7.071068e-01	141.815833	199.555296	5	9.58	0.00	38
2024-03-30	10	-87.08	1	False	5.349818	-0.027908	10	30	5	3	5.000000e-01	-8.660254e-01	141.520833	199.902392	5	0.00	2.50	38
2024-03-30	11	-85.00	1	False	5.349818	-0.023886	11	30	5	3	2.588190e-01	-9.659258e-01	141.520833	199.902392	5	0.00	2.08	38
2024-03-30	12	-97.08	1	False	5.349818	0.142118	12	30	5	3	1.224647e-16	-1.000000e+00	141.642500	199.749834	5	12.08	0.00	38
2024-03-30	13	-85.00	1	False	5.349818	-0.124433	13	30	5	3	-2.588190e-01	-9.659258e-01	141.642500	199.749834	5	0.00	12.08	38
2024-03-30	14	-90.00	1	False	5.349818	0.058824	14	30	5	3	-5.000000e-01	-8.660254e-01	141.642500	199.749834	5	5.00	0.00	38
2024-03-30	15	-74.51	1	False	5.349818	-0.172111	15	30	5	3	-7.071068e-01	-7.071068e-01	136.867917	203.615127	5	0.00	15.49	38
2024-03-30	16	274.49	1	False	5.614915	-4.683935	16	30	5	3	-8.660254e-01	-5.000000e-01	134.964167	202.034144	5	0.00	349.00	38
2024-03-30	17	368.75	1	False	5.910119	0.343400	17	30	5	3	-9.659258e-01	-2.588190e-01	133.825833	200.570681	5	0.00	94.26	38
2024-03-30	18	398.43	1	False	5.987532	0.080488	18	30	5	3	-1.836970e-16	-1.000000e+00	133.083333	199.509886	5	0.00	29.68	38

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-03-30	19	315.12	1	False	5.752954	-0.209096	19	30	5	3	-9.659258e-01	2.588190e-01	130.451250	196.528706	5	83.31	0.00	40
2024-03-30	20	340.11	1	False	5.829269	0.079303	20	30	5	3	-8.660254e-01	5.000000e-01	131.303750	197.427414	5	0.00	24.99	37
2024-03-30	21	306.57	1	False	5.725446	-0.098615	21	30	5	3	-7.071068e-01	7.071068e-01	142.404583	199.557793	5	33.54	0.00	27
2024-03-30	22	306.20	1	False	5.724238	-0.001207	22	30	5	3	-5.000000e-01	8.660254e-01	155.299167	199.733906	5	0.37	0.00	25
2024-03-30	23	298.66	1	False	5.699306	-0.024624	23	30	5	3	-2.588190e-01	9.659258e-01	167.310000	199.308356	5	7.54	0.00	26
2024-03-31	0	154.62	1	False	5.040970	-0.482288	0	31	6	3	0.000000e+00	1.000000e+00	172.217083	197.397326	6	144.04	0.00	32
2024-03-31	1	-42.58	1	False	5.040970	-1.275385	1	31	6	3	2.588190e-01	9.659258e-01	164.604583	202.154478	6	197.20	0.00	40
2024-03-31	2	-80.00	1	False	5.040970	0.878816	2	31	6	3	5.000000e-01	8.660254e-01	151.377500	207.495832	6	37.42	0.00	41
2024-03-31	3	-80.00	1	False	5.040970	0.000000	3	31	6	3	7.071068e-01	7.071068e-01	134.038333	208.768315	6	0.00	0.00	41
2024-03-31	4	-80.00	1	False	5.040970	0.000000	4	31	6	3	8.660254e-01	5.000000e-01	115.539583	207.172241	6	0.00	0.00	41
2024-03-31	5	-48.62	1	False	5.040970	-0.392250	5	31	6	3	9.659258e-01	2.588190e-01	97.795417	201.954847	6	0.00	31.38	41
2024-03-31	6	106.26	1	False	4.665889	-3.185520	6	31	6	3	1.000000e+00	6.123234e-17	85.847083	191.964702	6	0.00	154.88	41
2024-03-31	7	-61.35	1	False	4.665889	-1.577357	7	31	6	3	9.659258e-01	-2.588190e-01	74.517083	192.307566	6	167.61	0.00	41
2024-03-31	8	-80.00	1	False	4.665889	0.303993	8	31	6	3	8.660254e-01	-5.000000e-01	74.517083	192.307566	6	18.65	0.00	29
2024-03-31	9	-85.98	1	False	4.665889	0.074750	9	31	6	3	7.071068e-01	-7.071068e-01	74.667083	192.175364	6	5.98	0.00	29
2024-03-31	10	-80.00	1	False	4.665889	-0.069551	10	31	6	3	5.000000e-01	-8.660254e-01	74.962083	191.921544	6	0.00	5.98	29
2024-03-31	11	-85.00	1	False	4.665889	0.062500	11	31	6	3	2.588190e-01	-9.659258e-01	74.962083	191.921544	6	5.00	0.00	29
2024-03-31	12	-90.28	1	False	4.665889	0.062118	12	31	6	3	1.224647e-16	1.000000e+00	75.245417	191.661359	6	5.28	0.00	29
2024-03-31	13	-80.00	1	False	4.665889	-0.113868	13	31	6	3	-2.588190e-01	-9.659258e-01	75.453750	191.482235	6	0.00	10.28	29
2024-03-31	14	-80.00	1	False	4.665889	0.000000	14	31	6	3	-5.000000e-01	-8.660254e-01	75.870417	191.117085	6	0.00	0.00	29
2024-03-31	15	-14.50	1	False	4.665889	-0.818750	15	31	6	3	-7.071068e-01	-7.071068e-01	78.370833	189.449376	6	0.00	65.50	29
2024-03-31	16	325.43	1	False	5.785147	-23.443448	16	31	6	3	-8.660254e-01	-5.000000e-01	80.493333	192.010179	6	0.00	339.93	29
2024-03-31	17	440.90	1	False	6.088818	0.354823	17	31	6	3	-9.659258e-01	-2.588190e-01	83.499583	197.213861	6	0.00	115.47	29
2024-03-31	18	461.95	1	False	6.135457	0.047743	18	31	6	3	-1.000000e+00	-1.836970e-16	86.146250	201.992412	6	0.00	21.05	29
2024-03-31	19	370.12	1	False	5.913827	-0.198788	19	31	6	3	-9.659258e-01	2.588190e-01	88.437917	204.992849	6	91.83	0.00	29
2024-03-31	20	374.88	1	False	5.926606	0.012861	20	31	6	3	-8.660254e-01	5.000000e-01	89.886667	206.962234	6	0.00	4.76	29
2024-03-31	21	291.02	1	False	5.673392	-0.223698	21	31	6	3	-7.071068e-01	7.071068e-01	89.238750	206.277599	6	83.86	0.00	31
2024-03-31	22	340.20	1	False	5.829534	0.168992	22	31	6	3	-5.000000e-01	8.660254e-01	90.655417	207.942456	6	0.00	49.18	31
2024-03-31	23	399.64	1	False	5.990564	0.174721	23	31	6	3	-2.588190e-01	9.659258e-01	94.862917	213.287129	6	0.00	59.44	31
2024-04-01	0	422.65	0	True	6.046544	0.057577	0	1	0	4	0.000000e+00	1.000000e+00	106.030833	223.332693	0	0.00	23.01	25
2024-04-01	1	393.20	0	True	5.974318	-0.069679	1	1	0	4	2.588190e-01	9.659258e-01	124.188333	228.382839	0	29.45	0.00	18
2024-04-01	2	406.50	0	True	6.007584	0.033825	2	1	0	4	5.000000e-01	8.660254e-01	144.459167	231.046375	0	0.00	13.30	16
2024-04-01	3	405.81	0	True	6.005885	-0.001697	3	1	0	4	7.071068e-01	7.071068e-01	164.701250	231.806175	0	0.69	0.00	17
2024-04-01	4	378.41	0	True	5.935978	-0.067519	4	1	0	4	8.660254e-01	5.000000e-01	183.801667	229.642565	0	27.40	0.00	18
2024-04-01	5	386.10	0	True	5.956096	0.020322	5	1	0	4	9.659258e-01	2.588190e-01	201.915000	227.648836	0	0.00	7.69	18
2024-04-01	6	396.00	0	True	5.981414	0.025641	6	1	0	4	1.000000e+00	6.123234e-17	213.987500	230.025807	0	0.00	9.90	18
2024-04-01	7	330.25	0	True	5.799850	-0.166035	7	1	0	4	9.659258e-01	-2.588190e-01	230.304167	223.440457	0	65.75	0.00	13
2024-04-01	8	50.95	0	True	3.930845	-0.845723	8	1	0	4	8.660254e-01	-5.000000e-01	235.760417	217.040812	0	279.30	0.00	24
2024-04-01	9	-85.00	0	True	3.930845	-2.668302	9	1	0	4	7.071068e-01	-7.071068e-01	235.801250	216.977732	0	135.95	0.00	30
2024-04-01	10	-80.00	0	True	3.930845	-0.058824	10	1	0	4	5.000000e-01	-8.660254e-01	235.801250	216.977732	0	0.00	5.00	30
2024-04-01	11	-80.00	0	True	3.930845	0.000000	11	1	0	4	2.588190e-01	-9.659258e-01	236.009583	216.658484	0	0.00	0.00	29
2024-04-01	12	-80.00	0	True	3.930845	0.000000	12	1	0	4	1.224647e-16	-1.000000e+00	236.437917	215.994508	0	0.00	0.00	29
2024-04-01	13	-46.44	0	True	3.930845	-0.419500	13	1	0	4	-2.588190e-01	-9.659258e-01	237.836250	213.955854	0	0.00	33.56	29
2024-04-01	14	-47.50	0	True	3.930845	0.022825	14	1	0	4	-5.000000e-01	-8.660254e-01	239.190417	211.950194	0	1.06	0.00	29

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su	
2024-04-01	15	56.15	0	True	4.028027	-2.182105	15	1	0	4	-7.071068e-01	-7.071068e-01	242.134167	208.739836	0	0.00	103.65	29	
2024-04-01	16	287.29	0	True	5.660492	4.116474	16	1	0	4	-8.660254e-01	-5.000000e-01	240.545000	208.222663	0	0.00	231.14	29	
2024-04-01	17	345.06	0	True	5.843718	0.201086	17	1	0	4	-9.659258e-01	-2.588190e-01	236.551667	205.108892	0	0.00	57.77	29	
2024-04-01	18	341.74	0	True	5.834050	-0.009622	18	1	0	4	-1.000000e+00	-1.836970e-16	231.542917	200.787601	0	3.32	0.00	29	
2024-04-01	19	304.30	0	True	5.718014	-0.109557	19	1	0	4	-9.659258e-01	2.588190e-01	228.800417	199.256190	0	37.44	0.00	27	
2024-04-01	20	308.59	0	True	5.732014	0.014098	20	1	0	4	-8.660254e-01	5.000000e-01	226.038333	197.595734	0	0.00	4.29	27	
2024-04-01	21	270.12	0	True	5.598866	-0.124664	21	1	0	4	-7.071068e-01	7.071068e-01	225.167500	197.342792	0	38.47	0.00	25	
2024-04-01	22	299.95	0	True	5.703616	0.110432	22	1	0	4	-5.000000e-01	8.660254e-01	223.490417	196.491899	0	0.00	29.83	25	
2024-04-01	23	304.57	0	True	5.718901	0.015403	23	1	0	4	-2.588190e-01	9.659258e-01	219.529167	193.725170	0	0.00	4.62	25	
2024-04-02	0	316.98	0	True	5.758839	0.040746	0	2	1	4	0.000000e+00	1.000000e+00	215.126250	190.074412	1	0.00	12.41	25	
2024-04-02	1	336.24	0	True	5.817825	0.060761	1	2	1	4	2.588190e-01	9.659258e-01	212.752917	188.099602	1	0.00	19.26	24	
2024-04-02	2	341.56	0	True	5.833523	0.015822	2	2	1	4	5.000000e-01	8.660254e-01	210.047083	185.642386	1	0.00	5.32	24	
2024-04-02	3	370.63	0	True	5.915204	0.085109	3	2	1	4	7.071068e-01	7.071068e-01	208.581250	184.162426	1	0.00	29.07	24	
2024-04-02	4	347.43	0	True	5.850563	-0.062596	4	2	1	4	8.660254e-01	5.000000e-01	207.290417	183.025368	1	23.20	0.00	24	
2024-04-02	5	355.40	0	True	5.873244	0.022940	5	2	1	4	9.659258e-01	2.588190e-01	206.011250	181.824674	1	0.00	7.97	24	
2024-04-02	6	379.28	0	True	5.938275	0.067192	6	2	1	4	1.000000e+00	6.123234e-17	205.314583	181.095646	1	0.00	23.88	24	
2024-04-02	7	353.50	0	True	5.867883	-0.067971	7	2	1	4	9.659258e-01	-2.588190e-01	206.283333	181.853632	1	25.78	0.00	22	
2024-04-02	8	372.34	0	True	5.919807	0.053296	8	2	1	4	8.660254e-01	-5.000000e-01	219.674583	181.751103	1	0.00	18.84	11	
2024-04-02	9	328.73	0	True	5.795237	-0.117124	9	2	1	4	7.071068e-01	-7.071068e-01	236.913333	170.893299	1	43.61	0.00	7.2	
2024-04-02	10	316.96	0	True	5.758776	-0.035804	10	2	1	4	5.000000e-01	-8.660254e-01	253.453333	157.578364	1	11.77	0.00	7.6	
2024-04-02	11	301.66	0	True	5.709301	-0.048271	11	2	1	4	2.588190e-01	-9.659258e-01	269.355833	140.832162	1	15.30	0.00	8.2	
2024-04-02	12	284.15	0	True	5.649502	-0.058045	12	2	1	4	1.224647e-16	-1.000000e+00	284.528750	119.567918	1	17.51	0.00	9.0	
2024-04-02	13	285.11	0	True	5.652875	0.003378	13	2	1	4	-2.588190e-01	-9.659258e-01	298.343333	96.616454	1	0.00	0.96	9.0	
2024-04-02	14	296.75	0	True	5.692890	0.040826	14	2	1	4	-5.000000e-01	-8.660254e-01	312.687083	62.608547	1	0.00	11.64	9.0	
2024-04-02	15	328.62	0	True	5.794902	0.107397	15	2	1	4	-7.071068e-01	-7.071068e-01	324.040000	30.578016	1	0.00	31.87	9.0	
2024-04-02	16	330.88	0	True	5.801756	0.006877	16	2	1	4	-8.660254e-01	-5.000000e-01	325.856250	29.578487	1	0.00	2.26	9.0	
2024-04-02	17	327.84	0	True	5.792526	-0.009188	17	2	1	4	-9.659258e-01	-2.588190e-01	325.138750	29.299944	1	3.04	0.00	9.1	
2024-04-02	18	337.44	0	True	5.821388	0.029283	18	2	1	4	-1.000000e+00	-1.836970e-16	324.959583	29.207015	1	0.00	9.60	9.0	
2024-04-02	19	316.01	0	True	5.755774	-0.063508	19	2	1	4	-9.659258e-01	-2.588190e-01	2.588190e-01	325.447500	28.943503	1	21.43	0.00	8.2
2024-04-02	20	307.66	0	True	5.728995	-0.026423	20	2	1	4	-8.660254e-01	-5.000000e-01	325.408750	28.967666	1	8.35	0.00	8.6	
2024-04-02	21	293.25	0	True	5.681025	-0.046837	21	2	1	4	-7.071068e-01	-7.071068e-01	326.372500	27.390047	1	14.41	0.00	7.6	
2024-04-02	22	300.69	0	True	5.706080	0.025371	22	2	1	4	-5.000000e-01	-8.660254e-01	326.403333	27.359409	1	0.00	7.44	7.6	
2024-04-02	23	304.17	0	True	5.717587	0.011573	23	2	1	4	-2.588190e-01	-9.659258e-01	326.386667	27.373406	1	0.00	3.48	7.6	
2024-04-03	0	294.44	0	True	5.685075	-0.031989	0	3	2	4	0.000000e+00	1.000000e+00	325.447500	28.087528	2	9.73	0.00	8.0	
2024-04-03	1	281.12	0	True	5.638782	-0.045238	1	3	2	4	2.588190e-01	9.659258e-01	323.150833	29.390008	2	13.32	0.00	8.6	
2024-04-03	2	266.30	0	True	5.584623	-0.052718	2	3	2	4	5.000000e-01	8.660254e-01	320.015000	31.293760	2	14.82	0.00	9.2	
2024-04-03	3	276.63	0	True	5.622681	0.038791	3	3	2	4	7.071068e-01	7.071068e-01	316.098333	30.557217	2	0.00	10.33	9.2	
2024-04-03	4	278.49	0	True	5.629382	0.006724	4	3	2	4	8.660254e-01	5.000000e-01	313.225833	30.723722	2	0.00	1.86	8.2	
2024-04-03	5	283.24	0	True	5.646295	0.017056	5	3	2	4	9.659258e-01	2.588190e-01	310.219167	29.937843	2	0.00	4.75	8.2	
2024-04-03	6	288.10	0	True	5.663308	0.017159	6	3	2	4	1.000000e+00	6.123234e-17	306.420000	26.365131	2	0.00	4.86	8.2	
2024-04-03	7	289.02	0	True	5.666496	0.003193	7	3	2	4	9.659258e-01	-2.588190e-01	303.733333	24.584159	2	0.00	0.92	7.2	
2024-04-03	8	292.51	0	True	5.678499	0.012075	8	3	2	4	8.660254e-01	-5.000000e-01	300.407083	19.841014	2	0.00	3.49	7.2	
2024-04-03	9	265.25	0	True	5.580673	-0.093193	9	3	2	4	7.071068e-01	-7.071068e-01	297.762083	20.130274	2	27.26	0.00	6.5	
2024-04-03	10	185.76	0	True	5.224456	-0.299680	10	3	2	4	5.000000e-01	-8.660254e-01	292.295417	30.057136	2	79.49	0.00	9.2	

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-04-03	11	-2.67	0	True	5.224456	-1.014373	11	3	2	4	2.588190e-01	-9.659258e-01	279.615000	67.191094	2	188.43	0.00	16
2024-04-03	12	77.86	0	True	4.354912	-30.161049	12	3	2	4	1.224647e-16	-1.000000e+00	271.019583	78.780973	2	0.00	80.53	15
2024-04-03	13	285.24	0	True	5.653331	2.663499	13	3	2	4	-2.588190e-01	-9.659258e-01	271.025000	78.781988	2	0.00	207.38	15
2024-04-03	14	287.27	0	True	5.660423	0.007117	14	3	2	4	-5.000000e-01	-8.660254e-01	270.630000	78.671087	2	0.00	2.03	15
2024-04-03	15	305.44	0	True	5.721753	0.063251	15	3	2	4	-7.071068e-01	-7.071068e-01	269.664167	78.068177	2	0.00	18.17	15
2024-04-03	16	339.93	0	True	5.828740	0.112919	16	3	2	4	-8.660254e-01	-5.000000e-01	270.041250	78.397877	2	0.00	34.49	15
2024-04-03	17	335.56	0	True	5.815801	-0.012856	17	3	2	4	-9.659258e-01	-2.588190e-01	270.362917	78.660733	2	4.37	0.00	15
2024-04-03	18	350.72	0	True	5.859988	0.045178	18	3	2	4	-1.000000e+00	-1.836970e-16	270.916250	79.197971	2	0.00	15.16	15
2024-04-03	19	339.58	0	True	5.827710	-0.031763	19	3	2	4	-9.659258e-01	2.588190e-01	271.898333	79.924270	2	11.14	0.00	15
2024-04-03	20	337.27	0	True	5.820884	-0.006803	20	3	2	4	-8.660254e-01	5.000000e-01	273.132083	80.724833	2	2.31	0.00	15
2024-04-03	21	326.28	0	True	5.787756	-0.032585	21	3	2	4	-7.071068e-01	7.071068e-01	274.508333	81.361775	2	10.99	0.00	15
2024-04-03	22	339.87	0	True	5.828563	0.041651	22	3	2	4	-5.000000e-01	8.660254e-01	276.140833	82.297628	2	0.00	13.59	15
2024-04-03	23	338.98	0	True	5.825941	-0.002619	23	3	2	4	-2.588190e-01	9.659258e-01	277.591250	83.115773	2	0.89	0.00	15
2024-04-04	0	367.99	2	True	5.908056	0.085580	0	4	3	4	0.000000e+00	1.000000e+00	280.655833	85.096360	3	0.00	29.01	14
2024-04-04	1	373.12	2	True	5.921900	0.013941	1	4	3	4	2.588190e-01	9.659258e-01	284.489167	87.165191	3	0.00	5.13	14
2024-04-04	2	362.57	2	True	5.893218	-0.028275	2	4	3	4	5.000000e-01	8.660254e-01	288.500417	88.496703	3	10.55	0.00	13
2024-04-04	3	356.23	2	True	5.875577	-0.017486	3	4	3	4	7.071068e-01	7.071068e-01	291.817083	89.518206	3	6.34	0.00	14
2024-04-04	4	360.81	2	True	5.888352	0.012857	4	4	3	4	8.660254e-01	5.000000e-01	295.247083	90.556436	3	0.00	4.58	14
2024-04-04	5	362.50	2	True	5.893024	0.004684	5	4	3	4	9.659258e-01	2.588190e-01	298.549583	91.539441	3	0.00	1.69	14
2024-04-04	6	373.00	2	True	5.921578	0.028966	6	4	3	4	1.000000e+00	6.123234e-17	302.087083	92.750514	3	0.00	10.50	14
2024-04-04	7	331.52	2	True	5.803688	-0.111206	7	4	3	4	9.659258e-01	-2.588190e-01	303.857917	92.895785	3	41.48	0.00	15
2024-04-04	8	41.58	2	True	3.727619	-0.874578	8	4	3	4	8.660254e-01	-5.000000e-01	293.402500	107.241858	3	289.94	0.00	28
2024-04-04	9	-80.00	2	True	3.727619	-2.924002	9	4	3	4	7.071068e-01	-7.071068e-01	279.017083	131.577233	3	121.58	0.00	31
2024-04-04	10	-80.00	2	True	3.727619	0.000000	10	4	3	4	5.000000e-01	-8.660254e-01	267.943750	149.701530	3	0.00	0.00	28
2024-04-04	11	-80.00	2	True	3.727619	0.000000	11	4	3	4	2.588190e-01	-9.659258e-01	264.721667	156.458981	3	0.00	0.00	20
2024-04-04	12	-80.00	2	True	3.727619	0.000000	12	4	3	4	1.224647e-16	-1.000000e+00	258.144167	167.579172	3	0.00	0.00	20
2024-04-04	13	-80.00	2	True	3.727619	0.000000	13	4	3	4	-2.588190e-01	-9.659258e-01	242.925833	181.054023	3	0.00	0.00	20
2024-04-04	14	-85.00	2	True	3.727619	0.062500	14	4	3	4	-5.000000e-01	-8.660254e-01	227.414583	192.664096	3	5.00	0.00	21
2024-04-04	15	-6.10	2	True	3.727619	-0.928235	15	4	3	4	-7.071068e-01	-7.071068e-01	214.433750	197.610121	3	0.00	78.90	21
2024-04-04	16	212.01	2	True	5.356633	-35.755738	16	4	3	4	-8.660254e-01	-5.000000e-01	209.103750	195.794839	3	0.00	218.11	21
2024-04-04	17	345.54	2	True	5.845108	0.629829	17	4	3	4	-9.659258e-01	-2.588190e-01	209.519583	196.085468	3	0.00	133.53	20
2024-04-04	18	386.05	2	True	5.955967	0.117237	18	4	3	4	-1.836970e-16	-1.000000e+00	210.991667	197.320328	3	0.00	40.51	20
2024-04-04	19	372.25	2	True	5.919566	-0.035747	19	4	3	4	-9.659258e-01	2.588190e-01	212.352917	198.355959	3	13.80	0.00	20
2024-04-04	20	389.56	2	True	5.965018	0.046501	20	4	3	4	-8.660254e-01	5.000000e-01	214.531667	200.067504	3	0.00	17.31	20
2024-04-04	21	386.06	2	True	5.955993	-0.008984	21	4	3	4	-7.071068e-01	-7.071068e-01	217.022500	201.883147	3	3.50	0.00	20
2024-04-04	22	397.33	2	True	5.984767	0.029192	22	4	3	4	-5.000000e-01	8.660254e-01	219.416667	203.735574	3	0.00	11.27	20
2024-04-04	23	421.47	2	True	6.043749	0.060756	23	4	3	4	-2.588190e-01	9.659258e-01	222.853750	206.517171	3	0.00	24.14	20
2024-04-05	0	479.69	2	True	6.173140	0.138136	0	5	4	4	0.000000e+00	1.000000e+00	227.507917	211.137223	4	0.00	58.22	20
2024-04-05	1	448.03	2	True	6.104860	-0.066001	1	5	4	4	2.588190e-01	9.659258e-01	230.629167	213.918780	4	31.66	0.00	21
2024-04-05	2	454.86	2	True	6.119990	0.015245	2	5	4	4	5.000000e-01	8.660254e-01	234.474583	217.198047	4	0.00	6.83	21
2024-04-05	3	440.69	2	True	6.088342	-0.031152	3	5	4	4	7.071068e-01	7.071068e-01	237.993750	219.923702	4	14.17	0.00	21
2024-04-05	4	459.69	2	True	6.130552	0.043114	4	5	4	4	8.660254e-01	5.000000e-01	242.113750	223.225954	4	0.00	19.00	21
2024-04-05	5	503.62	2	True	6.221822	0.095564	5	5	4	4	9.659258e-01	2.588190e-01	247.993750	228.335079	4	0.00	43.93	21
2024-04-05	6	510.90	2	True	6.236174	0.014455	6	5	4	4	1.000000e+00	6.123234e-17	253.739583	233.298621	4	0.00	7.28	21

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-04-05	7	382.22	2	True	5.945996	-0.251869	7	5	4	4	9.659258e-01	-2.588190e-01	255.852083	234.261095	4	128.68	0.00	25
2024-04-05	8	111.05	2	True	4.709981	-0.709461	8	5	4	4	8.660254e-01	-5.000000e-01	258.746667	231.915842	4	271.17	0.00	24
2024-04-05	9	-80.00	2	True	4.709981	-1.720396	9	5	4	4	7.071068e-01	-7.071068e-01	258.746667	231.915842	4	191.05	0.00	27
2024-04-05	10	-80.00	2	True	4.709981	0.000000	10	5	4	4	5.000000e-01	-8.660254e-01	258.746667	231.915842	4	0.00	0.00	27
2024-04-05	11	-46.75	2	True	4.709981	-0.415625	11	5	4	4	2.588190e-01	-9.659258e-01	260.132083	229.894765	4	0.00	33.25	27
2024-04-05	12	-80.00	2	True	4.709981	0.711230	12	5	4	4	1.224647e-16	-1.000000e+00	260.132083	229.894765	4	33.25	0.00	28
2024-04-05	13	-80.00	2	True	4.709981	0.000000	13	5	4	4	-2.588190e-01	-9.659258e-01	260.132083	229.894765	4	0.00	0.00	28
2024-04-05	14	135.79	2	True	4.911110	-2.697375	14	5	4	4	-5.000000e-01	-8.660254e-01	269.331667	219.673720	4	0.00	215.79	28
2024-04-05	15	346.31	2	True	5.847334	1.550335	15	5	4	4	-7.071068e-01	-7.071068e-01	284.015417	212.110395	4	0.00	210.52	28
2024-04-05	16	391.77	2	True	5.970675	0.131270	16	5	4	4	-8.660254e-01	-5.000000e-01	291.505417	212.630392	4	0.00	45.46	28
2024-04-05	17	439.89	2	True	6.086525	0.122827	17	5	4	4	-9.659258e-01	-2.588190e-01	295.436667	214.536513	4	0.00	48.12	28
2024-04-05	18	427.60	2	True	6.058188	-0.027939	18	5	4	4	-1.000000e+00	-1.836970e-16	297.167917	215.465169	4	12.29	0.00	29
2024-04-05	19	400.44	2	True	5.992564	-0.063517	19	5	4	4	-9.659258e-01	2.588190e-01	298.342500	215.968515	4	27.16	0.00	29
2024-04-05	20	399.65	2	True	5.990589	-0.001973	20	5	4	4	-8.660254e-01	5.000000e-01	298.762917	216.163537	4	0.79	0.00	29
2024-04-05	21	373.56	2	True	5.923079	-0.065282	21	5	4	4	-7.071068e-01	7.071068e-01	298.242083	215.959017	4	26.09	0.00	30
2024-04-05	22	379.67	2	True	5.939302	0.016356	22	5	4	4	-5.000000e-01	8.660254e-01	297.506250	215.636563	4	0.00	6.11	30
2024-04-05	23	390.25	2	True	5.966788	0.027866	23	5	4	4	-2.588190e-01	9.659258e-01	296.205417	214.949307	4	0.00	10.58	30
2024-04-06	0	385.65	1	False	5.954930	-0.011787	0	6	5	4	0.000000e+00	1.000000e+00	292.287083	212.299928	5	4.60	0.00	30
2024-04-06	1	377.25	1	False	5.932908	-0.021781	1	6	5	4	2.588190e-01	9.659258e-01	289.337917	210.526573	5	8.40	0.00	29
2024-04-06	2	364.95	1	False	5.899760	-0.032604	2	6	5	4	5.000000e-01	8.660254e-01	285.591667	208.240650	5	12.30	0.00	30
2024-04-06	3	374.37	1	False	5.925245	0.025812	3	6	5	4	7.071068e-01	7.071068e-01	282.828333	206.525997	5	0.00	9.42	29
2024-04-06	4	389.85	1	False	5.965762	0.041349	4	6	5	4	8.660254e-01	5.000000e-01	279.918333	204.406783	5	0.00	15.48	29
2024-04-06	5	417.36	1	False	6.033949	0.070566	5	6	5	4	9.659258e-01	2.588190e-01	276.324167	201.032855	5	0.00	27.51	29
2024-04-06	6	438.73	1	False	6.083884	0.051203	6	6	5	4	1.000000e+00	6.123234e-17	273.317083	197.886618	5	0.00	21.37	29
2024-04-06	7	394.05	1	False	5.976478	-0.101839	7	6	5	4	9.659258e-01	-2.588190e-01	273.810000	198.184189	5	44.68	0.00	26
2024-04-06	8	170.70	1	False	5.139908	-0.566806	8	6	5	4	8.660254e-01	-5.000000e-01	276.295417	196.420465	5	223.35	0.00	24
2024-04-06	9	-80.00	1	False	5.139908	-1.468658	9	6	5	4	7.071068e-01	-7.071068e-01	276.295417	196.420465	5	250.70	0.00	26
2024-04-06	10	-80.00	1	False	5.139908	0.000000	10	6	5	4	5.000000e-01	-8.660254e-01	276.295417	196.420465	5	0.00	0.00	26
2024-04-06	11	-47.88	1	False	5.139908	-0.401500	11	6	5	4	2.588190e-01	-9.659258e-01	276.248333	196.501386	5	0.00	32.12	26
2024-04-06	12	-85.00	1	False	5.139908	0.775272	12	6	5	4	1.224647e-16	-1.000000e+00	276.040000	196.897758	5	37.12	0.00	26
2024-04-06	13	-50.50	1	False	5.139908	-0.405882	13	6	5	4	-2.588190e-01	-9.659258e-01	277.269167	194.657822	5	0.00	34.50	26
2024-04-06	14	14.71	1	False	2.688528	-1.291287	14	6	5	4	-5.000000e-01	-8.660254e-01	272.224167	199.980267	5	0.00	65.21	26
2024-04-06	15	293.57	1	False	5.682116	18.957172	15	6	5	4	-7.071068e-01	-7.071068e-01	270.026667	199.419757	5	0.00	278.86	26
2024-04-06	16	392.06	1	False	5.971415	0.335491	16	6	5	4	-8.660254e-01	-5.000000e-01	270.038750	199.427463	5	0.00	98.49	26
2024-04-06	17	445.77	1	False	6.099803	0.136994	17	6	5	4	-9.659258e-01	-2.588190e-01	270.283750	199.648689	5	0.00	53.71	26
2024-04-06	18	446.53	1	False	6.101507	0.001705	18	6	5	4	-1.000000e+00	-1.836970e-16	271.072500	200.333438	5	0.00	0.76	26
2024-04-06	19	395.08	1	False	5.979088	-0.115222	19	6	5	4	-9.659258e-01	-2.588190e-01	270.849167	200.185881	5	51.45	0.00	27
2024-04-06	20	394.79	1	False	5.978354	-0.000734	20	6	5	4	-8.660254e-01	5.000000e-01	270.646667	200.052340	5	0.29	0.00	27
2024-04-06	21	355.93	1	False	5.874734	-0.098432	21	6	5	4	-7.071068e-01	7.071068e-01	269.912083	199.690057	5	38.86	0.00	27
2024-04-06	22	318.51	1	False	5.763654	-0.105133	22	6	5	4	-5.000000e-01	-8.660254e-01	267.363750	198.615845	5	37.42	0.00	29
2024-04-06	23	309.06	1	False	5.733535	-0.029669	23	6	5	4	-2.588190e-01	-9.659258e-01	263.980333	197.117568	5	9.45	0.00	29
2024-04-07	0	309.93	0	False	5.736346	0.002815	0	7	6	4	0.000000e+00	1.000000e+00	260.825833	195.686280	6	0.00	0.87	29
2024-04-07	1	322.13	0	False	5.774955	0.039364	1	7	6	4	2.588190e-01	9.659258e-01	258.529167	194.580797	6	0.00	12.20	29
2024-04-07	2	326.09	0	False	5.787173	0.012293	2	7	6	4	5.000000e-01	8.660254e-01	256.910000	193.816917	6	0.00	3.96	28

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-04-07	3	338.86	0	False	5.825587	0.039161	3	7	6	4	7.071068e-01	7.071068e-01	255.430417	193.015132	6	0.00	12.77	28
2024-04-07	4	386.91	0	False	5.958192	0.141799	4	7	6	4	8.660254e-01	5.000000e-01	255.307917	192.927025	6	0.00	48.05	28
2024-04-07	5	448.36	0	False	6.105596	0.158822	5	7	6	4	9.659258e-01	2.588190e-01	256.599583	194.158993	6	0.00	61.45	28
2024-04-07	6	483.47	0	False	6.180989	0.078308	6	7	6	4	1.000000e+00	6.123234e-17	258.463750	196.187879	6	0.00	35.11	28
2024-04-07	7	420.39	0	False	6.041183	-0.130473	7	7	6	4	9.659258e-01	-2.588190e-01	259.561250	197.051119	6	63.08	0.00	29
2024-04-07	8	305.85	0	False	5.723095	-0.272461	8	7	6	4	8.660254e-01	-5.000000e-01	265.192500	196.331083	6	114.54	0.00	25
2024-04-07	9	2.86	0	False	1.050822	-0.990649	9	7	6	4	7.071068e-01	-7.071068e-01	268.645000	190.643073	6	302.99	0.00	27
2024-04-07	10	-18.75	0	False	1.050822	-7.555944	10	7	6	4	5.000000e-01	-8.660254e-01	271.197083	186.129478	6	21.61	0.00	28
2024-04-07	11	82.67	0	False	4.414857	-5.409067	11	7	6	4	2.588190e-01	-9.659258e-01	276.636667	178.135066	6	0.00	101.42	28
2024-04-07	12	-62.97	0	False	4.414857	-1.761703	12	7	6	4	1.224647e-16	-1.000000e+00	277.554583	176.237208	6	145.64	0.00	32
2024-04-07	13	47.87	0	False	3.868489	-1.760203	13	7	6	4	-2.588190e-01	-9.659258e-01	281.653333	169.282595	6	0.00	110.84	32
2024-04-07	14	202.88	0	False	5.312615	3.238145	14	7	6	4	-5.000000e-01	-8.660254e-01	289.493750	160.511803	6	0.00	155.01	32
2024-04-07	15	351.75	0	False	5.862921	0.733784	15	7	6	4	-7.071068e-01	-7.071068e-01	291.917917	161.014593	6	0.00	148.87	32
2024-04-07	16	399.12	0	False	5.989262	0.134670	16	7	6	4	-8.660254e-01	-5.000000e-01	292.212083	161.211832	6	0.00	47.37	32
2024-04-07	17	438.75	0	False	6.083930	0.099293	17	7	6	4	-9.659258e-01	-2.588190e-01	291.919583	160.927222	6	0.00	39.63	32
2024-04-07	18	474.15	0	False	6.161524	0.080684	18	7	6	4	-1.000000e+00	-1.836970e-16	293.070417	162.174877	6	0.00	35.40	32
2024-04-07	19	461.68	0	False	6.134872	-0.026300	19	7	6	4	-9.659258e-01	-2.588190e-01	295.845417	164.548699	6	12.47	0.00	31
2024-04-07	20	442.97	0	False	6.093502	-0.040526	20	7	6	4	-8.660254e-01	-5.000000e-01	297.852917	166.094944	6	18.71	0.00	31
2024-04-07	21	402.69	0	False	5.998167	-0.090932	21	7	6	4	-7.071068e-01	-7.071068e-01	299.801250	167.077171	6	40.28	0.00	31
2024-04-07	22	418.23	0	False	6.036032	0.038590	22	7	6	4	-5.000000e-01	-8.660254e-01	303.956250	168.793800	6	0.00	15.54	30
2024-04-07	23	425.75	0	False	6.053852	0.017981	23	7	6	4	-2.588190e-01	-9.659258e-01	308.818333	170.617968	6	0.00	7.52	29
2024-04-08	0	352.39	0	True	5.864739	-0.172308	0	8	0	4	0.000000e+00	1.000000e+00	310.587500	170.849976	0	73.36	0.00	33
2024-04-08	1	353.40	0	True	5.867601	0.002866	1	8	0	4	2.588190e-01	9.659258e-01	311.890417	171.060930	0	0.00	1.01	33
2024-04-08	2	356.57	0	True	5.876531	0.008970	2	8	0	4	5.000000e-01	8.660254e-01	313.160417	171.283936	0	0.00	3.17	33
2024-04-08	3	371.40	0	True	5.917280	0.041591	3	8	0	4	7.071068e-01	7.071068e-01	314.516250	171.624660	0	0.00	14.83	33
2024-04-08	4	400.21	0	True	5.991989	0.077571	4	8	0	4	8.660254e-01	5.000000e-01	315.070417	171.889847	0	0.00	28.81	33
2024-04-08	5	590.10	0	True	6.380292	0.474476	5	8	0	4	9.659258e-01	2.588190e-01	320.976250	178.958194	0	0.00	189.89	33
2024-04-08	6	858.89	0	True	6.755641	0.455499	6	8	0	4	1.000000e+00	6.123234e-17	336.618750	207.853762	0	0.00	268.79	33
2024-04-08	7	384.13	0	True	5.950981	-0.552760	7	8	0	4	9.659258e-01	-2.588190e-01	335.107917	207.349548	0	474.76	0.00	50
2024-04-08	8	332.59	0	True	5.806911	-0.134173	8	8	0	4	8.660254e-01	-5.000000e-01	336.222083	207.257320	0	51.54	0.00	47
2024-04-08	9	120.50	0	True	4.791650	-0.637692	9	8	0	4	7.071068e-01	-7.071068e-01	341.123750	200.304967	0	212.09	0.00	43
2024-04-08	10	-51.06	0	True	4.791650	-1.423734	10	8	0	4	5.000000e-01	-8.660254e-01	339.777500	202.920343	0	171.56	0.00	50
2024-04-08	11	-80.00	0	True	4.791650	0.566784	11	8	0	4	2.588190e-01	-9.659258e-01	332.999583	214.280356	0	28.94	0.00	51
2024-04-08	12	-80.00	0	True	4.791650	0.000000	12	8	0	4	1.224647e-16	-1.000000e+00	332.290000	215.672285	0	0.00	0.00	45
2024-04-08	13	-80.00	0	True	4.791650	0.000000	13	8	0	4	-2.588190e-01	-9.659258e-01	326.962083	224.406591	0	0.00	0.00	45
2024-04-08	14	-44.61	0	True	4.791650	-0.442375	14	8	0	4	-5.000000e-01	-8.660254e-01	316.650000	235.755827	0	0.00	35.39	45
2024-04-08	15	189.21	0	True	5.242858	-5.241426	15	8	0	4	-7.071068e-01	-7.071068e-01	309.877500	237.034833	0	0.00	233.82	45
2024-04-08	16	281.65	0	True	5.640665	0.488558	16	8	0	4	-8.660254e-01	-5.000000e-01	304.982917	236.323689	0	0.00	92.44	45
2024-04-08	17	329.80	0	True	5.798486	0.170957	17	8	0	4	-9.659258e-01	-2.588190e-01	300.443333	234.683139	0	0.00	48.15	45
2024-04-08	18	341.33	0	True	5.832850	0.034961	18	8	0	4	-1.836970e-16	-294.909167	231.959021	0	0.00	11.53	45	
2024-04-08	19	325.44	0	True	5.785178	-0.046553	19	8	0	4	-9.659258e-01	-2.588190e-01	289.232500	229.352675	0	15.89	0.00	45
2024-04-08	20	332.55	0	True	5.806790	0.021847	20	8	0	4	-8.660254e-01	-5.000000e-01	284.631667	227.232318	0	0.00	7.11	44
2024-04-08	21	320.03	0	True	5.768415	-0.037648	21	8	0	4	-7.071068e-01	-7.071068e-01	281.187500	225.988137	0	12.52	0.00	43
2024-04-08	22	323.78	0	True	5.780064	0.011718	22	8	0	4	-5.000000e-01	-8.660254e-01	277.252083	224.314071	0	0.00	3.75	43

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-04-08	23	307.37	0	True	5.728052	-0.050683	23	8	0	4	-2.588190e-01	9.659258e-01	272.319583	222.198306	0	16.41	0.00	44
2024-04-09	0	331.46	0	True	5.803507	0.078375	0	9	1	4	0.000000e+00	1.000000e+00	271.447500	221.911269	1	0.00	24.09	40
2024-04-09	1	332.00	0	True	5.805135	0.001629	1	9	1	4	2.588190e-01	9.659258e-01	270.555833	221.610447	1	0.00	0.54	40
2024-04-09	2	330.70	0	True	5.801212	-0.003916	2	9	1	4	5.000000e-01	8.660254e-01	269.477917	221.236483	1	1.30	0.00	41
2024-04-09	3	330.00	0	True	5.799093	-0.002117	3	9	1	4	7.071068e-01	7.071068e-01	267.752917	220.567625	1	0.70	0.00	41
2024-04-09	4	337.12	0	True	5.820439	0.021576	4	9	1	4	8.660254e-01	5.000000e-01	265.124167	219.292621	1	0.00	7.12	41
2024-04-09	5	361.65	0	True	5.890677	0.072763	5	9	1	4	9.659258e-01	2.588190e-01	255.605417	209.303838	1	0.00	24.53	41
2024-04-09	6	382.50	0	True	5.946729	0.057652	6	9	1	4	1.000000e+00	6.123234e-17	235.755833	168.145903	1	0.00	20.85	41
2024-04-09	7	356.71	0	True	5.876923	-0.067425	7	9	1	4	9.659258e-01	-2.588190e-01	234.613333	167.184318	1	25.79	0.00	22
2024-04-09	8	316.03	0	True	5.755837	-0.114042	8	9	1	4	8.660254e-01	-5.000000e-01	233.923333	166.796092	1	40.68	0.00	21
2024-04-09	9	127.71	0	True	4.849762	-0.595893	9	9	1	4	7.071068e-01	-7.071068e-01	234.223750	166.589288	1	188.32	0.00	20
2024-04-09	10	239.10	0	True	5.476882	0.872210	10	9	1	4	5.000000e-01	-8.660254e-01	246.313750	155.119129	1	0.00	111.39	13
2024-04-09	11	181.50	0	True	5.201256	-0.240903	11	9	1	4	2.588190e-01	-9.659258e-01	257.209583	139.610578	1	57.60	0.00	14
2024-04-09	12	66.56	0	True	4.198104	-0.633278	12	9	1	4	1.224647e-16	-1.000000e+00	263.316250	126.840808	1	114.94	0.00	19
2024-04-09	13	156.39	0	True	5.052353	1.349609	13	9	1	4	-2.588190e-01	-9.659258e-01	273.165833	106.582569	1	0.00	89.83	19
2024-04-09	14	288.01	0	True	5.662995	0.841614	14	9	1	4	-5.000000e-01	-8.660254e-01	287.025000	82.331632	1	0.00	131.62	19
2024-04-09	15	355.50	0	True	5.873525	0.234332	15	9	1	4	-7.071068e-01	-7.071068e-01	293.953750	80.723445	1	0.00	67.49	19
2024-04-09	16	390.57	0	True	5.967607	0.098650	16	9	1	4	-8.660254e-01	-5.000000e-01	298.492083	83.030460	1	0.00	35.07	19
2024-04-09	17	424.53	0	True	6.050983	0.086950	17	9	1	4	-9.659258e-01	-2.588190e-01	302.439167	86.751715	1	0.00	33.96	19
2024-04-09	18	432.74	0	True	6.070137	0.019339	18	9	1	4	-1.000000e+00	-1.836970e-16	306.247917	90.460761	1	0.00	8.21	19
2024-04-09	19	419.66	0	True	6.039445	-0.030226	19	9	1	4	-9.659258e-01	-2.588190e-01	310.173750	93.328896	1	13.08	0.00	19
2024-04-09	20	426.00	0	True	6.054439	0.015107	20	9	1	4	-8.660254e-01	-5.000000e-01	314.067500	96.208031	1	0.00	6.34	19
2024-04-09	21	393.56	0	True	5.975234	-0.076150	21	9	1	4	-7.071068e-01	-7.071068e-01	317.131250	97.567343	1	32.44	0.00	20
2024-04-09	22	384.97	0	True	5.953165	-0.021826	22	9	1	4	-5.000000e-01	-8.660254e-01	319.680833	98.543252	1	8.59	0.00	20
2024-04-09	23	379.48	0	True	5.938802	-0.014261	23	9	1	4	-2.588190e-01	-9.659258e-01	322.685417	99.248369	1	5.49	0.00	20
2024-04-10	0	369.45	0	True	5.912015	-0.026431	0	10	2	4	0.000000e+00	1.000000e+00	324.268333	99.696341	2	10.03	0.00	20
2024-04-10	1	364.82	0	True	5.899404	-0.012532	1	10	2	4	2.588190e-01	9.659258e-01	325.635833	100.031532	2	4.63	0.00	20
2024-04-10	2	360.19	0	True	5.886632	-0.012691	2	10	2	4	5.000000e-01	8.660254e-01	326.864583	100.277263	2	4.63	0.00	21
2024-04-10	3	353.93	0	True	5.869099	-0.017380	3	10	2	4	7.071068e-01	7.071068e-01	327.861667	100.428651	2	6.26	0.00	21
2024-04-10	4	361.94	0	True	5.891478	0.022632	4	10	2	4	8.660254e-01	5.000000e-01	328.895833	100.655670	2	0.00	8.01	21
2024-04-10	5	386.99	0	True	5.958399	0.069210	5	10	2	4	9.659258e-01	2.588190e-01	329.951667	101.145894	2	0.00	25.05	21
2024-04-10	6	420.57	0	True	6.041611	0.086772	6	10	2	4	1.000000e+00	6.123234e-17	331.537917	102.297792	2	0.00	33.58	21
2024-04-10	7	384.92	0	True	5.953036	-0.084766	7	10	2	4	9.659258e-01	-2.588190e-01	332.713333	102.760620	2	35.65	0.00	21
2024-04-10	8	360.56	0	True	5.887658	-0.063286	8	10	2	4	8.660254e-01	-5.000000e-01	334.568750	102.848266	2	24.36	0.00	21
2024-04-10	9	272.04	0	True	5.605949	-0.245507	9	10	2	4	7.071068e-01	-7.071068e-01	340.582500	94.072117	2	88.52	0.00	16
2024-04-10	10	263.39	0	True	5.573636	-0.031797	10	10	2	4	5.000000e-01	-8.660254e-01	341.594583	93.058035	2	8.65	0.00	17
2024-04-10	11	281.75	0	True	5.641020	0.069707	11	10	2	4	2.588190e-01	-9.659258e-01	345.771667	87.652401	2	0.00	18.36	14
2024-04-10	12	198.23	0	True	5.289428	-0.296433	12	10	2	4	1.224647e-16	-1.000000e+00	351.257917	72.169701	2	83.52	0.00	13
2024-04-10	13	308.19	0	True	5.730716	0.554709	13	10	2	4	-2.588190e-01	-9.659258e-01	357.582917	59.969528	2	0.00	109.96	13
2024-04-10	14	343.85	0	True	5.840206	0.115708	14	10	2	4	-5.000000e-01	-8.660254e-01	359.909583	58.210338	2	0.00	35.66	13
2024-04-10	15	343.03	0	True	5.837818	-0.002385	15	10	2	4	-7.071068e-01	-8.660254e-01	359.390000	58.306982	2	0.82	0.00	13
2024-04-10	16	362.85	0	True	5.893990	0.057779	16	10	2	4	-8.660254e-01	-5.000000e-01	358.235000	57.935856	2	0.00	19.82	13
2024-04-10	17	365.37	0	True	5.900911	0.006945	17	10	2	4	-9.659258e-01	-2.588190e-01	355.770000	56.225869	2	0.00	2.52	13
2024-04-10	18	366.29	0	True	5.903425	0.002518	18	10	2	4	-1.836970e-16	-1.000000e+00	353.001250	53.857024	2	0.00	0.92	13

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-04-10	19	358.87	0	True	5.882960	-0.020257	19	10	2	4	-9.659258e-01	2.588190e-01	350.468333	51.982603	2	7.42	0.00	13
2024-04-10	20	363.16	0	True	5.894844	0.011954	20	10	2	4	-8.660254e-01	5.000000e-01	347.850000	49.537822	2	0.00	4.29	13
2024-04-10	21	357.11	0	True	5.878044	-0.016659	21	10	2	4	-7.071068e-01	7.071068e-01	346.331250	48.625852	2	6.05	0.00	12
2024-04-10	22	355.63	0	True	5.873891	-0.004144	22	10	2	4	-5.000000e-01	8.660254e-01	345.108750	47.976686	2	1.48	0.00	11
2024-04-10	23	344.60	0	True	5.842384	-0.031015	23	10	2	4	-2.588190e-01	9.659258e-01	343.655417	47.415242	2	11.03	0.00	12
2024-04-11	0	363.50	0	True	5.895779	0.054846	0	11	3	4	0.000000e+00	1.000000e+00	343.407500	47.289897	3	0.00	18.90	11
2024-04-11	1	341.03	0	True	5.831970	-0.061816	1	11	3	4	2.588190e-01	9.659258e-01	342.416250	47.070376	3	22.47	0.00	12
2024-04-11	2	357.07	0	True	5.877932	0.047034	2	11	3	4	5.000000e-01	8.660254e-01	342.286250	47.023438	3	0.00	16.04	12
2024-04-11	3	331.95	0	True	5.804984	-0.070350	3	11	3	4	7.071068e-01	7.071068e-01	341.370417	47.000841	3	25.12	0.00	13
2024-04-11	4	341.25	0	True	5.832615	0.028016	4	11	3	4	8.660254e-01	5.000000e-01	340.508333	46.796455	3	0.00	9.30	13
2024-04-11	5	384.47	0	True	5.951866	0.126652	5	11	3	4	9.659258e-01	2.588190e-01	340.403333	46.690333	3	0.00	43.22	13
2024-04-11	6	415.09	0	True	6.028495	0.079642	6	11	3	4	1.000000e+00	6.123234e-17	340.175000	46.292951	3	0.00	30.62	13
2024-04-11	7	345.76	0	True	5.845745	-0.167024	7	11	3	4	9.659258e-01	-2.588190e-01	338.543333	45.327331	3	69.33	0.00	14
2024-04-11	8	102.43	0	True	4.629180	-0.703754	8	11	3	4	8.660254e-01	-5.000000e-01	327.787917	65.853433	3	243.33	0.00	23
2024-04-11	9	-80.00	0	True	4.629180	-1.781021	9	11	3	4	7.071068e-01	-7.071068e-01	313.119583	105.863495	3	182.43	0.00	27
2024-04-11	10	-80.00	0	True	4.629180	0.000000	10	11	3	4	5.000000e-01	-8.660254e-01	298.811667	132.684590	3	0.00	0.00	27
2024-04-11	11	-45.80	0	True	4.629180	-0.427500	11	11	3	4	2.588190e-01	-9.659258e-01	285.163750	150.204981	3	0.00	34.20	27
2024-04-11	12	-80.00	0	True	4.629180	0.746725	12	11	3	4	1.224647e-16	-1.000000e+00	273.570833	167.003896	3	34.20	0.00	25
2024-04-11	13	11.96	0	True	2.481568	-1.149500	13	11	3	4	-2.588190e-01	-9.659258e-01	261.227917	175.085361	3	0.00	91.96	25
2024-04-11	14	138.31	0	True	4.929498	10.564381	14	11	3	4	-5.000000e-01	-8.660254e-01	252.663750	175.893304	3	0.00	126.35	25
2024-04-11	15	314.22	0	True	5.750093	1.271853	15	11	3	4	-7.071068e-01	-7.071068e-01	251.463333	175.347231	3	0.00	175.91	25
2024-04-11	16	383.42	0	True	5.949131	0.220228	16	11	3	4	-8.660254e-01	-5.000000e-01	252.320417	175.964537	3	0.00	69.20	25
2024-04-11	17	383.08	0	True	5.948244	-0.000887	17	11	3	4	-9.659258e-01	-2.588190e-01	253.058333	176.495562	3	0.34	0.00	25
2024-04-11	18	375.69	0	True	5.928764	-0.019291	18	11	3	4	-1.000000e+00	-1.836970e-16	253.450000	176.767982	3	7.39	0.00	25
2024-04-11	19	353.43	0	True	5.867685	-0.059251	19	11	3	4	-9.659258e-01	-2.588190e-01	253.223333	176.630361	3	22.26	0.00	26
2024-04-11	20	338.25	0	True	5.823785	-0.042951	20	11	3	4	-8.660254e-01	-5.000000e-01	252.185417	176.028425	3	15.18	0.00	26
2024-04-11	21	283.43	0	True	5.646965	-0.162069	21	11	3	4	-7.071068e-01	-7.071068e-01	249.115417	174.756851	3	54.82	0.00	28
2024-04-11	22	221.47	0	True	5.400287	-0.218608	22	11	3	4	-5.000000e-01	-8.660254e-01	243.525417	173.341578	3	61.96	0.00	31
2024-04-11	23	194.79	0	True	5.271922	-0.120468	23	11	3	4	-2.588190e-01	-9.659258e-01	237.283333	172.237438	3	26.68	0.00	31
2024-04-12	0	202.82	0	True	5.312319	0.041224	0	12	4	4	0.000000e+00	1.000000e+00	230.588333	170.229159	4	0.00	8.03	31
2024-04-12	1	254.75	0	True	5.540283	0.256040	1	12	4	4	2.588190e-01	9.659258e-01	226.993333	168.699563	4	0.00	51.93	30
2024-04-12	2	292.58	0	True	5.678738	0.148499	2	12	4	4	5.000000e-01	8.660254e-01	224.306250	167.043064	4	0.00	37.83	30
2024-04-12	3	295.32	0	True	5.688060	0.009365	3	12	4	4	7.071068e-01	7.071068e-01	222.780000	166.181897	4	0.00	2.74	29
2024-04-12	4	317.89	0	True	5.761705	0.076426	4	12	4	4	8.660254e-01	5.000000e-01	221.806667	165.524957	4	0.00	22.57	29
2024-04-12	5	370.65	0	True	5.915258	0.165969	5	12	4	4	9.659258e-01	2.588190e-01	221.230833	164.957542	4	0.00	52.76	29
2024-04-12	6	389.00	0	True	5.963579	0.049508	6	12	4	4	1.000000e+00	6.123234e-17	220.143750	163.705666	4	0.00	18.35	29
2024-04-12	7	334.41	0	True	5.812368	-0.140334	7	12	4	4	9.659258e-01	-2.588190e-01	219.670833	163.342998	4	54.59	0.00	29
2024-04-12	8	68.24	0	True	4.223031	-0.795939	8	12	4	4	8.660254e-01	-5.000000e-01	218.246250	164.554561	4	266.17	0.00	30
2024-04-12	9	-80.00	0	True	4.223031	-2.172333	9	12	4	4	7.071068e-01	-7.071068e-01	218.246250	164.554561	4	148.24	0.00	28
2024-04-12	10	-80.00	0	True	4.223031	0.000000	10	12	4	4	5.000000e-01	-8.660254e-01	218.246250	164.554561	4	0.00	0.00	28
2024-04-12	11	-80.00	0	True	4.223031	0.000000	11	12	4	4	2.588190e-01	-9.659258e-01	216.821250	167.069414	4	0.00	0.00	28
2024-04-12	12	-80.00	0	True	4.223031	0.000000	12	12	4	4	1.224647e-16	-1.000000e+00	216.821250	167.069414	4	0.00	0.00	27
2024-04-12	13	-24.20	0	True	4.223031	-0.697500	13	12	4	4	-2.588190e-01	-9.659258e-01	215.314583	169.147348	4	0.00	55.80	27
2024-04-12	14	-58.00	0	True	4.223031	1.396694	14	12	4	4	-5.000000e-01	-8.660254e-01	207.135000	177.569876	4	33.80	0.00	28

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-04-12	15	147.46	0	True	4.993557	-3.542414	15	12	4	4	-7.071068e-01	-7.071068e-01	200.186667	176.456622	4	0.00	205.46	28
2024-04-12	16	295.61	0	True	5.689041	1.004679	16	12	4	4	-8.660254e-01	-5.000000e-01	196.527917	173.375627	4	0.00	148.15	28
2024-04-12	17	342.57	0	True	5.836476	0.158858	17	12	4	4	-9.659258e-01	-2.588190e-01	194.840000	171.669263	4	0.00	46.96	28
2024-04-12	18	352.96	0	True	5.866355	0.030330	18	12	4	4	-1.000000e+00	-1.836970e-16	193.892917	170.688046	4	0.00	10.39	28
2024-04-12	19	361.78	0	True	5.891036	0.024989	19	12	4	4	-9.659258e-01	2.588190e-01	194.240833	171.035528	4	0.00	8.82	27
2024-04-12	20	343.75	0	True	5.839915	-0.049837	20	12	4	4	-8.660254e-01	5.000000e-01	194.470000	171.240434	4	18.03	0.00	27
2024-04-12	21	295.97	0	True	5.690258	-0.138996	21	12	4	4	-7.071068e-01	7.071068e-01	194.992500	171.542541	4	47.78	0.00	27
2024-04-12	22	290.47	0	True	5.671500	-0.018583	22	12	4	4	-5.000000e-01	8.660254e-01	197.867500	172.580658	4	5.50	0.00	25
2024-04-12	23	266.43	0	True	5.585112	-0.082762	23	12	4	4	-2.588190e-01	9.659258e-01	200.852500	173.143748	4	24.04	0.00	24
2024-04-13	0	354.37	1	False	5.870342	0.330068	0	13	5	4	0.000000e+00	1.000000e+00	207.167083	175.959259	5	0.00	87.94	24
2024-04-13	1	363.06	1	False	5.894568	0.024522	1	13	5	4	2.588190e-01	9.659258e-01	211.680000	178.601800	5	0.00	8.69	24
2024-04-13	2	361.75	1	False	5.890953	-0.003608	2	13	5	4	5.000000e-01	8.660254e-01	214.562083	180.511918	5	1.31	0.00	24
2024-04-13	3	365.58	1	False	5.901485	0.010587	3	13	5	4	7.071068e-01	7.071068e-01	217.489583	182.438029	5	0.00	3.83	24
2024-04-13	4	376.00	1	False	5.929589	0.028503	4	13	5	4	8.660254e-01	5.000000e-01	219.910833	184.205486	5	0.00	10.42	24
2024-04-13	5	387.35	1	False	5.959329	0.030186	5	13	5	4	9.659258e-01	2.588190e-01	220.606667	184.830141	5	0.00	11.35	24
2024-04-13	6	395.31	1	False	5.979670	0.020550	6	13	5	4	1.000000e+00	6.123234e-17	220.869583	185.084404	5	0.00	7.96	24
2024-04-13	7	382.71	1	False	5.947278	-0.031874	7	13	5	4	9.659258e-01	-2.588190e-01	222.882083	186.628803	5	12.60	0.00	23
2024-04-13	8	353.88	1	False	5.868958	-0.075331	8	13	5	4	8.660254e-01	-5.000000e-01	234.783750	185.442341	5	28.83	0.00	13
2024-04-13	9	182.34	1	False	5.205873	-0.484741	9	13	5	4	7.071068e-01	-7.071068e-01	245.714583	173.423052	5	171.54	0.00	14
2024-04-13	10	169.41	1	False	5.132322	-0.070911	10	13	5	4	5.000000e-01	-8.660254e-01	256.106667	160.010635	5	12.93	0.00	14
2024-04-13	11	187.35	1	False	5.232979	0.105897	11	13	5	4	2.588190e-01	-9.659258e-01	267.246250	144.110449	5	0.00	17.94	14
2024-04-13	12	85.80	1	False	4.452019	-0.542034	12	13	5	4	1.224647e-16	-1.000000e+00	274.154583	130.026298	5	101.55	0.00	19
2024-04-13	13	86.41	1	False	4.459103	0.007110	13	13	5	4	-2.588190e-01	-9.659258e-01	278.763333	120.610778	5	0.00	0.61	19
2024-04-13	14	72.86	1	False	4.288540	-0.156811	14	13	5	4	-5.000000e-01	-8.660254e-01	284.215833	106.903695	5	13.55	0.00	18
2024-04-13	15	319.55	1	False	5.766914	3.385808	15	13	5	4	-7.071068e-01	-7.071068e-01	291.386250	103.033466	5	0.00	246.69	18
2024-04-13	16	379.06	1	False	5.937695	0.186231	16	13	5	4	-8.660254e-01	-5.000000e-01	294.863333	104.578714	5	0.00	59.51	18
2024-04-13	17	385.70	1	False	5.955060	0.017517	17	13	5	4	-9.659258e-01	-2.588190e-01	296.660417	105.797620	5	0.00	6.64	18
2024-04-13	18	377.89	1	False	5.934603	-0.020249	18	13	5	4	-1.000000e+00	-1.836970e-16	297.699167	106.494508	5	7.81	0.00	18
2024-04-13	19	375.58	1	False	5.928471	-0.006113	19	13	5	4	-9.659258e-01	-2.588190e-01	298.274167	106.892059	5	2.31	0.00	18
2024-04-13	20	385.45	1	False	5.954411	0.026279	20	13	5	4	-8.660254e-01	5.000000e-01	300.011667	107.996598	5	0.00	9.87	17
2024-04-13	21	372.63	1	False	5.920586	-0.033260	21	13	5	4	-7.071068e-01	7.071068e-01	303.205833	109.000862	5	12.82	0.00	16
2024-04-13	22	371.81	1	False	5.918383	-0.002201	22	13	5	4	-5.000000e-01	8.660254e-01	306.595000	109.848904	5	0.82	0.00	16
2024-04-13	23	362.61	1	False	5.893328	-0.024744	23	13	5	4	-2.588190e-01	9.659258e-01	310.602500	110.074084	5	9.20	0.00	15
2024-04-14	0	321.50	1	False	5.772998	-0.113372	0	14	6	4	0.000000e+00	1.000000e+00	309.232917	109.709722	6	41.11	0.00	17
2024-04-14	1	310.48	1	False	5.738119	-0.034277	1	14	6	4	2.588190e-01	9.659258e-01	307.042083	109.111459	6	11.02	0.00	17
2024-04-14	2	334.58	1	False	5.812876	0.077622	2	14	6	4	5.000000e-01	8.660254e-01	305.910000	108.659172	6	0.00	24.10	17
2024-04-14	3	319.37	1	False	5.766350	-0.045460	3	14	6	4	7.071068e-01	7.071068e-01	303.984583	107.963047	6	15.21	0.00	18
2024-04-14	4	314.12	1	False	5.749775	-0.016439	4	14	6	4	8.660254e-01	5.000000e-01	301.406250	106.902111	6	5.25	0.00	18
2024-04-14	5	330.25	1	False	5.799850	0.051350	5	14	6	4	9.659258e-01	2.588190e-01	299.027083	105.532850	6	0.00	16.13	18
2024-04-14	6	329.17	1	False	5.796574	-0.003270	6	14	6	4	1.000000e+00	6.123234e-17	296.271250	103.757895	6	1.08	0.00	18
2024-04-14	7	316.62	1	False	5.757702	-0.038126	7	14	6	4	9.659258e-01	-2.588190e-01	293.517500	102.229821	6	12.55	0.00	18
2024-04-14	8	330.09	1	False	5.799365	0.042543	8	14	6	4	8.660254e-01	-5.000000e-01	292.526250	101.733213	6	0.00	13.47	17
2024-04-14	9	341.12	1	False	5.832234	0.033415	9	14	6	4	7.071068e-01	-7.071068e-01	299.142083	99.392011	6	0.00	11.03	10
2024-04-14	10	379.23	1	False	5.938143	0.111720	10	14	6	4	5.000000e-01	-8.660254e-01	307.884583	96.675401	6	0.00	38.11	9.7

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-04-14	11	789.95	1	False	6.671970	1.083037	11	14	6	4	2.588190e-01	-9.659258e-01	332.992917	134.760538	6	0.00	410.72	9.7
2024-04-14	12	365.65	1	False	5.901677	-0.537123	12	14	6	4	1.224647e-16	-1.000000e+00	344.653333	124.129708	6	424.30	0.00	23
2024-04-14	13	373.35	1	False	5.922516	0.021058	13	14	6	4	-2.588190e-01	-9.659258e-01	356.609167	111.334106	6	0.00	7.70	23
2024-04-14	14	362.91	1	False	5.894155	-0.027963	14	14	6	4	-5.000000e-01	-8.660254e-01	368.694583	93.509416	6	10.44	0.00	23
2024-04-14	15	356.36	1	False	5.875941	-0.018049	15	14	6	4	-7.071068e-01	-7.071068e-01	370.228333	92.968612	6	6.55	0.00	23
2024-04-14	16	356.66	1	False	5.876783	0.000842	16	14	6	4	-8.660254e-01	-5.000000e-01	369.295000	92.988531	6	0.00	0.30	23
2024-04-14	17	354.04	1	False	5.869410	-0.007346	17	14	6	4	-9.659258e-01	-2.588190e-01	367.975833	92.970253	6	2.62	0.00	23
2024-04-14	18	364.38	1	False	5.898197	0.029206	18	14	6	4	-1.000000e+00	-1.836970e-16	367.412917	92.948513	6	0.00	10.34	23
2024-04-14	19	362.25	1	False	5.892335	-0.005846	19	14	6	4	-9.659258e-01	2.588190e-01	366.857500	92.937414	6	2.13	0.00	23
2024-04-14	20	365.76	1	False	5.901977	0.009689	20	14	6	4	-8.660254e-01	5.000000e-01	366.037083	92.853020	6	0.00	3.51	23
2024-04-14	21	355.13	1	False	5.872484	-0.029063	21	14	6	4	-7.071068e-01	7.071068e-01	365.307917	92.867708	6	10.63	0.00	23
2024-04-14	22	347.10	1	False	5.849613	-0.022611	22	14	6	4	-5.000000e-01	8.660254e-01	364.278333	92.929442	6	8.03	0.00	23
2024-04-14	23	336.80	1	False	5.819489	-0.029674	23	14	6	4	-2.588190e-01	9.659258e-01	363.202917	93.098775	6	10.30	0.00	23
2024-04-15	0	321.08	0	True	5.771690	-0.046675	0	15	0	4	0.000000e+00	1.000000e+00	363.185417	93.106994	0	15.72	0.00	22
2024-04-15	1	300.23	0	True	5.704549	-0.064937	1	15	0	4	2.588190e-01	9.659258e-01	362.758333	93.382367	0	20.85	0.00	22
2024-04-15	2	292.85	0	True	5.679661	-0.024581	2	15	0	4	5.000000e-01	8.660254e-01	361.019583	94.313706	0	7.38	0.00	23
2024-04-15	3	311.40	0	True	5.741078	0.063343	3	15	0	4	7.071068e-01	7.071068e-01	360.687500	94.480616	0	0.00	18.55	22
2024-04-15	4	329.57	0	True	5.797789	0.058349	4	15	0	4	8.660254e-01	5.000000e-01	361.331250	94.201753	0	0.00	18.17	22
2024-04-15	5	361.31	0	True	5.889736	0.096307	5	15	0	4	9.659258e-01	2.588190e-01	362.625417	93.969254	0	0.00	31.74	22
2024-04-15	6	369.12	0	True	5.911122	0.021616	6	15	0	4	1.000000e+00	6.123234e-17	364.290000	93.704320	0	0.00	7.81	22
2024-04-15	7	357.29	0	True	5.878548	-0.032049	7	15	0	4	9.659258e-01	-2.588190e-01	365.984583	93.170985	0	11.83	0.00	22
2024-04-15	8	342.44	0	True	5.836096	-0.041563	8	15	0	4	8.660254e-01	-5.000000e-01	366.499167	92.998064	0	14.85	0.00	22
2024-04-15	9	245.42	0	True	5.502971	-0.283320	9	15	0	4	7.071068e-01	-7.071068e-01	362.511667	96.132421	0	97.02	0.00	26
2024-04-15	10	285.00	0	True	5.652489	0.161275	10	15	0	4	5.000000e-01	-8.660254e-01	358.585417	97.336655	0	0.00	39.58	26
2024-04-15	11	223.49	0	True	5.409367	-0.215825	11	15	0	4	2.588190e-01	-9.659258e-01	334.982917	39.955005	0	61.51	0.00	29
2024-04-15	12	183.59	0	True	5.212705	-0.178531	12	15	0	4	1.224647e-16	-1.000000e+00	327.397083	49.919729	0	39.90	0.00	13
2024-04-15	13	247.73	0	True	5.512339	0.349365	13	15	0	4	-2.588190e-01	-9.659258e-01	322.162917	51.454151	0	0.00	64.14	13
2024-04-15	14	247.56	0	True	5.511653	-0.000686	14	15	0	4	-5.000000e-01	-8.660254e-01	317.356667	52.850919	0	0.17	0.00	12
2024-04-15	15	289.50	0	True	5.668155	0.169413	15	15	0	4	-7.071068e-01	-7.071068e-01	314.570833	52.466355	0	0.00	41.94	12
2024-04-15	16	323.25	0	True	5.778426	0.116580	16	15	0	4	-8.660254e-01	-5.000000e-01	313.178750	51.739248	0	0.00	33.75	12
2024-04-15	17	347.14	0	True	5.849728	0.073906	17	15	0	4	-9.659258e-01	-2.588190e-01	312.891250	51.521032	0	0.00	23.89	12
2024-04-15	18	374.17	0	True	5.924710	0.077865	18	15	0	4	-1.836970e-16	-1.000000e+00	313.299167	51.983102	0	0.00	27.03	12
2024-04-15	19	374.01	0	True	5.924283	-0.000428	19	15	0	4	-9.659258e-01	-2.588190e-01	313.789167	52.517262	0	0.16	0.00	12
2024-04-15	20	382.75	0	True	5.947382	0.023368	20	15	0	4	-8.660254e-01	-5.000000e-01	314.497083	53.356083	0	0.00	8.74	12
2024-04-15	21	378.28	0	True	5.935635	-0.011679	21	15	0	4	-7.071068e-01	-7.071068e-01	315.461667	54.323085	0	4.47	0.00	12
2024-04-15	22	380.15	0	True	5.940566	0.004943	22	15	0	4	-5.000000e-01	-8.660254e-01	316.838750	55.564700	0	0.00	1.87	11
2024-04-15	23	382.22	0	True	5.945996	0.005445	23	15	0	4	-2.588190e-01	-9.659258e-01	318.731250	57.028340	0	0.00	2.07	11
2024-04-16	0	354.64	0	True	5.871103	-0.072157	0	16	1	4	0.000000e+00	1.000000e+00	320.129583	57.497947	1	27.58	0.00	11
2024-04-16	1	340.67	0	True	5.830914	-0.039392	1	16	1	4	2.588190e-01	9.659258e-01	321.814583	57.481979	1	13.97	0.00	11
2024-04-16	2	336.17	0	True	5.817617	-0.013209	2	16	1	4	5.000000e-01	8.660254e-01	323.619583	57.212431	1	4.50	0.00	11
2024-04-16	3	343.08	0	True	5.837964	0.020555	3	16	1	4	7.071068e-01	7.071068e-01	324.939583	57.283659	1	0.00	6.91	11
2024-04-16	4	350.88	0	True	5.860444	0.022735	4	16	1	4	8.660254e-01	5.000000e-01	325.827500	57.523208	1	0.00	7.80	11
2024-04-16	5	371.34	0	True	5.917118	0.058311	5	16	1	4	9.659258e-01	2.588190e-01	326.245417	57.827831	1	0.00	20.46	11
2024-04-16	6	368.25	0	True	5.908762	-0.008321	6	16	1	4	1.000000e+00	6.123234e-17	326.209167	57.800052	1	3.09	0.00	11

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-04-16	7	272.86	0	True	5.608959	-0.259036	7	16	1	4	9.659258e-01	-2.588190e-01	322.691250	58.392434	1	95.39	0.00	15
2024-04-16	8	-57.00	0	True	5.608959	-1.208898	8	16	1	4	8.660254e-01	-5.000000e-01	306.047917	96.807737	1	329.86	0.00	28
2024-04-16	9	-80.00	0	True	5.608959	0.403509	9	16	1	4	7.071068e-01	-7.071068e-01	292.488750	124.498088	1	23.00	0.00	25
2024-04-16	10	-80.00	0	True	5.608959	0.000000	10	16	1	4	5.000000e-01	-8.660254e-01	277.280417	145.905798	1	0.00	0.00	25
2024-04-16	11	-80.00	0	True	5.608959	0.000000	11	16	1	4	2.588190e-01	-9.659258e-01	264.635000	162.928856	1	0.00	0.00	22
2024-04-16	12	-80.00	0	True	5.608959	0.000000	12	16	1	4	1.224647e-16	-1.000000e+00	253.652083	176.913597	1	0.00	0.00	20
2024-04-16	13	-34.50	0	True	5.608959	-0.568750	13	16	1	4	-2.588190e-01	-9.659258e-01	241.892500	186.447489	1	0.00	45.50	20
2024-04-16	14	-25.60	0	True	5.608959	-0.257971	14	16	1	4	-5.000000e-01	-8.660254e-01	230.510833	194.260294	1	0.00	8.90	20
2024-04-16	15	148.56	0	True	5.000989	-6.803125	15	16	1	4	-7.071068e-01	-7.071068e-01	224.638333	194.529642	1	0.00	174.16	20
2024-04-16	16	329.17	0	True	5.796574	1.215738	16	16	1	4	-8.660254e-01	-5.000000e-01	224.885000	194.663826	1	0.00	180.61	20
2024-04-16	17	368.58	0	True	5.909658	0.119725	17	16	1	4	-9.659258e-01	-2.588190e-01	225.778333	195.297425	1	0.00	39.41	20
2024-04-16	18	390.88	0	True	5.968401	0.060502	18	16	1	4	-1.000000e+00	-1.836970e-16	226.474583	195.878376	1	0.00	22.30	20
2024-04-16	19	385.71	0	True	5.955086	-0.013227	19	16	1	4	-9.659258e-01	2.588190e-01	226.962083	196.275681	1	5.17	0.00	21
2024-04-16	20	387.32	0	True	5.959251	0.004174	20	16	1	4	-8.660254e-01	5.000000e-01	227.152500	196.435542	1	0.00	1.61	21
2024-04-16	21	371.06	0	True	5.916364	-0.041981	21	16	1	4	-7.071068e-01	7.071068e-01	226.851667	196.199420	1	16.26	0.00	21
2024-04-16	22	375.21	0	True	5.927486	0.011184	22	16	1	4	-5.000000e-01	8.660254e-01	226.645833	196.034123	1	0.00	4.15	21
2024-04-16	23	381.75	0	True	5.944766	0.017430	23	16	1	4	-2.588190e-01	9.659258e-01	226.626250	196.017929	1	0.00	6.54	21
2024-04-17	0	379.25	0	True	5.938196	-0.006549	0	17	2	4	0.000000e+00	1.000000e+00	227.651667	196.779606	2	2.50	0.00	20
2024-04-17	1	376.75	0	True	5.931582	-0.006592	1	17	2	4	2.588190e-01	9.659258e-01	229.155000	197.815663	2	2.50	0.00	20
2024-04-17	2	374.75	0	True	5.926259	-0.005309	2	17	2	4	5.000000e-01	8.660254e-01	230.762500	198.877012	2	2.00	0.00	19
2024-04-17	3	376.25	0	True	5.930254	0.004003	3	17	2	4	7.071068e-01	7.071068e-01	232.144583	199.804585	2	0.00	1.50	19
2024-04-17	4	384.17	0	True	5.951085	0.021050	4	17	2	4	8.660254e-01	5.000000e-01	233.531667	200.777891	2	0.00	7.92	19
2024-04-17	5	392.54	0	True	5.972638	0.021787	5	17	2	4	9.659258e-01	2.588190e-01	234.415000	201.456037	2	0.00	8.37	19
2024-04-17	6	386.83	0	True	5.957985	-0.014546	6	17	2	4	1.000000e+00	6.123234e-17	235.189167	202.027596	2	5.71	0.00	20
2024-04-17	7	349.96	0	True	5.857819	-0.095313	7	17	2	4	9.659258e-01	-2.588190e-01	238.401667	203.261880	2	36.87	0.00	17
2024-04-17	8	165.38	0	True	5.108246	-0.527432	8	17	2	4	8.660254e-01	-5.000000e-01	247.667500	194.071199	2	184.58	0.00	11
2024-04-17	9	-80.00	0	True	5.108246	-1.483734	9	17	2	4	7.071068e-01	-7.071068e-01	247.667500	194.071199	2	245.38	0.00	20
2024-04-17	10	-8.87	0	True	5.108246	-0.889125	10	17	2	4	5.000000e-01	-8.660254e-01	250.631250	189.335012	2	0.00	71.13	20
2024-04-17	11	-39.45	0	True	5.108246	3.447576	11	17	2	4	2.588190e-01	-9.659258e-01	252.320833	186.414659	2	30.58	0.00	22
2024-04-17	12	-80.00	0	True	5.108246	1.027883	12	17	2	4	1.224647e-16	-1.000000e+00	252.320833	186.414659	2	40.55	0.00	23
2024-04-17	13	93.60	0	True	4.539030	-2.170000	13	17	2	4	-2.588190e-01	-9.659258e-01	257.658333	179.552845	2	0.00	173.60	23
2024-04-17	14	29.32	0	True	3.378270	-0.686752	14	17	2	4	-5.000000e-01	-8.660254e-01	259.946667	176.102686	2	64.28	0.00	26
2024-04-17	15	225.85	0	True	5.419871	6.702933	15	17	2	4	-7.071068e-01	-7.071068e-01	263.167083	174.678123	2	0.00	196.53	26
2024-04-17	16	340.89	0	True	5.831560	0.509365	16	17	2	4	-8.660254e-01	-5.000000e-01	263.655417	174.886922	2	0.00	115.04	26
2024-04-17	17	374.00	0	True	5.924256	0.097128	17	17	2	4	-9.659258e-01	-2.588190e-01	263.881250	175.031743	2	0.00	33.11	26
2024-04-17	18	386.96	0	True	5.958321	0.034652	18	17	2	4	-1.000000e+00	-1.836970e-16	263.717917	174.909866	2	0.00	12.96	26
2024-04-17	19	378.00	0	True	5.934894	-0.023155	19	17	2	4	-9.659258e-01	-2.588190e-01	263.396667	174.683000	2	8.96	0.00	26
2024-04-17	20	373.37	0	True	5.922570	-0.012249	20	17	2	4	-8.660254e-01	-5.000000e-01	262.815417	174.275456	2	4.63	0.00	26
2024-04-17	21	353.07	0	True	5.866666	-0.054370	21	17	2	4	-7.071068e-01	-7.071068e-01	262.065833	173.827752	2	20.30	0.00	27
2024-04-17	22	351.60	0	True	5.862494	-0.004163	22	17	2	4	-5.000000e-01	-8.660254e-01	261.082083	173.225355	2	1.47	0.00	27
2024-04-17	23	351.50	0	True	5.862210	-0.000284	23	17	2	4	-2.588190e-01	-9.659258e-01	259.821667	172.417349	2	0.10	0.00	27
2024-04-18	0	362.00	0	True	5.891644	0.029872	0	18	3	4	0.000000e+00	1.000000e+00	259.102917	171.933121	3	0.00	10.50	26
2024-04-18	1	363.50	0	True	5.895779	0.004144	1	18	3	4	2.588190e-01	9.659258e-01	258.550833	171.559795	3	0.00	1.50	26
2024-04-18	2	363.25	0	True	5.895091	-0.000688	2	18	3	4	5.000000e-01	8.660254e-01	258.071667	171.236896	3	0.25	0.00	26

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-04-18	3	365.25	0	True	5.900582	0.005506	3	18	3	4	7.071068e-01	7.071068e-01	257.613333	170.921257	3	0.00	2.00	26
2024-04-18	4	380.28	0	True	5.940908	0.041150	4	18	3	4	8.660254e-01	5.000000e-01	257.451250	170.797826	3	0.00	15.03	26
2024-04-18	5	444.38	0	True	6.096680	0.168560	5	18	3	4	9.659258e-01	2.588190e-01	259.611250	172.895426	3	0.00	64.10	26
2024-04-18	6	418.23	0	True	6.036032	-0.058846	6	18	3	4	1.000000e+00	6.123234e-17	260.919583	174.015151	3	26.15	0.00	27
2024-04-18	7	328.16	0	True	5.793501	-0.215360	7	18	3	4	9.659258e-01	-2.588190e-01	260.011250	173.586534	3	90.07	0.00	29
2024-04-18	8	49.35	0	True	3.898938	-0.849616	8	18	3	4	8.660254e-01	-5.000000e-01	255.176667	177.898931	3	278.81	0.00	33
2024-04-18	9	-80.00	0	True	3.898938	-2.621074	9	18	3	4	7.071068e-01	-7.071068e-01	255.176667	177.898931	3	129.35	0.00	28
2024-04-18	10	-45.74	0	True	3.898938	-0.428250	10	18	3	4	5.000000e-01	-8.660254e-01	253.640417	180.419588	3	0.00	34.26	28
2024-04-18	11	-23.18	0	True	3.898938	-0.493223	11	18	3	4	2.588190e-01	-9.659258e-01	254.318333	179.297513	3	0.00	22.56	27
2024-04-18	12	-80.00	0	True	3.898938	2.451251	12	18	3	4	1.224647e-16	-1.000000e+00	254.318333	179.297513	3	56.82	0.00	28
2024-04-18	13	-7.38	0	True	3.898938	-0.907750	13	18	3	4	-2.588190e-01	-9.659258e-01	250.110833	184.346734	3	0.00	72.62	28
2024-04-18	14	-50.50	0	True	3.898938	5.842818	14	18	3	4	-5.000000e-01	-8.660254e-01	246.785000	189.160426	3	43.12	0.00	27
2024-04-18	15	169.19	0	True	5.131022	-4.350297	15	18	3	4	-7.071068e-01	-7.071068e-01	244.424167	189.785609	3	0.00	219.69	27
2024-04-18	16	306.57	0	True	5.725446	0.811987	16	18	3	4	-8.660254e-01	-5.000000e-01	242.994167	189.155405	3	0.00	137.38	27
2024-04-18	17	370.50	0	True	5.914853	0.208533	17	18	3	4	-9.659258e-01	-2.588190e-01	242.848333	189.051333	3	0.00	63.93	27
2024-04-18	18	406.92	0	True	6.008617	0.098300	18	18	3	4	-1.000000e+00	-1.836970e-16	243.680000	189.755459	3	0.00	36.42	27
2024-04-18	19	375.13	0	True	5.927273	-0.078123	19	18	3	4	-9.659258e-01	2.588190e-01	243.560417	189.668015	3	31.79	0.00	28
2024-04-18	20	371.50	0	True	5.917549	-0.009677	20	18	3	4	-8.660254e-01	5.000000e-01	243.482500	189.612746	3	3.63	0.00	28
2024-04-18	21	373.08	0	True	5.921793	0.004253	21	18	3	4	-7.071068e-01	7.071068e-01	244.316250	190.158773	3	0.00	1.58	27
2024-04-18	22	435.00	0	True	6.075346	0.165970	22	18	3	4	-5.000000e-01	8.660254e-01	247.791250	192.946143	3	0.00	61.92	27
2024-04-18	23	439.25	0	True	6.085069	0.009770	23	18	3	4	-2.588190e-01	9.659258e-01	251.447500	195.807030	3	0.00	4.25	27
2024-04-19	0	350.31	0	True	5.858818	-0.202482	0	19	4	4	0.000000e+00	1.000000e+00	250.960417	195.534417	4	88.94	0.00	31
2024-04-19	1	332.55	0	True	5.806790	-0.050698	1	19	4	4	2.588190e-01	9.659258e-01	249.670833	194.860828	4	17.76	0.00	31
2024-04-19	2	324.24	0	True	5.781484	-0.024989	2	19	4	4	5.000000e-01	8.660254e-01	248.045417	194.033166	4	8.31	0.00	32
2024-04-19	3	326.63	0	True	5.788828	0.007371	3	19	4	4	7.071068e-01	7.071068e-01	246.436250	193.177152	4	0.00	2.39	32
2024-04-19	4	343.98	0	True	5.840584	0.053118	4	19	4	4	8.660254e-01	5.000000e-01	244.923750	192.223399	4	0.00	17.35	32
2024-04-19	5	355.51	0	True	5.873553	0.033519	5	19	4	4	9.659258e-01	2.588190e-01	241.220833	189.043778	4	0.00	11.53	32
2024-04-19	6	324.58	0	True	5.782532	-0.087002	6	19	4	4	1.000000e+00	6.123234e-17	237.318750	186.176019	4	30.93	0.00	32
2024-04-19	7	275.94	0	True	5.620183	-0.149855	7	19	4	4	9.659258e-01	-2.588190e-01	235.142917	185.371610	4	48.64	0.00	30
2024-04-19	8	234.52	0	True	5.457541	-0.150105	8	19	4	4	8.660254e-01	-5.000000e-01	242.858333	181.106897	4	41.42	0.00	20
2024-04-19	9	57.35	0	True	4.049173	-0.755458	9	19	4	4	7.071068e-01	-7.071068e-01	248.581250	172.423024	4	177.17	0.00	22
2024-04-19	10	85.93	0	True	4.453533	0.498344	10	19	4	4	5.000000e-01	-8.660254e-01	254.067500	164.566775	4	0.00	28.58	22
2024-04-19	11	84.64	0	True	4.438407	-0.015012	11	19	4	4	2.588190e-01	-9.659258e-01	258.560000	158.010217	4	1.29	0.00	22
2024-04-19	12	-80.00	0	True	4.438407	-1.945180	12	19	4	4	1.224647e-16	-1.000000e+00	258.560000	158.010217	4	164.64	0.00	27
2024-04-19	13	74.97	0	True	4.317088	-1.937125	13	19	4	4	-2.588190e-01	-9.659258e-01	261.991250	152.792116	4	0.00	154.97	27
2024-04-19	14	160.67	0	True	5.079353	1.143124	14	19	4	4	-5.000000e-01	-8.660254e-01	270.790000	139.518128	4	0.00	85.70	25
2024-04-19	15	289.98	0	True	5.669812	0.804817	15	19	4	4	-7.071068e-01	-7.071068e-01	275.822917	137.862543	4	0.00	129.31	25
2024-04-19	16	316.60	0	True	5.757639	0.091799	16	19	4	4	-8.660254e-01	-5.000000e-01	276.240833	137.974959	4	0.00	26.62	25
2024-04-19	17	329.87	0	True	5.798699	0.041914	17	19	4	4	-9.659258e-01	-2.588190e-01	274.547917	137.014053	4	0.00	13.27	25
2024-04-19	18	337.37	0	True	5.821180	0.022736	18	19	4	4	-1.000000e+00	-1.836970e-16	271.650000	134.810376	4	0.00	7.50	25
2024-04-19	19	304.60	0	True	5.718999	-0.097134	19	19	4	4	-9.659258e-01	2.588190e-01	268.711250	133.215840	4	32.77	0.00	25
2024-04-19	20	301.66	0	True	5.709301	-0.009652	20	19	4	4	-8.660254e-01	5.000000e-01	265.801250	131.626190	4	2.94	0.00	25
2024-04-19	21	297.81	0	True	5.696456	-0.012763	21	19	4	4	-7.071068e-01	7.071068e-01	262.665000	129.843586	4	3.85	0.00	25
2024-04-19	22	335.69	0	True	5.816188	0.127195	22	19	4	4	-5.000000e-01	8.660254e-01	258.527083	125.626702	4	0.00	37.88	25

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-04-19	23	352.45	0	True	5.864909	0.049927	23	19	4	4	-2.588190e-01	9.659258e-01	254.910417	121.375161	4	0.00	16.76	25
2024-04-20	0	386.00	1	False	5.955837	0.095191	0	20	5	4	0.000000e+00	1.000000e+00	256.397500	122.805025	5	0.00	33.55	22
2024-04-20	1	368.00	1	False	5.908083	-0.046632	1	20	5	4	2.588190e-01	9.659258e-01	257.874583	123.968485	5	18.00	0.00	22
2024-04-20	2	365.75	1	False	5.901950	-0.006114	2	20	5	4	5.000000e-01	8.660254e-01	259.604167	125.217932	5	2.25	0.00	21
2024-04-20	3	367.50	1	False	5.906723	0.004785	3	20	5	4	7.071068e-01	7.071068e-01	261.307083	126.441024	5	0.00	1.75	21
2024-04-20	4	405.42	1	False	6.004924	0.103184	4	20	5	4	8.660254e-01	5.000000e-01	263.867083	128.787841	5	0.00	37.92	21
2024-04-20	5	632.45	1	False	6.449601	0.559987	5	20	5	4	9.659258e-01	2.588190e-01	275.406250	148.286499	5	0.00	227.03	21
2024-04-20	6	509.67	1	False	6.233763	-0.194134	6	20	5	4	1.000000e+00	6.123234e-17	283.118333	155.588419	5	122.78	0.00	25
2024-04-20	7	362.00	1	False	5.891644	-0.289736	7	20	5	4	9.659258e-01	-2.588190e-01	286.704167	156.405352	5	147.67	0.00	29
2024-04-20	8	155.98	1	False	5.049728	-0.569116	8	20	5	4	8.660254e-01	-5.000000e-01	283.431667	158.354196	5	206.02	0.00	36
2024-04-20	9	-80.00	1	False	5.049728	-1.512886	9	20	5	4	7.071068e-01	-7.071068e-01	277.708750	169.003832	5	235.98	0.00	39
2024-04-20	10	-80.00	1	False	5.049728	0.000000	10	20	5	4	5.000000e-01	-8.660254e-01	270.795000	180.212683	5	0.00	0.00	39
2024-04-20	11	-80.00	1	False	5.049728	0.000000	11	20	5	4	2.588190e-01	-9.659258e-01	263.935000	190.449819	5	0.00	0.00	39
2024-04-20	12	-80.00	1	False	5.049728	0.000000	12	20	5	4	1.224647e-16	-1.000000e+00	263.935000	190.449819	5	0.00	0.00	32
2024-04-20	13	-80.00	1	False	5.049728	0.000000	13	20	5	4	-2.588190e-01	-9.659258e-01	257.477917	199.545019	5	0.00	0.00	32
2024-04-20	14	-80.00	1	False	5.049728	0.000000	14	20	5	4	-5.000000e-01	-8.660254e-01	247.450000	210.374933	5	0.00	0.00	32
2024-04-20	15	-43.45	1	False	5.049728	-0.456875	15	20	5	4	-7.071068e-01	-7.071068e-01	233.557083	218.304412	5	0.00	36.55	32
2024-04-20	16	268.96	1	False	5.594563	-7.190104	16	20	5	4	-8.660254e-01	-5.000000e-01	231.572083	217.732330	5	0.00	312.41	32
2024-04-20	17	357.75	1	False	5.879834	0.330123	17	20	5	4	-9.659258e-01	-2.588190e-01	232.733750	218.353070	5	0.00	88.79	32
2024-04-20	18	370.00	1	False	5.913503	0.034242	18	20	5	4	-1.000000e+00	-1.836970e-16	234.093333	219.133111	5	0.00	12.25	32
2024-04-20	19	370.25	1	False	5.914178	0.000676	19	20	5	4	-9.659258e-01	2.588190e-01	236.828750	220.457256	5	0.00	0.25	30
2024-04-20	20	372.87	1	False	5.921230	0.007076	20	20	5	4	-8.660254e-01	5.000000e-01	239.795833	221.842588	5	0.00	2.62	30
2024-04-20	21	370.96	1	False	5.916094	-0.005122	21	20	5	4	-7.071068e-01	7.071068e-01	242.843750	223.172825	5	1.91	0.00	30
2024-04-20	22	379.25	1	False	5.938196	0.022347	22	20	5	4	-5.000000e-01	8.660254e-01	244.658750	224.135799	5	0.00	8.29	30
2024-04-20	23	408.25	1	False	6.011880	0.076467	23	20	5	4	-2.588190e-01	9.659258e-01	246.983750	225.587263	5	0.00	29.00	30
2024-04-21	0	550.72	1	False	6.311227	0.348977	0	21	6	4	0.000000e+00	1.000000e+00	253.847083	232.403395	6	0.00	142.47	30
2024-04-21	1	501.76	1	False	6.218122	-0.088902	1	21	6	4	2.588190e-01	9.659258e-01	259.420417	236.821820	6	48.96	0.00	31
2024-04-21	2	490.48	1	False	6.195385	-0.022481	2	21	6	4	5.000000e-01	8.660254e-01	264.617500	240.595233	6	11.28	0.00	32
2024-04-21	3	454.54	1	False	6.119286	-0.073275	3	21	6	4	7.071068e-01	7.071068e-01	268.244167	242.858843	6	35.94	0.00	33
2024-04-21	4	535.39	1	False	6.282995	0.177872	4	21	6	4	8.660254e-01	5.000000e-01	273.659583	247.456228	6	0.00	80.85	33
2024-04-21	5	683.91	1	False	6.527826	0.277405	5	21	6	4	9.659258e-01	2.588190e-01	275.803750	250.899248	6	0.00	148.52	33
2024-04-21	6	568.33	1	False	6.342702	-0.168999	6	21	6	4	1.000000e+00	6.123234e-17	278.247917	253.548277	6	115.58	0.00	33
2024-04-21	7	395.50	1	False	5.980151	-0.304101	7	21	6	4	9.659258e-01	-2.588190e-01	279.643750	254.120961	6	172.83	0.00	34
2024-04-21	8	357.06	1	False	5.877904	-0.097193	8	21	6	4	8.660254e-01	-5.000000e-01	288.022083	253.179562	6	38.44	0.00	27
2024-04-21	9	147.18	1	False	4.991656	-0.587800	9	21	6	4	7.071068e-01	-7.071068e-01	297.487917	242.858276	6	209.88	0.00	26
2024-04-21	10	97.97	1	False	4.584661	-0.334352	10	21	6	4	5.000000e-01	-8.660254e-01	304.903333	233.362363	6	49.21	0.00	28
2024-04-21	11	172.05	1	False	5.147785	0.756150	11	21	6	4	2.588190e-01	-9.659258e-01	315.405417	220.610438	6	0.00	74.08	28
2024-04-21	12	159.01	1	False	5.068967	-0.075792	12	21	6	4	1.224647e-16	-1.000000e+00	325.364167	206.957257	6	13.04	0.00	29
2024-04-21	13	267.25	1	False	5.588185	0.680712	13	21	6	4	-2.588190e-01	-9.659258e-01	339.832917	188.720281	6	0.00	108.24	29
2024-04-21	14	223.98	1	False	5.411557	-0.161908	14	21	6	4	-5.000000e-01	-8.660254e-01	352.498750	168.428153	6	43.27	0.00	30
2024-04-21	15	323.31	1	False	5.778612	0.443477	15	21	6	4	-7.071068e-01	-7.071068e-01	367.780417	146.099556	6	0.00	99.33	30
2024-04-21	16	363.50	1	False	5.895779	0.124308	16	21	6	4	-8.660254e-01	-5.000000e-01	371.719583	144.585959	6	0.00	40.19	30
2024-04-21	17	386.35	1	False	5.956744	0.062861	17	21	6	4	-9.659258e-01	-2.588190e-01	372.911250	144.583676	6	0.00	22.85	30
2024-04-21	18	425.46	1	False	6.053171	0.101229	18	21	6	4	-1.836970e-16	-1.000000e+00	375.222083	144.977786	6	0.00	39.11	30

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-04-21	19	421.24	1	False	6.043203	-0.009919	19	21	6	4	-9.659258e-01	2.588190e-01	377.346667	145.275067	6	4.22	0.00	31
2024-04-21	20	415.39	1	False	6.029218	-0.013888	20	21	6	4	-8.660254e-01	5.000000e-01	379.118333	145.477230	6	5.85	0.00	31
2024-04-21	21	387.90	1	False	5.960748	-0.066179	21	21	6	4	-7.071068e-01	7.071068e-01	379.824167	145.477021	6	27.49	0.00	32
2024-04-21	22	388.32	1	False	5.961830	0.001083	22	21	6	4	-5.000000e-01	8.660254e-01	380.202083	145.487245	6	0.00	0.42	32
2024-04-21	23	405.50	1	False	6.005121	0.044242	23	21	6	4	-2.588190e-01	9.659258e-01	380.087500	145.465276	6	0.00	17.18	32
2024-04-22	0	365.00	0	True	5.899897	-0.099877	0	22	0	4	0.000000e+00	1.000000e+00	372.349167	140.860459	0	40.50	0.00	34
2024-04-22	1	364.00	0	True	5.897154	-0.002740	1	22	0	4	2.588190e-01	9.659258e-01	366.609167	138.138272	0	1.00	0.00	32
2024-04-22	2	362.75	0	True	5.893714	-0.003434	2	22	0	4	5.000000e-01	8.660254e-01	361.287083	135.595516	0	1.25	0.00	31
2024-04-22	3	362.00	0	True	5.891644	-0.002068	3	22	0	4	7.071068e-01	7.071068e-01	357.431250	134.136351	0	0.75	0.00	30
2024-04-22	4	363.50	0	True	5.895779	0.004144	4	22	0	4	8.660254e-01	5.000000e-01	350.269167	128.700075	0	0.00	1.50	30
2024-04-22	5	369.00	0	True	5.910797	0.015131	5	22	0	4	9.659258e-01	2.588190e-01	337.147917	107.515002	0	0.00	5.50	30
2024-04-22	6	368.00	0	True	5.908083	-0.002710	6	22	0	4	1.000000e+00	6.123234e-17	328.800833	95.939851	0	1.00	0.00	25
2024-04-22	7	322.19	0	True	5.775141	-0.124484	7	22	0	4	9.659258e-01	-2.588190e-01	325.746250	94.885161	0	45.81	0.00	20
2024-04-22	8	22.88	0	True	3.130263	-0.928986	8	22	0	4	8.660254e-01	-5.000000e-01	311.822083	112.900051	0	299.31	0.00	30
2024-04-22	9	-80.00	0	True	3.130263	-4.496503	9	22	0	4	7.071068e-01	-7.071068e-01	302.356250	134.719479	0	102.88	0.00	26
2024-04-22	10	-80.00	0	True	3.130263	0.000000	10	22	0	4	5.000000e-01	-8.660254e-01	294.940833	150.439590	0	0.00	0.00	24
2024-04-22	11	10.50	0	True	2.351375	-1.131250	11	22	0	4	2.588190e-01	-9.659258e-01	288.209583	159.517563	0	0.00	90.50	24
2024-04-22	12	-56.68	0	True	2.351375	-6.398095	12	22	0	4	1.224647e-16	-1.000000e+00	279.222500	172.648485	0	67.18	0.00	26
2024-04-22	13	-40.70	0	True	2.351375	-0.281934	13	22	0	4	-2.588190e-01	-9.659258e-01	266.391250	184.606298	0	0.00	15.98	26
2024-04-22	14	38.41	0	True	3.648318	-1.943735	14	22	0	4	-5.000000e-01	-8.660254e-01	258.659167	190.259555	0	0.00	79.11	24
2024-04-22	15	212.18	0	True	5.357435	4.524082	15	22	0	4	-7.071068e-01	-7.071068e-01	254.028750	189.969799	0	0.00	173.77	24
2024-04-22	16	335.82	0	True	5.816575	0.582713	16	22	0	4	-8.660254e-01	-5.000000e-01	252.875417	189.359331	0	0.00	123.64	24
2024-04-22	17	342.23	0	True	5.835483	0.019088	17	22	0	4	-9.659258e-01	-2.588190e-01	251.037083	188.217920	0	0.00	6.41	24
2024-04-22	18	342.05	0	True	5.834957	-0.000526	18	22	0	4	-1.000000e+00	-1.836970e-16	247.561667	185.609194	0	0.18	0.00	24
2024-04-22	19	320.25	0	True	5.769102	-0.063733	19	22	0	4	-9.659258e-01	-2.588190e-01	243.353750	182.621282	0	21.80	0.00	25
2024-04-22	20	337.82	0	True	5.822513	0.054863	20	22	0	4	-8.660254e-01	-5.000000e-01	240.121667	180.113362	0	0.00	17.57	25
2024-04-22	21	311.94	0	True	5.742811	-0.076609	21	22	0	4	-7.071068e-01	-7.071068e-01	236.956667	178.059340	0	25.88	0.00	25
2024-04-22	22	328.33	0	True	5.794019	0.052542	22	22	0	4	-5.000000e-01	-8.660254e-01	234.457083	176.254046	0	0.00	16.39	25
2024-04-22	23	283.96	0	True	5.648833	-0.135138	23	22	0	4	-2.588190e-01	-9.659258e-01	229.392917	172.838904	0	44.37	0.00	27
2024-04-23	0	299.14	0	True	5.700912	0.053458	0	23	1	4	0.000000e+00	1.000000e+00	226.648750	171.106405	1	0.00	15.18	25
2024-04-23	1	294.05	0	True	5.683750	-0.017015	1	23	1	4	2.588190e-01	9.659258e-01	223.734167	169.250770	1	5.09	0.00	25
2024-04-23	2	288.94	0	True	5.666219	-0.017378	2	23	1	4	5.000000e-01	8.660254e-01	220.658750	167.273966	1	5.11	0.00	25
2024-04-23	3	296.28	0	True	5.691305	0.025403	3	23	1	4	7.071068e-01	7.071068e-01	217.920417	165.386845	1	0.00	7.34	25
2024-04-23	4	303.62	0	True	5.715777	0.024774	4	23	1	4	8.660254e-01	5.000000e-01	215.425417	163.536486	1	0.00	7.34	25
2024-04-23	5	300.64	0	True	5.705914	-0.009815	5	23	1	4	9.659258e-01	2.588190e-01	212.577083	161.325738	1	2.98	0.00	25
2024-04-23	6	286.77	0	True	5.658681	-0.046135	6	23	1	4	1.000000e+00	6.123234e-17	209.192500	158.754833	1	13.87	0.00	26
2024-04-23	7	269.21	0	True	5.595492	-0.061234	7	23	1	4	9.659258e-01	-2.588190e-01	206.985000	157.478493	1	17.56	0.00	25
2024-04-23	8	253.20	0	True	5.534180	-0.059470	8	23	1	4	8.660254e-01	-5.000000e-01	216.581667	152.717246	1	16.01	0.00	13
2024-04-23	9	-21.50	0	True	5.534180	-1.084913	9	23	1	4	7.071068e-01	-7.071068e-01	219.019167	148.177100	1	274.70	0.00	20
2024-04-23	10	-80.00	0	True	5.534180	2.720930	10	23	1	4	5.000000e-01	-8.660254e-01	219.019167	148.177100	1	58.50	0.00	23
2024-04-23	11	-64.50	0	True	5.534180	-0.193750	11	23	1	4	2.588190e-01	-9.659258e-01	215.894167	153.462489	1	0.00	15.50	23
2024-04-23	12	-72.00	0	True	5.534180	0.116279	12	23	1	4	1.224647e-16	-1.000000e+00	215.255833	154.672657	1	7.50	0.00	20
2024-04-23	13	-52.84	0	True	5.534180	-0.266111	13	23	1	4	-2.588190e-01	-9.659258e-01	214.750000	155.563402	1	0.00	19.16	20
2024-04-23	14	-62.30	0	True	5.534180	0.179031	14	23	1	4	-5.000000e-01	-8.660254e-01	210.553750	161.761722	1	9.46	0.00	20

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-04-23	15	-48.90	0	True	5.534180	-0.215088	15	23	1	4	-7.071068e-01	-7.071068e-01	199.675417	170.205905	1	0.00	13.40	20
2024-04-23	16	158.35	0	True	5.064808	-4.238241	16	23	1	4	-8.660254e-01	-5.000000e-01	192.280833	167.873047	1	0.00	207.25	20
2024-04-23	17	300.43	0	True	5.705215	0.897253	17	23	1	4	-9.659258e-01	-2.588190e-01	190.539167	166.460592	1	0.00	142.08	20
2024-04-23	18	337.17	0	True	5.820587	0.122291	18	23	1	4	-1.000000e+00	-1.836970e-16	190.335833	166.270345	1	0.00	36.74	20
2024-04-23	19	347.12	0	True	5.849671	0.029510	19	23	1	4	-9.659258e-01	2.588190e-01	191.455417	167.270614	1	0.00	9.95	20
2024-04-23	20	339.24	0	True	5.826708	-0.022701	20	23	1	4	-8.660254e-01	5.000000e-01	191.514583	167.324879	1	7.88	0.00	20
2024-04-23	21	313.68	0	True	5.748373	-0.075345	21	23	1	4	-7.071068e-01	7.071068e-01	191.587083	167.379695	1	25.56	0.00	20
2024-04-23	22	300.23	0	True	5.704549	-0.042878	22	23	1	4	-5.000000e-01	8.660254e-01	190.416250	166.477429	1	13.45	0.00	20
2024-04-23	23	295.45	0	True	5.688500	-0.015921	23	23	1	4	-2.588190e-01	9.659258e-01	190.895000	166.774391	1	4.78	0.00	19
2024-04-24	0	313.06	0	True	5.746395	0.059604	0	24	2	4	0.000000e+00	1.000000e+00	191.475000	167.190893	2	0.00	17.61	19
2024-04-24	1	326.91	0	True	5.789685	0.044241	1	24	2	4	2.588190e-01	9.659258e-01	192.844167	168.198937	2	0.00	13.85	19
2024-04-24	2	327.75	0	True	5.792251	0.002570	2	24	2	4	5.000000e-01	8.660254e-01	194.461250	169.345634	2	0.00	0.84	18
2024-04-24	3	330.25	0	True	5.799850	0.007628	3	24	2	4	7.071068e-01	7.071068e-01	195.876667	170.372502	2	0.00	2.50	18
2024-04-24	4	341.75	0	True	5.834079	0.034822	4	24	2	4	8.660254e-01	5.000000e-01	197.465417	171.594312	2	0.00	11.50	18
2024-04-24	5	354.50	0	True	5.870708	0.037308	5	24	2	4	9.659258e-01	2.588190e-01	199.709583	173.345593	2	0.00	12.75	18
2024-04-24	6	353.25	0	True	5.867176	-0.003526	6	24	2	4	1.000000e+00	6.123234e-17	202.479583	175.317224	2	1.25	0.00	18
2024-04-24	7	190.60	0	True	5.250177	-0.460439	7	24	2	4	9.659258e-01	-2.588190e-01	199.204167	174.749717	2	162.65	0.00	24
2024-04-24	8	-80.43	0	True	5.250177	-1.421983	8	24	2	4	8.660254e-01	-5.000000e-01	185.302917	183.327161	2	271.03	0.00	34
2024-04-24	9	-80.79	0	True	5.250177	0.004476	9	24	2	4	7.071068e-01	-7.071068e-01	182.832500	186.605260	2	0.36	0.00	23
2024-04-24	10	-71.55	0	True	5.250177	-0.114371	10	24	2	4	5.000000e-01	-8.660254e-01	183.184583	186.095065	2	0.00	9.24	20
2024-04-24	11	-80.01	0	True	5.250177	0.118239	11	24	2	4	2.588190e-01	-9.659258e-01	182.538333	187.017239	2	8.46	0.00	21
2024-04-24	12	-80.00	0	True	5.250177	-0.000125	12	24	2	4	1.224647e-16	-1.000000e+00	182.205000	187.497159	2	0.00	0.01	21
2024-04-24	13	-56.70	0	True	5.250177	-0.291250	13	24	2	4	-2.588190e-01	-9.659258e-01	182.044167	187.709080	2	0.00	23.30	21
2024-04-24	14	-79.00	0	True	5.250177	0.393298	14	24	2	4	-5.000000e-01	-8.660254e-01	181.348333	188.682669	2	22.30	0.00	21
2024-04-24	15	-21.04	0	True	5.250177	-0.733671	15	24	2	4	-7.071068e-01	-7.071068e-01	182.509167	187.285047	2	0.00	57.96	21
2024-04-24	16	227.55	0	True	5.427370	-11.815114	16	24	2	4	-8.660254e-01	-5.000000e-01	185.392500	187.429561	2	0.00	248.59	21
2024-04-24	17	336.44	0	True	5.818420	0.478532	17	24	2	4	-9.659258e-01	-2.588190e-01	186.892917	188.531397	2	0.00	108.89	21
2024-04-24	18	348.32	0	True	5.853122	0.035311	18	24	2	4	-1.000000e+00	-1.836970e-16	187.357500	188.931128	2	0.00	11.88	21
2024-04-24	19	320.90	0	True	5.771130	-0.078721	19	24	2	4	-9.659258e-01	2.588190e-01	186.265000	188.040841	2	27.42	0.00	22
2024-04-24	20	266.14	0	True	5.584022	-0.170645	20	24	2	4	-8.660254e-01	5.000000e-01	183.219167	186.036608	2	54.76	0.00	24
2024-04-24	21	0.28	0	True	1.272966	-0.998948	21	24	2	4	-7.071068e-01	7.071068e-01	170.160833	187.474691	2	265.86	0.00	34
2024-04-24	22	-33.05	0	True	1.272966	-119.035714	22	24	2	4	-5.000000e-01	8.660254e-01	156.274167	189.750864	2	33.33	0.00	35
2024-04-24	23	-30.18	0	True	1.272966	-0.086838	23	24	2	4	-2.588190e-01	9.659258e-01	142.706250	191.004337	2	0.00	2.87	35
2024-04-25	0	-80.00	0	True	1.272966	1.650762	0	25	3	4	0.000000e+00	1.000000e+00	126.328750	192.606993	3	49.82	0.00	37
2024-04-25	1	-80.00	0	True	1.272966	0.000000	1	25	3	4	2.588190e-01	9.659258e-01	109.374167	192.091596	3	0.00	0.00	37
2024-04-25	2	-80.00	0	True	1.272966	0.000000	2	25	3	4	5.000000e-01	8.660254e-01	92.384583	189.957459	3	0.00	0.00	37
2024-04-25	3	-80.00	0	True	1.272966	0.000000	3	25	3	4	7.071068e-01	7.071068e-01	75.290833	186.040202	3	0.00	0.00	37
2024-04-25	4	32.56	0	True	3.483085	-1.407000	4	25	3	4	8.660254e-01	5.000000e-01	62.407917	177.285593	3	0.00	112.56	37
2024-04-25	5	263.73	0	True	5.574926	7.099816	5	25	3	4	9.659258e-01	2.588190e-01	58.625833	171.662418	3	0.00	231.17	37
2024-04-25	6	60.84	0	True	4.108247	-0.769310	6	25	3	4	1.000000e+00	6.123234e-17	46.442083	159.810013	3	202.89	0.00	45
2024-04-25	7	-80.00	0	True	4.108247	-2.314924	7	25	3	4	9.659258e-01	-2.588190e-01	35.167083	158.739273	3	140.84	0.00	44
2024-04-25	8	-80.00	0	True	4.108247	0.000000	8	25	3	4	8.660254e-01	-5.000000e-01	35.185000	158.725682	3	0.00	0.00	33
2024-04-25	9	-80.00	0	True	4.108247	0.000000	9	25	3	4	7.071068e-01	-7.071068e-01	35.217917	158.700665	3	0.00	0.00	33
2024-04-25	10	-80.00	0	True	4.108247	0.000000	10	25	3	4	5.000000e-01	-8.660254e-01	34.865833	158.956999	3	0.00	0.00	33

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-04-25	11	-80.00	0	True	4.108247	0.000000	11	25	3	4	2.588190e-01	-9.659258e-01	34.866250	158.956685	3	0.00	0.00	33
2024-04-25	12	-76.16	0	True	4.108247	-0.048000	12	25	3	4	1.224647e-16	-1.000000e+00	35.026250	158.837926	3	0.00	3.84	33
2024-04-25	13	-80.00	0	True	4.108247	0.050420	13	25	3	4	-2.588190e-01	-9.659258e-01	34.055417	159.492798	3	3.84	0.00	33
2024-04-25	14	-80.00	0	True	4.108247	0.000000	14	25	3	4	-5.000000e-01	-8.660254e-01	34.013750	159.523744	3	0.00	0.00	32
2024-04-25	15	-79.25	0	True	4.108247	-0.009375	15	25	3	4	-7.071068e-01	-7.071068e-01	31.588333	160.834313	3	0.00	0.75	32
2024-04-25	16	256.88	0	True	5.548609	-4.241388	16	25	3	4	-8.660254e-01	-5.000000e-01	32.810417	162.490946	3	0.00	336.13	32
2024-04-25	17	322.50	0	True	5.776103	0.255450	17	25	3	4	-9.659258e-01	-2.588190e-01	32.229583	161.379529	3	0.00	65.62	32
2024-04-25	18	329.39	0	True	5.797242	0.021364	18	25	3	4	-1.000000e+00	-1.836970e-16	31.440833	159.806042	3	0.00	6.89	32
2024-04-25	19	330.38	0	True	5.800244	0.003006	19	25	3	4	-9.659258e-01	2.588190e-01	31.835833	160.562545	3	0.00	0.99	31
2024-04-25	20	342.31	0	True	5.835717	0.036110	20	25	3	4	-8.660254e-01	5.000000e-01	35.009583	166.054159	3	0.00	11.93	29
2024-04-25	21	194.00	0	True	5.267858	-0.433262	21	25	3	4	-7.071068e-01	7.071068e-01	43.081250	168.975145	3	148.31	0.00	24
2024-04-25	22	183.05	0	True	5.209759	-0.056443	22	25	3	4	-5.000000e-01	8.660254e-01	52.085417	170.492799	3	10.95	0.00	23
2024-04-25	23	291.08	0	True	5.673598	0.590167	23	25	3	4	-2.588190e-01	9.659258e-01	65.471250	176.266813	3	0.00	108.03	23
2024-04-26	0	291.95	0	True	5.676583	0.002989	0	26	4	4	0.000000e+00	1.000000e+00	80.969167	179.246739	4	0.00	0.87	21
2024-04-26	1	316.70	0	True	5.757955	0.084775	1	26	4	4	2.588190e-01	9.659258e-01	97.498333	182.026859	4	0.00	24.75	21
2024-04-26	2	311.76	0	True	5.742234	-0.015598	2	26	4	4	5.000000e-01	8.660254e-01	113.821667	182.980690	4	4.94	0.00	21
2024-04-26	3	304.50	0	True	5.718671	-0.023287	3	26	4	4	7.071068e-01	7.071068e-01	129.842500	182.103152	4	7.26	0.00	21
2024-04-26	4	322.86	0	True	5.777219	0.060296	4	26	4	4	8.660254e-01	5.000000e-01	141.938333	184.978998	4	0.00	18.36	21
2024-04-26	5	335.72	0	True	5.816277	0.039832	5	26	4	4	9.659258e-01	2.588190e-01	144.937917	187.604865	4	0.00	12.86	21
2024-04-26	6	283.98	0	True	5.648904	-0.154117	6	26	4	4	1.000000e+00	6.123234e-17	154.235417	188.781454	4	51.74	0.00	15
2024-04-26	7	-48.31	0	True	5.648904	-1.170118	7	26	4	4	9.659258e-01	-2.588190e-01	155.555833	187.175880	4	332.29	0.00	23
2024-04-26	8	-80.00	0	True	5.648904	0.655972	8	26	4	4	8.660254e-01	-5.000000e-01	155.555833	187.175880	4	31.69	0.00	24
2024-04-26	9	-80.00	0	True	5.648904	0.000000	9	26	4	4	7.071068e-01	-7.071068e-01	155.555833	187.175880	4	0.00	0.00	24
2024-04-26	10	-79.39	0	True	5.648904	-0.007625	10	26	4	4	5.000000e-01	-8.660254e-01	155.581250	187.142542	4	0.00	0.61	24
2024-04-26	11	-64.55	0	True	5.648904	-0.186925	11	26	4	4	2.588190e-01	-9.659258e-01	156.225000	186.321707	4	0.00	14.84	24
2024-04-26	12	-65.72	0	True	5.648904	0.018125	12	26	4	4	1.224647e-16	-1.000000e+00	156.660000	185.766937	4	1.17	0.00	24
2024-04-26	13	-32.87	0	True	5.648904	-0.499848	13	26	4	4	-2.588190e-01	-9.659258e-01	158.623750	183.390327	4	0.00	32.85	24
2024-04-26	14	-70.84	0	True	5.648904	1.155157	14	26	4	4	-5.000000e-01	-8.660254e-01	159.005417	182.880942	4	37.97	0.00	26
2024-04-26	15	-80.00	0	True	5.648904	0.129305	15	26	4	4	-7.071068e-01	-7.071068e-01	158.974167	182.923484	4	9.16	0.00	26
2024-04-26	16	26.15	0	True	3.263849	-1.326875	16	26	4	4	-8.660254e-01	-5.000000e-01	149.360417	183.616039	4	0.00	106.15	26
2024-04-26	17	306.90	0	True	5.726522	10.736138	17	26	4	4	-9.659258e-01	-2.588190e-01	148.710417	183.003066	4	0.00	280.75	26
2024-04-26	18	335.00	0	True	5.814131	0.091561	18	26	4	4	-1.000000e+00	-1.836970e-16	148.944167	183.247302	4	0.00	28.10	26
2024-04-26	19	332.50	0	True	5.806640	-0.007463	19	26	4	4	-9.659258e-01	2.588190e-01	149.032500	183.339053	4	2.50	0.00	26
2024-04-26	20	342.25	0	True	5.835541	0.029323	20	26	4	4	-8.660254e-01	5.000000e-01	149.030000	183.336303	4	0.00	9.75	26
2024-04-26	21	362.70	0	True	5.893576	0.059752	21	26	4	4	-7.071068e-01	-7.071068e-01	156.059167	188.302180	4	0.00	20.45	20
2024-04-26	22	382.25	0	True	5.946075	0.053901	22	26	4	4	-5.000000e-01	8.660254e-01	164.359167	193.852003	4	0.00	19.55	19
2024-04-26	23	366.81	0	True	5.904844	-0.040392	23	26	4	4	-2.588190e-01	9.659258e-01	167.514583	196.601228	4	15.44	0.00	20
2024-04-27	0	347.73	1	False	5.851426	-0.052016	0	27	5	4	0.000000e+00	1.000000e+00	169.838750	198.457176	5	19.08	0.00	21
2024-04-27	1	281.40	1	False	5.639777	-0.190751	1	27	5	4	2.588190e-01	9.659258e-01	168.367917	197.449667	5	66.33	0.00	24
2024-04-27	2	230.93	1	False	5.442115	-0.179353	2	27	5	4	5.000000e-01	8.660254e-01	165.000000	195.577965	5	50.47	0.00	26
2024-04-27	3	163.18	1	False	5.094854	-0.293379	3	27	5	4	7.071068e-01	7.071068e-01	159.111667	193.309614	5	67.75	0.00	28
2024-04-27	4	138.61	1	False	4.931664	-0.150570	4	27	5	4	8.660254e-01	5.000000e-01	151.434583	190.156715	5	24.57	0.00	29
2024-04-27	5	295.80	1	False	5.689684	1.134045	5	27	5	4	9.659258e-01	2.588190e-01	149.771250	188.643223	5	0.00	157.19	29
2024-04-27	6	114.75	1	False	4.742756	-0.612069	6	27	5	4	1.000000e+00	6.123234e-17	142.720000	186.559855	5	181.05	0.00	34

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-04-27	7	-80.00	1	False	4.742756	-1.697168	7	27	5	4	9.659258e-01	-2.588190e-01	141.399583	188.076675	5	194.75	0.00	29
2024-04-27	8	-80.00	1	False	4.742756	0.000000	8	27	5	4	8.660254e-01	-5.000000e-01	141.399583	188.076675	5	0.00	0.00	27
2024-04-27	9	-80.00	1	False	4.742756	0.000000	9	27	5	4	7.071068e-01	-7.071068e-01	141.399583	188.076675	5	0.00	0.00	27
2024-04-27	10	-80.00	1	False	4.742756	0.000000	10	27	5	4	5.000000e-01	-8.660254e-01	141.374167	188.107849	5	0.00	0.00	27
2024-04-27	11	-80.00	1	False	4.742756	0.000000	11	27	5	4	2.588190e-01	-9.659258e-01	140.730417	188.868111	5	0.00	0.00	27
2024-04-27	12	-69.87	1	False	4.742756	-0.126625	12	27	5	4	1.224647e-16	-1.000000e+00	140.557500	189.067138	5	0.00	10.13	27
2024-04-27	13	-76.87	1	False	4.742756	0.100186	13	27	5	4	-2.588190e-01	-9.659258e-01	138.724167	191.025124	5	7.00	0.00	28
2024-04-27	14	-80.00	1	False	4.742756	0.040718	14	27	5	4	-5.000000e-01	-8.660254e-01	138.342500	191.470667	5	3.13	0.00	26
2024-04-27	15	-56.37	1	False	4.742756	-0.295375	15	27	5	4	-7.071068e-01	-7.071068e-01	139.327083	190.356601	5	0.00	23.63	26
2024-04-27	16	73.07	1	False	4.291418	-2.296257	16	27	5	4	-8.660254e-01	-5.000000e-01	141.282083	189.382158	5	0.00	129.44	26
2024-04-27	17	307.42	1	False	5.728215	3.207199	17	27	5	4	-9.659258e-01	-2.588190e-01	141.303750	189.401959	5	0.00	234.35	26
2024-04-27	18	323.97	1	False	5.780651	0.053835	18	27	5	4	-1.000000e+00	-1.836970e-16	140.844167	188.924300	5	0.00	16.55	26
2024-04-27	19	322.34	1	False	5.775607	-0.005031	19	27	5	4	-9.659258e-01	2.588190e-01	140.420833	188.487051	5	1.63	0.00	26
2024-04-27	20	323.96	1	False	5.780620	0.005026	20	27	5	4	-8.660254e-01	5.000000e-01	139.658750	187.670751	5	0.00	1.62	26
2024-04-27	21	292.92	1	False	5.679900	-0.095814	21	27	5	4	-7.071068e-01	7.071068e-01	136.751250	184.580120	5	31.04	0.00	27
2024-04-27	22	325.44	1	False	5.785178	0.111020	22	27	5	4	-5.000000e-01	8.660254e-01	134.384167	181.635709	5	0.00	32.52	27
2024-04-27	23	330.83	1	False	5.801605	0.016562	23	27	5	4	-2.588190e-01	9.659258e-01	132.885000	179.772860	5	0.00	5.39	26
2024-04-28	0	340.44	0	False	5.830239	0.029048	0	28	6	4	0.000000e+00	1.000000e+00	132.581250	179.399840	6	0.00	9.61	26
2024-04-28	1	335.54	0	False	5.815741	-0.014393	1	28	6	4	2.588190e-01	9.659258e-01	134.837083	181.678414	6	4.90	0.00	23
2024-04-28	2	342.56	0	False	5.836447	0.020921	2	28	6	4	5.000000e-01	8.660254e-01	139.488333	185.631449	6	0.00	7.02	21
2024-04-28	3	347.65	0	False	5.851196	0.014859	3	28	6	4	7.071068e-01	7.071068e-01	147.174583	190.412584	6	0.00	5.09	18
2024-04-28	4	366.33	0	False	5.903535	0.053732	4	28	6	4	8.660254e-01	5.000000e-01	156.662917	195.571066	6	0.00	18.68	17
2024-04-28	5	376.40	0	False	5.930652	0.027489	5	28	6	4	9.659258e-01	2.588190e-01	160.021250	198.730705	6	0.00	10.07	17
2024-04-28	6	354.62	0	False	5.871047	-0.057864	6	28	6	4	1.000000e+00	6.123234e-17	170.015833	202.353686	6	21.78	0.00	11
2024-04-28	7	347.72	0	False	5.851398	-0.019457	7	28	6	4	9.659258e-01	-2.588190e-01	187.837500	198.168736	6	6.90	0.00	3.1
2024-04-28	8	305.89	0	False	5.723226	-0.120298	8	28	6	4	8.660254e-01	-5.000000e-01	203.916250	191.018362	6	41.83	0.00	4.9
2024-04-28	9	149.35	0	False	5.006293	-0.511753	9	28	6	4	7.071068e-01	-7.071068e-01	213.472500	181.707080	6	156.54	0.00	11
2024-04-28	10	202.55	0	False	5.310987	0.356210	10	28	6	4	5.000000e-01	-8.660254e-01	225.245417	170.685116	6	0.00	53.20	11
2024-04-28	11	41.01	0	False	3.713816	-0.797531	11	28	6	4	2.588190e-01	-9.659258e-01	230.287500	162.885154	6	161.54	0.00	18
2024-04-28	12	-80.00	0	False	3.713816	-2.950744	12	28	6	4	1.224647e-16	-1.000000e+00	229.865417	163.707815	6	121.01	0.00	23
2024-04-28	13	-80.00	0	False	3.713816	0.000000	13	28	6	4	-2.588190e-01	-9.659258e-01	229.735000	163.963844	6	0.00	0.00	22
2024-04-28	14	-80.00	0	False	3.713816	0.000000	14	28	6	4	-5.000000e-01	-8.660254e-01	229.735000	163.963844	6	0.00	0.00	22
2024-04-28	15	-56.35	0	False	3.713816	-0.295625	15	28	6	4	-7.071068e-01	-7.071068e-01	229.735833	163.962327	6	0.00	23.65	22
2024-04-28	16	175.62	0	False	5.168323	-4.116593	16	28	6	4	-8.660254e-01	-5.000000e-01	234.008750	161.011744	6	0.00	231.97	22
2024-04-28	17	242.75	0	False	5.492032	0.382246	17	28	6	4	-9.659258e-01	-2.588190e-01	231.314167	160.269192	6	0.00	67.13	22
2024-04-28	18	322.87	0	False	5.777250	0.330051	18	28	6	4	-1.000000e+00	-1.836970e-16	231.268333	160.241697	6	0.00	80.12	22
2024-04-28	19	245.50	0	False	5.503297	-0.239632	19	28	6	4	-9.659258e-01	-2.588190e-01	228.066667	159.106569	6	77.37	0.00	25
2024-04-28	20	236.40	0	False	5.465525	-0.037067	20	28	6	4	-8.660254e-01	-5.000000e-01	224.418333	157.810725	6	9.10	0.00	26
2024-04-28	21	19.16	0	False	2.952825	-0.918951	21	28	6	4	-7.071068e-01	-7.071068e-01	213.011667	162.469126	6	217.24	0.00	34
2024-04-28	22	-50.62	0	False	2.952825	-3.641962	22	28	6	4	-5.000000e-01	-8.660254e-01	197.342500	169.151588	6	69.78	0.00	36
2024-04-28	23	24.86	0	False	3.213260	-1.491110	23	28	6	4	-2.588190e-01	-9.659258e-01	184.593750	170.180535	6	0.00	75.48	36
2024-04-29	0	251.57	0	True	5.527721	9.119469	0	29	0	4	0.000000e+00	1.000000e+00	180.890833	167.589200	0	0.00	226.71	36
2024-04-29	1	268.57	0	True	5.593112	0.067576	1	29	0	4	2.588190e-01	9.659258e-01	178.100417	165.446119	0	0.00	17.00	36
2024-04-29	2	287.64	0	True	5.661710	0.071006	2	29	0	4	5.000000e-01	8.660254e-01	175.812083	163.440178	0	0.00	19.07	36

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su	
2024-04-29	3	283.56	0	True	5.647424	-0.014184	3	29	0	4	7.071068e-01	7.071068e-01	173.141667	161.016082	0	4.08	0.00	36	
2024-04-29	4	296.30	0	True	5.691372	0.044929	4	29	0	4	8.660254e-01	5.000000e-01	170.223750	157.968628	0	0.00	12.74	36	
2024-04-29	5	312.93	0	True	5.745980	0.056126	5	29	0	4	9.659258e-01	2.588190e-01	167.579167	154.867767	0	0.00	16.63	36	
2024-04-29	6	303.31	0	True	5.714755	-0.030742	6	29	0	4	1.000000e+00	6.123234e-17	165.441250	152.509654	0	9.62	0.00	36	
2024-04-29	7	254.41	0	True	5.538947	-0.161221	7	29	0	4	9.659258e-01	-2.588190e-01	161.553333	148.805181	0	48.90	0.00	38	
2024-04-29	8	133.40	0	True	4.893352	-0.475650	8	29	0	4	8.660254e-01	-5.000000e-01	154.366250	145.663165	0	121.01	0.00	41	
2024-04-29	9	-80.00	0	True	4.893352	-1.599700	9	29	0	4	7.071068e-01	-7.071068e-01	144.810000	153.328161	0	213.40	0.00	43	
2024-04-29	10	-80.00	0	True	4.893352	0.000000	10	29	0	4	5.000000e-01	-8.660254e-01	133.037083	159.428090	0	0.00	0.00	43	
2024-04-29	11	-48.00	0	True	4.893352	-0.400000	11	29	0	4	2.588190e-01	-9.659258e-01	129.328333	162.664444	0	0.00	32.00	37	
2024-04-29	12	-80.00	0	True	4.893352	0.666667	12	29	0	4	1.224647e-16	-1.000000e+00	129.328333	162.664444	0	32.00	0.00	33	
2024-04-29	13	-80.00	0	True	4.893352	0.000000	13	29	0	4	-2.588190e-01	-9.659258e-01	129.328333	162.664444	0	0.00	0.00	33	
2024-04-29	14	-60.50	0	True	4.893352	-0.243750	14	29	0	4	-5.000000e-01	-8.660254e-01	130.140833	161.618740	0	0.00	19.50	33	
2024-04-29	15	152.12	0	True	5.024670	-3.514380	15	29	0	4	-7.071068e-01	-7.071068e-01	138.827083	156.686841	0	0.00	212.62	33	
2024-04-29	16	254.56	0	True	5.539537	0.673416	16	29	0	4	-8.660254e-01	-5.000000e-01	142.116250	158.312894	0	0.00	102.44	33	
2024-04-29	17	291.41	0	True	5.674731	0.144760	17	29	0	4	-9.659258e-01	-2.588190e-01	144.143750	159.960753	0	0.00	36.85	33	
2024-04-29	18	301.93	0	True	5.710195	0.036100	18	29	0	4	-1.000000e+00	-1.836970e-16	143.271250	158.997722	0	0.00	10.52	33	
2024-04-29	19	288.21	0	True	5.663689	-0.045441	19	29	0	4	-9.659258e-01	-2.588190e-01	145.050833	160.424282	0	13.72	0.00	30	
2024-04-29	20	286.05	0	True	5.656167	-0.007495	20	29	0	4	-8.660254e-01	-5.000000e-01	147.119583	161.966212	0	2.16	0.00	30	
2024-04-29	21	248.30	0	True	5.514638	-0.131970	21	29	0	4	-7.071068e-01	-7.071068e-01	7.071068e-01	156.667083	160.845097	0	37.75	0.00	23
2024-04-29	22	249.63	0	True	5.519980	0.005356	22	29	0	4	-5.000000e-01	-8.660254e-01	169.177500	155.612990	0	0.00	1.33	20	
2024-04-29	23	282.05	0	True	5.642084	0.129872	23	29	0	4	-2.588190e-01	-9.659258e-01	179.893750	154.090714	0	0.00	32.42	20	
2024-04-30	0	299.26	0	True	5.701313	0.061018	0	30	1	4	0.000000e+00	1.000000e+00	181.880833	155.357493	1	0.00	17.21	20	
2024-04-30	1	298.97	0	True	5.700343	-0.000969	1	30	1	4	2.588190e-01	9.659258e-01	183.147500	156.216574	1	0.29	0.00	20	
2024-04-30	2	299.00	0	True	5.700444	0.000100	2	30	1	4	5.000000e-01	8.660254e-01	183.620833	156.563775	1	0.00	0.03	20	
2024-04-30	3	294.47	0	True	5.685177	-0.015151	3	30	1	4	7.071068e-01	7.071068e-01	184.075417	156.882080	1	4.53	0.00	20	
2024-04-30	4	303.00	0	True	5.713733	0.028967	4	30	1	4	8.660254e-01	5.000000e-01	184.354583	157.096277	1	0.00	8.53	20	
2024-04-30	5	309.00	0	True	5.733341	0.019802	5	30	1	4	9.659258e-01	2.588190e-01	184.190833	156.958417	1	0.00	6.00	20	
2024-04-30	6	302.29	0	True	5.711387	-0.021715	6	30	1	4	1.000000e+00	6.123234e-17	184.148333	156.924895	1	6.71	0.00	20	
2024-04-30	7	227.45	0	True	5.426930	-0.247577	7	30	1	4	9.659258e-01	-2.588190e-01	183.025000	156.495974	1	74.84	0.00	21	
2024-04-30	8	83.79	0	True	4.428314	-0.631611	8	30	1	4	8.660254e-01	-5.000000e-01	180.957917	157.504336	1	143.66	0.00	22	
2024-04-30	9	-71.80	0	True	4.428314	-1.856904	9	30	1	4	7.071068e-01	-7.071068e-01	181.299583	156.921455	1	155.59	0.00	19	
2024-04-30	10	208.24	0	True	5.338691	-3.900279	10	30	1	4	5.000000e-01	-8.660254e-01	193.309583	146.754223	1	0.00	280.04	19	
2024-04-30	11	8.63	0	True	2.155245	-0.958557	11	30	1	4	2.588190e-01	-9.659258e-01	195.669167	143.115802	1	199.61	0.00	27	
2024-04-30	12	-55.10	0	True	2.155245	-7.384705	12	30	1	4	1.224647e-16	-1.000000e+00	196.706667	141.106637	1	63.73	0.00	29	
2024-04-30	13	108.86	0	True	4.690063	-2.975681	13	30	1	4	-2.588190e-01	-9.659258e-01	204.575833	129.819137	1	0.00	163.96	29	
2024-04-30	14	160.88	0	True	5.080659	0.477861	14	30	1	4	-5.000000e-01	-8.660254e-01	213.800000	117.440323	1	0.00	52.02	29	
2024-04-30	15	64.98	0	True	4.174080	-0.596096	15	30	1	4	-7.071068e-01	-7.071068e-01	210.169167	120.731080	1	95.90	0.00	33	
2024-04-30	16	176.53	0	True	5.173491	1.716682	16	30	1	4	-8.660254e-01	-5.000000e-01	206.917917	120.534175	1	0.00	111.55	33	
2024-04-30	17	295.32	0	True	5.688060	0.672917	17	30	1	4	-9.659258e-01	-2.588190e-01	207.080833	120.655922	1	0.00	118.79	33	
2024-04-30	18	322.57	0	True	5.776320	0.092273	18	30	1	4	-1.000000e+00	-1.836970e-16	207.940833	121.432432	1	0.00	27.25	33	
2024-04-30	19	328.80	0	True	5.795450	0.019314	19	30	1	4	-9.659258e-01	-2.588190e-01	208.632083	122.873100	1	0.00	6.23	32	
2024-04-30	20	329.35	0	True	5.797121	0.001673	20	30	1	4	-8.660254e-01	-5.000000e-01	211.436250	124.352922	1	0.00	0.55	32	
2024-04-30	21	311.50	0	True	5.741399	-0.054198	21	30	1	4	-7.071068e-01	-7.071068e-01	214.069583	125.827923	1	17.85	0.00	31	
2024-04-30	22	305.50	0	True	5.721950	-0.019262	22	30	1	4	-5.000000e-01	-8.660254e-01	216.397500	127.025543	1	6.00	0.00	32	

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-04-30	23	305.50	0	True	5.721950	0.000000	23	30	1	4	-2.588190e-01	9.659258e-01	217.374583	127.641198	1	0.00	0.00	32
2024-05-01	0	485.82	2	True	6.185838	0.590245	0	1	2	5	0.000000e+00	1.000000e+00	225.147917	138.097297	2	0.00	180.32	32
2024-05-01	1	482.56	2	True	6.179105	-0.006710	1	1	2	5	2.588190e-01	9.659258e-01	232.797500	147.152206	2	3.26	0.00	32
2024-05-01	2	470.21	2	True	6.153179	-0.025593	2	1	2	5	5.000000e-01	8.660254e-01	239.931250	154.469261	2	12.35	0.00	32
2024-05-01	3	464.22	2	True	6.140359	-0.012739	3	1	2	5	7.071068e-01	7.071068e-01	247.004167	160.830406	2	5.99	0.00	32
2024-05-01	4	485.69	2	True	6.185571	0.046250	4	1	2	5	8.660254e-01	5.000000e-01	254.616250	167.769561	2	0.00	21.47	32
2024-05-01	5	508.31	2	True	6.231091	0.046573	5	1	2	5	9.659258e-01	2.588190e-01	262.920833	175.340678	2	0.00	22.62	32
2024-05-01	6	473.60	2	True	6.160363	-0.068285	6	1	2	5	1.000000e+00	6.123234e-17	270.058750	180.426200	2	34.71	0.00	33
2024-05-01	7	231.99	2	True	5.446694	-0.510156	7	1	2	5	9.659258e-01	-2.588190e-01	270.247917	180.381959	2	241.61	0.00	40
2024-05-01	8	-54.15	2	True	5.446694	-1.233415	8	1	2	5	8.660254e-01	-5.000000e-01	264.500417	188.592109	2	286.14	0.00	46
2024-05-01	9	-80.00	2	True	5.446694	0.477378	9	1	2	5	7.071068e-01	-7.071068e-01	264.158750	189.234199	2	25.85	0.00	41
2024-05-01	10	-80.00	2	True	5.446694	0.000000	10	1	2	5	5.000000e-01	-8.660254e-01	252.148750	201.675262	2	0.00	0.00	41
2024-05-01	11	-80.00	2	True	5.446694	0.000000	11	1	2	5	2.588190e-01	-9.659258e-01	248.455833	207.067629	2	0.00	0.00	33
2024-05-01	12	-80.00	2	True	5.446694	0.000000	12	1	2	5	1.224647e-16	-1.000000e+00	247.418333	208.710568	2	0.00	0.00	30
2024-05-01	13	-80.00	2	True	5.446694	0.000000	13	1	2	5	-2.588190e-01	-9.659258e-01	239.549167	217.535655	2	0.00	0.00	30
2024-05-01	14	-94.89	2	True	5.446694	0.186125	14	1	2	5	-5.000000e-01	-8.660254e-01	228.892083	227.589970	2	14.89	0.00	31
2024-05-01	15	37.00	2	True	3.610918	-1.389925	15	1	2	5	-7.071068e-01	-7.071068e-01	227.726250	228.535817	2	0.00	131.89	27
2024-05-01	16	309.85	2	True	5.736088	7.374324	16	1	2	5	-8.660254e-01	-5.000000e-01	233.281250	228.857361	2	0.00	272.85	27
2024-05-01	17	469.63	2	True	6.151945	0.515669	17	1	2	5	-9.659258e-01	-2.588190e-01	240.544167	233.627987	2	0.00	159.78	27
2024-05-01	18	507.37	2	True	6.229241	0.080361	18	1	2	5	-1.000000e+00	-1.836970e-16	248.244167	239.422463	2	0.00	37.74	27
2024-05-01	19	509.58	2	True	6.233587	0.004356	19	1	2	5	-9.659258e-01	2.588190e-01	255.776667	244.849298	2	0.00	2.21	27
2024-05-01	20	490.33	2	True	6.195079	-0.037776	20	1	2	5	-8.660254e-01	5.000000e-01	262.484167	249.120154	2	19.25	0.00	27
2024-05-01	21	472.62	2	True	6.158292	-0.036119	21	1	2	5	-7.071068e-01	7.071068e-01	269.197500	252.644486	2	17.71	0.00	27
2024-05-01	22	486.40	2	True	6.187031	0.029157	22	1	2	5	-5.000000e-01	8.660254e-01	276.735000	256.444583	2	0.00	13.78	27
2024-05-01	23	463.48	2	True	6.138763	-0.047122	23	1	2	5	-2.588190e-01	9.659258e-01	283.317500	259.227475	2	22.92	0.00	28
2024-05-02	0	496.61	2	True	6.207805	0.071481	0	2	3	5	0.000000e+00	1.000000e+00	283.767083	259.603033	3	0.00	33.13	28
2024-05-02	1	490.12	2	True	6.194650	-0.013069	1	2	3	5	2.588190e-01	9.659258e-01	284.082083	259.859194	3	6.49	0.00	28
2024-05-02	2	476.70	2	True	6.166887	-0.027381	2	2	3	5	5.000000e-01	8.660254e-01	284.352500	260.064601	3	13.42	0.00	28
2024-05-02	3	478.07	2	True	6.169757	0.002874	3	2	3	5	7.071068e-01	7.071068e-01	284.929583	260.496089	3	0.00	1.37	28
2024-05-02	4	491.18	2	True	6.196811	0.027423	4	2	3	5	8.660254e-01	5.000000e-01	285.158333	260.682392	3	0.00	13.11	28
2024-05-02	5	538.01	2	True	6.287877	0.095342	5	2	3	5	9.659258e-01	2.588190e-01	286.395833	261.855641	3	0.00	46.83	28
2024-05-02	6	505.75	2	True	6.226042	-0.059962	6	2	3	5	1.000000e+00	6.123234e-17	287.735417	262.934977	3	32.26	0.00	28
2024-05-02	7	224.41	2	True	5.413475	-0.556283	7	2	3	5	9.659258e-01	-2.588190e-01	287.419583	263.009391	3	281.34	0.00	30
2024-05-02	8	-80.00	2	True	5.413475	-1.356490	8	2	3	5	8.660254e-01	-5.000000e-01	286.342500	264.517620	3	304.41	0.00	30
2024-05-02	9	-80.00	2	True	5.413475	0.000000	9	2	3	5	7.071068e-01	-7.071068e-01	286.342500	264.517620	3	0.00	0.00	29
2024-05-02	10	-80.00	2	True	5.413475	0.000000	10	2	3	5	5.000000e-01	-8.660254e-01	286.342500	264.517620	3	0.00	0.00	29
2024-05-02	11	-80.00	2	True	5.413475	0.000000	11	2	3	5	2.588190e-01	-9.659258e-01	286.342500	264.517620	3	0.00	0.00	29
2024-05-02	12	-80.00	2	True	5.413475	0.000000	12	2	3	5	1.224647e-16	-1.000000e+00	286.342500	264.517620	3	0.00	0.00	29
2024-05-02	13	-80.00	2	True	5.413475	0.000000	13	2	3	5	-2.588190e-01	-9.659258e-01	286.342500	264.517620	3	0.00	0.00	29
2024-05-02	14	-89.87	2	True	5.413475	0.123375	14	2	3	5	-5.000000e-01	-8.660254e-01	286.551667	264.204854	3	9.87	0.00	29
2024-05-02	15	53.61	2	True	3.981736	-1.596528	15	2	3	5	-7.071068e-01	-7.071068e-01	287.243750	263.543661	3	0.00	143.48	29
2024-05-02	16	380.14	2	True	5.940540	0.090841	16	2	3	5	-8.660254e-01	-5.000000e-01	290.172500	264.195564	3	0.00	326.53	29
2024-05-02	17	503.56	2	True	6.221703	0.324670	17	2	3	5	-9.659258e-01	-2.588190e-01	291.586250	265.286152	3	0.00	123.42	29
2024-05-02	18	525.20	2	True	6.263779	0.042974	18	2	3	5	-1.836970e-16	-1.000000e+00	292.329167	265.940872	3	0.00	21.64	29

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-05-02	19	524.04	2	True	6.261568	-0.002209	19	2	3	5	-9.659258e-01	2.588190e-01	292.931667	266.470315	3	1.16	0.00	29
2024-05-02	20	887.31	2	True	6.788194	0.693210	20	2	3	5	-8.660254e-01	5.000000e-01	309.472500	290.494405	3	0.00	363.27	28
2024-05-02	21	788.47	2	True	6.670094	-0.111393	21	2	3	5	-7.071068e-01	7.071068e-01	322.632917	304.999342	3	98.84	0.00	32
2024-05-02	22	650.91	2	True	6.478371	-0.174464	22	2	3	5	-5.000000e-01	8.660254e-01	329.487500	310.636394	3	137.56	0.00	37
2024-05-02	23	579.46	2	True	6.362097	-0.109769	23	2	3	5	-2.588190e-01	9.659258e-01	334.320000	313.698560	3	71.45	0.00	39
2024-05-03	0	512.36	2	True	6.239028	-0.115797	0	3	4	5	0.000000e+00	1.000000e+00	334.976250	314.069083	4	67.10	0.00	42
2024-05-03	1	489.69	2	True	6.193773	-0.044246	1	3	4	5	2.588190e-01	9.659258e-01	334.958333	314.059860	4	22.67	0.00	43
2024-05-03	2	473.68	2	True	6.160532	-0.032694	2	3	4	5	5.000000e-01	8.660254e-01	334.832500	314.001199	4	16.01	0.00	43
2024-05-03	3	474.60	2	True	6.162472	0.001942	3	3	4	5	7.071068e-01	7.071068e-01	334.687917	313.933169	4	0.00	0.92	43
2024-05-03	4	514.85	2	True	6.243876	0.084808	4	3	4	5	8.660254e-01	5.000000e-01	335.674167	314.482878	4	0.00	40.25	43
2024-05-03	5	1002.66	2	True	6.910412	0.947480	5	3	4	5	9.659258e-01	2.588190e-01	355.034583	340.691276	4	0.00	487.81	43
2024-05-03	6	549.86	2	True	6.309664	-0.451599	6	3	4	5	1.000000e+00	6.123234e-17	356.872500	341.657296	4	452.80	0.00	60
2024-05-03	7	380.62	2	True	5.941802	-0.307787	7	3	4	5	9.659258e-01	-2.588190e-01	363.381250	340.510115	4	169.24	0.00	56
2024-05-03	8	94.99	2	True	4.553772	-0.750434	8	3	4	5	8.660254e-01	-5.000000e-01	370.672500	332.379773	4	285.63	0.00	55
2024-05-03	9	-80.00	2	True	4.553772	-1.842194	9	3	4	5	7.071068e-01	-7.071068e-01	370.672500	332.379773	4	174.99	0.00	62
2024-05-03	10	-64.33	2	True	4.553772	-0.195875	10	3	4	5	5.000000e-01	-8.660254e-01	371.325417	331.470141	4	0.00	15.67	62
2024-05-03	11	-52.77	2	True	4.553772	-0.179698	11	3	4	5	2.588190e-01	-9.659258e-01	372.460000	329.901030	4	0.00	11.56	62
2024-05-03	12	-80.00	2	True	4.553772	0.516013	12	3	4	5	1.224647e-16	-1.000000e+00	372.460000	329.901030	4	27.23	0.00	63
2024-05-03	13	-80.00	2	True	4.553772	0.000000	13	3	4	5	-2.588190e-01	-9.659258e-01	372.460000	329.901030	4	0.00	0.00	63
2024-05-03	14	74.92	2	True	4.316421	-1.936500	14	3	4	5	-5.000000e-01	-8.660254e-01	379.326250	321.467247	4	0.00	154.92	63
2024-05-03	15	251.54	2	True	5.527602	2.357448	15	3	4	5	-7.071068e-01	-7.071068e-01	387.573333	315.226164	4	0.00	176.62	63
2024-05-03	16	388.51	2	True	5.962319	0.544526	16	3	4	5	-8.660254e-01	-5.000000e-01	387.922083	315.222213	4	0.00	136.97	63
2024-05-03	17	466.36	2	True	6.144958	0.200381	17	3	4	5	-9.659258e-01	-2.588190e-01	386.372083	314.719939	4	0.00	77.85	63
2024-05-03	18	468.59	2	True	6.149728	0.004782	18	3	4	5	-1.000000e+00	-1.836970e-16	384.013333	313.845142	4	0.00	2.23	63
2024-05-03	19	478.27	2	True	6.170175	0.020658	19	3	4	5	-9.659258e-01	-2.588190e-01	382.106250	313.095439	4	0.00	9.68	63
2024-05-03	20	525.86	2	True	6.265035	0.099504	20	3	4	5	-8.660254e-01	-5.000000e-01	367.045833	295.962106	4	0.00	47.59	63
2024-05-03	21	510.98	2	True	6.236330	-0.028297	21	3	4	5	-7.071068e-01	-7.071068e-01	355.483750	283.959766	4	14.88	0.00	59
2024-05-03	22	488.88	2	True	6.192117	-0.043250	22	3	4	5	-5.000000e-01	-8.660254e-01	348.732500	278.504267	4	22.10	0.00	55
2024-05-03	23	469.17	2	True	6.150965	-0.040317	23	3	4	5	-2.588190e-01	-9.659258e-01	344.137083	275.424541	4	19.71	0.00	53
2024-05-04	0	328.54	1	False	5.794659	-0.299742	0	4	5	5	0.000000e+00	1.000000e+00	336.477917	273.089092	5	140.63	0.00	56
2024-05-04	1	329.38	1	False	5.797212	0.002557	1	4	5	5	2.588190e-01	9.659258e-01	329.798333	271.132219	5	0.00	0.84	55
2024-05-04	2	333.19	1	False	5.808713	0.011567	2	4	5	5	5.000000e-01	8.660254e-01	323.944583	269.401818	5	0.00	3.81	54
2024-05-04	3	335.75	1	False	5.816367	0.007683	3	4	5	5	7.071068e-01	7.071068e-01	318.159167	267.510083	5	0.00	2.56	54
2024-05-04	4	352.86	1	False	5.866071	0.050961	4	4	5	5	8.660254e-01	5.000000e-01	311.409583	264.356587	5	0.00	17.11	54
2024-05-04	5	415.39	1	False	6.029218	0.177209	5	4	5	5	9.659258e-01	2.588190e-01	286.940000	221.256870	5	0.00	62.53	54
2024-05-04	6	316.59	1	False	5.757608	-0.237849	6	4	5	5	1.000000e+00	6.123234e-17	277.220417	214.216547	5	98.80	0.00	39
2024-05-04	7	307.72	1	False	5.729190	-0.028017	7	4	5	5	9.659258e-01	-2.588190e-01	274.182917	213.201077	5	8.87	0.00	33
2024-05-04	8	313.54	1	False	5.747927	0.018913	8	4	5	5	8.660254e-01	-5.000000e-01	283.289167	209.855726	5	0.00	5.82	21
2024-05-04	9	302.73	1	False	5.712841	-0.034477	9	4	5	5	7.071068e-01	-7.071068e-01	299.236250	195.069920	5	10.81	0.00	14
2024-05-04	10	310.08	1	False	5.736830	0.024279	10	4	5	5	5.000000e-01	-8.660254e-01	314.836667	179.043170	5	0.00	7.35	14
2024-05-04	11	322.39	1	False	5.775762	0.039699	11	4	5	5	2.588190e-01	-9.659258e-01	330.468333	161.023428	5	0.00	12.31	14
2024-05-04	12	319.79	1	False	5.767665	-0.008065	12	4	5	5	1.224647e-16	-1.000000e+00	347.126250	135.346035	5	2.60	0.00	13
2024-05-04	13	390.84	1	False	5.968298	0.222177	13	4	5	5	-2.588190e-01	-9.659258e-01	366.744583	100.339336	5	0.00	71.05	13
2024-05-04	14	830.48	1	False	6.722004	1.124859	14	4	5	5	-5.000000e-01	-8.660254e-01	398.226250	121.165760	5	0.00	439.64	13

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-05-04	15	1206.71	1	False	7.095653	0.453027	15	4	5	5	-7.071068e-01	-7.071068e-01	438.025000	201.276448	5	0.00	376.23	13
2024-05-04	16	1291.04	1	False	7.163203	0.069884	16	4	5	5	-8.660254e-01	-5.000000e-01	475.630417	265.643078	5	0.00	84.33	13
2024-05-04	17	1296.10	1	False	7.167115	0.003919	17	4	5	5	-9.659258e-01	-2.588190e-01	510.202917	313.980188	5	0.00	5.06	13
2024-05-04	18	1277.78	1	False	7.152879	-0.014135	18	4	5	5	-1.000000e+00	-1.836970e-16	543.919167	350.625648	5	18.32	0.00	14
2024-05-04	19	709.47	1	False	6.564518	-0.444764	19	4	5	5	-9.659258e-01	2.588190e-01	553.552500	351.917232	5	568.31	0.00	37
2024-05-04	20	403.03	1	False	5.999011	-0.431928	20	4	5	5	-8.660254e-01	5.000000e-01	548.434583	353.228187	5	306.44	0.00	50
2024-05-04	21	527.93	1	False	6.268964	0.309902	21	4	5	5	-7.071068e-01	7.071068e-01	549.140833	353.166983	5	0.00	124.90	49
2024-05-04	22	657.39	1	False	6.488277	0.245222	22	4	5	5	-5.000000e-01	8.660254e-01	556.162083	353.591663	5	0.00	129.46	48
2024-05-04	23	487.22	1	False	6.188716	-0.258857	23	4	5	5	-2.588190e-01	9.659258e-01	556.914167	353.417741	5	170.17	0.00	55
2024-05-05	0	396.01	1	False	5.981439	-0.187205	0	5	6	5	0.000000e+00	1.000000e+00	559.725417	351.786744	6	91.21	0.00	53
2024-05-05	1	418.01	1	False	6.035505	0.055554	1	5	6	5	2.588190e-01	9.659258e-01	563.418333	349.722682	6	0.00	22.00	53
2024-05-05	2	398.26	1	False	5.987105	-0.047248	2	5	6	5	5.000000e-01	8.660254e-01	566.129583	348.108724	6	19.75	0.00	53
2024-05-05	3	386.24	1	False	5.956459	-0.030181	3	5	6	5	7.071068e-01	7.071068e-01	568.233333	346.806048	6	12.02	0.00	54
2024-05-05	4	390.60	1	False	5.967684	0.011288	4	5	6	5	8.660254e-01	5.000000e-01	569.805833	345.871338	6	0.00	4.36	54
2024-05-05	5	398.86	1	False	5.988610	0.021147	5	5	6	5	9.659258e-01	2.588190e-01	569.117083	346.208497	6	0.00	8.26	54
2024-05-05	6	389.98	1	False	5.966095	-0.022263	6	5	6	5	1.000000e+00	6.123234e-17	572.175000	344.199335	6	8.88	0.00	50
2024-05-05	7	405.55	1	False	6.005244	0.039925	7	5	6	5	9.659258e-01	-2.588190e-01	576.251250	341.500006	6	0.00	15.57	50
2024-05-05	8	650.96	1	False	6.478448	0.605129	8	5	6	5	8.660254e-01	-5.000000e-01	590.310417	337.131906	6	0.00	245.41	50
2024-05-05	9	586.94	1	False	6.374923	-0.098347	9	5	6	5	7.071068e-01	-7.071068e-01	602.152500	331.536307	6	64.02	0.00	52
2024-05-05	10	544.14	1	False	6.299207	-0.072921	10	5	6	5	5.000000e-01	-8.660254e-01	611.905000	325.966913	6	42.80	0.00	54
2024-05-05	11	414.54	1	False	6.027169	-0.238174	11	5	6	5	2.588190e-01	-9.659258e-01	615.744583	322.937068	6	129.60	0.00	59
2024-05-05	12	390.99	1	False	5.968682	-0.056810	12	5	6	5	1.224647e-16	-1.000000e+00	618.711250	320.417278	6	23.55	0.00	60
2024-05-05	13	557.56	1	False	6.323570	0.426021	13	5	6	5	-2.588190e-01	-9.659258e-01	625.657917	317.051796	6	0.00	166.57	60
2024-05-05	14	1010.82	1	False	6.918517	0.812935	14	5	6	5	-5.000000e-01	-8.660254e-01	633.172083	324.174201	6	0.00	453.26	60
2024-05-05	15	1294.00	1	False	7.165493	0.280149	15	5	6	5	-7.071068e-01	-7.071068e-01	636.809167	331.300160	6	0.00	283.18	60
2024-05-05	16	780.86	1	False	6.660396	-0.396553	16	5	6	5	-8.660254e-01	-5.000000e-01	615.551667	302.623515	6	513.14	0.00	82
2024-05-05	17	429.99	1	False	6.063762	-0.449338	17	5	6	5	-9.659258e-01	-2.588190e-01	579.463750	267.548761	6	350.87	0.00	96
2024-05-05	18	404.70	1	False	6.003146	-0.058815	18	5	6	5	-1.000000e+00	-1.836970e-16	543.085417	224.337614	6	25.29	0.00	96
2024-05-05	19	385.74	1	False	5.955164	-0.046850	19	5	6	5	-9.659258e-01	2.588190e-01	529.596667	223.629782	6	18.96	0.00	74
2024-05-05	20	384.69	1	False	5.952438	-0.002722	20	5	6	5	-8.660254e-01	5.000000e-01	528.832500	224.111893	6	1.05	0.00	61
2024-05-05	21	378.50	1	False	5.936216	-0.016091	21	5	6	5	-7.071068e-01	-7.071068e-01	522.606250	226.204015	6	6.19	0.00	61
2024-05-05	22	377.81	1	False	5.934391	-0.001823	22	5	6	5	-5.000000e-01	8.660254e-01	510.957083	226.160035	6	0.69	0.00	61
2024-05-05	23	377.80	1	False	5.934365	-0.000026	23	5	6	5	-2.588190e-01	9.659258e-01	506.397917	227.756622	6	0.01	0.00	54
2024-05-06	0	383.97	0	True	5.950564	0.016331	0	6	0	5	0.000000e+00	1.000000e+00	505.896250	228.023442	0	0.00	6.17	50
2024-05-06	1	377.17	0	True	5.932696	-0.017710	1	6	0	5	2.588190e-01	9.659258e-01	504.194583	228.858683	0	6.80	0.00	50
2024-05-06	2	376.59	0	True	5.931157	-0.001538	2	6	0	5	5.000000e-01	8.660254e-01	503.291667	229.337046	0	0.58	0.00	50
2024-05-06	3	375.67	0	True	5.928711	-0.002443	3	6	0	5	7.071068e-01	7.071068e-01	502.851250	229.581623	0	0.92	0.00	49
2024-05-06	4	382.10	0	True	5.945682	0.017116	4	6	0	5	8.660254e-01	5.000000e-01	502.497083	229.768798	0	0.00	6.43	49
2024-05-06	5	390.29	0	True	5.966890	0.021434	5	6	0	5	9.659258e-01	2.588190e-01	502.140000	229.943456	0	0.00	8.19	49
2024-05-06	6	391.10	0	True	5.968963	0.002075	6	6	0	5	1.000000e+00	6.123234e-17	502.186667	229.919816	0	0.00	0.81	49
2024-05-06	7	386.11	0	True	5.956122	-0.012759	7	6	0	5	9.659258e-01	-2.588190e-01	501.376667	230.308980	0	4.99	0.00	49
2024-05-06	8	387.72	0	True	5.960283	0.004170	8	6	0	5	8.660254e-01	-5.000000e-01	490.408333	229.140792	0	0.00	1.61	49
2024-05-06	9	371.43	0	True	5.917360	-0.042015	9	6	0	5	7.071068e-01	-7.071068e-01	481.428750	229.415974	0	16.29	0.00	47
2024-05-06	10	372.58	0	True	5.920452	0.003096	10	6	0	5	5.000000e-01	-8.660254e-01	474.280417	230.048939	0	0.00	1.15	45

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-05-06	11	346.97	0	True	5.849238	-0.068737	11	6	0	5	2.588190e-01	-9.659258e-01	471.465000	231.222330	0	25.61	0.00	41
2024-05-06	12	236.98	0	True	5.467976	-0.317001	12	6	0	5	1.224647e-16	-1.000000e+00	465.047917	235.647610	0	109.99	0.00	45
2024-05-06	13	273.07	0	True	5.609728	0.152291	13	6	0	5	-2.588190e-01	-9.659258e-01	453.194167	237.935877	0	0.00	36.09	45
2024-05-06	14	298.06	0	True	5.697295	0.091515	14	6	0	5	-5.000000e-01	-8.660254e-01	423.495833	207.894448	0	0.00	24.99	45
2024-05-06	15	314.39	0	True	5.750634	0.054788	15	6	0	5	-7.071068e-01	-7.071068e-01	382.678750	95.143847	0	0.00	16.33	45
2024-05-06	16	349.82	0	True	5.857419	0.112694	16	6	0	5	-8.660254e-01	-5.000000e-01	364.718750	43.235452	0	0.00	35.43	23
2024-05-06	17	371.74	0	True	5.918195	0.062661	17	6	0	5	-9.659258e-01	-2.588190e-01	362.291667	40.988643	0	0.00	21.92	9.0
2024-05-06	18	382.23	0	True	5.946023	0.028219	18	6	0	5	-1.000000e+00	-1.836970e-16	361.355417	40.227406	0	0.00	10.49	8.0
2024-05-06	19	383.38	0	True	5.949027	0.003009	19	6	0	5	-9.659258e-01	2.588190e-01	361.257083	40.168048	0	0.00	1.15	7.2
2024-05-06	20	385.01	0	True	5.953269	0.004252	20	6	0	5	-8.660254e-01	5.000000e-01	361.270417	40.176217	0	0.00	1.63	7.1
2024-05-06	21	375.99	0	True	5.929563	-0.023428	21	6	0	5	-7.071068e-01	7.071068e-01	361.165833	40.132659	0	9.02	0.00	7.2
2024-05-06	22	375.89	0	True	5.929297	-0.000266	22	6	0	5	-5.000000e-01	8.660254e-01	361.085833	40.099939	0	0.10	0.00	7.2
2024-05-06	23	375.63	0	True	5.928605	-0.000692	23	6	0	5	-2.588190e-01	9.659258e-01	360.995417	40.063043	0	0.26	0.00	7.2
2024-05-07	0	466.22	0	True	6.144658	0.241168	0	7	1	5	0.000000e+00	1.000000e+00	364.422500	45.290653	1	0.00	90.59	7.2
2024-05-07	1	461.37	0	True	6.134200	-0.010403	1	7	1	5	2.588190e-01	9.659258e-01	367.930833	49.396141	1	4.85	0.00	7.1
2024-05-07	2	451.35	0	True	6.112243	-0.021718	2	7	1	5	5.000000e-01	8.660254e-01	371.045833	52.241251	1	10.02	0.00	7.2
2024-05-07	3	439.77	0	True	6.086252	-0.025656	3	7	1	5	7.071068e-01	7.071068e-01	373.716667	54.093654	1	11.58	0.00	8.0
2024-05-07	4	445.25	0	True	6.098636	0.012461	4	7	1	5	8.660254e-01	5.000000e-01	376.347917	56.020731	1	0.00	5.48	8.0
2024-05-07	5	465.65	0	True	6.143434	0.045817	5	7	1	5	9.659258e-01	2.588190e-01	379.487917	58.875426	1	0.00	20.40	8.0
2024-05-07	6	440.28	0	True	6.087411	-0.054483	6	7	1	5	1.000000e+00	6.123234e-17	381.537083	60.139447	1	25.37	0.00	9.0
2024-05-07	7	252.42	0	True	5.531094	-0.426683	7	7	1	5	9.659258e-01	-2.588190e-01	375.966667	65.637649	1	187.86	0.00	16
2024-05-07	8	76.12	0	True	4.332311	-0.698439	8	7	1	5	8.660254e-01	-5.000000e-01	362.983333	89.640635	1	176.30	0.00	24
2024-05-07	9	-80.00	0	True	4.332311	-2.050972	9	7	1	5	7.071068e-01	-7.071068e-01	344.173750	127.259898	1	156.12	0.00	29
2024-05-07	10	-22.56	0	True	4.332311	-0.718000	10	7	1	5	5.000000e-01	-8.660254e-01	327.709583	147.392990	1	0.00	57.44	29
2024-05-07	11	-49.04	0	True	4.332311	1.173759	11	7	1	5	2.588190e-01	-9.659258e-01	311.209167	166.119772	1	26.48	0.00	29
2024-05-07	12	-80.00	0	True	4.332311	0.631321	12	7	1	5	1.224647e-16	-1.000000e+00	298.001667	183.924729	1	30.96	0.00	26
2024-05-07	13	-80.00	0	True	4.332311	0.000000	13	7	1	5	-2.588190e-01	-9.659258e-01	283.290417	199.468926	1	0.00	0.00	26
2024-05-07	14	37.18	0	True	3.615771	-1.464750	14	7	1	5	-5.000000e-01	-8.660254e-01	272.420417	205.641841	1	0.00	117.18	26
2024-05-07	15	148.79	0	True	5.002536	3.001883	15	7	1	5	-7.071068e-01	-7.071068e-01	265.520417	206.946478	1	0.00	111.61	26
2024-05-07	16	318.88	0	True	5.764815	1.143155	16	7	1	5	-8.660254e-01	-5.000000e-01	264.231250	206.494381	1	0.00	170.09	26
2024-05-07	17	457.23	0	True	6.125187	0.433862	17	7	1	5	-9.659258e-01	-2.588190e-01	267.793333	209.149856	1	0.00	138.35	26
2024-05-07	18	496.65	0	True	6.207886	0.086215	18	7	1	5	-1.836970e-16	-1.000000e+00	272.560833	213.137878	1	0.00	39.42	26
2024-05-07	19	496.59	0	True	6.207765	-0.000121	19	7	1	5	-9.659258e-01	-2.588190e-01	277.277917	216.916385	1	0.06	0.00	26
2024-05-07	20	490.89	0	True	6.196220	-0.011478	20	7	1	5	-8.660254e-01	-5.000000e-01	281.689583	220.253740	1	5.70	0.00	26
2024-05-07	21	482.03	0	True	6.178006	-0.018049	21	7	1	5	-7.071068e-01	-7.071068e-01	286.107917	223.270603	1	8.86	0.00	26
2024-05-07	22	480.38	0	True	6.174577	-0.003423	22	7	1	5	-5.000000e-01	-8.660254e-01	290.461667	226.098326	1	1.65	0.00	26
2024-05-07	23	491.10	0	True	6.196648	0.022316	23	7	1	5	-2.588190e-01	-9.659258e-01	295.272917	229.196798	1	0.00	10.72	26
2024-05-08	0	483.29	0	True	6.180617	-0.015903	0	8	2	5	0.000000e+00	1.000000e+00	295.984167	229.776105	2	7.81	0.00	27
2024-05-08	1	487.02	0	True	6.188305	0.007718	1	8	2	5	2.588190e-01	9.659258e-01	297.052917	230.636845	2	0.00	3.73	27
2024-05-08	2	483.49	0	True	6.181031	-0.007248	2	8	2	5	5.000000e-01	8.660254e-01	298.392083	231.662733	2	3.53	0.00	26
2024-05-08	3	479.85	0	True	6.173474	-0.007529	3	8	2	5	7.071068e-01	7.071068e-01	300.062083	232.867533	2	3.64	0.00	26
2024-05-08	4	485.50	0	True	6.185179	0.011775	4	8	2	5	8.660254e-01	5.000000e-01	301.739167	234.100296	2	0.00	5.65	26
2024-05-08	5	508.42	0	True	6.231308	0.047209	5	8	2	5	9.659258e-01	2.588190e-01	303.521250	235.560552	2	0.00	22.92	26
2024-05-08	6	478.12	0	True	6.169862	-0.059596	6	8	2	5	1.000000e+00	6.123234e-17	305.097917	236.639876	2	30.30	0.00	26

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su	
2024-05-08	7	340.37	0	True	5.830033	-0.288108	7	8	2	5	9.659258e-01	-2.588190e-01	308.762500	236.469574	2	137.75	0.00	24	
2024-05-08	8	56.68	0	True	4.037421	-0.833475	8	8	2	5	8.660254e-01	-5.000000e-01	307.952500	237.332831	2	283.69	0.00	29	
2024-05-08	9	-80.00	0	True	4.037421	-2.411433	9	8	2	5	7.071068e-01	-7.071068e-01	307.952500	237.332831	2	136.68	0.00	28	
2024-05-08	10	-31.28	0	True	4.037421	-0.609000	10	8	2	5	5.000000e-01	-8.660254e-01	307.589167	237.866886	2	0.00	48.72	28	
2024-05-08	11	-43.70	0	True	4.037421	0.397059	11	8	2	5	2.588190e-01	-9.659258e-01	307.811667	237.521039	2	12.42	0.00	27	
2024-05-08	12	-80.00	0	True	4.037421	0.830664	12	8	2	5	1.224647e-16	-1.000000e+00	307.811667	237.521039	2	36.30	0.00	27	
2024-05-08	13	-53.68	0	True	4.037421	-0.329000	13	8	2	5	-2.588190e-01	-9.659258e-01	308.908333	235.706438	2	0.00	26.32	27	
2024-05-08	14	-39.24	0	True	4.037421	-0.269001	14	8	2	5	-5.000000e-01	-8.660254e-01	305.724167	240.013652	2	0.00	14.44	27	
2024-05-08	15	186.96	0	True	5.230895	-5.764526	15	8	2	5	-7.071068e-01	-7.071068e-01	307.314583	239.053078	2	0.00	226.20	27	
2024-05-08	16	378.64	0	True	5.936586	1.025246	16	8	2	5	-8.660254e-01	-5.000000e-01	309.804583	239.489617	2	0.00	191.68	27	
2024-05-08	17	446.52	0	True	6.101484	0.179273	17	8	2	5	-9.659258e-01	-2.588190e-01	309.358333	239.212788	2	0.00	67.88	27	
2024-05-08	18	453.66	0	True	6.117348	0.015990	18	8	2	5	-1.000000e+00	-1.836970e-16	307.567083	237.906744	2	0.00	7.14	27	
2024-05-08	19	449.81	0	True	6.108825	-0.008487	19	8	2	5	-9.659258e-01	-2.588190e-01	305.617917	236.478093	2	3.85	0.00	28	
2024-05-08	20	430.61	0	True	6.065203	-0.042685	20	8	2	5	-8.660254e-01	-5.000000e-01	303.106250	234.738458	2	19.20	0.00	28	
2024-05-08	21	321.55	0	True	5.773153	-0.253269	21	8	2	5	-7.071068e-01	-7.071068e-01	296.419583	231.685947	2	109.06	0.00	32	
2024-05-08	22	292.43	0	True	5.678225	-0.090561	22	8	2	5	-5.000000e-01	-8.660254e-01	288.588333	228.349969	2	29.12	0.00	33	
2024-05-08	23	276.95	0	True	5.623837	-0.052936	23	8	2	5	-2.588190e-01	-9.659258e-01	279.665417	224.239674	2	15.48	0.00	34	
2024-05-09	0	241.21	0	True	5.485668	-0.129049	0	9	3	5	0.000000e+00	1.000000e+00	269.578750	220.088223	3	35.74	0.00	35	
2024-05-09	1	247.69	0	True	5.512178	0.026865	1	9	3	5	2.588190e-01	9.659258e-01	259.606667	215.174832	3	0.00	6.48	35	
2024-05-09	2	218.59	0	True	5.387198	-0.117486	2	9	3	5	5.000000e-01	8.660254e-01	248.569167	209.921267	3	29.10	0.00	36	
2024-05-09	3	342.54	0	True	5.836388	0.567043	3	9	3	5	7.071068e-01	7.071068e-01	242.847917	205.160985	3	0.00	123.95	36	
2024-05-09	4	549.07	0	True	6.308226	0.602937	4	9	3	5	8.660254e-01	5.000000e-01	245.496667	208.807925	3	0.00	206.53	36	
2024-05-09	5	749.23	0	True	6.619046	0.364544	5	9	3	5	9.659258e-01	2.588190e-01	255.530417	226.985884	3	0.00	200.16	36	
2024-05-09	6	611.01	0	True	6.415113	-0.184483	6	9	3	5	1.000000e+00	6.123234e-17	261.067500	234.159310	3	138.22	0.00	41	
2024-05-09	7	29.45	0	True	3.382694	-0.951801	7	9	3	5	9.659258e-01	-2.588190e-01	248.112500	238.148036	3	581.56	0.00	59	
2024-05-09	8	-80.00	0	True	3.382694	-3.716469	8	9	3	5	8.660254e-01	-5.000000e-01	242.417500	244.475145	3	109.45	0.00	52	
2024-05-09	9	-80.00	0	True	3.382694	0.000000	9	9	3	5	7.071068e-01	-7.071068e-01	242.417500	244.475145	3	0.00	0.00	46	
2024-05-09	10	-80.00	0	True	3.382694	0.000000	10	9	3	5	5.000000e-01	-8.660254e-01	240.387500	247.035470	3	0.00	0.00	46	
2024-05-09	11	-80.00	0	True	3.382694	0.000000	11	9	3	5	2.588190e-01	-9.659258e-01	238.875000	248.954124	3	0.00	0.00	46	
2024-05-09	12	-80.00	0	True	3.382694	0.000000	12	9	3	5	1.224647e-16	-1.000000e+00	238.875000	248.954124	3	0.00	0.00	44	
2024-05-09	13	-80.00	0	True	3.382694	0.000000	13	9	3	5	-2.588190e-01	-9.659258e-01	237.778333	250.352929	3	0.00	0.00	44	
2024-05-09	14	-80.00	0	True	3.382694	0.000000	14	9	3	5	-5.000000e-01	-8.660254e-01	236.080000	252.443385	3	0.00	0.00	44	
2024-05-09	15	5.82	0	True	1.761300	-1.072750	15	9	3	5	-7.071068e-01	-7.071068e-01	228.532500	256.648633	3	0.00	85.82	44	
2024-05-09	16	281.52	0	True	5.640203	47.371134	16	9	3	5	-8.660254e-01	-5.000000e-01	224.485833	254.938900	3	0.00	275.70	44	
2024-05-09	17	605.47	0	True	6.406005	1.150718	17	9	3	5	-9.659258e-01	-2.588190e-01	231.108750	262.898181	3	0.00	323.95	44	
2024-05-09	18	556.70	0	True	6.322026	-0.080549	18	9	3	5	-1.000000e+00	-1.836970e-16	235.402083	267.491865	3	48.77	0.00	46	
2024-05-09	19	407.01	0	True	6.008838	-0.268888	19	9	3	5	-9.659258e-01	-2.588190e-01	258.8190e-01	233.618750	266.139539	3	149.69	0.00	52
2024-05-09	20	466.06	0	True	6.144314	0.145082	20	9	3	5	-8.660254e-01	-5.000000e-01	235.095833	267.375885	3	0.00	59.05	51	
2024-05-09	21	268.67	0	True	5.593484	-0.423529	21	9	3	5	-7.071068e-01	-7.071068e-01	232.892500	266.849840	3	197.39	0.00	55	
2024-05-09	22	270.44	0	True	5.600050	0.006588	22	9	3	5	-5.000000e-01	-8.660254e-01	231.976250	266.674220	3	0.00	1.77	54	
2024-05-09	23	243.86	0	True	5.496594	-0.098284	23	9	3	5	-2.588190e-01	-9.659258e-01	230.597500	266.517083	3	26.58	0.00	54	
2024-05-10	0	258.45	0	True	5.554702	0.059829	0	10	4	5	0.000000e+00	1.000000e+00	231.315833	266.570158	4	0.00	14.59	53	
2024-05-10	1	226.88	0	True	5.424421	-0.122151	1	10	4	5	2.588190e-01	9.659258e-01	230.448750	266.548425	4	31.57	0.00	54	
2024-05-10	2	175.25	0	True	5.166214	-0.227565	2	10	4	5	5.000000e-01	8.660254e-01	228.642917	266.778971	4	51.63	0.00	55	

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-05-10	3	249.88	0	True	5.520981	0.425849	3	10	4	5	7.071068e-01	7.071068e-01	224.782083	265.727400	4	0.00	74.63	55
2024-05-10	4	319.21	0	True	5.765849	0.277453	4	10	4	5	8.660254e-01	5.000000e-01	215.204583	257.547519	4	0.00	69.33	55
2024-05-10	5	410.86	0	True	6.018253	0.287115	5	10	4	5	9.659258e-01	2.588190e-01	201.105833	235.347474	4	0.00	91.65	55
2024-05-10	6	159.35	0	True	5.071103	-0.612155	6	10	4	5	1.000000e+00	6.123234e-17	182.286667	218.607871	4	251.51	0.00	60
2024-05-10	7	-80.00	0	True	5.071103	-1.502040	7	10	4	5	9.659258e-01	-2.588190e-01	177.726250	223.031714	4	239.35	0.00	46
2024-05-10	8	-80.00	0	True	5.071103	0.000000	8	10	4	5	8.660254e-01	-5.000000e-01	177.726250	223.031714	4	0.00	0.00	41
2024-05-10	9	-80.00	0	True	5.071103	0.000000	9	10	4	5	7.071068e-01	-7.071068e-01	177.726250	223.031714	4	0.00	0.00	41
2024-05-10	10	-80.00	0	True	5.071103	0.000000	10	10	4	5	5.000000e-01	-8.660254e-01	177.726250	223.031714	4	0.00	0.00	41
2024-05-10	11	-83.03	0	True	5.071103	0.037875	11	10	4	5	2.588190e-01	-9.659258e-01	177.600000	223.184751	4	3.03	0.00	41
2024-05-10	12	-77.88	0	True	5.071103	-0.062026	12	10	4	5	1.224647e-16	-1.000000e+00	177.688333	223.078758	4	0.00	5.15	41
2024-05-10	13	-80.00	0	True	5.071103	0.027221	13	10	4	5	-2.588190e-01	-9.659258e-01	177.688333	223.078758	4	2.12	0.00	41
2024-05-10	14	-80.00	0	True	5.071103	0.000000	14	10	4	5	-5.000000e-01	-8.660254e-01	177.688333	223.078758	4	0.00	0.00	41
2024-05-10	15	-84.88	0	True	5.071103	0.061000	15	10	4	5	-7.071068e-01	-7.071068e-01	173.909167	226.853302	4	4.88	0.00	41
2024-05-10	16	460.48	0	True	6.132269	-6.425071	16	10	4	5	-8.660254e-01	-5.000000e-01	181.365833	233.391254	4	0.00	545.36	41
2024-05-10	17	522.99	0	True	6.259562	0.135750	17	10	4	5	-9.659258e-01	-2.588190e-01	177.929167	227.405332	4	0.00	62.51	41
2024-05-10	18	822.97	0	True	6.712920	0.573586	18	10	4	5	-1.000000e+00	-1.836970e-16	189.023750	251.867756	4	0.00	299.98	39
2024-05-10	19	848.04	0	True	6.742928	0.030463	19	10	4	5	-9.659258e-01	-2.588190e-01	207.400000	282.668908	4	0.00	25.07	33
2024-05-10	20	880.82	0	True	6.780853	0.038654	20	10	4	5	-8.660254e-01	-5.000000e-01	224.681667	310.480772	4	0.00	32.78	33
2024-05-10	21	901.14	0	True	6.803661	0.023069	21	10	4	5	-7.071068e-01	-7.071068e-01	251.034583	339.830815	4	0.00	20.32	25
2024-05-10	22	906.39	0	True	6.809470	0.005826	22	10	4	5	-5.000000e-01	-8.660254e-01	277.532500	365.252587	4	0.00	5.25	25
2024-05-10	23	880.25	0	True	6.780206	-0.028840	23	10	4	5	-2.588190e-01	-9.659258e-01	304.048750	385.254138	4	26.14	0.00	25
2024-05-11	0	403.25	0	False	5.999557	-0.541892	0	11	5	5	0.000000e+00	1.000000e+00	310.082083	385.642619	5	477.00	0.00	45
2024-05-11	1	414.08	0	False	6.026059	0.026857	1	11	5	5	2.588190e-01	9.659258e-01	317.882083	385.779736	5	0.00	10.83	43
2024-05-11	2	414.92	0	False	6.028086	0.002029	2	11	5	5	5.000000e-01	8.660254e-01	327.868333	385.028353	5	0.00	0.84	41
2024-05-11	3	386.33	0	False	5.956692	-0.068905	3	11	5	5	7.071068e-01	7.071068e-01	333.553750	384.834067	5	28.59	0.00	43
2024-05-11	4	401.25	0	False	5.994585	0.038620	4	11	5	5	8.660254e-01	5.000000e-01	336.972083	385.065413	5	0.00	14.92	43
2024-05-11	5	416.26	0	False	6.031310	0.037408	5	11	5	5	9.659258e-01	2.588190e-01	337.197083	385.112039	5	0.00	15.01	43
2024-05-11	6	446.01	0	False	6.100341	0.071470	6	11	5	5	1.000000e+00	6.123234e-17	349.141250	383.799441	5	0.00	29.75	32
2024-05-11	7	505.01	0	False	6.224578	0.132284	7	11	5	5	9.659258e-01	-2.588190e-01	373.516667	373.806462	5	0.00	59.00	22
2024-05-11	8	417.89	0	False	6.035218	-0.172511	8	11	5	5	8.660254e-01	-5.000000e-01	394.262083	361.144433	5	87.12	0.00	26
2024-05-11	9	395.74	0	False	5.980757	-0.053004	9	11	5	5	7.071068e-01	-7.071068e-01	414.084583	346.750708	5	22.15	0.00	27
2024-05-11	10	345.82	0	False	5.845918	-0.126143	10	11	5	5	5.000000e-01	-8.660254e-01	431.827083	330.902232	5	49.92	0.00	29
2024-05-11	11	123.86	0	False	4.819152	-0.641837	11	11	5	5	2.588190e-01	-9.659258e-01	440.447500	319.401412	5	221.96	0.00	38
2024-05-11	12	-80.00	0	False	4.819152	-1.645891	12	11	5	5	1.224647e-16	-1.000000e+00	440.359167	319.551251	5	203.86	0.00	46
2024-05-11	13	12.33	0	False	2.512035	-1.154125	13	11	5	5	-2.588190e-01	-9.659258e-01	444.206250	313.512995	5	0.00	92.33	46
2024-05-11	14	90.55	0	False	4.505902	6.343877	14	11	5	5	-5.000000e-01	-8.660254e-01	451.312500	302.866575	5	0.00	78.22	46
2024-05-11	15	254.75	0	False	5.540283	1.813363	15	11	5	5	-7.071068e-01	-7.071068e-01	465.463750	284.075614	5	0.00	164.20	46
2024-05-11	16	391.45	0	False	5.969858	0.536605	16	11	5	5	-8.660254e-01	-5.000000e-01	462.587500	284.477447	5	0.00	136.70	46
2024-05-11	17	434.83	0	False	6.074955	0.110819	17	11	5	5	-9.659258e-01	-2.588190e-01	458.914167	284.232665	5	0.00	43.38	46
2024-05-11	18	451.10	0	False	6.111689	0.037417	18	11	5	5	-1.000000e+00	-1.836970e-16	443.419583	273.455443	5	0.00	16.27	46
2024-05-11	19	573.84	0	False	6.352351	0.272090	19	11	5	5	-9.659258e-01	-2.588190e-01	431.994583	261.271997	5	0.00	122.74	46
2024-05-11	20	518.81	0	False	6.251538	-0.095898	20	11	5	5	-8.660254e-01	-5.000000e-01	416.910833	244.120648	5	55.03	0.00	48
2024-05-11	21	513.05	0	False	6.240373	-0.011102	21	11	5	5	-7.071068e-01	-7.071068e-01	400.740417	222.551583	5	5.76	0.00	49
2024-05-11	22	873.94	0	False	6.773012	0.703421	22	11	5	5	-5.000000e-01	-8.660254e-01	399.388333	219.422585	5	0.00	360.89	49

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-05-11	23	709.34	0	False	6.564335	-0.188342	23	11	5	5	-2.588190e-01	9.659258e-01	392.267083	205.467572	5	164.60	0.00	54
2024-05-12	0	551.65	1	False	6.312914	-0.222305	0	12	6	5	0.000000e+00	1.000000e+00	398.450417	208.029462	6	157.69	0.00	41
2024-05-12	1	549.54	1	False	6.309082	-0.003825	1	12	6	5	2.588190e-01	9.659258e-01	404.094583	210.297216	6	2.11	0.00	41
2024-05-12	2	508.29	1	False	6.231052	-0.075063	2	12	6	5	5.000000e-01	8.660254e-01	407.985000	211.367122	6	41.25	0.00	43
2024-05-12	3	502.30	1	False	6.219198	-0.011785	3	12	6	5	7.071068e-01	7.071068e-01	412.817083	212.174599	6	5.99	0.00	42
2024-05-12	4	503.92	1	False	6.222418	0.003225	4	12	6	5	8.660254e-01	5.000000e-01	417.095000	212.964798	6	0.00	1.62	42
2024-05-12	5	549.31	1	False	6.308663	0.090074	5	12	6	5	9.659258e-01	2.588190e-01	422.638750	214.667045	6	0.00	45.39	42
2024-05-12	6	479.86	1	False	6.173494	-0.126431	6	12	6	5	1.000000e+00	6.123234e-17	424.049167	214.938307	6	69.45	0.00	45
2024-05-12	7	351.13	1	False	5.861157	-0.268266	7	12	6	5	9.659258e-01	-2.588190e-01	417.637500	214.713243	6	128.73	0.00	50
2024-05-12	8	61.58	1	False	4.120337	-0.824623	8	12	6	5	8.660254e-01	-5.000000e-01	402.791250	226.679996	6	289.55	0.00	59
2024-05-12	9	-80.00	1	False	4.120337	-2.299123	9	12	6	5	7.071068e-01	-7.071068e-01	382.968750	247.196031	6	141.58	0.00	64
2024-05-12	10	-80.00	1	False	4.120337	0.000000	10	12	6	5	5.000000e-01	-8.660254e-01	365.226250	264.644151	6	0.00	0.00	61
2024-05-12	11	-49.58	1	False	4.120337	-0.380250	11	12	6	5	2.588190e-01	-9.659258e-01	357.999583	273.733707	6	0.00	30.42	52
2024-05-12	12	-83.27	1	False	4.120337	0.679508	12	12	6	5	1.224647e-16	-1.000000e+00	357.863333	273.961918	6	33.69	0.00	45
2024-05-12	13	-48.04	1	False	4.120337	-0.423082	13	12	6	5	-2.588190e-01	-9.659258e-01	355.347917	277.526373	6	0.00	35.23	45
2024-05-12	14	-55.43	1	False	4.120337	0.153830	14	12	6	5	-5.000000e-01	-8.660254e-01	349.265417	285.079169	6	7.39	0.00	45
2024-05-12	15	153.80	1	False	5.035653	-3.774671	15	12	6	5	-7.071068e-01	-7.071068e-01	345.059167	287.270665	6	0.00	209.23	45
2024-05-12	16	394.96	1	False	5.978784	1.568010	16	12	6	5	-8.660254e-01	-5.000000e-01	345.205417	287.296202	6	0.00	241.16	45
2024-05-12	17	463.80	1	False	6.139453	0.174296	17	12	6	5	-9.659258e-01	-2.588190e-01	346.412500	287.749635	6	0.00	68.84	45
2024-05-12	18	517.28	1	False	6.248584	0.115308	18	12	6	5	-1.000000e+00	-1.836970e-16	349.170000	289.110356	6	0.00	53.48	45
2024-05-12	19	537.48	1	False	6.286892	0.039050	19	12	6	5	-9.659258e-01	-2.588190e-01	347.655000	287.974887	6	0.00	20.20	45
2024-05-12	20	536.26	1	False	6.284619	-0.002270	20	12	6	5	-8.660254e-01	-5.000000e-01	348.382083	288.447451	6	1.22	0.00	43
2024-05-12	21	523.01	1	False	6.259601	-0.024708	21	12	6	5	-7.071068e-01	-7.071068e-01	348.797083	288.701718	6	13.25	0.00	44
2024-05-12	22	526.15	1	False	6.265586	0.006004	22	12	6	5	-5.000000e-01	-8.660254e-01	334.305833	269.271057	6	0.00	3.14	44
2024-05-12	23	525.50	1	False	6.264350	-0.001235	23	12	6	5	-2.588190e-01	-9.659258e-01	326.645833	260.614251	6	0.65	0.00	37
2024-05-13	0	736.69	0	True	6.602167	0.401884	0	13	0	5	0.000000e+00	1.000000e+00	334.355833	270.123788	0	0.00	211.19	30
2024-05-13	1	626.14	0	True	6.439574	-0.150063	1	13	0	5	2.588190e-01	9.659258e-01	337.547500	273.211743	0	110.55	0.00	35
2024-05-13	2	500.00	0	True	6.214608	-0.201457	2	13	0	5	5.000000e-01	8.660254e-01	337.202083	272.991642	0	126.14	0.00	38
2024-05-13	3	500.00	0	True	6.214608	0.000000	3	13	0	5	7.071068e-01	7.071068e-01	337.106250	272.931562	0	0.00	0.00	38
2024-05-13	4	568.84	0	True	6.343599	0.137680	4	13	0	5	8.660254e-01	5.000000e-01	339.811250	274.970810	0	0.00	68.84	38
2024-05-13	5	621.98	0	True	6.432908	0.093418	5	13	0	5	9.659258e-01	2.588190e-01	342.839167	277.763991	0	0.00	53.14	38
2024-05-13	6	407.50	0	True	6.010041	-0.344834	6	13	0	5	1.000000e+00	6.123234e-17	339.824167	276.602316	0	214.48	0.00	44
2024-05-13	7	204.52	0	True	5.320666	-0.498110	7	13	0	5	9.659258e-01	-2.588190e-01	333.715417	277.957390	0	202.98	0.00	47
2024-05-13	8	56.53	0	True	4.034771	-0.723597	8	13	0	5	8.660254e-01	-5.000000e-01	333.505000	278.174183	0	147.99	0.00	41
2024-05-13	9	-76.73	0	True	4.034771	-2.357332	9	13	0	5	7.071068e-01	-7.071068e-01	333.641250	277.963563	0	133.26	0.00	41
2024-05-13	10	31.90	0	True	3.462606	-1.415744	10	13	0	5	5.000000e-01	-8.660254e-01	338.303750	271.588967	0	0.00	108.63	41
2024-05-13	11	14.91	0	True	2.702032	-0.532602	11	13	0	5	2.588190e-01	-9.659258e-01	340.990833	267.878092	0	16.99	0.00	42
2024-05-13	12	-15.94	0	True	2.702032	-2.069081	12	13	0	5	1.224647e-16	-1.000000e+00	343.796250	263.559492	0	30.85	0.00	41
2024-05-13	13	58.57	0	True	4.070223	-4.674404	13	13	0	5	-2.588190e-01	-9.659258e-01	348.238333	257.496959	0	0.00	74.51	41
2024-05-13	14	51.69	0	True	3.945264	-0.117466	14	13	0	5	-5.000000e-01	-8.660254e-01	352.701667	251.043250	0	6.88	0.00	41
2024-05-13	15	192.25	0	True	5.258797	2.719288	15	13	0	5	-7.071068e-01	-7.071068e-01	354.303750	249.838528	0	0.00	140.56	41
2024-05-13	16	419.27	0	True	6.038515	1.180858	16	13	0	5	-8.660254e-01	-5.000000e-01	355.316667	250.059709	0	0.00	227.02	41
2024-05-13	17	637.34	0	True	6.457303	0.520118	17	13	0	5	-9.659258e-01	-2.588190e-01	362.547500	255.776773	0	0.00	218.07	41
2024-05-13	18	572.86	0	True	6.350641	-0.101170	18	13	0	5	-1.836970e-16	-1.000000e+00	364.863333	257.484564	0	64.48	0.00	44

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su	
2024-05-13	19	267.53	0	True	5.589232	-0.532992	19	13	0	5	-9.659258e-01	2.588190e-01	353.615417	255.504769	0	305.33	0.00	57	
2024-05-13	20	236.56	0	True	5.466202	-0.115763	20	13	0	5	-8.660254e-01	5.000000e-01	341.127917	253.506043	0	30.97	0.00	58	
2024-05-13	21	139.15	0	True	4.935552	-0.411777	21	13	0	5	-7.071068e-01	7.071068e-01	325.133750	253.641024	0	97.41	0.00	62	
2024-05-13	22	69.29	0	True	4.238301	-0.502048	22	13	0	5	-5.000000e-01	8.660254e-01	306.097917	255.038656	0	69.86	0.00	64	
2024-05-13	23	58.42	0	True	4.067658	-0.156877	23	13	0	5	-2.588190e-01	9.659258e-01	286.636250	255.389335	0	10.87	0.00	65	
2024-05-14	0	77.30	0	True	4.347694	0.323177	0	14	1	5	0.000000e+00	1.000000e+00	259.161667	239.864293	1	0.00	18.88	65	
2024-05-14	1	118.69	0	True	4.776515	0.535446	1	14	1	5	2.588190e-01	9.659258e-01	238.017917	228.190615	1	0.00	41.39	60	
2024-05-14	2	112.06	0	True	4.719034	-0.055860	2	14	1	5	5.000000e-01	8.660254e-01	221.853750	222.494950	1	6.63	0.00	55	
2024-05-14	3	128.79	0	True	4.858183	0.149295	3	14	1	5	7.071068e-01	7.071068e-01	206.386667	215.098163	1	0.00	16.73	55	
2024-05-14	4	285.73	0	True	5.655047	1.218573	4	14	1	5	8.660254e-01	5.000000e-01	194.590417	201.702468	1	0.00	156.94	55	
2024-05-14	5	365.19	0	True	5.900418	0.278095	5	14	1	5	9.659258e-01	2.588190e-01	183.890833	184.086957	1	0.00	79.46	55	
2024-05-14	6	199.05	0	True	5.293556	-0.454941	6	14	1	5	1.000000e+00	6.123234e-17	175.205417	177.891326	1	166.14	0.00	53	
2024-05-14	7	-80.00	0	True	5.293556	-1.401909	7	14	1	5	9.659258e-01	-2.588190e-01	163.350417	185.183801	1	279.05	0.00	56	
2024-05-14	8	-80.00	0	True	5.293556	0.000000	8	14	1	5	8.660254e-01	-5.000000e-01	157.661667	190.625066	1	0.00	0.00	50	
2024-05-14	9	-80.00	0	True	5.293556	0.000000	9	14	1	5	7.071068e-01	-7.071068e-01	157.525417	190.800970	1	0.00	0.00	45	
2024-05-14	10	-73.96	0	True	5.293556	-0.075500	10	14	1	5	5.000000e-01	-8.660254e-01	153.114583	195.008590	1	0.00	6.04	45	
2024-05-14	11	13.66	0	True	2.614472	-1.184694	11	14	1	5	2.588190e-01	-9.659258e-01	153.062500	195.047270	1	0.00	87.62	44	
2024-05-14	12	-39.53	0	True	2.614472	-3.893851	12	14	1	5	1.224647e-16	-1.000000e+00	152.079583	195.993112	1	53.19	0.00	45	
2024-05-14	13	111.11	0	True	4.710521	-3.810777	13	14	1	5	-2.588190e-01	-9.659258e-01	154.268750	195.195036	1	0.00	150.64	45	
2024-05-14	14	188.30	0	True	5.238036	0.694717	14	14	1	5	-5.000000e-01	-8.660254e-01	159.960833	194.062235	1	0.00	77.19	45	
2024-05-14	15	255.99	0	True	5.545138	0.359480	15	14	1	5	-7.071068e-01	-7.071068e-01	162.616667	194.957432	1	0.00	67.69	45	
2024-05-14	16	514.94	0	True	6.244050	1.011563	16	14	1	5	-8.660254e-01	-5.000000e-01	166.602917	201.307966	1	0.00	258.95	45	
2024-05-14	17	679.82	0	True	6.521828	0.320193	17	14	1	5	-9.659258e-01	-2.588190e-01	168.372917	205.764304	1	0.00	164.88	45	
2024-05-14	18	703.24	0	True	6.555698	0.034450	18	14	1	5	-1.000000e+00	-1.836970e-16	173.805417	218.250009	1	0.00	23.42	42	
2024-05-14	19	659.47	0	True	6.491436	-0.062240	19	14	1	5	-9.659258e-01	-2.588190e-01	158.136250	239.223891	1	43.77	0.00	31	
2024-05-14	20	676.90	0	True	6.517524	0.026430	20	14	1	5	-8.660254e-01	-5.000000e-01	208.483750	259.007324	1	0.00	17.43	30	
2024-05-14	21	594.19	0	True	6.387199	-0.122189	21	14	1	5	-7.071068e-01	-7.071068e-01	7.071068e-01	227.443750	270.127574	1	82.71	0.00	29
2024-05-14	22	631.34	0	True	6.447845	0.062522	22	14	1	5	-5.000000e-01	-8.660254e-01	8.660254e-01	250.862500	280.003253	1	0.00	37.15	26
2024-05-14	23	538.46	0	True	6.288713	-0.147116	23	14	1	5	-2.588190e-01	-9.659258e-01	9.659258e-01	270.864167	282.790329	1	92.88	0.00	30
2024-05-15	0	322.04	0	True	5.774676	-0.401924	0	15	2	5	0.000000e+00	1.000000e+00	281.061667	279.904848	2	216.42	0.00	39	
2024-05-15	1	346.72	0	True	5.848518	0.076636	1	15	2	5	2.588190e-01	9.659258e-01	290.562917	278.017402	2	0.00	24.68	39	
2024-05-15	2	289.45	0	True	5.667983	-0.165177	2	15	2	5	5.000000e-01	8.660254e-01	297.954167	275.411262	2	57.27	0.00	41	
2024-05-15	3	148.64	0	True	5.001527	-0.486474	3	15	2	5	7.071068e-01	7.071068e-01	298.781250	274.910511	2	140.81	0.00	47	
2024-05-15	4	212.77	0	True	5.360212	0.431445	4	15	2	5	8.660254e-01	5.000000e-01	295.741250	275.463952	2	0.00	64.13	47	
2024-05-15	5	343.15	0	True	5.838168	0.612774	5	15	2	5	9.659258e-01	2.588190e-01	294.822917	275.259022	2	0.00	130.38	47	
2024-05-15	6	346.27	0	True	5.847219	0.009092	6	15	2	5	1.000000e+00	6.123234e-17	300.957083	274.671697	2	0.00	3.12	40	
2024-05-15	7	76.99	0	True	4.343676	-0.777659	7	15	2	5	9.659258e-01	-2.588190e-01	307.498333	266.966085	2	269.28	0.00	39	
2024-05-15	8	-82.99	0	True	4.343676	-0.2077932	8	15	2	5	8.660254e-01	-5.000000e-01	307.373750	267.155410	2	159.98	0.00	46	
2024-05-15	9	-84.30	0	True	4.343676	0.015785	9	15	2	5	7.071068e-01	-7.071068e-01	307.194583	267.427798	2	1.31	0.00	46	
2024-05-15	10	-78.03	0	True	4.343676	-0.074377	10	15	2	5	5.000000e-01	-8.660254e-01	307.025000	267.681178	2	0.00	6.27	46	
2024-05-15	11	-68.87	0	True	4.343676	-0.117391	11	15	2	5	2.588190e-01	-9.659258e-01	303.586250	272.107246	2	0.00	9.16	46	
2024-05-15	12	-80.83	0	True	4.343676	0.173661	12	15	2	5	1.224647e-16	-1.000000e+00	301.865417	274.491637	2	11.96	0.00	44	
2024-05-15	13	-80.00	0	True	4.343676	-0.010268	13	15	2	5	-2.588190e-01	-9.659258e-01	293.902500	282.908952	2	0.00	0.83	44	
2024-05-15	14	-80.00	0	True	4.343676	0.000000	14	15	2	5	-5.000000e-01	-8.660254e-01	282.723333	292.404852	2	0.00	0.00	44	

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su	
2024-05-15	15	-80.00	0	True	4.343676	0.000000	15	15	2	5	-7.071068e-01	-7.071068e-01	268.723750	301.637817	2	0.00	0.00	44	
2024-05-15	16	304.31	0	True	5.718047	-4.803875	16	15	2	5	-8.660254e-01	-5.000000e-01	259.947500	297.194050	2	0.00	384.31	44	
2024-05-15	17	611.60	0	True	6.416078	1.009793	17	15	2	5	-9.659258e-01	-2.588190e-01	257.105000	293.304384	2	0.00	307.29	44	
2024-05-15	18	722.95	0	True	6.583340	0.182063	18	15	2	5	-1.000000e+00	-1.836970e-16	257.926250	294.632458	2	0.00	111.35	44	
2024-05-15	19	686.82	0	True	6.532072	-0.049976	19	15	2	5	-9.659258e-01	2.588190e-01	259.065833	296.301246	2	36.13	0.00	44	
2024-05-15	20	652.14	0	True	6.480259	-0.050494	20	15	2	5	-8.660254e-01	5.000000e-01	258.034167	294.822587	2	34.68	0.00	45	
2024-05-15	21	551.21	0	True	6.312116	-0.154767	21	15	2	5	-7.071068e-01	7.071068e-01	256.243333	292.815610	2	100.93	0.00	46	
2024-05-15	22	423.39	0	True	6.048294	-0.231890	22	15	2	5	-5.000000e-01	8.660254e-01	247.578750	284.183137	2	127.82	0.00	52	
2024-05-15	23	361.64	0	True	5.890649	-0.145847	23	15	2	5	-2.588190e-01	9.659258e-01	240.211250	278.550333	2	61.75	0.00	50	
2024-05-16	0	344.16	0	True	5.841107	-0.048335	0	16	3	5	0.000000e+00	1.000000e+00	241.132917	278.869272	3	17.48	0.00	42	
2024-05-16	1	341.78	0	True	5.834167	-0.006915	1	16	3	5	2.588190e-01	9.659258e-01	240.927083	278.789762	3	2.38	0.00	42	
2024-05-16	2	299.44	0	True	5.701914	-0.123881	2	16	3	5	5.000000e-01	8.660254e-01	241.343333	278.872805	3	42.34	0.00	41	
2024-05-16	3	315.00	0	True	5.752573	0.051964	3	16	3	5	7.071068e-01	7.071068e-01	248.275000	278.535705	3	0.00	15.56	36	
2024-05-16	4	345.68	0	True	5.845513	0.097397	4	16	3	5	8.660254e-01	5.000000e-01	253.812917	279.119756	3	0.00	30.68	36	
2024-05-16	5	396.59	0	True	5.982903	0.147275	5	16	3	5	9.659258e-01	2.588190e-01	256.039583	280.074949	3	0.00	50.91	36	
2024-05-16	6	171.31	0	True	5.143475	-0.568043	6	16	3	5	1.000000e+00	6.123234e-17	248.749583	279.901192	3	225.28	0.00	45	
2024-05-16	7	-80.00	0	True	5.143475	-1.466990	7	16	3	5	9.659258e-01	-2.588190e-01	242.208333	285.860684	3	251.31	0.00	44	
2024-05-16	8	-80.00	0	True	5.143475	0.000000	8	16	3	5	8.660254e-01	-5.000000e-01	242.332917	285.713408	3	0.00	0.00	38	
2024-05-16	9	-80.00	0	True	5.143475	0.000000	9	16	3	5	7.071068e-01	-7.071068e-01	242.512083	285.500945	3	0.00	0.00	38	
2024-05-16	10	-80.00	0	True	5.143475	0.000000	10	16	3	5	5.000000e-01	-8.660254e-01	242.430000	285.597377	3	0.00	0.00	38	
2024-05-16	11	-53.30	0	True	5.143475	-0.333750	11	16	3	5	2.588190e-01	-9.659258e-01	243.078750	284.876271	3	0.00	26.70	38	
2024-05-16	12	-80.00	0	True	5.143475	0.500938	12	16	3	5	1.224647e-16	-1.000000e+00	243.113333	284.835287	3	26.70	0.00	38	
2024-05-16	13	-6.28	0	True	5.143475	-0.921500	13	16	3	5	-2.588190e-01	-9.659258e-01	246.185000	281.578207	3	0.00	73.72	38	
2024-05-16	14	109.55	0	True	4.696381	-18.444268	14	16	3	5	-5.000000e-01	-8.660254e-01	254.082917	274.603272	3	0.00	115.83	38	
2024-05-16	15	211.68	0	True	5.355076	0.932268	15	16	3	5	-7.071068e-01	-7.071068e-01	266.236250	265.477563	3	0.00	102.13	38	
2024-05-16	16	424.09	0	True	6.049946	1.003449	16	16	3	5	-8.660254e-01	-5.000000e-01	271.227083	267.343789	3	0.00	212.41	38	
2024-05-16	17	601.92	0	True	6.400125	0.419321	17	16	3	5	-9.659258e-01	-2.588190e-01	270.823750	266.814731	3	0.00	177.83	38	
2024-05-16	18	627.81	0	True	6.442238	0.043012	18	16	3	5	-1.000000e+00	-1.836970e-16	266.859583	260.435772	3	0.00	25.89	38	
2024-05-16	19	643.77	0	True	6.467342	0.025422	19	16	3	5	-9.659258e-01	-2.588190e-01	258.8190e-01	265.065833	257.549800	3	0.00	15.96	37
2024-05-16	20	621.00	0	True	6.431331	-0.035370	20	16	3	5	-8.660254e-01	-5.000000e-01	263.768333	255.585943	3	22.77	0.00	36	
2024-05-16	21	502.42	0	True	6.219436	-0.190950	21	16	3	5	-7.071068e-01	-7.071068e-01	261.735417	253.384802	3	118.58	0.00	37	
2024-05-16	22	432.18	0	True	6.068842	-0.139803	22	16	3	5	-5.000000e-01	-8.660254e-01	266.0254e-01	262.101667	253.634851	3	70.24	0.00	34
2024-05-16	23	393.78	0	True	5.975792	-0.088852	23	16	3	5	-2.588190e-01	-9.659258e-01	263.440833	254.267313	3	38.40	0.00	33	
2024-05-17	0	384.73	0	True	5.952542	-0.022982	0	17	4	5	0.000000e+00	1.000000e+00	265.131250	254.961192	4	9.05	0.00	33	
2024-05-17	1	406.58	0	True	6.007781	0.056793	1	17	4	5	2.588190e-01	9.659258e-01	267.831250	256.148529	4	0.00	21.85	33	
2024-05-17	2	402.85	0	True	5.998564	-0.009174	2	17	4	5	5.000000e-01	8.660254e-01	272.140000	257.569152	4	3.73	0.00	31	
2024-05-17	3	416.18	0	True	6.031118	0.033089	3	17	4	5	7.071068e-01	7.071068e-01	276.355833	259.124525	4	0.00	13.33	31	
2024-05-17	4	452.73	0	True	6.115296	0.087823	4	17	4	5	8.660254e-01	5.000000e-01	280.816250	261.282079	4	0.00	36.55	31	
2024-05-17	5	499.81	0	True	6.214228	0.103991	5	17	4	5	9.659258e-01	2.588190e-01	285.117083	264.104906	4	0.00	47.08	31	
2024-05-17	6	417.81	0	True	6.035027	-0.164062	6	17	4	5	1.000000e+00	6.123234e-17	295.387917	264.279647	4	82.00	0.00	25	
2024-05-17	7	270.94	0	True	5.601897	-0.351523	7	17	4	5	9.659258e-01	-2.588190e-01	310.010417	252.031384	4	146.87	0.00	21	
2024-05-17	8	308.95	0	True	5.733179	0.140289	8	17	4	5	8.660254e-01	-5.000000e-01	326.216667	237.975648	4	0.00	38.01	21	
2024-05-17	9	188.21	0	True	5.237558	-0.390808	9	17	4	5	7.071068e-01	-7.071068e-01	337.392083	223.954761	4	120.74	0.00	26	
2024-05-17	10	226.59	0	True	5.423142	0.203921	10	17	4	5	5.000000e-01	-8.660254e-01	350.166667	207.230841	4	0.00	38.38	26	

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-05-17	11	200.05	0	True	5.298567	-0.117128	11	17	4	5	2.588190e-01	-9.659258e-01	360.722917	191.652032	4	26.54	0.00	27
2024-05-17	12	321.85	0	True	5.774086	0.608848	12	17	4	5	1.224647e-16	-1.000000e+00	377.466667	167.506972	4	0.00	121.80	26
2024-05-17	13	393.47	0	True	5.975005	0.222526	13	17	4	5	-2.588190e-01	-9.659258e-01	394.122917	146.210649	4	0.00	71.62	26
2024-05-17	14	394.45	0	True	5.977492	0.002491	14	17	4	5	-5.000000e-01	-8.660254e-01	405.993750	133.077306	4	0.00	0.98	26
2024-05-17	15	491.19	0	True	6.196831	0.245253	15	17	4	5	-7.071068e-01	-7.071068e-01	417.640000	127.444007	4	0.00	96.74	26
2024-05-17	16	561.55	0	True	6.330701	0.143244	16	17	4	5	-8.660254e-01	-5.000000e-01	423.367500	130.791338	4	0.00	70.36	26
2024-05-17	17	652.25	0	True	6.480428	0.161517	17	17	4	5	-9.659258e-01	-2.588190e-01	425.464583	134.139328	4	0.00	90.70	26
2024-05-17	18	656.27	0	True	6.486572	0.006163	18	17	4	5	-1.000000e+00	-1.836970e-16	426.650417	136.117115	4	0.00	4.02	26
2024-05-17	19	627.80	0	True	6.442222	-0.043382	19	17	4	5	-9.659258e-01	2.588190e-01	425.985000	135.044373	4	28.47	0.00	27
2024-05-17	20	862.22	0	True	6.759510	0.373399	20	17	4	5	-8.660254e-01	5.000000e-01	436.035833	157.327720	4	0.00	234.42	26
2024-05-17	21	761.38	0	True	6.635133	-0.116954	21	17	4	5	-7.071068e-01	7.071068e-01	446.825833	170.414336	4	100.84	0.00	26
2024-05-17	22	820.59	0	True	6.710024	0.077767	22	17	4	5	-5.000000e-01	8.660254e-01	463.009583	186.634178	4	0.00	59.21	23
2024-05-17	23	758.52	0	True	6.631369	-0.075641	23	17	4	5	-2.588190e-01	9.659258e-01	478.207083	195.396343	4	62.07	0.00	24
2024-05-18	0	533.93	1	False	6.280265	-0.296090	0	18	5	5	0.000000e+00	1.000000e+00	484.423750	194.665082	5	224.59	0.00	33
2024-05-18	1	480.24	1	False	6.174286	-0.100556	1	18	5	5	2.588190e-01	9.659258e-01	487.492917	193.963818	5	53.69	0.00	35
2024-05-18	2	471.35	1	False	6.155601	-0.018512	2	18	5	5	5.000000e-01	8.660254e-01	490.347083	193.166498	5	8.89	0.00	35
2024-05-18	3	468.32	1	False	6.149152	-0.006428	3	18	5	5	7.071068e-01	7.071068e-01	492.519583	192.588429	5	3.03	0.00	35
2024-05-18	4	506.39	1	False	6.227307	0.081291	4	18	5	5	8.660254e-01	5.000000e-01	494.755417	192.417816	5	0.00	38.07	35
2024-05-18	5	587.99	1	False	6.376710	0.161141	5	18	5	5	9.659258e-01	2.588190e-01	498.429583	193.358118	5	0.00	81.60	35
2024-05-18	6	457.24	1	False	6.125208	-0.222368	6	18	5	5	1.000000e+00	6.123234e-17	500.072500	192.810067	5	130.75	0.00	37
2024-05-18	7	347.44	1	False	5.850592	-0.240136	7	18	5	5	9.659258e-01	-2.588190e-01	503.260000	189.460646	5	109.80	0.00	36
2024-05-18	8	168.49	1	False	5.126876	-0.515053	8	18	5	5	8.660254e-01	-5.000000e-01	497.407500	197.713591	5	178.95	0.00	43
2024-05-18	9	58.69	1	False	4.072269	-0.651671	9	18	5	5	7.071068e-01	-7.071068e-01	492.010833	208.019256	5	109.80	0.00	43
2024-05-18	10	86.95	1	False	4.465333	0.481513	10	18	5	5	5.000000e-01	-8.660254e-01	486.192500	217.502607	5	0.00	28.26	43
2024-05-18	11	166.12	1	False	5.112710	0.910523	11	18	5	5	2.588190e-01	-9.659258e-01	484.778750	219.544067	5	0.00	79.17	42
2024-05-18	12	179.91	1	False	5.192457	0.083012	12	18	5	5	1.224647e-16	-1.000000e+00	478.864583	225.942515	5	0.00	13.79	42
2024-05-18	13	319.64	1	False	5.767195	0.776666	13	18	5	5	-2.588190e-01	-9.659258e-01	475.788333	227.651868	5	0.00	139.73	42
2024-05-18	14	346.04	1	False	5.846554	0.082593	14	18	5	5	-5.000000e-01	-8.660254e-01	473.771250	228.616314	5	0.00	26.40	42
2024-05-18	15	420.28	1	False	6.040921	0.214542	15	18	5	5	-7.071068e-01	-7.071068e-01	470.816667	228.839513	5	0.00	74.24	42
2024-05-18	16	485.58	1	False	6.185344	0.155373	16	18	5	5	-8.660254e-01	-5.000000e-01	467.651250	228.053957	5	0.00	65.30	42
2024-05-18	17	509.31	1	False	6.233057	0.048869	17	18	5	5	-9.659258e-01	-2.588190e-01	461.695417	224.867632	5	0.00	23.73	42
2024-05-18	18	492.72	1	False	6.199941	-0.032573	18	18	5	5	-1.000000e+00	-1.836970e-16	454.880833	221.162357	5	16.59	0.00	42
2024-05-18	19	455.26	1	False	6.120869	-0.076027	19	18	5	5	-9.659258e-01	2.588190e-01	447.691667	218.079843	5	37.46	0.00	43
2024-05-18	20	471.26	1	False	6.155410	0.035145	20	18	5	5	-8.660254e-01	5.000000e-01	431.401667	199.587161	5	0.00	16.00	43
2024-05-18	21	418.99	1	False	6.037847	-0.110915	21	18	5	5	-7.071068e-01	7.071068e-01	417.135417	186.802561	5	52.27	0.00	41
2024-05-18	22	401.88	1	False	5.996154	-0.040836	22	18	5	5	-5.000000e-01	8.660254e-01	399.689167	165.862926	5	17.11	0.00	41
2024-05-18	23	412.48	1	False	6.022188	0.026376	23	18	5	5	-2.588190e-01	9.659258e-01	385.270833	147.317529	5	0.00	10.60	39
2024-05-19	0	390.04	1	False	5.966249	-0.054403	0	19	6	5	0.000000e+00	1.000000e+00	379.275417	143.892618	6	22.44	0.00	30
2024-05-19	1	369.74	1	False	5.912800	-0.052046	1	19	6	5	2.588190e-01	9.659258e-01	374.671250	142.280385	6	20.30	0.00	29
2024-05-19	2	372.00	1	False	5.918894	0.006112	2	19	6	5	5.000000e-01	8.660254e-01	370.531667	140.782653	6	0.00	2.26	29
2024-05-19	3	373.29	1	False	5.922356	0.003468	3	19	6	5	7.071068e-01	7.071068e-01	366.572083	139.240665	6	0.00	1.29	28
2024-05-19	4	391.02	1	False	5.968759	0.047497	4	19	6	5	8.660254e-01	5.000000e-01	361.765000	136.161222	6	0.00	17.73	28
2024-05-19	5	415.44	1	False	6.029338	0.062452	5	19	6	5	9.659258e-01	2.588190e-01	354.575417	128.008134	6	0.00	24.42	28
2024-05-19	6	291.02	1	False	5.673392	-0.299490	6	19	6	5	1.000000e+00	6.123234e-17	347.649583	126.701971	6	124.42	0.00	28

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-05-19	7	112.17	1	False	4.720016	-0.614563	7	19	6	5	9.659258e-01	-2.588190e-01	337.846667	135.513871	6	178.85	0.00	31
2024-05-19	8	-64.99	1	False	4.720016	-1.579388	8	19	6	5	8.660254e-01	-5.000000e-01	328.118333	155.157219	6	177.16	0.00	31
2024-05-19	9	-80.00	1	False	4.720016	0.230959	9	19	6	5	7.071068e-01	-7.071068e-01	322.339583	167.703677	6	15.01	0.00	27
2024-05-19	10	-80.00	1	False	4.720016	0.000000	10	19	6	5	5.000000e-01	-8.660254e-01	315.383333	180.840017	6	0.00	0.00	27
2024-05-19	11	8.05	1	False	2.085672	-1.100625	11	19	6	5	2.588190e-01	-9.659258e-01	308.797083	189.197932	6	0.00	88.05	27
2024-05-19	12	25.24	1	False	3.228430	2.135404	12	19	6	5	1.224647e-16	-1.000000e+00	302.352500	196.280708	6	0.00	17.19	27
2024-05-19	13	179.91	1	False	5.192457	6.127971	13	19	6	5	-2.588190e-01	-9.659258e-01	296.530417	197.811995	6	0.00	154.67	27
2024-05-19	14	292.40	1	False	5.678123	0.625257	14	19	6	5	-5.000000e-01	-8.660254e-01	294.295417	197.531114	6	0.00	112.49	27
2024-05-19	15	402.72	1	False	5.998242	0.377291	15	19	6	5	-7.071068e-01	-7.071068e-01	293.563750	197.076168	6	0.00	110.32	27
2024-05-19	16	476.14	1	False	6.165712	0.182310	16	19	6	5	-8.660254e-01	-5.000000e-01	293.170417	196.685304	6	0.00	73.42	27
2024-05-19	17	482.34	1	False	6.178649	0.013021	17	19	6	5	-9.659258e-01	-2.588190e-01	292.046667	195.470003	6	0.00	6.20	27
2024-05-19	18	485.49	1	False	6.185159	0.006531	18	19	6	5	-1.000000e+00	-1.836970e-16	291.745417	195.152601	6	0.00	3.15	26
2024-05-19	19	445.57	1	False	6.099354	-0.082226	19	19	6	5	-9.659258e-01	2.588190e-01	291.341667	194.809320	6	39.92	0.00	26
2024-05-19	20	372.21	1	False	5.919458	-0.164643	20	19	6	5	-8.660254e-01	5.000000e-01	287.214583	191.858839	6	73.36	0.00	30
2024-05-19	21	368.25	1	False	5.908762	-0.010639	21	19	6	5	-7.071068e-01	7.071068e-01	285.100417	190.619178	6	3.96	0.00	28
2024-05-19	22	359.06	1	False	5.883490	-0.024956	22	19	6	5	-5.000000e-01	8.660254e-01	283.316250	189.676680	6	9.19	0.00	27
2024-05-19	23	338.55	1	False	5.824672	-0.057121	23	19	6	5	-2.588190e-01	9.659258e-01	280.235833	188.081428	6	20.51	0.00	28
2024-05-20	0	360.65	0	True	5.887908	0.065278	0	20	0	5	0.000000e+00	1.000000e+00	279.011250	187.429968	0	0.00	22.10	27
2024-05-20	1	386.52	0	True	5.957184	0.071732	1	20	0	5	2.588190e-01	9.659258e-01	279.710417	187.814030	0	0.00	25.87	26
2024-05-20	2	395.15	0	True	5.979265	0.022327	2	20	0	5	5.000000e-01	8.660254e-01	280.675000	188.367255	0	0.00	8.63	26
2024-05-20	3	374.52	0	True	5.925645	-0.052208	3	20	0	5	7.071068e-01	7.071068e-01	280.726250	188.393715	0	20.63	0.00	27
2024-05-20	4	371.84	0	True	5.918464	-0.007156	4	20	0	5	8.660254e-01	5.000000e-01	279.927083	187.945654	0	2.68	0.00	27
2024-05-20	5	392.92	0	True	5.973606	0.056691	5	20	0	5	9.659258e-01	2.588190e-01	278.988750	187.294769	0	0.00	21.08	27
2024-05-20	6	370.22	0	True	5.914097	-0.057773	6	20	0	5	1.000000e+00	6.123234e-17	282.288750	188.211448	0	22.70	0.00	23
2024-05-20	7	312.41	0	True	5.744316	-0.156150	7	20	0	5	9.659258e-01	-2.588190e-01	290.632083	184.748697	0	57.81	0.00	18
2024-05-20	8	250.02	0	True	5.521541	-0.199706	8	20	0	5	8.660254e-01	-5.000000e-01	303.757500	168.894809	0	62.39	0.00	13
2024-05-20	9	171.52	0	True	5.144700	-0.313975	9	20	0	5	7.071068e-01	-7.071068e-01	314.237500	150.891051	0	78.50	0.00	16
2024-05-20	10	204.07	0	True	5.318463	0.189774	10	20	0	5	5.000000e-01	-8.660254e-01	326.073750	128.031562	0	0.00	32.55	16
2024-05-20	11	206.03	0	True	5.328022	0.009605	11	20	0	5	2.588190e-01	-9.659258e-01	334.322917	112.027963	0	0.00	1.96	16
2024-05-20	12	127.40	0	True	4.847332	-0.381643	12	20	0	5	1.224647e-16	-1.000000e+00	338.579583	101.189892	0	78.63	0.00	19
2024-05-20	13	185.56	0	True	5.223378	0.456515	13	20	0	5	-2.588190e-01	-9.659258e-01	338.815000	100.810562	0	0.00	58.16	19
2024-05-20	14	225.95	0	True	5.420314	0.217665	14	20	0	5	-5.000000e-01	-8.660254e-01	336.046250	103.028883	0	0.00	40.39	19
2024-05-20	15	319.52	0	True	5.766820	0.414118	15	20	0	5	-7.071068e-01	-7.071068e-01	332.579583	102.083335	0	0.00	93.57	19
2024-05-20	16	374.13	0	True	5.924603	0.170913	16	20	0	5	-8.660254e-01	-5.000000e-01	328.329167	97.883344	0	0.00	54.61	19
2024-05-20	17	432.72	0	True	6.070091	0.156603	17	20	0	5	-9.659258e-01	-2.588190e-01	326.261667	94.969548	0	0.00	58.59	19
2024-05-20	18	513.31	0	True	6.240880	0.186241	18	20	0	5	-1.000000e+00	-1.836970e-16	327.420833	97.142458	0	0.00	80.59	19
2024-05-20	19	513.64	0	True	6.241523	0.000643	19	20	0	5	-9.659258e-01	2.588190e-01	330.257083	101.631988	0	0.00	0.33	17
2024-05-20	20	475.61	0	True	6.164598	-0.074040	20	20	0	5	-8.660254e-01	-5.000000e-01	334.565417	105.601866	0	38.03	0.00	16
2024-05-20	21	431.55	0	True	6.067383	-0.092639	21	20	0	5	-7.071068e-01	7.071068e-01	337.202917	107.257259	0	44.06	0.00	18
2024-05-20	22	435.17	0	True	6.075737	0.008388	22	20	0	5	-5.000000e-01	8.660254e-01	340.374167	109.041915	0	0.00	3.62	17
2024-05-20	23	456.06	0	True	6.122624	0.048004	23	20	0	5	-2.588190e-01	9.659258e-01	345.270417	111.565487	0	0.00	20.89	16
2024-05-21	0	403.77	0	True	6.000845	-0.114656	0	21	1	5	0.000000e+00	1.000000e+00	347.067083	112.169501	1	52.29	0.00	19
2024-05-21	1	397.87	0	True	5.986125	-0.014612	1	21	1	5	2.588190e-01	9.659258e-01	347.540000	112.366822	1	5.90	0.00	19
2024-05-21	2	400.66	0	True	5.993113	0.007012	2	21	1	5	5.000000e-01	8.660254e-01	347.769583	112.473904	1	0.00	2.79	19

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-05-21	3	398.32	0	True	5.987256	-0.005840	3	21	1	5	7.071068e-01	7.071068e-01	348.761250	112.824388	1	2.34	0.00	18
2024-05-21	4	401.43	0	True	5.995033	0.007808	4	21	1	5	8.660254e-01	5.000000e-01	349.994167	113.248431	1	0.00	3.11	18
2024-05-21	5	429.64	0	True	6.062948	0.070274	5	21	1	5	9.659258e-01	2.588190e-01	351.524167	114.098435	1	0.00	28.21	18
2024-05-21	6	384.57	0	True	5.952126	-0.104902	6	21	1	5	1.000000e+00	6.123234e-17	352.122083	114.238182	1	45.07	0.00	19
2024-05-21	7	346.53	0	True	5.847969	-0.098916	7	21	1	5	9.659258e-01	-2.588190e-01	353.543750	113.934391	1	38.04	0.00	18
2024-05-21	8	316.42	0	True	5.757070	-0.086890	8	21	1	5	8.660254e-01	-5.000000e-01	356.310417	112.102698	1	30.11	0.00	17
2024-05-21	9	261.44	0	True	5.566205	-0.173756	9	21	1	5	7.071068e-01	-7.071068e-01	360.057083	107.046788	1	54.98	0.00	16
2024-05-21	10	298.14	0	True	5.697563	0.140376	10	21	1	5	5.000000e-01	-8.660254e-01	363.976667	102.721739	1	0.00	36.70	16
2024-05-21	11	328.34	0	True	5.794050	0.101295	11	21	1	5	2.588190e-01	-9.659258e-01	369.072917	97.443379	1	0.00	30.20	16
2024-05-21	12	287.57	0	True	5.661466	-0.124170	12	21	1	5	1.224647e-16	-1.000000e+00	375.746667	84.842020	1	40.77	0.00	14
2024-05-21	13	301.34	0	True	5.708239	0.047884	13	21	1	5	-2.588190e-01	-9.659258e-01	380.570833	76.432612	1	0.00	13.77	14
2024-05-21	14	318.90	0	True	5.764878	0.058273	14	21	1	5	-5.000000e-01	-8.660254e-01	384.443750	70.371813	1	0.00	17.56	14
2024-05-21	15	358.59	0	True	5.882180	0.124459	15	21	1	5	-7.071068e-01	-7.071068e-01	386.071667	69.247551	1	0.00	39.69	14
2024-05-21	16	402.61	0	True	5.997968	0.122759	16	21	1	5	-8.660254e-01	-5.000000e-01	387.258333	69.278033	1	0.00	44.02	14
2024-05-21	17	430.38	0	True	6.064669	0.068975	17	21	1	5	-9.659258e-01	-2.588190e-01	387.160833	69.212885	1	0.00	27.77	14
2024-05-21	18	414.77	0	True	6.027724	-0.036270	18	21	1	5	-1.000000e+00	-1.836970e-16	383.055000	64.141083	1	15.61	0.00	15
2024-05-21	19	407.16	0	True	6.009206	-0.018348	19	21	1	5	-9.659258e-01	-2.588190e-01	378.618333	58.115327	1	7.61	0.00	15
2024-05-21	20	403.85	0	True	6.001044	-0.008129	20	21	1	5	-8.660254e-01	-5.000000e-01	375.628333	54.650943	1	3.31	0.00	14
2024-05-21	21	385.11	0	True	5.953529	-0.046403	21	21	1	5	-7.071068e-01	-7.071068e-01	373.693333	53.392516	1	18.74	0.00	13
2024-05-21	22	379.60	0	True	5.939118	-0.014308	22	21	1	5	-5.000000e-01	-8.660254e-01	371.377917	51.791529	1	5.51	0.00	13
2024-05-21	23	365.42	0	True	5.901047	-0.037355	23	21	1	5	-2.588190e-01	-9.659258e-01	367.601250	48.551390	1	14.18	0.00	13
2024-05-22	0	460.35	0	True	6.131987	0.259783	0	22	2	5	0.000000e+00	1.000000e+00	369.958750	51.658253	2	0.00	94.93	11
2024-05-22	1	440.52	0	True	6.087956	-0.043076	1	22	2	5	2.588190e-01	9.659258e-01	371.735833	53.365551	2	19.83	0.00	12
2024-05-22	2	417.60	0	True	6.034524	-0.052029	2	22	2	5	5.000000e-01	8.660254e-01	372.441667	53.874348	2	22.92	0.00	13
2024-05-22	3	421.67	0	True	6.044223	0.009746	3	22	2	5	7.071068e-01	7.071068e-01	373.414583	54.568372	2	0.00	4.07	13
2024-05-22	4	452.57	0	True	6.114942	0.073280	4	22	2	5	8.660254e-01	5.000000e-01	375.545417	56.667993	2	0.00	30.90	13
2024-05-22	5	486.45	0	True	6.187134	0.074861	5	22	2	5	9.659258e-01	2.588190e-01	377.912500	60.107925	2	0.00	33.88	13
2024-05-22	6	421.84	0	True	6.044626	-0.132819	6	22	2	5	1.000000e+00	6.123234e-17	379.465417	60.765253	2	64.61	0.00	14
2024-05-22	7	330.72	0	True	5.801272	-0.216006	7	22	2	5	9.659258e-01	-2.588190e-01	378.806667	61.221808	2	91.12	0.00	16
2024-05-22	8	261.47	0	True	5.566320	-0.209392	8	22	2	5	8.660254e-01	-5.000000e-01	376.517083	64.591193	2	69.25	0.00	17
2024-05-22	9	100.04	0	True	4.605570	-0.617394	9	22	2	5	7.071068e-01	-7.071068e-01	369.792083	82.900658	2	161.43	0.00	22
2024-05-22	10	137.23	0	True	4.921658	0.371751	10	22	2	5	5.000000e-01	-8.660254e-01	363.087500	94.625166	2	0.00	37.19	22
2024-05-22	11	130.00	0	True	4.867534	-0.052685	11	22	2	5	2.588190e-01	-9.659258e-01	354.823333	105.793787	2	7.23	0.00	22
2024-05-22	12	152.11	0	True	5.024604	0.170077	12	22	2	5	1.224647e-16	-1.000000e+00	349.179167	112.911780	2	0.00	22.11	20
2024-05-22	13	129.05	0	True	4.860200	-0.151601	13	22	2	5	-2.588190e-01	-9.659258e-01	342.000417	121.254323	2	23.06	0.00	21
2024-05-22	14	137.24	0	True	4.921731	0.063464	14	22	2	5	-5.000000e-01	-8.660254e-01	334.431250	128.228436	2	0.00	8.19	21
2024-05-22	15	255.33	0	True	5.542557	0.860463	15	22	2	5	-7.071068e-01	-7.071068e-01	330.128750	129.111903	2	0.00	118.09	21
2024-05-22	16	408.99	0	True	6.013691	0.601809	16	22	2	5	-8.660254e-01	-5.000000e-01	330.394583	129.274092	2	0.00	153.66	21
2024-05-22	17	467.33	0	True	6.147036	0.142644	17	22	2	5	-9.659258e-01	-2.588190e-01	331.934167	130.728481	2	0.00	58.34	21
2024-05-22	18	446.97	0	True	6.102491	-0.043567	18	22	2	5	-1.000000e+00	-1.836970e-16	333.275833	131.776621	2	20.36	0.00	22
2024-05-22	19	421.90	0	True	6.044768	-0.056089	19	22	2	5	-9.659258e-01	-2.588190e-01	333.890000	132.169705	2	25.07	0.00	22
2024-05-22	20	414.98	0	True	6.028230	-0.016402	20	22	2	5	-8.660254e-01	-5.000000e-01	334.353750	132.445089	2	6.92	0.00	22
2024-05-22	21	345.41	0	True	5.844732	-0.167647	21	22	2	5	-7.071068e-01	-7.071068e-01	332.699583	132.030877	2	69.57	0.00	25
2024-05-22	22	361.47	0	True	5.890179	0.046495	22	22	2	5	-5.000000e-01	-8.660254e-01	331.944167	131.802537	2	0.00	16.06	24

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-05-22	23	362.99	0	True	5.894375	0.004205	23	22	2	5	-2.588190e-01	9.659258e-01	331.842917	131.776634	2	0.00	1.52	24
2024-05-23	0	383.46	0	True	5.949235	0.056393	0	23	3	5	0.000000e+00	1.000000e+00	328.639167	129.430321	3	0.00	20.47	24
2024-05-23	1	329.52	0	True	5.797637	-0.140667	1	23	3	5	2.588190e-01	9.659258e-01	324.014167	127.222992	3	53.94	0.00	25
2024-05-23	2	286.99	0	True	5.659447	-0.129067	2	23	3	5	5.000000e-01	8.660254e-01	318.572083	125.831591	3	42.53	0.00	26
2024-05-23	3	264.15	0	True	5.576517	-0.079585	3	23	3	5	7.071068e-01	7.071068e-01	312.008750	124.319238	3	22.84	0.00	27
2024-05-23	4	365.77	0	True	5.902005	0.384706	4	23	3	5	8.660254e-01	5.000000e-01	308.392083	121.277648	3	0.00	101.62	27
2024-05-23	5	416.39	0	True	6.031622	0.138393	5	23	3	5	9.659258e-01	2.588190e-01	305.472917	117.592622	3	0.00	50.62	27
2024-05-23	6	215.09	0	True	5.371057	-0.483441	6	23	3	5	1.000000e+00	6.123234e-17	296.858333	116.262686	3	201.30	0.00	33
2024-05-23	7	25.59	0	True	3.242202	-0.881027	7	23	3	5	9.659258e-01	-2.588190e-01	284.144583	128.444173	3	189.50	0.00	37
2024-05-23	8	-71.87	0	True	3.242202	-3.808519	8	23	3	5	8.660254e-01	-5.000000e-01	270.255417	147.597317	3	97.46	0.00	38
2024-05-23	9	-80.00	0	True	3.242202	0.113121	9	23	3	5	7.071068e-01	-7.071068e-01	262.753750	160.625033	3	8.13	0.00	31
2024-05-23	10	-80.00	0	True	3.242202	0.000000	10	23	3	5	5.000000e-01	-8.660254e-01	253.702500	173.602112	3	0.00	0.00	31
2024-05-23	11	-7.85	0	True	3.242202	-0.901875	11	23	3	5	2.588190e-01	-9.659258e-01	247.958750	180.034124	3	0.00	72.15	31
2024-05-23	12	0.09	0	True	-2.407946	-1.011465	12	23	3	5	1.224647e-16	-1.000000e+00	241.624583	186.124268	3	0.00	7.94	31
2024-05-23	13	123.96	0	True	4.819959	1376.333333	13	23	3	5	-2.588190e-01	-9.659258e-01	241.412500	186.260970	3	0.00	123.87	30
2024-05-23	14	178.12	0	True	5.182457	0.436915	14	23	3	5	-5.000000e-01	-8.660254e-01	243.115833	185.452071	3	0.00	54.16	30
2024-05-23	15	277.74	0	True	5.626685	0.559286	15	23	3	5	-7.071068e-01	-7.071068e-01	244.049583	185.572621	3	0.00	99.62	30
2024-05-23	16	495.03	0	True	6.204618	0.782350	16	23	3	5	-8.660254e-01	-5.000000e-01	247.634583	189.683137	3	0.00	217.29	30
2024-05-23	17	594.98	0	True	6.388528	0.201907	17	23	3	5	-9.659258e-01	-2.588190e-01	252.953333	197.730245	3	0.00	99.95	30
2024-05-23	18	612.48	0	True	6.417516	0.029413	18	23	3	5	-1.000000e+00	-1.836970e-16	259.849583	207.439075	3	0.00	17.50	29
2024-05-23	19	603.77	0	True	6.403193	-0.014221	19	23	3	5	-9.659258e-01	2.588190e-01	267.427500	216.730149	3	8.71	0.00	29
2024-05-23	20	585.09	0	True	6.371766	-0.030939	20	23	3	5	-8.660254e-01	5.000000e-01	274.515417	224.411019	3	18.68	0.00	29
2024-05-23	21	502.82	0	True	6.220232	-0.140611	21	23	3	5	-7.071068e-01	-7.071068e-01	281.074167	228.829873	3	82.27	0.00	30
2024-05-23	22	474.22	0	True	6.161671	-0.056879	22	23	3	5	-5.000000e-01	-8.660254e-01	285.772083	231.691670	3	28.60	0.00	31
2024-05-23	23	495.27	0	True	6.205103	0.044389	23	23	3	5	-2.588190e-01	-9.659258e-01	291.283750	235.155949	3	0.00	21.05	31
2024-05-24	0	427.63	0	True	6.058258	-0.136572	0	24	4	5	0.000000e+00	1.000000e+00	293.124167	236.079751	4	67.64	0.00	34
2024-05-24	1	440.58	0	True	6.088092	0.030283	1	24	4	5	2.588190e-01	9.659258e-01	297.751667	237.905585	4	0.00	12.95	31
2024-05-24	2	440.59	0	True	6.088115	0.000023	2	24	4	5	5.000000e-01	8.660254e-01	304.151667	239.663033	4	0.00	0.01	30
2024-05-24	3	440.00	0	True	6.086775	-0.001339	3	24	4	5	7.071068e-01	7.071068e-01	311.478750	241.070859	4	0.59	0.00	29
2024-05-24	4	466.51	0	True	6.145279	0.060250	4	24	4	5	8.660254e-01	5.000000e-01	315.676250	242.927163	4	0.00	26.51	29
2024-05-24	5	486.58	0	True	6.187401	0.043022	5	24	4	5	9.659258e-01	2.588190e-01	318.600833	244.609050	4	0.00	20.07	29
2024-05-24	6	453.28	0	True	6.116510	-0.068437	6	24	4	5	1.000000e+00	6.123234e-17	328.525417	245.058339	4	33.30	0.00	22
2024-05-24	7	397.53	0	True	5.985270	-0.122992	7	24	4	5	9.659258e-01	-2.588190e-01	344.022917	236.685462	4	55.75	0.00	16
2024-05-24	8	381.71	0	True	5.944661	-0.039796	8	24	4	5	8.660254e-01	-5.000000e-01	362.922083	219.519366	4	15.82	0.00	13
2024-05-24	9	331.82	0	True	5.804593	-0.130701	9	24	4	5	7.071068e-01	-7.071068e-01	380.081250	198.479237	4	49.89	0.00	15
2024-05-24	10	394.62	0	True	5.977923	0.189259	10	24	4	5	5.000000e-01	-8.660254e-01	399.857083	172.603188	4	0.00	62.80	15
2024-05-24	11	392.13	0	True	5.971593	-0.006310	11	24	4	5	2.588190e-01	-9.659258e-01	416.522917	149.256335	4	2.49	0.00	15
2024-05-24	12	235.87	0	True	5.463281	-0.398490	12	24	4	5	1.224647e-16	-1.000000e+00	426.347083	126.711619	4	156.26	0.00	21
2024-05-24	13	269.54	0	True	5.596717	0.142748	13	24	4	5	-2.588190e-01	-9.659258e-01	432.412917	114.503017	4	0.00	33.67	21
2024-05-24	14	351.52	0	True	5.862267	0.304148	14	24	4	5	-5.000000e-01	-8.660254e-01	439.637917	102.613162	4	0.00	81.98	21
2024-05-24	15	429.86	0	True	6.063460	0.222861	15	24	4	5	-7.071068e-01	-7.071068e-01	445.976250	96.706208	4	0.00	78.34	21
2024-05-24	16	469.46	0	True	6.151583	0.092123	16	24	4	5	-8.660254e-01	-5.000000e-01	444.910833	96.282207	4	0.00	39.60	21
2024-05-24	17	471.68	0	True	6.156301	0.004729	17	24	4	5	-9.659258e-01	-2.588190e-01	439.773333	91.075325	4	0.00	2.22	21
2024-05-24	18	478.56	0	True	6.170782	0.014586	18	24	4	5	-1.836970e-16	-1.000000e+00	434.193333	83.849757	4	0.00	6.88	21

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-05-24	19	437.42	0	True	6.080894	-0.085966	19	24	4	5	-9.659258e-01	2.588190e-01	427.262083	75.702257	4	41.14	0.00	23
2024-05-24	20	458.47	0	True	6.127895	0.048123	20	24	4	5	-8.660254e-01	5.000000e-01	421.986250	68.272277	4	0.00	21.05	22
2024-05-24	21	447.82	0	True	6.104391	-0.023229	21	24	4	5	-7.071068e-01	7.071068e-01	419.694583	66.336636	4	10.65	0.00	19
2024-05-24	22	477.86	0	True	6.169318	0.067081	22	24	4	5	-5.000000e-01	8.660254e-01	419.846250	66.470744	4	0.00	30.04	18
2024-05-24	23	495.01	0	True	6.204578	0.035889	23	24	4	5	-2.588190e-01	9.659258e-01	419.835417	66.457937	4	0.00	17.15	18
2024-05-25	0	387.01	1	False	5.958451	-0.218177	0	25	5	5	0.000000e+00	1.000000e+00	418.142917	66.767319	5	108.00	0.00	19
2024-05-25	1	384.72	1	False	5.952516	-0.005917	1	25	5	5	2.588190e-01	9.659258e-01	415.815417	66.924610	5	2.29	0.00	19
2024-05-25	2	375.25	1	False	5.927592	-0.024615	2	25	5	5	5.000000e-01	8.660254e-01	413.092917	67.201405	5	9.47	0.00	20
2024-05-25	3	380.78	1	False	5.942222	0.014737	3	25	5	5	7.071068e-01	7.071068e-01	410.625417	67.257672	5	0.00	5.53	20
2024-05-25	4	398.67	1	False	5.988134	0.046983	4	25	5	5	8.660254e-01	5.000000e-01	407.798750	66.224505	5	0.00	17.89	20
2024-05-25	5	413.90	1	False	6.025624	0.038202	5	25	5	5	9.659258e-01	2.588190e-01	404.770417	64.092798	5	0.00	15.23	20
2024-05-25	6	381.76	1	False	5.944792	-0.077652	6	25	5	5	1.000000e+00	6.123234e-17	401.790417	63.398178	5	32.14	0.00	20
2024-05-25	7	361.68	1	False	5.890760	-0.052598	7	25	5	5	9.659258e-01	-2.588190e-01	400.296667	63.923089	5	20.08	0.00	18
2024-05-25	8	344.52	1	False	5.842152	-0.047445	8	25	5	5	8.660254e-01	-5.000000e-01	398.747083	64.837473	5	17.16	0.00	18
2024-05-25	9	331.18	1	False	5.802662	-0.038721	9	25	5	5	7.071068e-01	-7.071068e-01	398.720417	64.866321	5	13.34	0.00	17
2024-05-25	10	359.06	1	False	5.883490	0.084184	10	25	5	5	5.000000e-01	-8.660254e-01	397.238750	65.368241	5	0.00	27.88	17
2024-05-25	11	356.53	1	False	5.876418	-0.007046	11	25	5	5	2.588190e-01	-9.659258e-01	395.755417	65.891035	5	2.53	0.00	17
2024-05-25	12	320.99	1	False	5.771410	-0.099683	12	25	5	5	1.224647e-16	-1.000000e+00	399.302083	58.822535	5	35.54	0.00	12
2024-05-25	13	318.47	1	False	5.763528	-0.007851	13	25	5	5	-2.588190e-01	-9.659258e-01	401.340833	54.842841	5	2.52	0.00	12
2024-05-25	14	287.08	1	False	5.659761	-0.098565	14	25	5	5	-5.000000e-01	-8.660254e-01	398.655833	58.821157	5	31.39	0.00	13
2024-05-25	15	311.10	1	False	5.740114	0.083670	15	25	5	5	-7.071068e-01	-7.071068e-01	393.707500	61.035633	5	0.00	24.02	13
2024-05-25	16	355.98	1	False	5.874875	0.144262	16	25	5	5	-8.660254e-01	-5.000000e-01	388.979167	59.282437	5	0.00	44.88	13
2024-05-25	17	361.78	1	False	5.891036	0.016293	17	25	5	5	-9.659258e-01	-2.588190e-01	384.400000	56.809554	5	0.00	5.80	13
2024-05-25	18	370.09	1	False	5.913746	0.022970	18	25	5	5	-1.000000e+00	-1.836970e-16	379.880417	53.192397	5	0.00	8.31	13
2024-05-25	19	356.59	1	False	5.876587	-0.036478	19	25	5	5	-9.659258e-01	2.588190e-01	376.512500	51.934879	5	13.50	0.00	12
2024-05-25	20	352.02	1	False	5.863688	-0.012816	20	25	5	5	-8.660254e-01	5.000000e-01	372.077083	49.099291	5	4.57	0.00	12
2024-05-25	21	329.55	1	False	5.797728	-0.063832	21	25	5	5	-7.071068e-01	7.071068e-01	367.149167	47.059521	5	22.47	0.00	13
2024-05-25	22	318.42	1	False	5.763371	-0.033773	22	25	5	5	-5.000000e-01	8.660254e-01	360.505833	41.699857	5	11.13	0.00	13
2024-05-25	23	321.73	1	False	5.773713	0.010395	23	25	5	5	-2.588190e-01	9.659258e-01	353.285833	31.036661	5	0.00	3.31	13
2024-05-26	0	288.32	1	False	5.664071	-0.103845	0	26	6	5	0.000000e+00	1.000000e+00	349.173750	32.858543	6	33.41	0.00	10
2024-05-26	1	314.29	1	False	5.750316	0.090074	1	26	6	5	2.588190e-01	9.659258e-01	346.239167	32.690502	6	0.00	25.97	10
2024-05-26	2	349.96	1	False	5.857819	0.113494	2	26	6	5	5.000000e-01	8.660254e-01	345.185417	32.117280	6	0.00	35.67	9.5
2024-05-26	3	352.71	1	False	5.865646	0.007858	3	26	6	5	7.071068e-01	7.071068e-01	344.015833	31.264487	6	0.00	2.75	9.5
2024-05-26	4	384.70	1	False	5.952464	0.090698	4	26	6	5	8.660254e-01	5.000000e-01	343.433750	30.318425	6	0.00	31.99	9.5
2024-05-26	5	399.76	1	False	5.990864	0.039147	5	26	6	5	9.659258e-01	2.588190e-01	342.844583	28.998187	6	0.00	15.06	9.5
2024-05-26	6	397.73	1	False	5.985773	-0.005078	6	26	6	5	1.000000e+00	6.123234e-17	343.510000	30.092578	6	2.03	0.00	8.7
2024-05-26	7	394.33	1	False	5.977188	-0.008549	7	26	6	5	9.659258e-01	-2.588190e-01	344.870417	31.647557	6	3.40	0.00	8.0
2024-05-26	8	316.67	1	False	5.757860	-0.196942	8	26	6	5	8.660254e-01	-5.000000e-01	343.710000	32.167283	6	77.66	0.00	10
2024-05-26	9	206.02	1	False	5.327973	-0.349417	9	26	6	5	7.071068e-01	-7.071068e-01	338.495000	42.706129	6	110.65	0.00	14
2024-05-26	10	90.97	1	False	4.510530	-0.558441	10	26	6	5	5.000000e-01	-8.660254e-01	327.324583	65.871660	6	115.05	0.00	19
2024-05-26	11	-40.10	1	False	4.510530	-1.440805	11	26	6	5	2.588190e-01	-9.659258e-01	310.798333	99.431383	6	131.07	0.00	24
2024-05-26	12	-80.00	1	False	4.510530	0.995012	12	26	6	5	1.224647e-16	-1.000000e+00	294.090417	127.400696	6	39.90	0.00	24
2024-05-26	13	-80.00	1	False	4.510530	0.000000	13	26	6	5	-2.588190e-01	-9.659258e-01	277.487500	148.330576	6	0.00	0.00	24
2024-05-26	14	-80.00	1	False	4.510530	0.000000	14	26	6	5	-5.000000e-01	-8.660254e-01	262.192500	165.258148	6	0.00	0.00	23

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-05-26	15	-57.47	1	False	4.510530	-0.281625	15	26	6	5	-7.071068e-01	-7.071068e-01	246.835417	177.208780	6	0.00	22.53	23
2024-05-26	16	90.26	1	False	4.502694	-2.570559	16	26	6	5	-8.660254e-01	-5.000000e-01	235.763750	178.390052	6	0.00	147.73	23
2024-05-26	17	250.94	1	False	5.525214	1.780191	17	26	6	5	-9.659258e-01	-2.588190e-01	231.145417	176.409550	6	0.00	160.68	23
2024-05-26	18	375.96	1	False	5.929483	0.498207	18	26	6	5	-1.000000e+00	-1.836970e-16	231.390000	176.614516	6	0.00	125.02	23
2024-05-26	19	392.30	1	False	5.972027	0.043462	19	26	6	5	-9.659258e-01	2.588190e-01	232.877917	177.861165	6	0.00	16.34	22
2024-05-26	20	407.96	1	False	6.011169	0.039918	20	26	6	5	-8.660254e-01	5.000000e-01	235.208750	179.845849	6	0.00	15.66	22
2024-05-26	21	429.55	1	False	6.062738	0.052922	21	26	6	5	-7.071068e-01	7.071068e-01	239.375417	183.252707	6	0.00	21.59	21
2024-05-26	22	425.84	1	False	6.054064	-0.008637	22	26	6	5	-5.000000e-01	8.660254e-01	243.851250	186.549441	6	3.71	0.00	21
2024-05-26	23	436.41	1	False	6.078582	0.024822	23	26	6	5	-2.588190e-01	9.659258e-01	248.629583	190.066550	6	0.00	10.57	21
2024-05-27	0	504.91	0	True	6.224380	0.156962	0	27	0	5	0.000000e+00	1.000000e+00	257.654167	197.046832	0	0.00	68.50	20
2024-05-27	1	482.92	0	True	6.179851	-0.043552	1	27	0	5	2.588190e-01	9.659258e-01	264.680417	202.095939	0	21.99	0.00	21
2024-05-27	2	474.95	0	True	6.163210	-0.016504	2	27	0	5	5.000000e-01	8.660254e-01	269.888333	205.962579	0	7.97	0.00	21
2024-05-27	3	413.37	0	True	6.024343	-0.129656	3	27	0	5	7.071068e-01	7.071068e-01	272.415833	207.390377	0	61.58	0.00	23
2024-05-27	4	409.56	0	True	6.015083	-0.009217	4	27	0	5	8.660254e-01	5.000000e-01	273.451667	208.036652	0	3.81	0.00	24
2024-05-27	5	444.88	0	True	6.097805	0.086239	5	27	0	5	9.659258e-01	2.588190e-01	275.331667	209.426937	0	0.00	35.32	24
2024-05-27	6	267.00	0	True	5.587249	-0.399838	6	27	0	5	1.000000e+00	6.123234e-17	269.884583	207.798788	0	177.88	0.00	31
2024-05-27	7	-1.76	0	True	5.587249	-1.006592	7	27	0	5	9.659258e-01	-2.588190e-01	253.380833	213.145682	0	268.76	0.00	42
2024-05-27	8	-80.00	0	True	5.587249	44.454545	8	27	0	5	8.660254e-01	-5.000000e-01	236.852917	223.168489	0	78.24	0.00	42
2024-05-27	9	-80.00	0	True	5.587249	0.000000	9	27	0	5	7.071068e-01	-7.071068e-01	224.935417	232.335259	0	0.00	0.00	37
2024-05-27	10	-80.00	0	True	5.587249	0.000000	10	27	0	5	5.000000e-01	-8.660254e-01	217.811667	239.142799	0	0.00	0.00	33
2024-05-27	11	-44.63	0	True	5.587249	-0.442125	11	27	0	5	2.588190e-01	-9.659258e-01	217.622917	239.356905	0	0.00	35.37	27
2024-05-27	12	-80.00	0	True	5.587249	0.792516	12	27	0	5	1.224647e-16	-1.000000e+00	217.622917	239.356905	0	35.37	0.00	27
2024-05-27	13	-55.60	0	True	5.587249	-0.305000	13	27	0	5	-2.588190e-01	-9.659258e-01	218.639583	238.086238	0	0.00	24.40	27
2024-05-27	14	20.97	0	True	3.043093	-1.377158	14	27	0	5	-5.000000e-01	-8.660254e-01	222.846667	233.426199	0	0.00	76.57	27
2024-05-27	15	105.35	0	True	4.657288	4.023844	15	27	0	5	-7.071068e-01	-7.071068e-01	229.630833	227.208256	0	0.00	84.38	27
2024-05-27	16	317.69	0	True	5.761076	2.015567	16	27	0	5	-8.660254e-01	-5.000000e-01	239.107083	225.881617	0	0.00	212.34	27
2024-05-27	17	457.62	0	True	6.126039	0.440461	17	27	0	5	-9.659258e-01	-2.588190e-01	247.718750	230.249924	0	0.00	139.93	27
2024-05-27	18	507.03	0	True	6.228570	0.107972	18	27	0	5	-1.000000e+00	-1.836970e-16	253.180000	234.930733	0	0.00	49.41	27
2024-05-27	19	506.31	0	True	6.227149	-0.001420	19	27	0	5	-9.659258e-01	2.588190e-01	257.930417	238.983823	0	0.72	0.00	27
2024-05-27	20	495.29	0	True	6.205143	-0.021765	20	27	0	5	-8.660254e-01	5.000000e-01	261.569167	242.013122	0	11.02	0.00	27
2024-05-27	21	479.77	0	True	6.173307	-0.031335	21	27	0	5	-7.071068e-01	7.071068e-01	263.661667	243.739619	0	15.52	0.00	28
2024-05-27	22	478.80	0	True	6.171283	-0.002022	22	27	0	5	-5.000000e-01	8.660254e-01	265.868333	245.505058	0	0.97	0.00	28
2024-05-27	23	472.19	0	True	6.157381	-0.013805	23	27	0	5	-2.588190e-01	9.659258e-01	267.359167	246.691472	0	6.61	0.00	28
2024-05-28	0	509.78	0	True	6.233979	0.079608	0	28	1	5	0.000000e+00	1.000000e+00	267.562083	246.897283	1	0.00	37.59	28
2024-05-28	1	500.00	0	True	6.214608	-0.019185	1	28	1	5	2.588190e-01	9.659258e-01	268.273750	247.568731	1	9.78	0.00	28
2024-05-28	2	519.33	0	True	6.252540	0.038660	2	28	1	5	5.000000e-01	8.660254e-01	270.122917	249.338993	1	0.00	19.33	27
2024-05-28	3	524.98	0	True	6.263360	0.010879	3	28	1	5	7.071068e-01	7.071068e-01	274.773333	253.138718	1	0.00	5.65	25
2024-05-28	4	539.51	0	True	6.290661	0.027677	4	28	1	5	8.660254e-01	5.000000e-01	280.187917	257.499369	1	0.00	14.53	25
2024-05-28	5	548.32	0	True	6.306859	0.016330	5	28	1	5	9.659258e-01	2.588190e-01	284.497917	261.214703	1	0.00	8.81	25
2024-05-28	6	460.07	0	True	6.131379	-0.160946	6	28	1	5	1.000000e+00	6.123234e-17	292.542500	263.614342	1	88.25	0.00	21
2024-05-28	7	194.32	0	True	5.269506	-0.577629	7	28	1	5	9.659258e-01	-2.588190e-01	300.712500	257.053515	1	265.75	0.00	21
2024-05-28	8	39.19	0	True	3.668422	-0.798322	8	28	1	5	8.660254e-01	-5.000000e-01	305.678750	250.444804	1	155.13	0.00	24
2024-05-28	9	-80.00	0	True	3.668422	-3.041337	9	28	1	5	7.071068e-01	-7.071068e-01	305.678750	250.444804	1	119.19	0.00	29
2024-05-28	10	70.28	0	True	4.252487	-1.878500	10	28	1	5	5.000000e-01	-8.660254e-01	311.940417	242.123151	1	0.00	150.28	29

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-05-28	11	54.90	0	True	4.005513	-0.218839	11	28	1	5	2.588190e-01	-9.659258e-01	316.087500	236.538242	1	15.38	0.00	30
2024-05-28	12	45.43	0	True	3.816173	-0.172495	12	28	1	5	1.224647e-16	-1.000000e+00	321.313750	228.660796	1	9.47	0.00	29
2024-05-28	13	74.45	0	True	4.310128	0.638785	13	28	1	5	-2.588190e-01	-9.659258e-01	326.732500	220.744343	1	0.00	29.02	29
2024-05-28	14	88.68	0	True	4.485034	0.191135	14	28	1	5	-5.000000e-01	-8.660254e-01	329.553750	217.068688	1	0.00	14.23	29
2024-05-28	15	234.87	0	True	5.459032	1.648512	15	28	1	5	-7.071068e-01	-7.071068e-01	334.950417	212.820752	1	0.00	146.19	29
2024-05-28	16	395.81	0	True	5.980934	0.685230	16	28	1	5	-8.660254e-01	-5.000000e-01	338.205417	213.142446	1	0.00	160.94	29
2024-05-28	17	530.71	0	True	6.274216	0.340820	17	28	1	5	-9.659258e-01	-2.588190e-01	341.250833	215.432703	1	0.00	134.90	29
2024-05-28	18	542.65	0	True	6.296465	0.022498	18	28	1	5	-1.000000e+00	-1.836970e-16	342.735000	216.743162	1	0.00	11.94	29
2024-05-28	19	530.04	0	True	6.272952	-0.023238	19	28	1	5	-9.659258e-01	2.588190e-01	343.723750	217.574344	1	12.61	0.00	29
2024-05-28	20	484.15	0	True	6.182395	-0.086578	20	28	1	5	-8.660254e-01	5.000000e-01	343.259583	217.248577	1	45.89	0.00	31
2024-05-28	21	303.29	0	True	5.714689	-0.373562	21	28	1	5	-7.071068e-01	7.071068e-01	335.906250	215.406035	1	180.86	0.00	37
2024-05-28	22	220.12	0	True	5.394173	-0.274226	22	28	1	5	-5.000000e-01	8.660254e-01	325.127917	214.414690	1	83.17	0.00	41
2024-05-28	23	228.55	0	True	5.431755	0.038297	23	28	1	5	-2.588190e-01	9.659258e-01	314.976250	212.911581	1	0.00	8.43	41
2024-05-29	0	233.07	0	True	5.451339	0.019777	0	29	2	5	0.000000e+00	1.000000e+00	303.446667	209.366605	2	0.00	4.52	41
2024-05-29	1	320.44	0	True	5.769695	0.374866	1	29	2	5	2.588190e-01	9.659258e-01	295.965000	205.204329	2	0.00	87.37	40
2024-05-29	2	272.01	0	True	5.605839	-0.151136	2	29	2	5	5.000000e-01	8.660254e-01	285.660000	199.634021	2	48.43	0.00	42
2024-05-29	3	259.16	0	True	5.557446	-0.047241	3	29	2	5	7.071068e-01	7.071068e-01	274.584167	193.044271	2	12.85	0.00	43
2024-05-29	4	351.41	0	True	5.861954	0.355958	4	29	2	5	8.660254e-01	5.000000e-01	266.746667	185.491399	2	0.00	92.25	43
2024-05-29	5	365.51	0	True	5.901294	0.040124	5	29	2	5	9.659258e-01	2.588190e-01	259.129583	176.984467	2	0.00	14.10	43
2024-05-29	6	186.62	0	True	5.229074	-0.489426	6	29	2	5	1.000000e+00	6.123234e-17	247.735833	172.224008	2	178.89	0.00	46
2024-05-29	7	-80.00	0	True	5.229074	-1.428679	7	29	2	5	9.659258e-01	-2.588190e-01	236.305833	184.582673	2	266.62	0.00	47
2024-05-29	8	-80.00	0	True	5.229074	0.000000	8	29	2	5	8.660254e-01	-5.000000e-01	231.339583	191.587232	2	0.00	0.00	40
2024-05-29	9	-80.00	0	True	5.229074	0.000000	9	29	2	5	7.071068e-01	-7.071068e-01	231.339583	191.587232	2	0.00	0.00	35
2024-05-29	10	-80.00	0	True	5.229074	0.000000	10	29	2	5	5.000000e-01	-8.660254e-01	225.077917	199.377455	2	0.00	0.00	35
2024-05-29	11	-79.48	0	True	5.229074	-0.006500	11	29	2	5	2.588190e-01	-9.659258e-01	219.478750	206.136730	2	0.00	0.52	34
2024-05-29	12	-79.20	0	True	5.229074	-0.003523	12	29	2	5	1.224647e-16	-1.000000e+00	214.285833	212.192787	2	0.00	0.28	34
2024-05-29	13	-80.00	0	True	5.229074	0.010101	13	29	2	5	-2.588190e-01	-9.659258e-01	207.850417	218.855626	2	0.80	0.00	34
2024-05-29	14	47.35	0	True	3.857567	-1.591875	14	29	2	5	-5.000000e-01	-8.660254e-01	206.128333	219.993743	2	0.00	127.35	34
2024-05-29	15	260.43	0	True	5.562334	4.500106	15	29	2	5	-7.071068e-01	-7.071068e-01	207.193333	220.200703	2	0.00	213.08	34
2024-05-29	16	425.96	0	True	6.054345	0.635603	16	29	2	5	-8.660254e-01	-5.000000e-01	208.449583	221.406254	2	0.00	165.53	34
2024-05-29	17	552.28	0	True	6.314055	0.296554	17	29	2	5	-9.659258e-01	-2.588190e-01	209.348333	222.810601	2	0.00	126.32	34
2024-05-29	18	595.19	0	True	6.388881	0.077696	18	29	2	5	-1.000000e+00	-1.836970e-16	211.537500	226.456037	2	0.00	42.91	34
2024-05-29	19	528.76	0	True	6.270535	-0.111611	19	29	2	5	-9.659258e-01	2.588190e-01	211.484167	226.377901	2	66.43	0.00	36
2024-05-29	20	524.08	0	True	6.261644	-0.008851	20	29	2	5	-8.660254e-01	5.000000e-01	213.147917	228.604748	2	4.68	0.00	35
2024-05-29	21	372.26	0	True	5.919593	-0.289689	21	29	2	5	-7.071068e-01	7.071068e-01	216.021667	230.215010	2	151.82	0.00	33
2024-05-29	22	374.48	0	True	5.925538	0.005964	22	29	2	5	-5.000000e-01	8.660254e-01	222.453333	232.479576	2	0.00	2.22	30
2024-05-29	23	371.29	0	True	5.916983	-0.008518	23	29	2	5	-2.588190e-01	9.659258e-01	228.400833	234.459745	2	3.19	0.00	30
2024-05-30	0	191.25	0	True	5.253581	-0.484904	0	30	3	5	0.000000e+00	1.000000e+00	226.658333	234.578908	3	180.04	0.00	38
2024-05-30	1	202.83	0	True	5.312368	0.060549	1	30	3	5	2.588190e-01	9.659258e-01	221.75917	233.761633	3	0.00	11.58	38
2024-05-30	2	309.04	0	True	5.733471	0.523640	2	30	3	5	5.000000e-01	8.660254e-01	223.300833	234.229475	3	0.00	106.21	36
2024-05-30	3	351.22	0	True	5.861413	0.136487	3	30	3	5	7.071068e-01	7.071068e-01	227.136667	235.592093	3	0.00	42.18	35
2024-05-30	4	407.78	0	True	6.010728	0.161039	4	30	3	5	8.660254e-01	5.000000e-01	229.485417	237.160681	3	0.00	56.56	35
2024-05-30	5	440.96	0	True	6.088954	0.081367	5	30	3	5	9.659258e-01	2.588190e-01	232.629167	239.530424	3	0.00	33.18	35
2024-05-30	6	423.16	0	True	6.047750	-0.040366	6	30	3	5	1.000000e+00	6.123234e-17	242.485000	242.404155	3	17.80	0.00	28

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-05-30	7	400.75	0	True	5.993338	-0.052959	7	30	3	5	9.659258e-01	-2.588190e-01	262.516250	234.325677	3	22.41	0.00	18
2024-05-30	8	397.62	0	True	5.985497	-0.007810	8	30	3	5	8.660254e-01	-5.000000e-01	282.417083	224.027039	3	3.13	0.00	18
2024-05-30	9	346.97	0	True	5.849238	-0.127383	9	30	3	5	7.071068e-01	-7.071068e-01	300.207500	210.542941	3	50.65	0.00	20
2024-05-30	10	367.99	0	True	5.908056	0.060582	10	30	3	5	5.000000e-01	-8.660254e-01	318.873750	194.626289	3	0.00	21.02	20
2024-05-30	11	342.18	0	True	5.835337	-0.070138	11	30	3	5	2.588190e-01	-9.659258e-01	336.442917	175.161451	3	25.81	0.00	21
2024-05-30	12	213.35	0	True	5.362934	-0.376498	12	30	3	5	1.224647e-16	-1.000000e+00	348.632500	153.863583	3	128.83	0.00	27
2024-05-30	13	145.16	0	True	4.977837	-0.319616	13	30	3	5	-2.588190e-01	-9.659258e-01	358.014167	131.886794	3	68.19	0.00	30
2024-05-30	14	86.41	0	True	4.459103	-0.404726	14	30	3	5	-5.000000e-01	-8.660254e-01	359.641667	128.072320	3	58.75	0.00	32
2024-05-30	15	155.88	0	True	5.049086	0.803958	15	30	3	5	-7.071068e-01	-7.071068e-01	355.285417	133.266382	3	0.00	69.47	32
2024-05-30	16	342.61	0	True	5.836593	1.197909	16	30	3	5	-8.660254e-01	-5.000000e-01	351.812500	132.427939	3	0.00	186.73	32
2024-05-30	17	414.13	0	True	6.026180	0.208750	17	30	3	5	-9.659258e-01	-2.588190e-01	346.056250	126.190967	3	0.00	71.52	32
2024-05-30	18	437.97	0	True	6.082150	0.057566	18	30	3	5	-1.000000e+00	-1.836970e-16	339.505417	116.396301	3	0.00	23.84	32
2024-05-30	19	419.15	0	True	6.038229	-0.042971	19	30	3	5	-9.659258e-01	2.588190e-01	334.938333	110.656468	3	18.82	0.00	30
2024-05-30	20	400.41	0	True	5.992489	-0.044710	20	30	3	5	-8.660254e-01	5.000000e-01	329.785417	104.154222	3	18.74	0.00	31
2024-05-30	21	372.35	0	True	5.919834	-0.070078	21	30	3	5	-7.071068e-01	7.071068e-01	329.789167	104.155819	3	28.06	0.00	26
2024-05-30	22	337.20	0	True	5.820676	-0.094400	22	30	3	5	-5.000000e-01	8.660254e-01	328.235833	103.737491	3	35.15	0.00	27
2024-05-30	23	253.81	0	True	5.536586	-0.247301	23	30	3	5	-2.588190e-01	9.659258e-01	323.340833	104.387285	3	83.39	0.00	30
2024-05-31	0	199.10	0	True	5.293807	-0.215555	0	31	4	5	0.000000e+00	1.000000e+00	323.667917	103.966853	4	54.71	0.00	25
2024-05-31	1	303.98	0	True	5.716962	0.526770	1	31	4	5	2.588190e-01	9.659258e-01	327.882500	100.859126	4	0.00	104.88	25
2024-05-31	2	234.36	0	True	5.456858	-0.229028	2	31	4	5	5.000000e-01	8.660254e-01	324.770833	102.602651	4	69.62	0.00	28
2024-05-31	3	327.22	0	True	5.790633	0.396228	3	31	4	5	7.071068e-01	7.071068e-01	323.770833	102.450504	4	0.00	92.86	28
2024-05-31	4	428.85	0	True	6.061107	0.310586	4	31	4	5	8.660254e-01	5.000000e-01	324.648750	103.288542	4	0.00	101.63	28
2024-05-31	5	461.87	0	True	6.135283	0.076997	5	31	4	5	9.659258e-01	2.588190e-01	325.520000	104.394564	4	0.00	33.02	28
2024-05-31	6	328.44	0	True	5.794354	-0.288891	6	31	4	5	1.000000e+00	6.123234e-17	321.573333	102.312459	4	133.43	0.00	33
2024-05-31	7	66.46	0	True	4.196600	-0.797649	7	31	4	5	9.659258e-01	-2.588190e-01	307.644583	113.236561	4	261.98	0.00	43
2024-05-31	8	-44.87	0	True	4.196600	-1.675143	8	31	4	5	8.660254e-01	-5.000000e-01	289.207500	132.358318	4	111.33	0.00	47
2024-05-31	9	-80.00	0	True	4.196600	0.782928	9	31	4	5	7.071068e-01	-7.071068e-01	271.417083	151.5558908	4	35.13	0.00	47
2024-05-31	10	-80.00	0	True	4.196600	0.000000	10	31	4	5	5.000000e-01	-8.660254e-01	252.750833	166.043172	4	0.00	0.00	47
2024-05-31	11	-76.37	0	True	4.196600	-0.045375	11	31	4	5	2.588190e-01	-9.659258e-01	235.311250	177.805623	4	0.00	3.63	46
2024-05-31	12	-80.00	0	True	4.196600	0.047532	12	31	4	5	1.224647e-16	-1.000000e+00	223.088333	189.104826	4	3.63	0.00	40
2024-05-31	13	-80.00	0	True	4.196600	0.000000	13	31	4	5	-2.588190e-01	-9.659258e-01	213.706667	198.491260	4	0.00	0.00	38
2024-05-31	14	-73.37	0	True	4.196600	-0.082875	14	31	4	5	-5.000000e-01	-8.660254e-01	207.049167	205.502225	4	0.00	6.63	35
2024-05-31	15	65.55	0	True	4.182813	-1.893417	15	31	4	5	-7.071068e-01	-7.071068e-01	203.285417	207.299461	4	0.00	138.92	35
2024-05-31	16	235.62	0	True	5.462220	2.594508	16	31	4	5	-8.660254e-01	-5.000000e-01	198.827500	205.313944	4	0.00	170.07	35
2024-05-31	17	407.80	0	True	6.010777	0.730753	17	31	4	5	-9.659258e-01	-2.588190e-01	198.563750	205.029206	4	0.00	172.18	35
2024-05-31	18	522.24	0	True	6.258127	0.280628	18	31	4	5	-1.000000e+00	-1.836970e-16	202.075000	209.969511	4	0.00	114.44	35
2024-05-31	19	588.14	0	True	6.376965	0.126187	19	31	4	5	-9.659258e-01	2.588190e-01	209.116250	220.152144	4	0.00	65.90	34
2024-05-31	20	608.18	0	True	6.410471	0.034074	20	31	4	5	-8.660254e-01	5.000000e-01	217.773333	231.779517	4	0.00	20.04	34
2024-05-31	21	574.32	0	True	6.353187	-0.055674	21	31	4	5	-7.071068e-01	7.071068e-01	226.188750	241.114445	4	33.86	0.00	34
2024-05-31	22	610.03	0	True	6.413508	0.062178	22	31	4	5	-5.000000e-01	-8.660254e-01	237.556667	252.727826	4	0.00	35.71	32
2024-05-31	23	672.75	0	True	6.511374	0.102815	23	31	4	5	-2.588190e-01	9.659258e-01	255.012500	267.911184	4	0.00	62.72	29
2024-06-01	0	474.52	1	False	6.162304	-0.294656	0	1	5	6	0.000000e+00	1.000000e+00	266.488333	271.289507	5	198.23	0.00	35
2024-06-01	1	435.50	1	False	6.076495	-0.082230	1	1	5	6	2.588190e-01	9.659258e-01	271.968333	273.399891	5	39.02	0.00	36
2024-06-01	2	409.01	1	False	6.013740	-0.060827	2	1	5	6	5.000000e-01	8.660254e-01	279.245417	274.676695	5	26.49	0.00	35

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-06-01	3	397.34	1	False	5.984792	-0.028532	3	1	5	6	7.071068e-01	7.071068e-01	282.167083	275.580613	5	11.67	0.00	35
2024-06-01	4	428.64	1	False	6.060617	0.078774	4	1	5	6	8.660254e-01	5.000000e-01	282.158333	275.575756	5	0.00	31.30	35
2024-06-01	5	461.01	1	False	6.133420	0.075518	5	1	5	6	9.659258e-01	2.588190e-01	282.122500	275.551427	5	0.00	32.37	35
2024-06-01	6	401.49	1	False	5.995183	-0.129108	6	1	5	6	1.000000e+00	6.123234e-17	285.166250	276.487164	5	59.52	0.00	32
2024-06-01	7	130.54	1	False	4.871680	-0.674861	7	1	5	6	9.659258e-01	-2.588190e-01	287.836250	274.586190	5	270.95	0.00	32
2024-06-01	8	-44.05	1	False	4.871680	-1.337444	8	1	5	6	8.660254e-01	-5.000000e-01	287.870417	274.543040	5	174.59	0.00	35
2024-06-01	9	-80.00	1	False	4.871680	0.816118	9	1	5	6	7.071068e-01	-7.071068e-01	287.870417	274.543040	5	35.95	0.00	35
2024-06-01	10	-80.00	1	False	4.871680	0.000000	10	1	5	6	5.000000e-01	-8.660254e-01	287.870417	274.543040	5	0.00	0.00	35
2024-06-01	11	-31.15	1	False	4.871680	-0.610625	11	1	5	6	2.588190e-01	-9.659258e-01	289.754583	272.078713	5	0.00	48.85	35
2024-06-01	12	-80.00	1	False	4.871680	1.568218	12	1	5	6	1.224647e-16	-1.000000e+00	289.754583	272.078713	5	48.85	0.00	37
2024-06-01	13	-69.69	1	False	4.871680	-0.128875	13	1	5	6	-2.588190e-01	-9.659258e-01	290.184167	271.477001	5	0.00	10.31	37
2024-06-01	14	-25.68	1	False	4.871680	-0.631511	14	1	5	6	-5.000000e-01	-8.660254e-01	292.171250	268.862200	5	0.00	44.01	37
2024-06-01	15	103.10	1	False	4.635699	-5.014798	15	1	5	6	-7.071068e-01	-7.071068e-01	293.735833	267.592349	5	0.00	128.78	37
2024-06-01	16	193.44	1	False	5.264967	0.876237	16	1	5	6	-8.660254e-01	-5.000000e-01	291.978333	268.128617	5	0.00	90.34	37
2024-06-01	17	394.98	1	False	5.978835	1.041873	17	1	5	6	-9.659258e-01	-2.588190e-01	291.444167	267.900517	5	0.00	201.54	37
2024-06-01	18	439.83	1	False	6.086388	0.113550	18	1	5	6	-1.000000e+00	-1.836970e-16	288.010417	265.329530	5	0.00	44.85	37
2024-06-01	19	408.76	1	False	6.013128	-0.070641	19	1	5	6	-9.659258e-01	2.588190e-01	280.536250	258.957479	5	31.07	0.00	38
2024-06-01	20	398.37	1	False	5.987381	-0.025418	20	1	5	6	-8.660254e-01	5.000000e-01	271.794167	250.829635	5	10.39	0.00	39
2024-06-01	21	386.22	1	False	5.956407	-0.030499	21	1	5	6	-7.071068e-01	7.071068e-01	263.956667	243.806213	5	12.15	0.00	38
2024-06-01	22	376.08	1	False	5.929802	-0.026254	22	1	5	6	-5.000000e-01	8.660254e-01	254.208750	233.841098	5	10.14	0.00	38
2024-06-01	23	374.40	1	False	5.925325	-0.004467	23	1	5	6	-2.588190e-01	9.659258e-01	241.777500	218.018593	5	1.68	0.00	38
2024-06-02	0	506.25	1	False	6.227031	0.352163	0	2	6	6	0.000000e+00	1.000000e+00	243.099583	219.581929	6	0.00	131.85	30
2024-06-02	1	510.94	1	False	6.236252	0.009264	1	2	6	6	2.588190e-01	9.659258e-01	246.242917	222.969736	6	0.00	4.69	28
2024-06-02	2	480.76	1	False	6.175368	-0.059068	2	2	6	6	5.000000e-01	8.660254e-01	249.232500	225.711167	6	30.18	0.00	29
2024-06-02	3	441.06	1	False	6.089181	-0.082578	3	2	6	6	7.071068e-01	7.071068e-01	251.054167	227.130447	6	39.70	0.00	30
2024-06-02	4	479.31	1	False	6.172348	0.086723	4	2	6	6	8.660254e-01	5.000000e-01	253.165417	229.080064	6	0.00	38.25	30
2024-06-02	5	454.27	1	False	6.118692	-0.052242	5	2	6	6	9.659258e-01	2.588190e-01	252.884583	228.818167	6	25.04	0.00	31
2024-06-02	6	135.25	1	False	4.907125	-0.702270	6	2	6	6	1.000000e+00	6.123234e-17	241.791250	227.751693	6	319.02	0.00	42
2024-06-02	7	-80.00	1	False	4.907125	-1.591497	7	2	6	6	9.659258e-01	-2.588190e-01	233.018750	236.124044	6	215.25	0.00	39
2024-06-02	8	-80.00	1	False	4.907125	0.000000	8	2	6	6	8.660254e-01	-5.000000e-01	231.520833	238.064183	6	0.00	0.00	32
2024-06-02	9	-33.23	1	False	4.907125	-0.584625	9	2	6	6	7.071068e-01	-7.071068e-01	233.469583	235.581741	6	0.00	46.77	30
2024-06-02	10	35.61	1	False	3.572626	-2.071622	10	2	6	6	5.000000e-01	-8.660254e-01	238.286667	230.009427	6	0.00	68.84	30
2024-06-02	11	97.59	1	False	4.580775	1.740522	11	2	6	6	2.588190e-01	-9.659258e-01	243.650833	224.896941	6	0.00	61.98	30
2024-06-02	12	114.71	1	False	4.742407	0.175428	12	2	6	6	1.224647e-16	-1.000000e+00	251.763750	216.052006	6	0.00	17.12	28
2024-06-02	13	167.43	1	False	5.120565	0.459594	13	2	6	6	-2.588190e-01	-9.659258e-01	261.643750	205.895892	6	0.00	52.72	28
2024-06-02	14	224.77	1	False	5.415078	0.342471	14	2	6	6	-5.000000e-01	-8.660254e-01	272.079167	196.848309	6	0.00	57.34	28
2024-06-02	15	351.73	1	False	5.862864	0.564844	15	2	6	6	-7.071068e-01	-7.071068e-01	282.438750	194.091809	6	0.00	126.96	28
2024-06-02	16	458.35	1	False	6.127633	0.303130	16	2	6	6	-8.660254e-01	-5.000000e-01	293.476667	196.330183	6	0.00	106.62	28
2024-06-02	17	496.44	1	False	6.207463	0.083102	17	2	6	6	-9.659258e-01	-2.588190e-01	297.704167	199.674703	6	0.00	38.09	28
2024-06-02	18	555.79	1	False	6.320391	0.119551	18	2	6	6	-1.000000e+00	-1.836970e-16	302.535833	204.605449	6	0.00	59.35	28
2024-06-02	19	575.74	1	False	6.355656	0.035895	19	2	6	6	-9.659258e-01	2.588190e-01	309.493333	211.110227	6	0.00	19.95	27
2024-06-02	20	571.82	1	False	6.348824	-0.006809	20	2	6	6	-8.660254e-01	5.000000e-01	316.720417	217.167119	6	3.92	0.00	27
2024-06-02	21	543.22	1	False	6.297514	-0.050016	21	2	6	6	-7.071068e-01	7.071068e-01	323.262083	221.669618	6	28.60	0.00	28
2024-06-02	22	567.52	1	False	6.341276	0.044733	22	2	6	6	-5.000000e-01	8.660254e-01	331.238750	227.032443	6	0.00	24.30	27

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-06-02	23	592.36	1	False	6.384115	0.043769	23	2	6	6	-2.588190e-01	9.659258e-01	340.320417	233.112006	6	0.00	24.84	27
2024-06-03	0	591.71	0	True	6.383017	-0.001097	0	3	0	6	0.000000e+00	1.000000e+00	343.881250	236.386526	0	0.65	0.00	27
2024-06-03	1	573.78	0	True	6.352246	-0.030302	1	3	0	6	2.588190e-01	9.659258e-01	346.499583	238.654547	0	17.93	0.00	28
2024-06-03	2	559.03	0	True	6.326203	-0.025707	2	3	0	6	5.000000e-01	8.660254e-01	349.760833	241.091349	0	14.75	0.00	27
2024-06-03	3	543.55	0	True	6.298122	-0.027691	3	3	0	6	7.071068e-01	7.071068e-01	354.031250	243.672706	0	15.48	0.00	26
2024-06-03	4	553.50	0	True	6.316262	0.018306	4	3	0	6	8.660254e-01	5.000000e-01	357.122500	245.792471	0	0.00	9.95	26
2024-06-03	5	554.28	0	True	6.317670	0.001409	5	3	0	6	9.659258e-01	2.588190e-01	361.289583	248.345595	0	0.00	0.78	25
2024-06-03	6	429.74	0	True	6.063180	-0.224688	6	3	0	6	1.000000e+00	6.123234e-17	373.560000	243.927586	0	124.54	0.00	17
2024-06-03	7	171.39	0	True	5.143942	-0.601177	7	3	0	6	9.659258e-01	-2.588190e-01	384.034583	228.514881	0	258.35	0.00	19
2024-06-03	8	74.45	0	True	4.310128	-0.565611	8	3	0	6	8.660254e-01	-5.000000e-01	390.470000	216.750582	0	96.94	0.00	23
2024-06-03	9	51.91	0	True	3.949511	-0.302754	9	3	0	6	7.071068e-01	-7.071068e-01	394.017500	210.109484	0	22.54	0.00	24
2024-06-03	10	43.49	0	True	3.772531	-0.162204	10	3	0	6	5.000000e-01	-8.660254e-01	394.345833	209.530417	0	8.42	0.00	24
2024-06-03	11	22.33	0	True	3.105931	-0.486549	11	3	0	6	2.588190e-01	-9.659258e-01	391.210000	214.665022	0	21.16	0.00	25
2024-06-03	12	-58.81	0	True	3.105931	-3.633677	12	3	0	6	1.224647e-16	-1.000000e+00	383.980000	226.952959	0	81.14	0.00	28
2024-06-03	13	-4.03	0	True	3.105931	-0.931474	13	3	0	6	-2.588190e-01	-9.659258e-01	376.835833	236.561305	0	0.00	54.78	28
2024-06-03	14	45.95	0	True	3.827554	-12.401985	14	3	0	6	-5.000000e-01	-8.660254e-01	369.385000	244.250213	0	0.00	49.98	28
2024-06-03	15	201.52	0	True	5.305889	3.385637	15	3	0	6	-7.071068e-01	-7.071068e-01	363.126250	246.635152	0	0.00	155.57	28
2024-06-03	16	410.46	0	True	6.017278	1.036820	16	3	0	6	-8.660254e-01	-5.000000e-01	361.130833	246.024214	0	0.00	208.94	28
2024-06-03	17	557.96	0	True	6.324287	0.359353	17	3	0	6	-9.659258e-01	-2.588190e-01	363.694167	247.809313	0	0.00	147.50	28
2024-06-03	18	566.98	0	True	6.340324	0.016166	18	3	0	6	-1.000000e+00	-1.836970e-16	364.160417	248.196677	0	0.00	9.02	28
2024-06-03	19	588.71	0	True	6.377934	0.038326	19	3	0	6	-9.659258e-01	2.588190e-01	364.700833	248.691022	0	0.00	21.73	28
2024-06-03	20	571.90	0	True	6.348964	-0.028554	20	3	0	6	-8.660254e-01	5.000000e-01	364.704167	248.693920	0	16.81	0.00	29
2024-06-03	21	510.50	0	True	6.235391	-0.107361	21	3	0	6	-7.071068e-01	7.071068e-01	363.340833	247.760686	0	61.40	0.00	30
2024-06-03	22	532.26	0	True	6.277132	0.042625	22	3	0	6	-5.000000e-01	8.660254e-01	361.871667	246.599127	0	0.00	21.76	30
2024-06-03	23	556.78	0	True	6.322170	0.046068	23	3	0	6	-2.588190e-01	9.659258e-01	360.389167	245.256531	0	0.00	24.52	30
2024-06-04	0	508.69	0	True	6.231839	-0.086372	0	4	1	6	0.000000e+00	1.000000e+00	356.930000	242.421143	1	48.09	0.00	32
2024-06-04	1	511.33	0	True	6.237015	0.005190	1	4	1	6	2.588190e-01	9.659258e-01	354.327917	240.318374	1	0.00	2.64	32
2024-06-04	2	478.51	0	True	6.170677	-0.064186	2	4	1	6	5.000000e-01	8.660254e-01	350.972917	237.886096	1	32.82	0.00	32
2024-06-04	3	465.07	0	True	6.142188	-0.028087	3	4	1	6	7.071068e-01	7.071068e-01	347.702917	235.652735	1	13.44	0.00	32
2024-06-04	4	485.38	0	True	6.184932	0.043671	4	4	1	6	8.660254e-01	5.000000e-01	344.864583	233.466323	1	0.00	20.31	32
2024-06-04	5	489.51	0	True	6.193405	0.008509	5	4	1	6	9.659258e-01	2.588190e-01	342.165833	231.304687	1	0.00	4.13	32
2024-06-04	6	381.42	0	True	5.943901	-0.220813	6	4	1	6	1.000000e+00	6.123234e-17	340.152500	230.718830	1	108.09	0.00	32
2024-06-04	7	154.62	0	True	5.040970	-0.594620	7	4	1	6	9.659258e-01	-2.588190e-01	339.453750	231.276883	1	226.80	0.00	30
2024-06-04	8	101.27	0	True	4.617790	-0.345039	8	4	1	6	8.660254e-01	-5.000000e-01	340.571250	230.002028	1	53.35	0.00	28
2024-06-04	9	124.27	0	True	4.822457	0.227116	9	4	1	6	7.071068e-01	-7.071068e-01	343.586250	226.501195	1	0.00	23.00	27
2024-06-04	10	200.53	0	True	5.300964	0.613664	10	4	1	6	5.000000e-01	-8.660254e-01	350.129583	219.618639	1	0.00	76.26	27
2024-06-04	11	304.18	0	True	5.717620	0.516880	11	4	1	6	2.588190e-01	-9.659258e-01	361.873333	208.586630	1	0.00	103.65	26
2024-06-04	12	273.03	0	True	5.609582	-0.102406	12	4	1	6	1.224647e-16	-1.000000e+00	375.700000	189.624712	1	31.15	0.00	24
2024-06-04	13	358.31	0	True	5.881399	0.312347	13	4	1	6	-2.588190e-01	-9.659258e-01	390.797500	171.649331	1	0.00	85.28	24
2024-06-04	14	390.76	0	True	5.968094	0.090564	14	4	1	6	-5.000000e-01	-8.660254e-01	405.164583	155.169840	1	0.00	32.45	24
2024-06-04	15	446.97	0	True	6.102491	0.143848	15	4	1	6	-7.071068e-01	-7.071068e-01	415.391667	149.135620	1	0.00	56.21	24
2024-06-04	16	484.71	0	True	6.183551	0.084435	16	4	1	6	-8.660254e-01	-5.000000e-01	418.485417	149.797539	1	0.00	37.74	24
2024-06-04	17	453.12	0	True	6.116157	-0.065173	17	4	1	6	-9.659258e-01	-2.588190e-01	414.117083	147.056981	1	31.59	0.00	25
2024-06-04	18	431.05	0	True	6.066224	-0.048707	18	4	1	6	-1.836970e-16	-1.000000e+00	408.453333	143.487942	1	22.07	0.00	26

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-06-04	19	417.75	0	True	6.034883	-0.030855	19	4	1	6	-9.659258e-01	2.588190e-01	401.330000	138.299976	1	13.30	0.00	27
2024-06-04	20	405.05	0	True	6.004011	-0.030401	20	4	1	6	-8.660254e-01	5.000000e-01	394.377917	133.461943	1	12.70	0.00	27
2024-06-04	21	370.81	0	True	5.915690	-0.084533	21	4	1	6	-7.071068e-01	7.071068e-01	388.557500	131.204475	1	34.24	0.00	26
2024-06-04	22	411.76	0	True	6.020441	0.110434	22	4	1	6	-5.000000e-01	8.660254e-01	383.536667	127.725770	1	0.00	40.95	26
2024-06-04	23	445.29	0	True	6.098726	0.081431	23	4	1	6	-2.588190e-01	9.659258e-01	378.891250	123.094409	1	0.00	33.53	26
2024-06-05	0	454.14	0	True	6.118406	0.019875	0	5	2	6	0.000000e+00	1.000000e+00	376.618333	121.080649	2	0.00	8.85	24
2024-06-05	1	434.06	0	True	6.073183	-0.044215	1	5	2	6	2.588190e-01	9.659258e-01	373.398750	118.339154	2	20.08	0.00	24
2024-06-05	2	414.96	0	True	6.028182	-0.044003	2	5	2	6	5.000000e-01	8.660254e-01	370.750833	116.582918	2	19.10	0.00	24
2024-06-05	3	403.83	0	True	6.000994	-0.026822	3	5	2	6	7.071068e-01	7.071068e-01	368.199167	115.089403	2	11.13	0.00	24
2024-06-05	4	413.17	0	True	6.023859	0.023129	4	5	2	6	8.660254e-01	5.000000e-01	365.190417	112.814178	2	0.00	9.34	24
2024-06-05	5	419.27	0	True	6.038515	0.014764	5	5	2	6	9.659258e-01	2.588190e-01	362.263750	110.332613	2	0.00	6.10	24
2024-06-05	6	356.45	0	True	5.876194	-0.149832	6	5	2	6	1.000000e+00	6.123234e-17	361.223333	110.261827	2	62.82	0.00	22
2024-06-05	7	279.24	0	True	5.632072	-0.216608	7	5	2	6	9.659258e-01	-2.588190e-01	366.415833	102.790556	2	77.21	0.00	16
2024-06-05	8	259.30	0	True	5.557986	-0.071408	8	5	2	6	8.660254e-01	-5.000000e-01	373.000417	89.235056	2	19.94	0.00	14
2024-06-05	9	166.13	0	True	5.112771	-0.359314	9	5	2	6	7.071068e-01	-7.071068e-01	374.744583	84.442450	2	93.17	0.00	18
2024-06-05	10	259.04	0	True	5.556982	0.559261	10	5	2	6	5.000000e-01	-8.660254e-01	377.182500	79.917435	2	0.00	92.91	18
2024-06-05	11	283.60	0	True	5.647565	0.094812	11	5	2	6	2.588190e-01	-9.659258e-01	376.325000	80.839882	2	0.00	24.56	18
2024-06-05	12	240.98	0	True	5.484714	-0.150282	12	5	2	6	1.224647e-16	-1.000000e+00	374.989583	82.859913	2	42.62	0.00	19
2024-06-05	13	339.38	0	True	5.827120	0.408333	13	5	2	6	-2.588190e-01	-9.659258e-01	374.200833	83.115295	2	0.00	98.40	19
2024-06-05	14	299.95	0	True	5.703616	-0.116182	14	5	2	6	-5.000000e-01	-8.660254e-01	370.417083	84.385987	2	39.43	0.00	20
2024-06-05	15	369.84	0	True	5.913070	0.233006	15	5	2	6	-7.071068e-01	-7.071068e-01	367.203333	82.797550	2	0.00	69.89	20
2024-06-05	16	397.04	0	True	5.984037	0.073545	16	5	2	6	-8.660254e-01	-5.000000e-01	363.550417	79.245668	2	0.00	27.20	20
2024-06-05	17	390.58	0	True	5.967633	-0.016270	17	5	2	6	-9.659258e-01	-2.588190e-01	360.944583	77.173454	2	6.46	0.00	19
2024-06-05	18	358.12	0	True	5.880868	-0.083107	18	5	2	6	-1.000000e+00	-1.836970e-16	357.905833	75.715043	2	32.46	0.00	20
2024-06-05	19	400.63	0	True	5.993038	0.118703	19	5	2	6	-9.659258e-01	2.588190e-01	357.192500	75.205653	2	0.00	42.51	19
2024-06-05	20	379.80	0	True	5.939645	-0.051993	20	5	2	6	-8.660254e-01	5.000000e-01	356.140417	74.681838	2	20.83	0.00	19
2024-06-05	21	373.37	0	True	5.922570	-0.016930	21	5	2	6	-7.071068e-01	7.071068e-01	356.247083	74.705526	2	6.43	0.00	18
2024-06-05	22	417.45	0	True	6.034165	0.118060	22	5	2	6	-5.000000e-01	8.660254e-01	356.484167	74.898141	2	0.00	44.08	18
2024-06-05	23	438.06	0	True	6.082356	0.049371	23	5	2	6	-2.588190e-01	9.659258e-01	356.182917	74.539102	2	0.00	20.61	18
2024-06-06	0	585.59	0	True	6.372620	0.336780	0	6	3	6	0.000000e+00	1.000000e+00	361.660000	85.998444	3	0.00	147.53	18
2024-06-06	1	547.30	0	True	6.304997	-0.065387	1	6	3	6	2.588190e-01	9.659258e-01	366.378333	92.967500	3	38.29	0.00	19
2024-06-06	2	541.75	0	True	6.294805	-0.010141	2	6	3	6	5.000000e-01	8.660254e-01	371.661250	99.239108	3	5.55	0.00	19
2024-06-06	3	538.62	0	True	6.289010	-0.005778	3	6	3	6	7.071068e-01	7.071068e-01	377.277500	104.797235	3	3.13	0.00	18
2024-06-06	4	567.72	0	True	6.341628	0.054027	4	6	3	6	8.660254e-01	5.000000e-01	383.717083	111.624648	3	0.00	29.10	18
2024-06-06	5	582.55	0	True	6.367415	0.026122	5	6	3	6	9.659258e-01	2.588190e-01	390.520417	118.641055	3	0.00	14.83	18
2024-06-06	6	454.57	0	True	6.119352	-0.219689	6	6	3	6	1.000000e+00	6.123234e-17	394.608750	119.105636	3	127.98	0.00	21
2024-06-06	7	199.27	0	True	5.294661	-0.561630	7	6	3	6	9.659258e-01	-2.588190e-01	391.276667	123.510661	3	255.30	0.00	28
2024-06-06	8	75.72	0	True	4.327042	-0.620013	8	6	3	6	8.660254e-01	-5.000000e-01	383.627500	136.988774	3	123.55	0.00	33
2024-06-06	9	-37.75	0	True	4.327042	-1.498547	9	6	3	6	7.071068e-01	-7.071068e-01	375.132500	156.057143	3	113.47	0.00	33
2024-06-06	10	26.57	0	True	3.279783	-1.703841	10	6	3	6	5.000000e-01	-8.660254e-01	365.446250	170.153986	3	0.00	64.32	33
2024-06-06	11	52.06	0	True	3.952397	0.959353	11	6	3	6	2.588190e-01	-9.659258e-01	355.798750	181.201673	3	0.00	25.49	33
2024-06-06	12	44.54	0	True	3.796388	-0.144449	12	6	3	6	1.224647e-16	-1.000000e+00	347.613750	190.796257	3	7.52	0.00	32
2024-06-06	13	161.10	0	True	5.082025	2.616974	13	6	3	6	-2.588190e-01	-9.659258e-01	340.185417	194.564076	3	0.00	116.56	32
2024-06-06	14	270.47	0	True	5.600161	0.678895	14	6	3	6	-5.000000e-01	-8.660254e-01	338.957083	194.921865	3	0.00	109.37	30

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-06-06	15	520.30	0	True	6.254406	0.923688	15	6	3	6	-7.071068e-01	-7.071068e-01	345.226250	198.347796	3	0.00	249.83	30
2024-06-06	16	595.05	0	True	6.388645	0.143667	16	6	3	6	-8.660254e-01	-5.000000e-01	353.476667	204.615874	3	0.00	74.75	30
2024-06-06	17	547.11	0	True	6.304650	-0.080565	17	6	3	6	-9.659258e-01	-2.588190e-01	359.998750	208.311263	3	47.94	0.00	32
2024-06-06	18	533.31	0	True	6.279103	-0.025223	18	6	3	6	-1.000000e+00	-1.836970e-16	367.298333	211.290737	3	13.80	0.00	31
2024-06-06	19	521.63	0	True	6.256959	-0.021901	19	6	3	6	-9.659258e-01	2.588190e-01	372.340000	213.552159	3	11.68	0.00	32
2024-06-06	20	446.55	0	True	6.101551	-0.143933	20	6	3	6	-8.660254e-01	5.000000e-01	375.121250	214.087537	3	75.08	0.00	34
2024-06-06	21	337.41	0	True	5.821299	-0.244407	21	6	3	6	-7.071068e-01	7.071068e-01	373.622917	214.226118	3	109.14	0.00	38
2024-06-06	22	399.60	0	True	5.990464	0.184316	22	6	3	6	-5.000000e-01	8.660254e-01	372.879167	214.098291	3	0.00	62.19	38
2024-06-06	23	468.09	0	True	6.148661	0.171396	23	6	3	6	-2.588190e-01	9.659258e-01	374.130417	214.582991	3	0.00	68.49	38
2024-06-07	0	550.49	0	True	6.310809	0.176035	0	7	4	6	0.000000e+00	1.000000e+00	372.667917	213.194237	4	0.00	82.40	38
2024-06-07	1	498.52	0	True	6.211644	-0.094407	1	7	4	6	2.588190e-01	9.659258e-01	370.635417	211.684161	4	51.97	0.00	39
2024-06-07	2	458.10	0	True	6.127088	-0.081080	2	7	4	6	5.000000e-01	8.660254e-01	367.150000	209.420788	4	40.42	0.00	40
2024-06-07	3	468.58	0	True	6.149707	0.022877	3	7	4	6	7.071068e-01	7.071068e-01	364.231667	207.405737	4	0.00	10.48	40
2024-06-07	4	541.63	0	True	6.294583	0.155897	4	7	4	6	8.660254e-01	5.000000e-01	363.144583	206.358544	4	0.00	73.05	40
2024-06-07	5	572.40	0	True	6.349838	0.056810	5	7	4	6	9.659258e-01	2.588190e-01	362.721667	205.899228	4	0.00	30.77	40
2024-06-07	6	382.95	0	True	5.947904	-0.330975	6	7	4	6	1.000000e+00	6.123234e-17	359.737500	205.027322	4	189.45	0.00	43
2024-06-07	7	242.01	0	True	5.488979	-0.368038	7	7	4	6	9.659258e-01	-2.588190e-01	361.518333	203.754594	4	140.94	0.00	38
2024-06-07	8	195.18	0	True	5.273922	-0.193504	8	7	4	6	8.660254e-01	-5.000000e-01	366.495833	197.842673	4	46.83	0.00	35
2024-06-07	9	121.81	0	True	4.802462	-0.375909	9	7	4	6	7.071068e-01	-7.071068e-01	373.144167	185.993840	4	73.37	0.00	33
2024-06-07	10	138.52	0	True	4.931015	0.137181	10	7	4	6	5.000000e-01	-8.660254e-01	377.808750	178.163084	4	0.00	16.71	33
2024-06-07	11	-22.43	0	True	4.931015	-1.161926	11	7	4	6	2.588190e-01	-9.659258e-01	374.705000	184.616589	4	160.95	0.00	40
2024-06-07	12	-63.60	0	True	4.931015	1.835488	12	7	4	6	1.224647e-16	-1.000000e+00	370.199167	194.101121	4	41.17	0.00	41
2024-06-07	13	-31.07	0	True	4.931015	-0.511478	13	7	4	6	-2.588190e-01	-9.659258e-01	362.192083	206.659392	4	0.00	32.53	41
2024-06-07	14	60.02	0	True	4.094678	-2.931767	14	7	4	6	-5.000000e-01	-8.660254e-01	353.423333	215.016283	4	0.00	91.09	41
2024-06-07	15	232.92	0	True	5.450695	2.880706	15	7	4	6	-7.071068e-01	-7.071068e-01	341.449167	213.314234	4	0.00	172.90	41
2024-06-07	16	437.11	0	True	6.080185	0.876653	16	7	4	6	-8.660254e-01	-5.000000e-01	334.868333	207.507608	4	0.00	204.19	41
2024-06-07	17	538.83	0	True	6.289400	0.232710	17	7	4	6	-9.659258e-01	-2.588190e-01	334.523333	207.145963	4	0.00	101.72	39
2024-06-07	18	572.27	0	True	6.349611	0.062060	18	7	4	6	-1.836970e-16	-1.000000e+00	336.146667	208.916610	4	0.00	33.44	39
2024-06-07	19	596.97	0	True	6.391867	0.043161	19	7	4	6	-9.659258e-01	2.588190e-01	339.285833	212.362455	4	0.00	24.70	38
2024-06-07	20	591.00	0	True	6.381816	-0.010001	20	7	4	6	-8.660254e-01	5.000000e-01	345.304583	217.519084	4	5.97	0.00	35
2024-06-07	21	561.35	0	True	6.330345	-0.050169	21	7	4	6	-7.071068e-01	7.071068e-01	354.635417	221.924238	4	29.65	0.00	32
2024-06-07	22	607.47	0	True	6.409303	0.082159	22	7	4	6	-5.000000e-01	8.660254e-01	363.296667	227.735692	4	0.00	46.12	32
2024-06-07	23	672.71	0	True	6.511314	0.107396	23	7	4	6	-2.588190e-01	9.659258e-01	371.822500	235.526419	4	0.00	65.24	32
2024-06-08	0	653.99	1	False	6.483092	-0.027828	0	8	5	6	0.000000e+00	1.000000e+00	376.135000	239.847962	5	18.72	0.00	33
2024-06-08	1	709.74	1	False	6.564899	0.085246	1	8	5	6	2.588190e-01	9.659258e-01	384.935833	248.261550	5	0.00	55.75	31
2024-06-08	2	713.12	1	False	6.569650	0.004762	2	8	5	6	5.000000e-01	8.660254e-01	395.561667	256.838588	5	0.00	3.38	29
2024-06-08	3	605.40	1	False	6.405889	-0.151055	3	8	5	6	7.071068e-01	7.071068e-01	401.262500	260.028414	5	107.72	0.00	33
2024-06-08	4	641.34	1	False	6.463560	0.059366	4	8	5	6	8.660254e-01	5.000000e-01	405.417083	263.146493	5	0.00	35.94	33
2024-06-08	5	625.84	1	False	6.439095	-0.024168	5	8	5	6	9.659258e-01	2.588190e-01	407.643750	264.841523	5	15.50	0.00	34
2024-06-08	6	438.55	1	False	6.083474	-0.299262	6	8	5	6	1.000000e+00	6.123234e-17	409.960417	264.859302	5	187.29	0.00	34
2024-06-08	7	219.81	1	False	5.392764	-0.498780	7	8	5	6	9.659258e-01	-2.588190e-01	409.035417	265.509326	5	218.74	0.00	37
2024-06-08	8	33.23	1	False	3.503453	-0.848824	8	8	5	6	8.660254e-01	-5.000000e-01	402.287500	273.129400	5	186.58	0.00	43
2024-06-08	9	-27.56	1	False	3.503453	-1.829371	9	8	5	6	7.071068e-01	-7.071068e-01	396.063750	281.375812	5	60.79	0.00	43
2024-06-08	10	4.48	1	False	1.499623	-1.162554	10	8	5	6	5.000000e-01	-8.660254e-01	390.478750	287.963195	5	0.00	32.04	43

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-06-08	11	76.78	1	False	4.340944	16.138393	11	8	5	6	2.588190e-01	-9.659258e-01	394.612500	282.437188	5	0.00	72.30	36
2024-06-08	12	90.95	1	False	4.510310	0.184553	12	8	5	6	1.224647e-16	-1.000000e+00	401.052083	273.144696	5	0.00	14.17	34
2024-06-08	13	207.93	1	False	5.337201	1.286201	13	8	5	6	-2.588190e-01	-9.659258e-01	411.010417	260.782366	5	0.00	116.98	34
2024-06-08	14	313.69	1	False	5.748405	0.508633	14	8	5	6	-5.000000e-01	-8.660254e-01	421.580000	250.891193	5	0.00	105.76	34
2024-06-08	15	443.49	1	False	6.094675	0.413784	15	8	5	6	-7.071068e-01	-7.071068e-01	430.353750	247.667989	5	0.00	129.80	34
2024-06-08	16	502.53	1	False	6.219655	0.133126	16	8	5	6	-8.660254e-01	-5.000000e-01	433.079583	248.105201	5	0.00	59.04	34
2024-06-08	17	492.47	1	False	6.199434	-0.020019	17	8	5	6	-9.659258e-01	-2.588190e-01	431.147917	247.425607	5	10.06	0.00	35
2024-06-08	18	495.04	1	False	6.204639	0.005219	18	8	5	6	-1.000000e+00	-1.836970e-16	427.930000	246.008585	5	0.00	2.57	35
2024-06-08	19	498.90	1	False	6.212406	0.007797	19	8	5	6	-9.659258e-01	2.588190e-01	423.843750	243.884027	5	0.00	3.86	35
2024-06-08	20	474.07	1	False	6.161355	-0.049769	20	8	5	6	-8.660254e-01	5.000000e-01	418.971667	241.556402	5	24.83	0.00	35
2024-06-08	21	414.15	1	False	6.026228	-0.126395	21	8	5	6	-7.071068e-01	7.071068e-01	412.838333	239.645320	5	59.92	0.00	37
2024-06-08	22	449.83	1	False	6.108870	0.086152	22	8	5	6	-5.000000e-01	8.660254e-01	406.270000	236.214594	5	0.00	35.68	37
2024-06-08	23	441.13	1	False	6.089340	-0.019341	23	8	5	6	-2.588190e-01	9.659258e-01	396.620833	229.491791	5	8.70	0.00	37
2024-06-09	0	505.97	1	False	6.226477	0.146986	0	9	6	6	0.000000e+00	1.000000e+00	390.453333	224.202405	6	0.00	64.84	36
2024-06-09	1	514.50	1	False	6.243196	0.016859	1	9	6	6	2.588190e-01	9.659258e-01	382.318333	215.486290	6	0.00	8.53	36
2024-06-09	2	461.89	1	False	6.135327	-0.102255	2	9	6	6	5.000000e-01	8.660254e-01	371.850417	204.542108	6	52.61	0.00	38
2024-06-09	3	415.74	1	False	6.030060	-0.099916	3	9	6	6	7.071068e-01	7.071068e-01	363.947917	198.707126	6	46.15	0.00	36
2024-06-09	4	451.96	1	False	6.113594	0.087122	4	9	6	6	8.660254e-01	5.000000e-01	356.057083	190.816255	6	0.00	36.22	36
2024-06-09	5	484.24	1	False	6.182581	0.071422	5	9	6	6	9.659258e-01	2.588190e-01	350.157083	184.185869	6	0.00	32.28	35
2024-06-09	6	217.89	1	False	5.383990	-0.550037	6	9	6	6	1.000000e+00	6.123234e-17	340.962917	185.086875	6	266.35	0.00	38
2024-06-09	7	0.32	1	False	-1.139434	-0.998531	7	9	6	6	9.659258e-01	-2.588190e-01	331.817500	196.409811	6	217.57	0.00	38
2024-06-09	8	-80.00	1	False	-1.139434	-251.000000	8	9	6	6	8.660254e-01	-5.000000e-01	327.099583	205.063264	6	80.32	0.00	34
2024-06-09	9	-80.00	1	False	-1.139434	0.000000	9	9	6	6	7.071068e-01	-7.071068e-01	324.914583	209.243330	6	0.00	0.00	31
2024-06-09	10	-80.00	1	False	-1.139434	0.000000	10	9	6	6	5.000000e-01	-8.660254e-01	321.394583	215.485687	6	0.00	0.00	31
2024-06-09	11	15.42	1	False	2.735665	-1.192750	11	9	6	6	2.588190e-01	-9.659258e-01	318.837917	218.851860	6	0.00	95.42	31
2024-06-09	12	36.00	1	False	3.583519	1.334630	12	9	6	6	1.224647e-16	-1.000000e+00	316.548333	221.609695	6	0.00	20.58	31
2024-06-09	13	136.11	1	False	4.913463	2.780833	13	9	6	6	-2.588190e-01	-9.659258e-01	313.555833	223.616018	6	0.00	100.11	31
2024-06-09	14	164.49	1	False	5.102850	0.208508	14	9	6	6	-5.000000e-01	-8.660254e-01	307.339167	225.676560	6	0.00	28.38	31
2024-06-09	15	253.11	1	False	5.533824	0.538756	15	9	6	6	-7.071068e-01	-7.071068e-01	299.406667	224.022658	6	0.00	88.62	31
2024-06-09	16	445.50	1	False	6.099197	0.760104	16	9	6	6	-8.660254e-01	-5.000000e-01	297.030417	222.068354	6	0.00	192.39	31
2024-06-09	17	528.03	1	False	6.269153	0.185253	17	9	6	6	-9.659258e-01	-2.588190e-01	298.512083	223.542781	6	0.00	82.53	31
2024-06-09	18	561.85	1	False	6.331235	0.064049	18	9	6	6	-1.836970e-16	1.000000e+00	301.295833	226.493044	6	0.00	33.82	31
2024-06-09	19	571.76	1	False	6.348719	0.017638	19	9	6	6	-9.659258e-01	-2.588190e-01	304.331667	229.722096	6	0.00	9.91	31
2024-06-09	20	543.39	1	False	6.297827	-0.049619	20	9	6	6	-8.660254e-01	-5.000000e-01	307.220000	232.369563	6	28.37	0.00	31
2024-06-09	21	517.50	1	False	6.249010	-0.047645	21	9	6	6	-7.071068e-01	-7.071068e-01	311.526250	235.375529	6	25.89	0.00	30
2024-06-09	22	552.92	1	False	6.315213	0.068444	22	9	6	6	-5.000000e-01	-8.660254e-01	315.821667	238.923120	6	0.00	35.42	30
2024-06-09	23	555.74	1	False	6.320301	0.005100	23	9	6	6	-2.588190e-01	-9.659258e-01	320.597083	242.652842	6	0.00	2.82	29
2024-06-10	0	551.58	2	True	6.312787	-0.007486	0	10	0	6	0.000000e+00	1.000000e+00	322.497500	244.340510	0	4.16	0.00	30
2024-06-10	1	575.43	2	True	6.355118	0.043239	1	10	0	6	2.588190e-01	9.659258e-01	325.036250	246.727076	0	0.00	23.85	30
2024-06-10	2	567.58	2	True	6.341382	-0.013642	2	10	0	6	5.000000e-01	8.660254e-01	329.440000	250.194780	0	7.85	0.00	28
2024-06-10	3	535.56	2	True	6.283313	-0.056415	3	10	0	6	7.071068e-01	7.071068e-01	334.432500	253.169509	0	32.02	0.00	27
2024-06-10	4	571.93	2	True	6.349017	0.067910	4	10	0	6	8.660254e-01	5.000000e-01	339.431250	256.750010	0	0.00	36.37	27
2024-06-10	5	590.51	2	True	6.380987	0.032486	5	10	0	6	9.659258e-01	2.588190e-01	343.859167	260.248499	0	0.00	18.58	27
2024-06-10	6	367.77	2	True	5.907458	-0.377199	6	10	0	6	1.000000e+00	6.123234e-17	350.104167	258.889011	0	222.74	0.00	25

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-06-10	7	61.74	2	True	4.122932	-0.832123	7	10	0	6	9.659258e-01	-2.588190e-01	352.663333	255.563206	0	306.03	0.00	29
2024-06-10	8	-80.00	2	True	4.122932	-2.295756	8	10	0	6	8.660254e-01	-5.000000e-01	352.663333	255.563206	0	141.74	0.00	32
2024-06-10	9	-22.77	2	True	4.122932	-0.715375	9	10	0	6	7.071068e-01	-7.071068e-01	355.047917	251.586692	0	0.00	57.23	32
2024-06-10	10	42.84	2	True	3.757472	-2.881423	10	10	0	6	5.000000e-01	-8.660254e-01	360.166250	243.469775	0	0.00	65.61	32
2024-06-10	11	54.30	2	True	3.994524	0.267507	11	10	0	6	2.588190e-01	-9.659258e-01	361.786250	241.194890	0	0.00	11.46	32
2024-06-10	12	-9.77	2	True	3.994524	-1.179926	12	10	0	6	1.224647e-16	-1.000000e+00	359.879167	244.046904	0	64.07	0.00	34
2024-06-10	13	95.85	2	True	4.562784	-10.810645	13	10	0	6	-2.588190e-01	-9.659258e-01	358.201667	245.784080	0	0.00	105.62	34
2024-06-10	14	137.65	2	True	4.924714	0.436098	14	10	0	6	-5.000000e-01	-8.660254e-01	357.083333	246.762915	0	0.00	41.80	34
2024-06-10	15	263.52	2	True	5.574129	0.914421	15	10	0	6	-7.071068e-01	-7.071068e-01	357.517083	246.581291	0	0.00	125.87	34
2024-06-10	16	457.49	2	True	6.125755	0.736073	16	10	0	6	-8.660254e-01	-5.000000e-01	358.016667	246.779365	0	0.00	193.97	34
2024-06-10	17	530.45	2	True	6.273726	0.159479	17	10	0	6	-9.659258e-01	-2.588190e-01	358.117500	246.852336	0	0.00	72.96	34
2024-06-10	18	555.00	2	True	6.318968	0.046281	18	10	0	6	-1.000000e+00	-1.836970e-16	357.832083	246.610375	0	0.00	24.55	34
2024-06-10	19	555.08	2	True	6.319112	0.000144	19	10	0	6	-9.659258e-01	2.588190e-01	357.137083	246.04027	0	0.00	0.08	34
2024-06-10	20	525.69	2	True	6.264712	-0.052947	20	10	0	6	-8.660254e-01	5.000000e-01	356.399583	245.447280	0	29.39	0.00	34
2024-06-10	21	485.64	2	True	6.185468	-0.076186	21	10	0	6	-7.071068e-01	7.071068e-01	355.072083	244.622859	0	40.05	0.00	35
2024-06-10	22	489.00	2	True	6.192362	0.006919	22	10	0	6	-5.000000e-01	8.660254e-01	352.408750	242.715663	0	0.00	3.36	35
2024-06-10	23	486.65	2	True	6.187545	-0.004806	23	10	0	6	-2.588190e-01	9.659258e-01	349.530000	240.599683	0	2.35	0.00	35
2024-06-11	0	599.55	0	True	6.396179	0.231994	0	11	1	6	0.000000e+00	1.000000e+00	351.528750	242.542572	1	0.00	112.90	35
2024-06-11	1	475.78	0	True	6.164956	-0.206438	1	11	1	6	2.588190e-01	9.659258e-01	347.376667	239.375232	1	123.77	0.00	40
2024-06-11	2	389.89	0	True	5.965865	-0.180525	2	11	1	6	5.000000e-01	8.660254e-01	339.972917	234.975840	1	85.89	0.00	43
2024-06-11	3	378.22	0	True	5.935476	-0.029932	3	11	1	6	7.071068e-01	7.071068e-01	333.417083	231.450143	1	11.67	0.00	42
2024-06-11	4	396.55	0	True	5.982802	0.048464	4	11	1	6	8.660254e-01	5.000000e-01	326.109583	226.303628	1	0.00	18.33	42
2024-06-11	5	376.58	0	True	5.931131	-0.050359	5	11	1	6	9.659258e-01	2.588190e-01	317.195833	219.548886	1	19.97	0.00	43
2024-06-11	6	138.08	0	True	4.927833	-0.633332	6	11	1	6	1.000000e+00	6.123234e-17	307.625417	222.238211	1	238.50	0.00	44
2024-06-11	7	-80.00	0	True	4.927833	-1.579374	7	11	1	6	9.659258e-01	-2.588190e-01	301.719583	230.775879	1	218.08	0.00	40
2024-06-11	8	-74.32	0	True	4.927833	-0.071000	8	11	1	6	8.660254e-01	-5.000000e-01	301.956250	230.369951	1	0.00	5.68	34
2024-06-11	9	-68.42	0	True	4.927833	-0.079386	9	11	1	6	7.071068e-01	-7.071068e-01	300.054167	233.337023	1	0.00	5.90	34
2024-06-11	10	13.45	0	True	2.598979	-1.196580	10	11	1	6	5.000000e-01	-8.660254e-01	298.829583	234.818029	1	0.00	81.87	34
2024-06-11	11	57.77	0	True	4.056470	3.295167	11	11	1	6	2.588190e-01	-9.659258e-01	298.974167	234.661936	1	0.00	44.32	34
2024-06-11	12	62.24	0	True	4.130998	0.077376	12	11	1	6	1.224647e-16	-1.000000e+00	301.974583	230.974044	1	0.00	4.47	32
2024-06-11	13	139.04	0	True	4.934762	1.233933	13	11	1	6	-2.588190e-01	-9.659258e-01	303.774167	229.461545	1	0.00	76.80	32
2024-06-11	14	129.12	0	True	4.860742	-0.071346	14	11	1	6	-5.000000e-01	-8.660254e-01	303.418750	229.736486	1	9.92	0.00	32
2024-06-11	15	342.45	0	True	5.836126	1.652184	15	11	1	6	-7.071068e-01	-7.071068e-01	306.707500	229.705442	1	0.00	213.33	32
2024-06-11	16	543.76	0	True	6.298508	0.587852	16	11	1	6	-8.660254e-01	-5.000000e-01	310.302083	232.821446	1	0.00	201.31	32
2024-06-11	17	630.53	0	True	6.446561	0.159574	17	11	1	6	-9.659258e-01	-2.588190e-01	314.472083	237.779353	1	0.00	86.77	32
2024-06-11	18	681.58	0	True	6.524414	0.080964	18	11	1	6	-1.000000e+00	-1.836970e-16	319.746250	244.650986	1	0.00	51.05	32
2024-06-11	19	738.70	0	True	6.604892	0.083805	19	11	1	6	-9.659258e-01	-2.588190e-01	327.397083	254.983361	1	0.00	57.12	32
2024-06-11	20	688.12	0	True	6.533963	-0.068472	20	11	1	6	-8.660254e-01	-5.000000e-01	334.165000	262.519686	1	50.58	0.00	33
2024-06-11	21	561.15	0	True	6.329988	-0.184517	21	11	1	6	-7.071068e-01	-7.071068e-01	337.311250	264.856106	1	126.97	0.00	36
2024-06-11	22	572.21	0	True	6.349506	0.019710	22	11	1	6	-5.000000e-01	-8.660254e-01	340.778333	267.459941	1	0.00	11.06	36
2024-06-11	23	600.02	0	True	6.396963	0.048601	23	11	1	6	-2.588190e-01	-9.659258e-01	345.502083	271.124312	1	0.00	27.81	36
2024-06-12	0	574.62	0	True	6.353709	-0.042332	0	12	2	6	0.000000e+00	1.000000e+00	344.463333	270.154690	2	25.40	0.00	37
2024-06-12	1	622.35	0	True	6.433503	0.083064	1	12	2	6	2.588190e-01	9.659258e-01	350.570417	274.867843	2	0.00	47.73	32
2024-06-12	2	660.26	0	True	6.492634	0.060914	2	12	2	6	5.000000e-01	8.660254e-01	361.835833	281.997487	2	0.00	37.91	29

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-06-12	3	762.39	0	True	6.636458	0.154681	3	12	2	6	7.071068e-01	7.071068e-01	377.842917	293.631324	2	0.00	102.13	28
2024-06-12	4	626.30	0	True	6.439829	-0.178504	4	12	2	6	8.660254e-01	5.000000e-01	387.415833	297.980649	2	136.09	0.00	34
2024-06-12	5	586.59	0	True	6.374326	-0.063404	5	12	2	6	9.659258e-01	2.588190e-01	396.166250	300.719572	2	39.71	0.00	35
2024-06-12	6	288.06	0	True	5.663169	-0.508924	6	12	2	6	1.000000e+00	6.123234e-17	402.415417	296.654037	2	298.53	0.00	37
2024-06-12	7	147.51	0	True	4.993896	-0.487919	7	12	2	6	9.659258e-01	-2.588190e-01	411.895000	283.930383	2	140.55	0.00	34
2024-06-12	8	133.60	0	True	4.894850	-0.094299	8	12	2	6	8.660254e-01	-5.000000e-01	420.558333	271.342912	2	13.91	0.00	35
2024-06-12	9	99.79	0	True	4.603068	-0.253069	9	12	2	6	7.071068e-01	-7.071068e-01	427.567083	260.103158	2	33.81	0.00	36
2024-06-12	10	157.23	0	True	5.057710	0.575609	10	12	2	6	5.000000e-01	-8.660254e-01	433.557917	251.669368	2	0.00	57.44	36
2024-06-12	11	249.81	0	True	5.520701	0.588819	11	12	2	6	2.588190e-01	-9.659258e-01	441.559583	242.071848	2	0.00	92.58	36
2024-06-12	12	300.82	0	True	5.706512	0.204195	12	12	2	6	1.224647e-16	-1.000000e+00	451.500417	230.436686	2	0.00	51.01	36
2024-06-12	13	370.64	0	True	5.915231	0.232099	13	12	2	6	-2.588190e-01	-9.659258e-01	461.150417	221.457277	2	0.00	69.82	36
2024-06-12	14	376.07	0	True	5.929775	0.014650	14	12	2	6	-5.000000e-01	-8.660254e-01	471.440000	210.841992	2	0.00	5.43	36
2024-06-12	15	557.98	0	True	6.324323	0.483713	15	12	2	6	-7.071068e-01	-7.071068e-01	480.420417	209.695966	2	0.00	181.91	36
2024-06-12	16	724.14	0	True	6.584985	0.297788	16	12	2	6	-8.660254e-01	-5.000000e-01	487.936250	215.224532	2	0.00	166.16	36
2024-06-12	17	707.21	0	True	6.561328	-0.023379	17	12	2	6	-9.659258e-01	-2.588190e-01	491.131250	217.984821	2	16.93	0.00	36
2024-06-12	18	674.91	0	True	6.514579	-0.045672	18	12	2	6	-1.000000e+00	-1.836970e-16	490.853333	217.735563	2	32.30	0.00	38
2024-06-12	19	663.83	0	True	6.498026	-0.016417	19	12	2	6	-9.659258e-01	2.588190e-01	487.733750	214.543117	2	11.08	0.00	38
2024-06-12	20	543.13	0	True	6.297349	-0.181824	20	12	2	6	-8.660254e-01	5.000000e-01	481.692500	210.661423	2	120.70	0.00	41
2024-06-12	21	439.91	0	True	6.086570	-0.190047	21	12	2	6	-7.071068e-01	7.071068e-01	476.640833	210.126176	2	103.22	0.00	40
2024-06-12	22	461.46	0	True	6.134395	0.048987	22	12	2	6	-5.000000e-01	8.660254e-01	472.026250	209.149951	2	0.00	21.55	40
2024-06-12	23	439.00	0	True	6.084499	-0.048672	23	12	2	6	-2.588190e-01	9.659258e-01	465.317083	207.441262	2	22.46	0.00	41
2024-06-13	0	471.06	0	True	6.154985	0.073030	0	13	3	6	0.000000e+00	1.000000e+00	461.002083	206.141801	3	0.00	32.06	40
2024-06-13	1	511.87	0	True	6.238071	0.086634	1	13	3	6	2.588190e-01	9.659258e-01	456.398750	203.599990	3	0.00	40.81	40
2024-06-13	2	513.73	0	True	6.241698	0.003634	2	13	3	6	5.000000e-01	8.660254e-01	450.293333	199.374110	3	0.00	1.86	40
2024-06-13	3	504.32	0	True	6.223211	-0.018317	3	13	3	6	7.071068e-01	7.071068e-01	439.540417	188.471006	3	9.41	0.00	40
2024-06-13	4	543.93	0	True	6.298821	0.078541	4	13	3	6	8.660254e-01	5.000000e-01	436.108333	185.651111	3	0.00	39.61	35
2024-06-13	5	502.69	0	True	6.219974	-0.075819	5	13	3	6	9.659258e-01	2.588190e-01	432.612500	183.471452	3	41.24	0.00	35
2024-06-13	6	234.13	0	True	5.455877	-0.534246	6	13	3	6	1.000000e+00	6.123234e-17	430.365417	185.636331	3	268.56	0.00	33
2024-06-13	7	80.82	0	True	4.392224	-0.654807	7	13	3	6	9.659258e-01	-2.588190e-01	427.586667	190.490098	3	153.31	0.00	34
2024-06-13	8	89.41	0	True	4.493233	0.106286	8	13	3	6	8.660254e-01	-5.000000e-01	425.745417	193.642759	3	0.00	8.59	33
2024-06-13	9	79.89	0	True	4.380651	-0.106476	9	13	3	6	7.071068e-01	-7.071068e-01	424.916250	195.136012	3	9.52	0.00	32
2024-06-13	10	62.92	0	True	4.141864	-0.212417	10	13	3	6	5.000000e-01	-8.660254e-01	420.986667	201.603378	3	16.97	0.00	33
2024-06-13	11	75.52	0	True	4.324398	0.200254	11	13	3	6	2.588190e-01	-9.659258e-01	413.724583	210.959533	3	0.00	12.60	33
2024-06-13	12	14.93	0	True	2.703373	-0.802304	12	13	3	6	1.224647e-16	-1.000000e+00	401.812500	225.202749	3	60.59	0.00	36
2024-06-13	13	134.80	0	True	4.903792	0.028801	13	13	3	6	-2.588190e-01	-9.659258e-01	391.985833	231.674512	3	0.00	119.87	36
2024-06-13	14	141.48	0	True	4.952158	0.049555	14	13	3	6	-5.000000e-01	-8.660254e-01	382.211250	237.256756	3	0.00	6.68	36
2024-06-13	15	193.98	0	True	5.267755	0.371077	15	13	3	6	-7.071068e-01	-7.071068e-01	367.044583	237.166548	3	0.00	52.50	36
2024-06-13	16	409.04	0	True	6.013813	1.108671	16	13	3	6	-8.660254e-01	-5.000000e-01	353.915417	224.945677	3	0.00	215.06	36
2024-06-13	17	539.06	0	True	6.289827	0.317866	17	13	3	6	-9.659258e-01	-2.588190e-01	346.909167	215.900156	3	0.00	130.02	35
2024-06-13	18	581.51	0	True	6.365628	0.078748	18	13	3	6	-1.836970e-16	3.588190e-01	343.017500	210.505159	3	0.00	42.45	34
2024-06-13	19	610.81	0	True	6.414786	0.050386	19	13	3	6	-9.659258e-01	2.588190e-01	340.808333	207.244944	3	0.00	29.30	33
2024-06-13	20	673.87	0	True	6.513037	0.103240	20	13	3	6	-8.660254e-01	5.000000e-01	346.255833	214.389380	3	0.00	63.06	28
2024-06-13	21	729.27	0	True	6.592044	0.082212	21	13	3	6	-7.071068e-01	7.071068e-01	358.312500	227.613763	3	0.00	55.40	24
2024-06-13	22	585.05	0	True	6.371697	-0.197759	22	13	3	6	-5.000000e-01	8.660254e-01	363.462083	231.415176	3	144.22	0.00	30

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su	
2024-06-13	23	509.10	0	True	6.232644	-0.129818	23	13	3	6	-2.588190e-01	9.659258e-01	366.382917	232.847991	3	75.95	0.00	32	
2024-06-14	0	423.62	0	True	6.048837	-0.167904	0	14	4	6	0.000000e+00	1.000000e+00	364.406250	232.120969	4	85.48	0.00	36	
2024-06-14	1	434.62	0	True	6.074472	0.025967	1	14	4	6	2.588190e-01	9.659258e-01	361.187500	230.517290	4	0.00	11.00	36	
2024-06-14	2	454.87	0	True	6.120012	0.046592	2	14	4	6	5.000000e-01	8.660254e-01	358.735000	229.132763	4	0.00	20.25	36	
2024-06-14	3	472.58	0	True	6.158207	0.038934	3	14	4	6	7.071068e-01	7.071068e-01	357.412500	228.346195	4	0.00	17.71	35	
2024-06-14	4	439.99	0	True	6.086752	-0.068962	4	14	4	6	8.660254e-01	5.000000e-01	353.081667	225.624328	4	32.59	0.00	37	
2024-06-14	5	413.29	0	True	6.024150	-0.060683	5	14	4	6	9.659258e-01	2.588190e-01	349.356667	223.777368	4	26.70	0.00	36	
2024-06-14	6	356.94	0	True	5.877568	-0.136345	6	14	4	6	1.000000e+00	6.123234e-17	354.473750	222.428008	4	56.35	0.00	27	
2024-06-14	7	342.25	0	True	5.835541	-0.041155	7	14	4	6	9.659258e-01	-2.588190e-01	365.366667	214.711368	4	14.69	0.00	21	
2024-06-14	8	389.01	0	True	5.963605	0.136625	8	14	4	6	8.660254e-01	-5.000000e-01	377.850000	206.522897	4	0.00	46.76	21	
2024-06-14	9	412.77	0	True	6.022891	0.061078	9	14	4	6	7.071068e-01	-7.071068e-01	391.720000	196.580712	4	0.00	23.76	21	
2024-06-14	10	447.16	0	True	6.102916	0.083315	10	14	4	6	5.000000e-01	-8.660254e-01	407.730000	183.874240	4	0.00	34.39	20	
2024-06-14	11	512.49	0	True	6.239281	0.146100	11	14	4	6	2.588190e-01	-9.659258e-01	425.937083	170.711956	4	0.00	65.33	20	
2024-06-14	12	462.97	0	True	6.137662	-0.096626	12	14	4	6	1.224647e-16	-1.000000e+00	444.605417	146.607967	4	49.52	0.00	20	
2024-06-14	13	440.78	0	True	6.088546	-0.047930	13	14	4	6	-2.588190e-01	-9.659258e-01	457.354583	130.965289	4	22.19	0.00	21	
2024-06-14	14	408.86	0	True	6.013373	-0.072417	14	14	4	6	-5.000000e-01	-8.660254e-01	468.495417	113.077502	4	31.92	0.00	22	
2024-06-14	15	418.49	0	True	6.036653	0.023553	15	14	4	6	-7.071068e-01	-7.071068e-01	477.850000	97.608718	4	0.00	9.63	22	
2024-06-14	16	433.41	0	True	6.071684	0.035652	16	14	4	6	-8.660254e-01	-5.000000e-01	478.865417	96.986547	4	0.00	14.92	22	
2024-06-14	17	432.13	0	True	6.068726	-0.002953	17	14	4	6	-9.659258e-01	-2.588190e-01	474.410000	96.556217	4	1.28	0.00	22	
2024-06-14	18	440.88	0	True	6.088773	0.020249	18	14	4	6	-1.000000e+00	-1.836970e-16	468.550417	94.007675	4	0.00	8.75	22	
2024-06-14	19	455.87	0	True	6.122208	0.034000	19	14	4	6	-9.659258e-01	2.588190e-01	462.094583	89.000226	4	0.00	14.99	22	
2024-06-14	20	463.71	0	True	6.139259	0.017198	20	14	4	6	-8.660254e-01	5.000000e-01	453.337917	76.754098	4	0.00	7.84	22	
2024-06-14	21	451.58	0	True	6.112753	-0.026159	21	14	4	6	-7.071068e-01	-7.071068e-01	470.71068e-01	441.767500	49.409114	4	12.13	0.00	23
2024-06-14	22	497.13	0	True	6.208852	0.100868	22	14	4	6	-5.000000e-01	8.660254e-01	438.104167	40.840114	4	0.00	45.55	17	
2024-06-14	23	513.09	0	True	6.240451	0.032104	23	14	4	6	-2.588190e-01	9.659258e-01	438.270417	41.148642	4	0.00	15.96	13	
2024-06-15	0	690.44	1	False	6.537329	0.345651	0	15	5	6	0.000000e+00	1.000000e+00	449.387917	65.724173	5	0.00	177.35	10	
2024-06-15	1	678.96	1	False	6.520562	-0.016627	1	15	5	6	2.588190e-01	9.659258e-01	459.568750	80.582123	5	11.48	0.00	10	
2024-06-15	2	624.84	1	False	6.437496	-0.079710	2	15	5	6	5.000000e-01	8.660254e-01	466.650833	87.337121	5	54.12	0.00	13	
2024-06-15	3	577.26	1	False	6.358293	-0.076147	3	15	5	6	7.071068e-01	7.071068e-01	471.012500	90.212653	5	47.58	0.00	15	
2024-06-15	4	569.75	1	False	6.345198	-0.013010	4	15	5	6	8.660254e-01	5.000000e-01	476.419167	92.140383	5	7.51	0.00	13	
2024-06-15	5	544.86	1	False	6.300529	-0.043686	5	15	5	6	9.659258e-01	2.588190e-01	481.901250	92.135093	5	24.89	0.00	13	
2024-06-15	6	390.42	1	False	5.967223	-0.283449	6	15	5	6	1.000000e+00	6.123234e-17	483.296250	90.397896	5	154.44	0.00	17	
2024-06-15	7	293.15	1	False	5.680684	-0.249142	7	15	5	6	9.659258e-01	-2.588190e-01	481.250417	94.204226	5	97.27	0.00	21	
2024-06-15	8	258.89	1	False	5.556403	-0.116868	8	15	5	6	8.660254e-01	-5.000000e-01	475.828750	103.070771	5	34.26	0.00	22	
2024-06-15	9	169.36	1	False	5.132027	-0.345823	9	15	5	6	7.071068e-01	-7.071068e-01	465.686667	120.112344	5	89.53	0.00	26	
2024-06-15	10	211.10	1	False	5.352332	0.246457	10	15	5	6	5.000000e-01	-8.660254e-01	455.850833	130.878257	5	0.00	41.74	26	
2024-06-15	11	237.35	1	False	5.469536	0.124349	11	15	5	6	2.588190e-01	-9.659258e-01	444.386667	137.580030	5	0.00	26.25	26	
2024-06-15	12	199.91	1	False	5.297867	-0.157742	12	15	5	6	1.224647e-16	-1.000000e+00	433.425833	146.241348	5	37.44	0.00	26	
2024-06-15	13	246.64	1	False	5.507930	0.233755	13	15	5	6	-2.588190e-01	-9.659258e-01	425.336667	151.105299	5	0.00	46.73	25	
2024-06-15	14	263.30	1	False	5.573294	0.067548	14	15	5	6	-5.000000e-01	-8.660254e-01	419.271667	154.674447	5	0.00	16.66	23	
2024-06-15	15	346.90	1	False	5.849037	0.317509	15	15	5	6	-7.071068e-01	-7.071068e-01	416.288750	155.378884	5	0.00	83.60	23	
2024-06-15	16	474.08	1	False	6.161376	0.366619	16	15	5	6	-8.660254e-01	-5.000000e-01	417.983333	155.794948	5	0.00	127.18	23	
2024-06-15	17	622.32	1	False	6.433454	0.312690	17	15	5	6	-9.659258e-01	-2.588190e-01	425.907917	161.286092	5	0.00	148.24	23	
2024-06-15	18	670.26	1	False	6.507666	0.077034	18	15	5	6	-1.836970e-16	-1.000000e+00	435.465417	168.831684	5	0.00	47.94	23	

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-06-15	19	670.03	1	False	6.507322	-0.000343	19	15	5	6	-9.659258e-01	2.588190e-01	444.388750	175.485455	5	0.23	0.00	23
2024-06-15	20	655.57	1	False	6.485505	-0.021581	20	15	5	6	-8.660254e-01	5.000000e-01	452.382917	180.696573	5	14.46	0.00	24
2024-06-15	21	639.49	1	False	6.460671	-0.024528	21	15	5	6	-7.071068e-01	7.071068e-01	460.212500	184.687273	5	16.08	0.00	24
2024-06-15	22	677.84	1	False	6.518911	0.059970	22	15	5	6	-5.000000e-01	8.660254e-01	467.742083	189.868845	5	0.00	38.35	24
2024-06-15	23	708.48	1	False	6.563122	0.045202	23	15	5	6	-2.588190e-01	9.659258e-01	475.883333	195.988209	5	0.00	30.64	24
2024-06-16	0	630.67	1	False	6.446783	-0.109827	0	16	6	6	0.000000e+00	1.000000e+00	473.392917	193.507352	6	77.81	0.00	27
2024-06-16	1	523.77	1	False	6.261053	-0.169502	1	16	6	6	2.588190e-01	9.659258e-01	466.926667	188.876969	6	106.90	0.00	31
2024-06-16	2	489.71	1	False	6.193813	-0.065029	2	16	6	6	5.000000e-01	8.660254e-01	461.296250	185.956439	6	34.06	0.00	30
2024-06-16	3	474.03	1	False	6.161271	-0.032019	3	16	6	6	7.071068e-01	7.071068e-01	456.995000	184.344417	6	15.68	0.00	29
2024-06-16	4	472.38	1	False	6.157784	-0.003481	4	16	6	6	8.660254e-01	5.000000e-01	452.937917	182.820160	6	1.65	0.00	29
2024-06-16	5	450.70	1	False	6.110802	-0.045895	5	16	6	6	9.659258e-01	2.588190e-01	449.014583	181.769056	6	21.68	0.00	29
2024-06-16	6	347.65	1	False	5.851196	-0.228644	6	16	6	6	1.000000e+00	6.123234e-17	447.232500	182.576369	6	103.05	0.00	27
2024-06-16	7	241.63	1	False	5.487408	-0.304962	7	16	6	6	9.659258e-01	-2.588190e-01	445.085833	184.756641	6	106.02	0.00	27
2024-06-16	8	165.58	1	False	5.109454	-0.314737	8	16	6	6	8.660254e-01	-5.000000e-01	441.197917	189.759254	6	76.05	0.00	29
2024-06-16	9	96.53	1	False	4.569854	-0.417019	9	16	6	6	7.071068e-01	-7.071068e-01	438.163333	194.810535	6	69.05	0.00	28
2024-06-16	10	153.91	1	False	5.036368	0.594427	10	16	6	6	5.000000e-01	-8.660254e-01	435.780417	198.031865	6	0.00	57.38	28
2024-06-16	11	227.68	1	False	5.427941	0.479306	11	16	6	6	2.588190e-01	-9.659258e-01	435.377500	198.462515	6	0.00	73.77	28
2024-06-16	12	197.48	1	False	5.285637	-0.132642	12	16	6	6	1.224647e-16	-1.000000e+00	435.276250	198.588447	6	30.20	0.00	28
2024-06-16	13	335.41	1	False	5.815354	0.698450	13	16	6	6	-2.588190e-01	-9.659258e-01	438.975000	195.728387	6	0.00	137.93	28
2024-06-16	14	342.01	1	False	5.834840	0.019677	14	16	6	6	-5.000000e-01	-8.660254e-01	442.254583	193.301207	6	0.00	6.60	28
2024-06-16	15	397.80	1	False	5.985949	0.163124	15	16	6	6	-7.071068e-01	-7.071068e-01	444.375417	192.487037	6	0.00	55.79	28
2024-06-16	16	433.15	1	False	6.071084	0.088864	16	16	6	6	-8.660254e-01	-5.000000e-01	442.670000	192.393710	6	0.00	35.35	28
2024-06-16	17	455.98	1	False	6.122449	0.052707	17	16	6	6	-9.659258e-01	-2.588190e-01	435.739167	188.599295	6	0.00	22.83	28
2024-06-16	18	469.59	1	False	6.151860	0.029848	18	16	6	6	-1.000000e+00	-1.836970e-16	427.377917	182.085858	6	0.00	13.61	28
2024-06-16	19	471.13	1	False	6.155134	0.003279	19	16	6	6	-9.659258e-01	-2.588190e-01	419.090417	174.948042	6	0.00	1.54	28
2024-06-16	20	458.44	1	False	6.127829	-0.026935	20	16	6	6	-8.660254e-01	-5.000000e-01	410.876667	167.846128	6	12.69	0.00	27
2024-06-16	21	443.40	1	False	6.094472	-0.032807	21	16	6	6	-7.071068e-01	-7.071068e-01	402.706250	160.861133	6	15.04	0.00	27
2024-06-16	22	445.06	1	False	6.098209	0.003744	22	16	6	6	-5.000000e-01	-8.660254e-01	393.007083	150.216146	6	0.00	1.66	27
2024-06-16	23	437.67	1	False	6.081465	-0.016605	23	16	6	6	-2.588190e-01	-9.659258e-01	381.723333	134.876488	6	7.39	0.00	28
2024-06-17	0	470.84	0	True	6.154518	0.075788	0	17	0	6	0.000000e+00	1.000000e+00	375.063750	125.682706	0	0.00	33.17	24
2024-06-17	1	443.54	0	True	6.094788	-0.057981	1	17	0	6	2.588190e-01	9.659258e-01	371.720833	122.584226	0	27.30	0.00	21
2024-06-17	2	423.47	0	True	6.048483	-0.045250	2	17	0	6	5.000000e-01	8.660254e-01	368.960833	120.540853	0	20.07	0.00	21
2024-06-17	3	407.51	0	True	6.010065	-0.037689	3	17	0	6	7.071068e-01	7.071068e-01	366.189167	118.771680	0	15.96	0.00	21
2024-06-17	4	424.28	0	True	6.050394	0.041152	4	17	0	6	8.660254e-01	5.000000e-01	364.185000	117.298583	0	0.00	16.77	21
2024-06-17	5	421.66	0	True	6.044199	-0.006175	5	17	0	6	9.659258e-01	2.588190e-01	362.975000	116.514492	0	2.62	0.00	20
2024-06-17	6	269.40	0	True	5.596197	-0.361097	6	17	0	6	1.000000e+00	6.123234e-17	359.714583	118.046733	0	152.26	0.00	22
2024-06-17	7	96.21	0	True	4.566533	-0.642873	7	17	0	6	9.659258e-01	-2.588190e-01	353.655417	127.708106	0	173.19	0.00	25
2024-06-17	8	78.87	0	True	4.367801	-0.180231	8	17	0	6	8.660254e-01	-5.000000e-01	350.042500	134.315766	0	17.34	0.00	22
2024-06-17	9	-42.29	0	True	4.367801	-1.536199	9	17	0	6	7.071068e-01	-7.071068e-01	344.258333	147.999694	0	121.16	0.00	24
2024-06-17	10	-55.00	0	True	4.367801	0.300544	10	17	0	6	5.000000e-01	-8.660254e-01	335.553750	164.864394	0	12.71	0.00	25
2024-06-17	11	-80.00	0	True	4.367801	0.454545	11	17	0	6	2.588190e-01	-9.659258e-01	322.733750	184.420348	0	25.00	0.00	26
2024-06-17	12	-48.42	0	True	4.367801	-0.394750	12	17	0	6	1.224647e-16	-1.000000e+00	312.487917	198.011533	0	0.00	31.58	25
2024-06-17	13	80.64	0	True	4.389995	-2.665428	13	17	0	6	-2.588190e-01	-9.659258e-01	301.872500	203.482783	0	0.00	129.06	25
2024-06-17	14	84.62	0	True	4.438171	0.049355	14	17	0	6	-5.000000e-01	-8.660254e-01	291.147917	208.007924	0	0.00	3.98	25

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-06-17	15	255.62	0	True	5.543692	0.2020799	15	17	0	6	-7.071068e-01	285.223750	206.859865	0	0.00	171.00	25	
2024-06-17	16	409.48	0	True	6.014888	0.601909	16	17	0	6	-8.660254e-01	-5.000000e-01	284.237500	206.179236	0	0.00	153.86	25
2024-06-17	17	494.54	0	True	6.203628	0.207727	17	17	0	6	-9.659258e-01	-2.588190e-01	285.844167	207.720222	0	0.00	85.06	25
2024-06-17	18	520.79	0	True	6.255347	0.053080	18	17	0	6	-1.000000e+00	-1.836970e-16	287.977500	209.940433	0	0.00	26.25	25
2024-06-17	19	520.25	0	True	6.254309	-0.001037	19	17	0	6	-9.659258e-01	2.588190e-01	290.024167	212.032587	0	0.54	0.00	25
2024-06-17	20	489.15	0	True	6.192669	-0.059779	20	17	0	6	-8.660254e-01	5.000000e-01	291.303750	213.182686	0	31.10	0.00	25
2024-06-17	21	444.69	0	True	6.097377	-0.090892	21	17	0	6	-7.071068e-01	7.071068e-01	291.357500	213.222860	0	44.46	0.00	27
2024-06-17	22	434.95	0	True	6.075231	-0.021903	22	17	0	6	-5.000000e-01	8.660254e-01	290.936250	212.915763	0	9.74	0.00	27
2024-06-17	23	408.69	0	True	6.012957	-0.060375	23	17	0	6	-2.588190e-01	9.659258e-01	289.728750	212.128137	0	26.26	0.00	28
2024-06-18	0	442.19	0	True	6.091740	0.081969	0	18	1	6	0.000000e+00	1.000000e+00	288.535000	211.142948	1	0.00	33.50	28
2024-06-18	1	428.07	0	True	6.059287	-0.031932	1	18	1	6	2.588190e-01	9.659258e-01	287.890417	210.672259	1	14.12	0.00	27
2024-06-18	2	390.69	0	True	5.967914	-0.087322	2	18	1	6	5.000000e-01	8.660254e-01	286.524583	209.859743	1	37.38	0.00	28
2024-06-18	3	366.63	0	True	5.904353	-0.061583	3	18	1	6	7.071068e-01	7.071068e-01	284.821250	208.999204	1	24.06	0.00	28
2024-06-18	4	381.09	0	True	5.943036	0.039440	4	18	1	6	8.660254e-01	5.000000e-01	283.021667	207.929394	1	0.00	14.46	28
2024-06-18	5	341.55	0	True	5.833494	-0.103755	5	18	1	6	9.659258e-01	2.588190e-01	279.683750	206.243222	1	39.54	0.00	30
2024-06-18	6	124.74	0	True	4.826232	-0.634783	6	18	1	6	1.000000e+00	6.123234e-17	273.656250	208.656573	1	216.81	0.00	33
2024-06-18	7	-28.70	0	True	4.826232	-1.230079	7	18	1	6	9.659258e-01	-2.588190e-01	268.451667	214.744138	1	153.44	0.00	32
2024-06-18	8	-23.37	0	True	4.826232	-0.185714	8	18	1	6	8.660254e-01	-5.000000e-01	264.191667	219.627071	1	0.00	5.33	31
2024-06-18	9	-80.00	0	True	4.826232	2.423192	9	18	1	6	7.071068e-01	-7.071068e-01	262.620417	222.036699	1	56.63	0.00	28
2024-06-18	10	70.14	0	True	4.250493	-1.876750	10	18	1	6	5.000000e-01	-8.660254e-01	267.834583	215.630550	1	0.00	150.14	28
2024-06-18	11	93.82	0	True	4.541378	0.337610	11	18	1	6	2.588190e-01	-9.659258e-01	275.077083	206.150385	1	0.00	23.68	27
2024-06-18	12	112.77	0	True	4.725350	0.201983	12	18	1	6	1.224647e-16	-1.000000e+00	281.793333	197.601290	1	0.00	18.95	27
2024-06-18	13	188.88	0	True	5.241112	0.674914	13	18	1	6	-2.588190e-01	-9.659258e-01	286.303333	194.013252	1	0.00	76.11	27
2024-06-18	14	223.74	0	True	5.410485	0.184562	14	18	1	6	-5.000000e-01	-8.660254e-01	292.100000	189.757034	1	0.00	34.86	27
2024-06-18	15	349.31	0	True	5.855960	0.561232	15	18	1	6	-7.071068e-01	-7.071068e-01	296.003750	189.937551	1	0.00	125.57	27
2024-06-18	16	453.14	0	True	6.116201	0.297243	16	18	1	6	-8.660254e-01	-5.000000e-01	297.822917	191.276013	1	0.00	103.83	27
2024-06-18	17	485.15	0	True	6.184458	0.070640	17	18	1	6	-9.659258e-01	-2.588190e-01	297.431667	190.865301	1	0.00	32.01	27
2024-06-18	18	453.56	0	True	6.117128	-0.065114	18	18	1	6	-1.836970e-16	-1.000000e+00	294.630417	187.915191	1	31.59	0.00	28
2024-06-18	19	447.45	0	True	6.103565	-0.013471	19	18	1	6	-9.659258e-01	-2.588190e-01	291.597083	184.674513	1	6.11	0.00	28
2024-06-18	20	453.77	0	True	6.117590	0.014124	20	18	1	6	-8.660254e-01	-8.660254e-01	290.122917	183.164014	1	0.00	6.32	27
2024-06-18	21	470.59	0	True	6.153987	0.037067	21	18	1	6	-7.071068e-01	-7.071068e-01	291.202083	184.187726	1	0.00	16.82	25
2024-06-18	22	534.55	0	True	6.281425	0.135914	22	18	1	6	-5.000000e-01	-8.660254e-01	295.352083	188.635734	1	0.00	63.96	25
2024-06-18	23	491.95	0	True	6.198377	-0.079693	23	18	1	6	-2.588190e-01	-9.659258e-01	298.821250	191.553777	1	42.60	0.00	25
2024-06-19	0	455.99	0	True	6.122471	-0.073097	0	19	2	6	0.000000e+00	1.000000e+00	299.396250	192.022986	2	35.96	0.00	27
2024-06-19	1	418.51	0	True	6.036701	-0.082195	1	19	2	6	2.588190e-01	9.659258e-01	298.997917	191.754187	2	37.48	0.00	28
2024-06-19	2	399.74	0	True	5.990814	-0.044850	2	19	2	6	5.000000e-01	8.660254e-01	299.375000	191.951135	2	18.77	0.00	27
2024-06-19	3	383.31	0	True	5.948844	-0.041102	3	19	2	6	7.071068e-01	7.071068e-01	300.070000	192.235220	2	16.43	0.00	27
2024-06-19	4	393.03	0	True	5.973886	0.025358	4	19	2	6	8.660254e-01	5.000000e-01	300.567500	192.469322	2	0.00	9.72	27
2024-06-19	5	370.10	0	True	5.913773	-0.058342	5	19	2	6	9.659258e-01	2.588190e-01	301.757083	192.821540	2	22.93	0.00	26
2024-06-19	6	160.99	0	True	5.081342	-0.565009	6	19	2	6	1.000000e+00	6.123234e-17	303.267500	191.512167	2	209.11	0.00	26
2024-06-19	7	42.95	0	True	3.760037	-0.733213	7	19	2	6	9.659258e-01	-2.588190e-01	306.252917	186.607913	2	118.04	0.00	24
2024-06-19	8	118.44	0	True	4.774407	1.757625	8	19	2	6	8.660254e-01	-5.000000e-01	312.161667	177.751941	2	0.00	75.49	24
2024-06-19	9	99.23	0	True	4.597440	-0.162192	9	19	2	6	7.071068e-01	-7.071068e-01	319.629583	163.775158	2	19.21	0.00	23
2024-06-19	10	115.99	0	True	4.753504	0.168901	10	19	2	6	5.000000e-01	-8.660254e-01	321.540000	160.981959	2	0.00	16.76	23

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-06-19	11	144.98	0	True	4.976596	0.249935	11	19	2	6	2.588190e-01	-9.659258e-01	323.671667	158.149265	2	0.00	28.99	23
2024-06-19	12	105.18	0	True	4.655673	-0.274521	12	19	2	6	1.224647e-16	-1.000000e+00	323.355417	158.596297	2	39.80	0.00	24
2024-06-19	13	154.54	0	True	5.040453	0.469291	13	19	2	6	-2.588190e-01	-9.659258e-01	321.924583	160.010861	2	0.00	49.36	24
2024-06-19	14	165.42	0	True	5.108488	0.070402	14	19	2	6	-5.000000e-01	-8.660254e-01	319.494583	161.997275	2	0.00	10.88	24
2024-06-19	15	289.02	0	True	5.666496	0.747189	15	19	2	6	-7.071068e-01	-7.071068e-01	316.982500	161.982283	2	0.00	123.60	24
2024-06-19	16	394.70	0	True	5.978126	0.365649	16	19	2	6	-8.660254e-01	-5.000000e-01	314.547500	160.276775	2	0.00	105.68	24
2024-06-19	17	499.17	0	True	6.212947	0.264682	17	19	2	6	-9.659258e-01	-2.588190e-01	315.131667	160.949748	2	0.00	104.47	24
2024-06-19	18	545.81	0	True	6.302271	0.093435	18	19	2	6	-1.000000e+00	-1.836970e-16	318.975417	165.438337	2	0.00	46.64	23
2024-06-19	19	544.72	0	True	6.300272	-0.001997	19	19	2	6	-9.659258e-01	2.588190e-01	323.028333	169.855062	2	1.09	0.00	23
2024-06-19	20	497.17	0	True	6.208932	-0.087293	20	19	2	6	-8.660254e-01	5.000000e-01	324.836667	171.530264	2	47.55	0.00	25
2024-06-19	21	488.70	0	True	6.191749	-0.017036	21	19	2	6	-7.071068e-01	7.071068e-01	325.591250	172.237704	2	8.47	0.00	25
2024-06-19	22	554.94	0	True	6.318860	0.135543	22	19	2	6	-5.000000e-01	8.660254e-01	326.440833	173.359864	2	0.00	66.24	25
2024-06-19	23	594.11	0	True	6.387064	0.070584	23	19	2	6	-2.588190e-01	9.659258e-01	330.697500	178.770246	2	0.00	39.17	23
2024-06-20	0	531.61	0	True	6.275910	-0.105199	0	20	3	6	0.000000e+00	1.000000e+00	333.848333	181.716666	3	62.50	0.00	25
2024-06-20	1	499.97	0	True	6.214548	-0.059517	1	20	3	6	2.588190e-01	9.659258e-01	337.242500	184.111745	3	31.64	0.00	24
2024-06-20	2	481.05	0	True	6.175971	-0.037842	2	20	3	6	5.000000e-01	8.660254e-01	340.630417	186.049699	3	18.92	0.00	24
2024-06-20	3	443.16	0	True	6.093931	-0.078765	3	20	3	6	7.071068e-01	7.071068e-01	343.124167	187.045077	3	37.89	0.00	25
2024-06-20	4	473.62	0	True	6.160405	0.068734	4	20	3	6	8.660254e-01	5.000000e-01	346.482083	188.696070	3	0.00	30.46	25
2024-06-20	5	454.80	0	True	6.119858	-0.039736	5	20	3	6	9.659258e-01	2.588190e-01	350.011250	189.944935	3	18.82	0.00	25
2024-06-20	6	381.84	0	True	5.945002	-0.160422	6	20	3	6	1.000000e+00	6.123234e-17	359.213333	185.691488	3	72.96	0.00	19
2024-06-20	7	333.00	0	True	5.808142	-0.127907	7	20	3	6	9.659258e-01	-2.588190e-01	371.298750	173.233924	3	48.84	0.00	16
2024-06-20	8	352.96	0	True	5.866355	0.059940	8	20	3	6	8.660254e-01	-5.000000e-01	381.070417	164.757653	3	0.00	19.96	16
2024-06-20	9	327.48	0	True	5.791427	-0.072189	9	20	3	6	7.071068e-01	-7.071068e-01	390.580833	154.019210	3	25.48	0.00	17
2024-06-20	10	349.10	0	True	5.855358	0.066019	10	20	3	6	5.000000e-01	-8.660254e-01	400.293750	142.898634	3	0.00	21.62	17
2024-06-20	11	373.21	0	True	5.922141	0.069063	11	20	3	6	2.588190e-01	-9.659258e-01	409.803333	132.376029	3	0.00	24.11	17
2024-06-20	12	365.86	0	True	5.902251	-0.019694	12	20	3	6	1.224647e-16	-1.000000e+00	420.665000	115.972770	3	7.35	0.00	15
2024-06-20	13	375.69	0	True	5.928764	0.026868	13	20	3	6	-2.588190e-01	-9.659258e-01	429.879583	101.832162	3	0.00	9.83	15
2024-06-20	14	373.54	0	True	5.923025	-0.005723	14	20	3	6	-5.000000e-01	-8.660254e-01	438.551250	85.956430	3	2.15	0.00	15
2024-06-20	15	398.89	0	True	5.988686	0.067864	15	20	3	6	-7.071068e-01	-7.071068e-01	443.129167	80.392008	3	0.00	25.35	15
2024-06-20	16	500.31	0	True	6.215228	0.254256	16	20	3	6	-8.660254e-01	-5.000000e-01	447.529583	80.516177	3	0.00	101.42	15
2024-06-20	17	575.15	0	True	6.354631	0.149587	17	20	3	6	-9.659258e-01	-2.588190e-01	450.695417	84.051061	3	0.00	74.84	15
2024-06-20	18	621.38	0	True	6.431943	0.080379	18	20	3	6	-1.000000e+00	-1.836970e-16	453.844167	89.036839	3	0.00	46.23	15
2024-06-20	19	635.12	0	True	6.453814	0.022112	19	20	3	6	-9.659258e-01	2.588190e-01	457.610833	94.775674	3	0.00	13.74	15
2024-06-20	20	582.83	0	True	6.367896	-0.082331	20	20	3	6	-8.660254e-01	5.000000e-01	461.180000	97.891917	3	52.29	0.00	16
2024-06-20	21	557.54	0	True	6.323534	-0.043392	21	20	3	6	-7.071068e-01	7.071068e-01	464.048333	99.724724	3	25.29	0.00	16
2024-06-20	22	569.44	0	True	6.344653	0.021344	22	20	3	6	-5.000000e-01	8.660254e-01	464.652500	100.341335	3	0.00	11.90	16
2024-06-20	23	585.42	0	True	6.372330	0.028063	23	20	3	6	-2.588190e-01	9.659258e-01	464.290417	99.868440	3	0.00	15.98	16
2024-06-21	0	655.04	0	True	6.484696	0.118923	0	21	4	6	0.000000e+00	1.000000e+00	469.433333	106.447355	4	0.00	69.62	14
2024-06-21	1	445.62	0	True	6.099467	-0.319706	1	21	4	6	2.588190e-01	9.659258e-01	467.168750	106.347546	4	209.42	0.00	21
2024-06-21	2	417.71	0	True	6.034787	-0.062632	2	21	4	6	5.000000e-01	8.660254e-01	464.529583	106.773170	4	27.91	0.00	22
2024-06-21	3	413.77	0	True	6.025310	-0.009432	3	21	4	6	7.071068e-01	7.071068e-01	463.305000	107.196612	4	3.94	0.00	20
2024-06-21	4	415.25	0	True	6.028881	0.003577	4	21	4	6	8.660254e-01	5.000000e-01	460.872917	107.613749	4	0.00	1.48	20
2024-06-21	5	404.22	0	True	6.001959	-0.026562	5	21	4	6	9.659258e-01	2.588190e-01	458.765417	108.231357	4	11.03	0.00	20
2024-06-21	6	358.56	0	True	5.882096	-0.112958	6	21	4	6	1.000000e+00	6.123234e-17	457.795417	109.051969	4	45.66	0.00	19

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-06-21	7	344.30	0	True	5.841513	-0.039770	7	21	4	6	9.659258e-01	-2.588190e-01	458.266250	108.512798	4	14.26	0.00	17
2024-06-21	8	376.95	0	True	5.932113	0.094830	8	21	4	6	8.660254e-01	-5.000000e-01	459.265833	107.607292	4	0.00	32.65	17
2024-06-21	9	387.30	0	True	5.959200	0.027457	9	21	4	6	7.071068e-01	-7.071068e-01	461.758333	105.085276	4	0.00	10.35	16
2024-06-21	10	432.12	0	True	6.068703	0.115724	10	21	4	6	5.000000e-01	-8.660254e-01	465.217500	102.551451	4	0.00	44.82	16
2024-06-21	11	710.91	0	True	6.566546	0.645168	11	21	4	6	2.588190e-01	-9.659258e-01	479.288333	112.101294	4	0.00	278.79	16
2024-06-21	12	1121.78	0	True	7.022672	0.577949	12	21	4	6	1.224647e-16	-1.000000e+00	510.785000	170.058136	4	0.00	410.87	16
2024-06-21	13	1146.12	0	True	7.044138	0.021698	13	21	4	6	-2.588190e-01	-9.659258e-01	542.886250	211.189472	4	0.00	24.34	16
2024-06-21	14	672.59	0	True	6.511136	-0.413159	14	21	4	6	-5.000000e-01	-8.660254e-01	555.346667	209.579440	4	473.53	0.00	35
2024-06-21	15	498.05	0	True	6.210700	-0.259504	15	21	4	6	-7.071068e-01	-7.071068e-01	559.478333	207.326248	4	174.54	0.00	43
2024-06-21	16	453.87	0	True	6.117811	-0.088706	16	21	4	6	-8.660254e-01	-5.000000e-01	557.543333	208.117687	4	44.18	0.00	45
2024-06-21	17	420.70	0	True	6.041920	-0.073083	17	21	4	6	-9.659258e-01	-2.588190e-01	551.107917	209.929647	4	33.17	0.00	46
2024-06-21	18	402.14	0	True	5.996800	-0.044117	18	21	4	6	-1.000000e+00	-1.836970e-16	541.972917	211.503008	4	18.56	0.00	47
2024-06-21	19	393.94	0	True	5.976199	-0.020391	19	21	4	6	-9.659258e-01	2.588190e-01	531.923750	212.611580	4	8.20	0.00	47
2024-06-21	20	387.67	0	True	5.960154	-0.015916	20	21	4	6	-8.660254e-01	5.000000e-01	523.792083	214.305293	4	6.27	0.00	45
2024-06-21	21	378.57	0	True	5.936401	-0.023474	21	21	4	6	-7.071068e-01	7.071068e-01	516.335000	216.185446	4	9.10	0.00	44
2024-06-21	22	403.31	0	True	5.999705	0.065351	22	21	4	6	-5.000000e-01	8.660254e-01	509.412917	217.069006	4	0.00	24.74	44
2024-06-21	23	422.25	0	True	6.045598	0.046961	23	21	4	6	-2.588190e-01	9.659258e-01	502.614167	217.140195	4	0.00	18.94	44
2024-06-22	0	466.42	1	False	6.145087	0.104606	0	22	5	6	0.000000e+00	1.000000e+00	494.755000	214.784104	5	0.00	44.17	44
2024-06-22	1	452.89	1	False	6.115649	-0.029008	1	22	5	6	2.588190e-01	9.659258e-01	495.057917	214.716911	5	13.53	0.00	36
2024-06-22	2	441.17	1	False	6.089430	-0.025878	2	22	5	6	5.000000e-01	8.660254e-01	496.035417	214.402645	5	11.72	0.00	36
2024-06-22	3	431.20	1	False	6.066572	-0.022599	3	22	5	6	7.071068e-01	7.071068e-01	496.761667	214.141231	5	9.97	0.00	36
2024-06-22	4	431.40	1	False	6.067036	0.000464	4	22	5	6	8.660254e-01	5.000000e-01	497.434583	213.899191	5	0.00	0.20	36
2024-06-22	5	407.97	1	False	6.011194	-0.054312	5	22	5	6	9.659258e-01	2.588190e-01	497.590833	213.829497	5	23.43	0.00	36
2024-06-22	6	307.05	1	False	5.727011	-0.247371	6	22	5	6	1.000000e+00	6.123234e-17	495.444583	215.537338	5	100.92	0.00	39
2024-06-22	7	216.16	1	False	5.376019	-0.296010	7	22	5	6	9.659258e-01	-2.588190e-01	490.105417	220.963006	5	90.89	0.00	42
2024-06-22	8	153.64	1	False	5.034612	-0.289230	8	22	5	6	8.660254e-01	-5.000000e-01	480.800833	230.433804	5	62.52	0.00	45
2024-06-22	9	102.24	1	False	4.627323	-0.334548	9	22	5	6	7.071068e-01	-7.071068e-01	468.923333	242.493753	5	51.40	0.00	47
2024-06-22	10	128.61	1	False	4.856785	0.257923	10	22	5	6	5.000000e-01	-8.660254e-01	456.277083	252.215788	5	0.00	26.37	47
2024-06-22	11	189.55	1	False	5.244653	0.473836	11	22	5	6	2.588190e-01	-9.659258e-01	434.553750	251.782707	5	0.00	60.94	47
2024-06-22	12	185.42	1	False	5.222624	-0.021788	12	22	5	6	1.224647e-16	-1.000000e+00	395.538750	209.692305	5	4.13	0.00	47
2024-06-22	13	228.04	1	False	5.429521	0.229857	13	22	5	6	-2.588190e-01	-9.659258e-01	357.285417	138.453232	5	0.00	42.62	47
2024-06-22	14	226.02	1	False	5.420623	-0.008858	14	22	5	6	-5.000000e-01	-8.660254e-01	338.678333	123.428928	5	2.02	0.00	27
2024-06-22	15	284.79	1	False	5.651752	0.260021	15	22	5	6	-7.071068e-01	-7.071068e-01	329.792500	119.055657	5	0.00	58.77	20
2024-06-22	16	375.96	1	False	5.929483	0.320131	16	22	5	6	-8.660254e-01	-5.000000e-01	326.546250	116.561429	5	0.00	91.17	18
2024-06-22	17	418.28	1	False	6.036151	0.112565	17	22	5	6	-9.659258e-01	-2.588190e-01	326.445417	116.477455	5	0.00	42.32	17
2024-06-22	18	426.34	1	False	6.055237	0.019269	18	22	5	6	-1.000000e+00	-1.836970e-16	327.453750	117.263323	5	0.00	8.06	16
2024-06-22	19	422.99	1	False	6.047349	-0.007858	19	22	5	6	-9.659258e-01	-2.588190e-01	328.664167	118.126202	5	3.35	0.00	16
2024-06-22	20	406.02	1	False	6.006402	-0.040119	20	22	5	6	-8.660254e-01	-5.000000e-01	329.428750	118.583230	5	16.97	0.00	16
2024-06-22	21	375.08	1	False	5.927139	-0.076203	21	22	5	6	-7.071068e-01	-7.071068e-01	329.283333	118.522474	5	30.94	0.00	17
2024-06-22	22	387.50	1	False	5.959716	0.033113	22	22	5	6	-5.000000e-01	-8.660254e-01	328.624583	118.136451	5	0.00	12.42	17
2024-06-22	23	387.58	1	False	5.959922	0.000206	23	22	5	6	-2.588190e-01	-9.659258e-01	327.180000	117.149667	5	0.00	0.08	17
2024-06-23	0	459.44	1	False	6.130008	0.185407	0	23	6	6	0.000000e+00	1.000000e+00	326.889167	116.797097	6	0.00	71.86	17
2024-06-23	1	472.51	1	False	6.158059	0.028448	1	23	6	6	2.588190e-01	9.659258e-01	327.706667	117.781873	6	0.00	13.07	17
2024-06-23	2	490.54	1	False	6.195507	0.038158	2	23	6	6	5.000000e-01	8.660254e-01	329.763750	120.254858	6	0.00	18.03	16

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-06-23	3	489.23	1	False	6.192833	-0.002671	3	23	6	6	7.071068e-01	7.071068e-01	332.181667	122.936563	6	1.31	0.00	16
2024-06-23	4	486.15	1	False	6.186517	-0.006296	4	23	6	6	8.660254e-01	5.000000e-01	334.462917	125.342182	6	3.08	0.00	16
2024-06-23	5	461.87	1	False	6.135283	-0.049943	5	23	6	6	9.659258e-01	2.588190e-01	336.708750	127.185839	6	24.28	0.00	16
2024-06-23	6	309.00	1	False	5.733341	-0.330981	6	23	6	6	1.000000e+00	6.123234e-17	336.790000	127.166689	6	152.87	0.00	18
2024-06-23	7	141.33	1	False	4.951098	-0.542621	7	23	6	6	9.659258e-01	-2.588190e-01	333.672083	131.109171	6	167.67	0.00	21
2024-06-23	8	58.88	1	False	4.075501	-0.583386	8	23	6	6	8.660254e-01	-5.000000e-01	329.723750	138.011678	6	82.45	0.00	22
2024-06-23	9	-0.37	1	False	4.075501	-1.006284	9	23	6	6	7.071068e-01	-7.071068e-01	325.448333	146.682215	6	59.25	0.00	22
2024-06-23	10	105.35	1	False	4.657288	-285.729730	10	23	6	6	5.000000e-01	-8.660254e-01	324.479167	148.109223	6	0.00	105.72	22
2024-06-23	11	112.19	1	False	4.720194	0.064926	11	23	6	6	2.588190e-01	-9.659258e-01	321.255833	151.965001	6	0.00	6.84	22
2024-06-23	12	-55.65	1	False	4.720194	-1.496034	12	23	6	6	1.224647e-16	-1.000000e+00	311.211250	168.411053	6	167.84	0.00	29
2024-06-23	13	-51.42	1	False	4.720194	-0.076011	13	23	6	6	-2.588190e-01	-9.659258e-01	299.567083	183.405276	6	0.00	4.23	29
2024-06-23	14	-80.00	1	False	4.720194	0.555815	14	23	6	6	-5.000000e-01	-8.660254e-01	286.816250	198.737579	6	28.58	0.00	30
2024-06-23	15	48.24	1	False	3.876189	-1.603000	15	23	6	6	-7.071068e-01	-7.071068e-01	276.960000	204.621114	6	0.00	128.24	30
2024-06-23	16	266.58	1	False	5.585674	4.526119	16	23	6	6	-8.660254e-01	-5.000000e-01	272.402500	203.535452	6	0.00	218.34	30
2024-06-23	17	384.55	1	False	5.952074	0.442531	17	23	6	6	-9.659258e-01	-2.588190e-01	270.997083	202.598667	6	0.00	117.97	30
2024-06-23	18	415.80	1	False	6.030204	0.081264	18	23	6	6	-1.000000e+00	-1.836970e-16	270.557917	202.258433	6	0.00	31.25	30
2024-06-23	19	408.46	1	False	6.012394	-0.017653	19	23	6	6	-9.659258e-01	-2.588190e-01	269.952500	201.803557	6	7.34	0.00	30
2024-06-23	20	384.74	1	False	5.952568	-0.058072	20	23	6	6	-8.660254e-01	-5.000000e-01	269.065833	201.225644	6	23.72	0.00	31
2024-06-23	21	380.26	1	False	5.940855	-0.011644	21	23	6	6	-7.071068e-01	-7.071068e-01	269.281667	201.347040	6	4.48	0.00	30
2024-06-23	22	418.24	1	False	6.036055	0.099879	22	23	6	6	-5.000000e-01	-8.660254e-01	270.562500	202.227609	6	0.00	37.98	30
2024-06-23	23	446.57	1	False	6.101596	0.067736	23	23	6	6	-2.588190e-01	-9.659258e-01	273.020417	204.061872	6	0.00	28.33	30
2024-06-24	0	433.05	0	True	6.070853	-0.030275	0	24	0	6	0.000000e+00	1.000000e+00	271.920833	203.082429	0	13.52	0.00	30
2024-06-24	1	424.66	0	True	6.051289	-0.019374	1	24	0	6	2.588190e-01	9.659258e-01	269.927083	201.254189	0	8.39	0.00	31
2024-06-24	2	409.73	0	True	6.015498	-0.035158	2	24	0	6	5.000000e-01	8.660254e-01	266.560000	198.053289	0	14.93	0.00	31
2024-06-24	3	381.60	0	True	5.944373	-0.068655	3	24	0	6	7.071068e-01	7.071068e-01	262.075417	193.968511	0	28.13	0.00	32
2024-06-24	4	376.55	0	True	5.931051	-0.013234	4	24	0	6	8.660254e-01	5.000000e-01	257.508750	189.707042	0	5.05	0.00	32
2024-06-24	5	330.49	0	True	5.800576	-0.122321	5	24	0	6	9.659258e-01	2.588190e-01	252.034583	185.400280	0	46.06	0.00	33
2024-06-24	6	124.28	0	True	4.822537	-0.623952	6	24	0	6	1.000000e+00	6.123234e-17	244.337917	186.761824	0	206.21	0.00	35
2024-06-24	7	-58.13	0	True	4.822537	-1.467734	7	24	0	6	9.659258e-01	-2.588190e-01	236.027083	195.765837	0	182.41	0.00	36
2024-06-24	8	-50.21	0	True	4.822537	-0.136246	8	24	0	6	8.660254e-01	-5.000000e-01	231.481667	201.247497	0	0.00	7.92	33
2024-06-24	9	-80.00	0	True	4.822537	0.593308	9	24	0	6	7.071068e-01	-7.071068e-01	228.163750	205.840186	0	29.79	0.00	31
2024-06-24	10	-47.66	0	True	4.822537	-0.404250	10	24	0	6	5.000000e-01	-8.660254e-01	221.788333	212.084296	0	0.00	32.34	31
2024-06-24	11	4.71	0	True	1.549688	-1.098825	11	24	0	6	2.588190e-01	-9.659258e-01	217.310000	215.604720	0	0.00	52.37	31
2024-06-24	12	-9.26	0	True	1.549688	-2.966030	12	24	0	6	1.224647e-16	-1.000000e+00	219.242917	213.246258	0	13.97	0.00	25
2024-06-24	13	80.74	0	True	4.391234	-9.719222	13	24	0	6	-2.588190e-01	-9.659258e-01	224.749583	207.584253	0	0.00	90.00	25
2024-06-24	14	94.24	0	True	4.545845	0.167203	14	24	0	6	-5.000000e-01	-8.660254e-01	232.009583	199.346058	0	0.00	13.50	24
2024-06-24	15	219.93	0	True	5.393309	1.333722	15	24	0	6	-7.071068e-01	-7.071068e-01	239.163333	195.508256	0	0.00	125.69	24
2024-06-24	16	333.71	0	True	5.810272	0.517346	16	24	0	6	-8.660254e-01	-5.000000e-01	241.960417	196.395744	0	0.00	113.78	24
2024-06-24	17	409.66	0	True	6.015328	0.227593	17	24	0	6	-9.659258e-01	-2.588190e-01	243.006667	197.253392	0	0.00	75.95	24
2024-06-24	18	436.18	0	True	6.078055	0.064737	18	24	0	6	-1.000000e+00	-1.836970e-16	243.855833	198.071771	0	0.00	26.52	24
2024-06-24	19	440.25	0	True	6.087343	0.009331	19	24	0	6	-9.659258e-01	-2.588190e-01	245.180417	199.322749	0	0.00	4.07	24
2024-06-24	20	431.20	0	True	6.066572	-0.020557	20	24	0	6	-8.660254e-01	-5.000000e-01	247.116250	200.956010	0	9.05	0.00	23
2024-06-24	21	412.54	0	True	6.022333	-0.043275	21	24	0	6	-7.071068e-01	-7.071068e-01	248.461250	201.991245	0	18.66	0.00	24
2024-06-24	22	412.15	0	True	6.021387	-0.000945	22	24	0	6	-5.000000e-01	-8.660254e-01	248.207500	201.772396	0	0.39	0.00	24

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-06-24	23	421.53	0	True	6.043891	0.022759	23	24	0	6	-2.588190e-01	9.659258e-01	247.164167	200.764319	0	0.00	9.38	24
2024-06-25	0	411.55	0	True	6.019931	-0.023676	0	25	1	6	0.000000e+00	1.000000e+00	246.268333	199.945109	1	9.98	0.00	23
2024-06-25	1	413.81	0	True	6.025407	0.005491	1	25	1	6	2.588190e-01	9.659258e-01	245.816250	199.536070	1	0.00	2.26	23
2024-06-25	2	409.78	0	True	6.015620	-0.009739	2	25	1	6	5.000000e-01	8.660254e-01	245.818333	199.537856	1	4.03	0.00	23
2024-06-25	3	401.41	0	True	5.994983	-0.020426	3	25	1	6	7.071068e-01	7.071068e-01	246.643750	200.163948	1	8.37	0.00	22
2024-06-25	4	405.44	0	True	6.004973	0.010040	4	25	1	6	8.660254e-01	5.000000e-01	247.847500	201.063993	1	0.00	4.03	22
2024-06-25	5	393.98	0	True	5.976300	-0.028266	5	25	1	6	9.659258e-01	2.588190e-01	250.492917	202.610329	1	11.46	0.00	20
2024-06-25	6	303.61	0	True	5.715744	-0.229377	6	25	1	6	1.000000e+00	6.123234e-17	257.965000	201.054124	1	90.37	0.00	15
2024-06-25	7	119.65	0	True	4.784571	-0.605909	7	25	1	6	9.659258e-01	-2.588190e-01	265.372500	191.971645	1	183.96	0.00	15
2024-06-25	8	123.22	0	True	4.813971	0.029837	8	25	1	6	8.660254e-01	-5.000000e-01	272.598750	182.611890	1	0.00	3.57	15
2024-06-25	9	98.74	0	True	4.592490	-0.198669	9	25	1	6	7.071068e-01	-7.071068e-01	280.046250	170.874118	1	24.48	0.00	15
2024-06-25	10	130.30	0	True	4.869839	0.319627	10	25	1	6	5.000000e-01	-8.660254e-01	287.461250	159.519135	1	0.00	31.56	15
2024-06-25	11	152.71	0	True	5.028541	0.171988	11	25	1	6	2.588190e-01	-9.659258e-01	293.627917	150.731999	1	0.00	22.41	15
2024-06-25	12	95.67	0	True	4.560905	-0.373518	12	25	1	6	1.224647e-16	-1.000000e+00	298.000000	142.881922	1	57.04	0.00	17
2024-06-25	13	164.63	0	True	5.103701	0.720811	13	25	1	6	-2.588190e-01	-9.659258e-01	301.495417	138.288140	1	0.00	68.96	17
2024-06-25	14	182.39	0	True	5.206147	0.107878	14	25	1	6	-5.000000e-01	-8.660254e-01	305.168333	133.636520	1	0.00	17.76	17
2024-06-25	15	274.66	0	True	5.615534	0.505894	15	25	1	6	-7.071068e-01	-7.071068e-01	307.448750	132.581546	1	0.00	92.27	17
2024-06-25	16	354.19	0	True	5.869833	0.289558	16	25	1	6	-8.660254e-01	-5.000000e-01	308.302083	132.823606	1	0.00	79.53	17
2024-06-25	17	384.19	0	True	5.951137	0.084700	17	25	1	6	-9.659258e-01	-2.588190e-01	307.240833	132.078214	1	0.00	30.00	17
2024-06-25	18	395.67	0	True	5.980581	0.029881	18	25	1	6	-1.000000e+00	-1.836970e-16	305.552917	130.609456	1	0.00	11.48	17
2024-06-25	19	393.75	0	True	5.975716	-0.004853	19	25	1	6	-9.659258e-01	2.588190e-01	303.615417	128.857592	1	1.92	0.00	17
2024-06-25	20	390.96	0	True	5.968605	-0.007086	20	25	1	6	-8.660254e-01	5.000000e-01	301.938750	127.378620	1	2.79	0.00	17
2024-06-25	21	374.35	0	True	5.925191	-0.042485	21	25	1	6	-7.071068e-01	7.071068e-01	300.347500	126.169689	1	16.61	0.00	17
2024-06-25	22	381.94	0	True	5.945264	0.020275	22	25	1	6	-5.000000e-01	-8.660254e-01	299.088750	125.152375	1	0.00	7.59	17
2024-06-25	23	381.70	0	True	5.944635	-0.000628	23	25	1	6	-2.588190e-01	-9.659258e-01	297.429167	123.713967	1	0.24	0.00	17
2024-06-26	0	415.04	0	True	6.028375	0.087346	0	26	2	6	0.000000e+00	1.000000e+00	297.574583	123.855909	2	0.00	33.34	16
2024-06-26	1	409.55	0	True	6.015059	-0.013228	1	26	2	6	2.588190e-01	9.659258e-01	297.397083	123.685022	2	5.49	0.00	16
2024-06-26	2	401.63	0	True	5.995531	-0.019338	2	26	2	6	5.000000e-01	8.660254e-01	297.057500	123.373851	2	7.92	0.00	17
2024-06-26	3	391.01	0	True	5.968733	-0.026442	3	26	2	6	7.071068e-01	7.071068e-01	296.624167	123.009117	2	10.62	0.00	17
2024-06-26	4	394.77	0	True	5.978303	0.009616	4	26	2	6	8.660254e-01	5.000000e-01	296.179583	122.617390	2	0.00	3.76	17
2024-06-26	5	385.84	0	True	5.955423	-0.022621	5	26	2	6	9.659258e-01	2.588190e-01	295.840417	122.346064	2	8.93	0.00	17
2024-06-26	6	206.20	0	True	5.328847	-0.465582	6	26	2	6	1.000000e+00	6.123234e-17	291.781667	123.685531	2	179.64	0.00	20
2024-06-26	7	58.98	0	True	4.077198	-0.713967	7	26	2	6	9.659258e-01	-2.588190e-01	289.253750	127.904598	2	147.22	0.00	19
2024-06-26	8	-13.37	0	True	4.077198	-1.226687	8	26	2	6	8.660254e-01	-5.000000e-01	283.562500	138.235313	2	72.35	0.00	22
2024-06-26	9	-80.00	0	True	4.077198	4.983545	9	26	2	6	7.071068e-01	-7.071068e-01	276.115000	152.685270	2	66.63	0.00	24
2024-06-26	10	17.79	0	True	2.878637	-1.222375	10	26	2	6	5.000000e-01	-8.660254e-01	271.427083	158.955362	2	0.00	97.79	24
2024-06-26	11	102.41	0	True	4.628984	4.756605	11	26	2	6	2.588190e-01	-9.659258e-01	269.331250	160.908314	2	0.00	84.62	24
2024-06-26	12	114.59	0	True	4.741361	0.118934	12	26	2	6	1.224647e-16	-1.000000e+00	270.119583	160.064645	2	0.00	12.18	21
2024-06-26	13	269.13	0	True	5.595195	1.348634	13	26	2	6	-2.588190e-01	-9.659258e-01	274.473750	158.483821	2	0.00	154.54	21
2024-06-26	14	257.75	0	True	5.551990	-0.042284	14	26	2	6	-5.000000e-01	-8.660254e-01	277.613750	157.322354	2	11.38	0.00	22
2024-06-26	15	326.19	0	True	5.787480	0.265529	15	26	2	6	-7.071068e-01	-7.071068e-01	279.760833	157.631618	2	0.00	68.44	22
2024-06-26	16	379.60	0	True	5.939118	0.163739	16	26	2	6	-8.660254e-01	-5.000000e-01	280.819583	158.237435	2	0.00	53.41	22
2024-06-26	17	387.76	0	True	5.960387	0.021496	17	26	2	6	-9.659258e-01	-2.588190e-01	280.968333	158.340477	2	0.00	8.16	22
2024-06-26	18	388.16	0	True	5.961418	0.001032	18	26	2	6	-1.836970e-16	-1.000000e+00	280.655417	158.111200	2	0.00	0.40	22

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-06-26	19	386.87	0	True	5.958089	-0.003323	19	26	2	6	-9.659258e-01	2.588190e-01	280.368750	157.903337	2	1.29	0.00	22
2024-06-26	20	365.54	0	True	5.901376	-0.055135	20	26	2	6	-8.660254e-01	5.000000e-01	279.309583	157.213018	2	21.33	0.00	22
2024-06-26	21	343.25	0	True	5.838459	-0.060978	21	26	2	6	-7.071068e-01	7.071068e-01	278.013750	156.522238	2	22.29	0.00	23
2024-06-26	22	357.43	0	True	5.878940	0.041311	22	26	2	6	-5.000000e-01	8.660254e-01	276.992500	155.893372	2	0.00	14.18	23
2024-06-26	23	371.52	0	True	5.917603	0.039420	23	26	2	6	-2.588190e-01	9.659258e-01	276.568333	155.609680	2	0.00	14.09	23
2024-06-27	0	368.62	0	True	5.909766	-0.007806	0	27	3	6	0.000000e+00	1.000000e+00	274.634167	154.094817	3	2.90	0.00	23
2024-06-27	1	365.59	0	True	5.901512	-0.008220	1	27	3	6	2.588190e-01	9.659258e-01	272.802500	152.676136	3	3.03	0.00	23
2024-06-27	2	366.65	0	True	5.904408	0.002899	2	27	3	6	5.000000e-01	8.660254e-01	271.345000	151.555686	3	0.00	1.06	22
2024-06-27	3	362.77	0	True	5.893769	-0.010582	3	27	3	6	7.071068e-01	7.071068e-01	270.168333	150.693396	3	3.88	0.00	22
2024-06-27	4	368.52	0	True	5.909495	0.015850	4	27	3	6	8.660254e-01	5.000000e-01	269.074583	149.842563	3	0.00	5.75	22
2024-06-27	5	357.30	0	True	5.878576	-0.030446	5	27	3	6	9.659258e-01	2.588190e-01	267.885417	148.986413	3	11.22	0.00	22
2024-06-27	6	206.62	0	True	5.330881	-0.421718	6	27	3	6	1.000000e+00	6.123234e-17	267.902917	148.978876	3	150.68	0.00	21
2024-06-27	7	-56.68	0	True	5.330881	-1.274320	7	27	3	6	9.659258e-01	-2.588190e-01	263.083750	157.649326	3	263.30	0.00	26
2024-06-27	8	67.12	0	True	4.206482	-2.184192	8	27	3	6	8.660254e-01	-5.000000e-01	266.437500	152.277107	3	0.00	123.80	23
2024-06-27	9	-80.00	0	True	4.206482	-2.191895	9	27	3	6	7.071068e-01	-7.071068e-01	266.437500	152.277107	3	147.12	0.00	26
2024-06-27	10	-5.81	0	True	4.206482	-0.927375	10	27	3	6	5.000000e-01	-8.660254e-01	265.454167	154.018804	3	0.00	74.19	26
2024-06-27	11	123.37	0	True	4.815188	-22.234079	11	27	3	6	2.588190e-01	-9.659258e-01	266.327500	153.110847	3	0.00	129.18	26
2024-06-27	12	109.05	0	True	4.691806	-0.116074	12	27	3	6	1.224647e-16	-1.000000e+00	266.096667	153.353539	3	14.32	0.00	27
2024-06-27	13	147.72	0	True	4.995319	0.354608	13	27	3	6	-2.588190e-01	-9.659258e-01	261.037917	155.240030	3	0.00	38.67	27
2024-06-27	14	99.73	0	True	4.602467	-0.324871	14	27	3	6	-5.000000e-01	-8.660254e-01	254.453750	158.698065	3	47.99	0.00	28
2024-06-27	15	209.56	0	True	5.345010	1.101273	15	27	3	6	-7.071068e-01	-7.071068e-01	249.594167	158.190766	3	0.00	109.83	28
2024-06-27	16	330.84	0	True	5.801635	0.578736	16	27	3	6	-8.660254e-01	-5.000000e-01	247.562500	156.755089	3	0.00	121.28	28
2024-06-27	17	376.37	0	True	5.930573	0.137619	17	27	3	6	-9.659258e-01	-2.588190e-01	247.087917	156.328842	3	0.00	45.53	28
2024-06-27	18	389.27	0	True	5.964273	0.034275	18	27	3	6	-1.000000e+00	-1.836970e-16	247.134167	156.372551	3	0.00	12.90	28
2024-06-27	19	385.13	0	True	5.953581	-0.010635	19	27	3	6	-9.659258e-01	-2.588190e-01	247.061667	156.305337	3	4.14	0.00	28
2024-06-27	20	374.52	0	True	5.925645	-0.027549	20	27	3	6	-8.660254e-01	-5.000000e-01	247.435833	156.611731	3	10.61	0.00	28
2024-06-27	21	360.68	0	True	5.887991	-0.036954	21	27	3	6	-7.071068e-01	-7.071068e-01	248.162083	157.114970	3	13.84	0.00	28
2024-06-27	22	376.09	0	True	5.929828	0.042725	22	27	3	6	-5.000000e-01	-8.660254e-01	248.939583	157.724193	3	0.00	15.41	28
2024-06-27	23	389.72	0	True	5.965429	0.036241	23	27	3	6	-2.588190e-01	-9.659258e-01	249.697917	158.381563	3	0.00	13.63	28
2024-06-28	0	449.97	0	True	6.109181	0.154598	0	28	4	6	0.000000e+00	1.000000e+00	253.087500	161.869413	4	0.00	60.25	27
2024-06-28	1	437.64	0	True	6.081397	-0.027402	1	28	4	6	2.588190e-01	9.659258e-01	256.089583	164.690192	4	12.33	0.00	28
2024-06-28	2	422.25	0	True	6.045598	-0.035166	2	28	4	6	5.000000e-01	8.660254e-01	258.406250	166.691936	4	15.39	0.00	28
2024-06-28	3	412.65	0	True	6.022600	-0.022735	3	28	4	6	7.071068e-01	7.071068e-01	260.484583	168.352414	4	9.60	0.00	29
2024-06-28	4	417.58	0	True	6.034476	0.011947	4	28	4	6	8.660254e-01	5.000000e-01	262.528750	170.010913	4	0.00	4.93	29
2024-06-28	5	403.75	0	True	6.000796	-0.033119	5	28	4	6	9.659258e-01	2.588190e-01	264.464167	171.395461	4	13.83	0.00	29
2024-06-28	6	256.66	0	True	5.547752	-0.364310	6	28	4	6	1.000000e+00	6.123234e-17	266.549167	170.965026	4	147.09	0.00	29
2024-06-28	7	92.49	0	True	4.527101	-0.639640	7	28	4	6	9.659258e-01	-2.588190e-01	272.764583	161.131902	4	164.17	0.00	25
2024-06-28	8	140.80	0	True	4.947340	0.522327	8	28	4	6	8.660254e-01	-5.000000e-01	275.834583	157.709009	4	0.00	48.31	25
2024-06-28	9	-52.34	0	True	4.947340	-1.371733	9	28	4	6	7.071068e-01	-7.071068e-01	276.987083	155.074660	4	193.14	0.00	26
2024-06-28	10	93.54	0	True	4.538389	-2.787161	10	28	4	6	5.000000e-01	-8.660254e-01	281.126667	148.378896	4	0.00	145.88	26
2024-06-28	11	280.91	0	True	5.638034	2.003100	11	28	4	6	2.588190e-01	-9.659258e-01	287.690833	144.531265	4	0.00	187.37	26
2024-06-28	12	297.42	0	True	5.695145	0.058773	12	28	4	6	1.224647e-16	-1.000000e+00	295.539583	139.433205	4	0.00	16.51	26
2024-06-28	13	367.62	0	True	5.907050	0.236030	13	28	4	6	-2.588190e-01	-9.659258e-01	304.702083	136.491337	4	0.00	70.20	26
2024-06-28	14	378.26	0	True	5.935582	0.028943	14	28	4	6	-5.000000e-01	-8.660254e-01	316.307500	129.991991	4	0.00	10.64	24

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-06-28	15	402.42	0	True	5.997496	0.063871	15	28	4	6	-7.071068e-01	-7.071068e-01	324.343333	129.063963	4	0.00	24.16	24
2024-06-28	16	432.09	0	True	6.068634	0.073729	16	28	4	6	-8.660254e-01	-5.000000e-01	328.562083	130.926903	4	0.00	29.67	24
2024-06-28	17	450.85	0	True	6.111135	0.043417	17	28	4	6	-9.659258e-01	-2.588190e-01	331.665417	132.976010	4	0.00	18.76	24
2024-06-28	18	441.50	0	True	6.090178	-0.020739	18	28	4	6	-1.000000e+00	-1.836970e-16	333.841667	134.379722	4	9.35	0.00	24
2024-06-28	19	424.68	0	True	6.051336	-0.038097	19	28	4	6	-9.659258e-01	2.588190e-01	335.489583	135.275542	4	16.82	0.00	25
2024-06-28	20	413.52	0	True	6.024706	-0.026279	20	28	4	6	-8.660254e-01	5.000000e-01	337.114583	135.997100	4	11.16	0.00	25
2024-06-28	21	401.99	0	True	5.996427	-0.027883	21	28	4	6	-7.071068e-01	7.071068e-01	338.835833	136.568544	4	11.53	0.00	25
2024-06-28	22	452.36	0	True	6.114478	0.125302	22	28	4	6	-5.000000e-01	8.660254e-01	342.013750	138.348917	4	0.00	50.37	25
2024-06-28	23	496.66	0	True	6.207906	0.097931	23	28	4	6	-2.588190e-01	9.659258e-01	346.469583	141.635294	4	0.00	44.30	25
2024-06-29	0	425.84	1	False	6.054064	-0.142593	0	29	5	6	0.000000e+00	1.000000e+00	345.464167	140.952638	5	70.82	0.00	28
2024-06-29	1	413.04	1	False	6.023544	-0.030058	1	29	5	6	2.588190e-01	9.659258e-01	344.439167	140.341316	5	12.80	0.00	28
2024-06-29	2	403.11	1	False	5.999209	-0.024041	2	29	5	6	5.000000e-01	8.660254e-01	343.641667	139.933716	5	9.93	0.00	27
2024-06-29	3	396.13	1	False	5.981742	-0.017315	3	29	5	6	7.071068e-01	7.071068e-01	342.953333	139.619785	5	6.98	0.00	27
2024-06-29	4	397.35	1	False	5.984818	0.003080	4	29	5	6	8.660254e-01	5.000000e-01	342.110417	139.210123	5	0.00	1.22	27
2024-06-29	5	388.95	1	False	5.963451	-0.021140	5	29	5	6	9.659258e-01	2.588190e-01	341.493750	138.957755	5	8.40	0.00	27
2024-06-29	6	336.60	1	False	5.818895	-0.134593	6	29	5	6	1.000000e+00	6.123234e-17	344.824583	137.789039	5	52.35	0.00	23
2024-06-29	7	321.03	1	False	5.771535	-0.046257	7	29	5	6	9.659258e-01	-2.588190e-01	354.347083	127.072559	5	15.57	0.00	17
2024-06-29	8	370.23	1	False	5.914124	0.153257	8	29	5	6	8.660254e-01	-5.000000e-01	363.906667	118.660580	5	0.00	49.20	17
2024-06-29	9	378.05	1	False	5.935026	0.021122	9	29	5	6	7.071068e-01	-7.071068e-01	381.839583	78.869254	5	0.00	7.82	9.4
2024-06-29	10	422.15	1	False	6.045361	0.116651	10	29	5	6	5.000000e-01	-8.660254e-01	395.531667	49.815829	5	0.00	44.10	9.4
2024-06-29	11	468.95	1	False	6.150496	0.110861	11	29	5	6	2.588190e-01	-9.659258e-01	403.366667	45.614652	5	0.00	46.80	9.4
2024-06-29	12	465.36	1	False	6.142811	-0.007655	12	29	5	6	1.224647e-16	-1.000000e+00	410.364167	41.336023	5	3.59	0.00	9.5
2024-06-29	13	559.56	1	False	6.327151	0.202424	13	29	5	6	-2.588190e-01	-9.659258e-01	418.361667	50.301970	5	0.00	94.20	9.5
2024-06-29	14	449.83	1	False	6.108870	-0.196101	14	29	5	6	-5.000000e-01	-8.660254e-01	421.343750	49.941406	5	109.73	0.00	14
2024-06-29	15	411.97	1	False	6.020951	-0.084165	15	29	5	6	-7.071068e-01	-7.071068e-01	421.741667	49.821975	5	37.86	0.00	15
2024-06-29	16	404.24	1	False	6.002009	-0.018764	16	29	5	6	-8.660254e-01	-5.000000e-01	420.581250	49.894748	5	7.73	0.00	16
2024-06-29	17	396.32	1	False	5.982222	-0.019592	17	29	5	6	-9.659258e-01	-2.588190e-01	418.309167	49.697647	5	7.92	0.00	16
2024-06-29	18	396.76	1	False	5.983332	0.001110	18	29	5	6	-1.000000e+00	-1.836970e-16	416.445000	49.628988	5	0.00	0.44	15
2024-06-29	19	404.75	1	False	6.003270	0.020138	19	29	5	6	-9.659258e-01	2.588190e-01	415.614583	49.651939	5	0.00	7.99	15
2024-06-29	20	400.13	1	False	5.991789	-0.011414	20	29	5	6	-8.660254e-01	5.000000e-01	415.056667	49.751627	5	4.62	0.00	14
2024-06-29	21	389.76	1	False	5.965531	-0.025917	21	29	5	6	-7.071068e-01	7.071068e-01	414.547083	49.953505	5	10.37	0.00	14
2024-06-29	22	396.05	1	False	5.981540	0.016138	22	29	5	6	-5.000000e-01	8.660254e-01	412.200833	49.419817	5	0.00	6.29	14
2024-06-29	23	402.02	1	False	5.996502	0.015074	23	29	5	6	-2.588190e-01	9.659258e-01	408.257500	46.048378	5	0.00	5.97	14
2024-06-30	0	444.95	1	False	6.097962	0.106786	0	30	6	6	0.000000e+00	1.000000e+00	409.053750	46.528346	6	0.00	42.93	11
2024-06-30	1	443.23	1	False	6.094089	-0.003866	1	30	6	6	2.588190e-01	9.659258e-01	410.311667	47.046023	6	1.72	0.00	11
2024-06-30	2	424.79	1	False	6.051595	-0.041604	2	30	6	6	5.000000e-01	8.660254e-01	411.215000	47.109827	6	18.44	0.00	11
2024-06-30	3	411.75	1	False	6.020416	-0.030698	3	30	6	6	7.071068e-01	7.071068e-01	411.865833	47.000133	6	13.04	0.00	12
2024-06-30	4	420.27	1	False	6.040897	0.020692	4	30	6	6	8.660254e-01	5.000000e-01	412.820833	46.925157	6	0.00	8.52	12
2024-06-30	5	398.51	1	False	5.987733	-0.051776	5	30	6	6	9.659258e-01	2.588190e-01	413.219167	46.753979	6	21.76	0.00	12
2024-06-30	6	244.40	1	False	5.498806	-0.386716	6	30	6	6	1.000000e+00	6.123234e-17	409.377500	56.164242	6	154.11	0.00	16
2024-06-30	7	27.78	1	False	3.324316	-0.886334	7	30	6	6	9.659258e-01	-2.588190e-01	397.158750	94.817887	6	216.62	0.00	25
2024-06-30	8	-80.00	1	False	3.324316	-3.879770	8	30	6	6	8.660254e-01	-5.000000e-01	378.399167	135.980996	6	107.78	0.00	29
2024-06-30	9	-80.00	1	False	3.324316	0.000000	9	30	6	6	7.071068e-01	-7.071068e-01	359.313750	165.066089	6	0.00	0.00	29
2024-06-30	10	20.67	1	False	3.028683	-1.258375	10	30	6	6	5.000000e-01	-8.660254e-01	342.585417	178.239192	6	0.00	100.67	29

trade_date	trade_hour	price	data_type	is_workday	log_price	returns	hour	day	weekday	month	hour_sin	hour_cos	price_ma24	price_volatility	dayofweek	supply_pressure	demand_pressure	su
2024-06-30	11	151.34	1	False	5.019529	6.321722	11	30	6	6	2.588190e-01	-9.659258e-01	329.351667	180.228774	6	0.00	130.67	29
2024-06-30	12	155.83	1	False	5.048766	0.029668	12	30	6	6	1.224647e-16	1.000000e+00	316.454583	181.145500	6	0.00	4.49	29
2024-06-30	13	228.86	1	False	5.433110	0.468652	13	30	6	6	-2.588190e-01	-9.659258e-01	302.675417	174.297436	6	0.00	73.03	29
2024-06-30	14	230.53	1	False	5.440381	0.007297	14	30	6	6	-5.000000e-01	-8.660254e-01	293.537917	171.980453	6	0.00	1.67	25
2024-06-30	15	316.54	1	False	5.757450	0.373097	15	30	6	6	-7.071068e-01	-7.071068e-01	289.561667	170.217359	6	0.00	86.01	23
2024-06-30	16	392.08	1	False	5.971466	0.238643	16	30	6	6	-8.660254e-01	-5.000000e-01	289.055000	169.878929	6	0.00	75.54	23
2024-06-30	17	434.88	1	False	6.075070	0.109161	17	30	6	6	-9.659258e-01	-2.588190e-01	290.661667	171.115364	6	0.00	42.80	22
2024-06-30	18	449.77	1	False	6.108736	0.034239	18	30	6	6	-1.000000e+00	-1.836970e-16	292.870417	172.877474	6	0.00	14.89	22
2024-06-30	19	454.20	1	False	6.118538	0.009849	19	30	6	6	-9.659258e-01	2.588190e-01	294.930833	174.555409	6	0.00	4.43	22
2024-06-30	20	436.80	1	False	6.079475	-0.038309	20	30	6	6	-8.660254e-01	5.000000e-01	296.458750	175.673184	6	17.40	0.00	23
2024-06-30	21	414.45	1	False	6.026952	-0.051168	21	30	6	6	-7.071068e-01	7.071068e-01	297.487500	176.314438	6	22.35	0.00	23
2024-06-30	22	425.19	1	False	6.052536	0.025914	22	30	6	6	-5.000000e-01	8.660254e-01	298.701667	177.121175	6	0.00	10.74	23
2024-06-30	23	440.14	1	False	6.087093	0.035161	23	30	6	6	-2.588190e-01	9.659258e-01	300.290000	178.255254	6	0.00	14.95	23