

Project # 3: Futureskills

FORECAST DAILY ELECTRICITY PRICES FOR HEDGING - APPLICATION OF ARIMA

Loading of data:

```
data1 = readtable("Electricity_ElectricityPrice.csv")
```

data1 = 3895x7 table

	PriceHub	TradeDate	WtdAvgPrice	Change	DailyVolumeMWh	NumberTrades
1	'ABC'	01/05/2001	125.5000	NaN	800	2
2	'ABC'	01/08/2001	135.5000	10	400	1
3	'ABC'	01/12/2001	175	39.5000	800	1
4	'ABC'	01/19/2001	325	150	400	1
5	'ABC'	01/26/2001	245	-80	400	1
6	'ABC'	02/12/2001	212.5000	-32.5000	800	2
7	'ABC'	02/28/2001	268	55.5000	400	1
8	'ABC'	03/01/2001	242.5000	-25.5000	1600	2
9	'ABC'	03/29/2001	154	-88.5000	1600	2
10	'ABC'	04/19/2001	150	-4	800	1
11	'ABC'	04/30/2001	302.5000	152.5000	800	2
12	'ABC'	05/03/2001	142.5000	-160	1600	2
13	'ABC'	05/04/2001	255	112.5000	1200	3
14	'ABC'	05/07/2001	297	42	2000	5
15	'ABC'	05/08/2001	467.6700	170.6700	1200	3
16	'ABC'	05/09/2001	537.5000	69.8300	1600	4
17	'ABC'	05/10/2001	385	-152.5000	1600	2
18	'ABC'	05/11/2001	415	30	2800	7
19	'ABC'	05/14/2001	219.1700	-195.8300	2400	6
20	'ABC'	05/15/2001	220	0.8300	800	2
21	'ABC'	05/16/2001	167.5000	-52.5000	800	2
22	'ABC'	05/17/2001	141	-26.5000	3200	4
23	'ABC'	05/18/2001	327.5000	186.5000	3200	8
24	'ABC'	05/21/2001	399.4400	71.9400	3600	9
25	'ABC'	05/22/2001	389.5000	-9.9400	4800	6
26	'ABC'	05/23/2001	272.5000	-117	3200	4

	PriceHub	TradeDate	WtdAvgPrice	Change	DailyVolumeMWh	NumberTrades
27	'ABC'	05/25/2001	170	-102.5000	2000	5
28	'ABC'	05/29/2001	130	-40	1200	3
29	'ABC'	05/30/2001	160	30	3200	8
30	'ABC'	05/31/2001	171.6300	11.6300	6400	8
31	'ABC'	06/01/2001	189.2900	17.6600	2800	7
32	'ABC'	06/04/2001	130	-59.2900	400	1
33	'ABC'	06/05/2001	97.3300	-32.6700	1200	3
34	'ABC'	06/06/2001	79.5000	-17.8300	800	2
35	'ABC'	06/07/2001	51.5000	-28	1600	2
36	'ABC'	06/08/2001	75	23.5000	400	1
37	'ABC'	06/11/2001	64.8000	-10.2000	2000	5
38	'ABC'	06/12/2001	63.0400	-1.7600	5200	13
39	'ABC'	06/13/2001	65.8300	2.7900	2400	6
40	'ABC'	06/14/2001	44.5000	-21.3300	1600	2
41	'ABC'	06/15/2001	69.5000	25	2400	6
42	'ABC'	06/18/2001	130	60.5000	400	1
43	'ABC'	06/20/2001	90	-40	400	1
44	'ABC'	06/21/2001	82.5000	-7.5000	1600	2
45	'ABC'	06/22/2001	83.3300	0.8300	1200	3
46	'ABC'	06/25/2001	55.3600	-27.9700	4400	11
47	'ABC'	06/26/2001	49.2000	-6.1600	2000	5
48	'ABC'	06/27/2001	55.8000	6.6000	2000	5
49	'ABC'	06/28/2001	52	-3.8000	8000	10
50	'ABC'	06/29/2001	92	40	1200	3
51	'ABC'	07/02/2001	91.7500	-0.2500	800	2
52	'ABC'	07/05/2001	91.7500	0	800	1
53	'ABC'	07/06/2001	85.6700	-6.0800	1200	3
54	'ABC'	07/09/2001	76.5000	-9.1700	1600	4
55	'ABC'	07/10/2001	71.5000	-5	800	2
56	'ABC'	07/11/2001	58.5000	-13	800	2
57	'ABC'	07/12/2001	49	-9.5000	1600	2
58	'ABC'	07/13/2001	55.3900	6.3900	2800	7
59	'ABC'	07/16/2001	54.7500	-0.6400	2400	6

	PriceHub	TradeDate	WtdAvgPrice	Change	DailyVolumeMWh	NumberTrades
60	'ABC'	07/17/2001	46.2800	-8.4700	3200	8
61	'ABC'	07/18/2001	42.0900	-4.2000	5600	14
62	'ABC'	07/19/2001	39.6000	-2.4900	4000	5
63	'ABC'	07/20/2001	58	18.4000	400	1
64	'ABC'	07/23/2001	72.3300	14.3300	1200	3
65	'ABC'	07/24/2001	63.2800	-9.0500	3200	7
66	'ABC'	07/25/2001	65.2000	1.9200	2000	5
67	'ABC'	07/26/2001	64.8800	-0.3300	6400	8
68	'ABC'	07/27/2001	65.6800	0.8100	4400	11
69	'ABC'	07/30/2001	55.3300	-10.3500	2400	6
70	'ABC'	07/31/2001	51.2500	-4.0800	4800	12
71	'ABC'	08/01/2001	57.4500	6.2000	2000	5
72	'ABC'	08/02/2001	51.1000	-6.3500	4000	5
73	'ABC'	08/03/2001	76	24.9000	5200	13
74	'ABC'	08/06/2001	71.4600	-4.5400	5200	13
75	'ABC'	08/07/2001	73	1.5400	6000	15
76	'ABC'	08/08/2001	72.3800	-0.6200	7600	19
77	'ABC'	08/09/2001	58.9400	-13.4400	7200	9
78	'ABC'	08/10/2001	59.4800	0.5400	5600	14
79	'ABC'	08/13/2001	51.6100	-7.8800	7600	19
80	'ABC'	08/14/2001	50.1600	-1.4400	5600	14
81	'ABC'	08/15/2001	48.8100	-1.3500	6400	16
82	'ABC'	08/16/2001	49.3300	0.5200	7200	9
83	'ABC'	08/17/2001	52.5000	3.1700	4000	10
84	'ABC'	08/20/2001	46.2000	-6.3000	5600	14
85	'ABC'	08/21/2001	42.3100	-3.8900	6000	15
86	'ABC'	08/22/2001	40.7800	-1.5300	3600	9
87	'ABC'	08/23/2001	39.2800	-1.5000	16000	19
88	'ABC'	08/24/2001	49.0400	9.7700	6400	16
89	'ABC'	08/27/2001	57.1200	8.0800	10000	25
90	'ABC'	08/28/2001	46.3700	-10.7500	6800	17
91	'ABC'	08/29/2001	35.9700	-10.4000	14400	18
92	'ABC'	08/30/2001	28.5600	-7.4100	3600	9

	PriceHub	TradeDate	WtdAvgPrice	Change	DailyVolumeMWh	NumberTrades
93	'ABC'	08/31/2001	33.0700	4.5100	4400	11
94	'ABC'	09/04/2001	34.1300	1.0600	8400	21
95	'ABC'	09/05/2001	33.5100	-0.6200	6800	17
96	'ABC'	09/06/2001	31.5100	-1.9900	7200	9
97	'ABC'	09/07/2001	33.1700	1.6500	5200	13
98	'ABC'	09/10/2001	32.9100	-0.2600	6000	15
99	'ABC'	09/11/2001	32.8500	-0.0600	7200	18
100	'ABC'	09/12/2001	31.9200	-0.9300	7200	18

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Creation and plotting of time-series object:

```
trade_date = datenum(data1.TradeDate);
time_series = timeseries(data1.WtdAvgPrice, trade_date)
```

timeseries

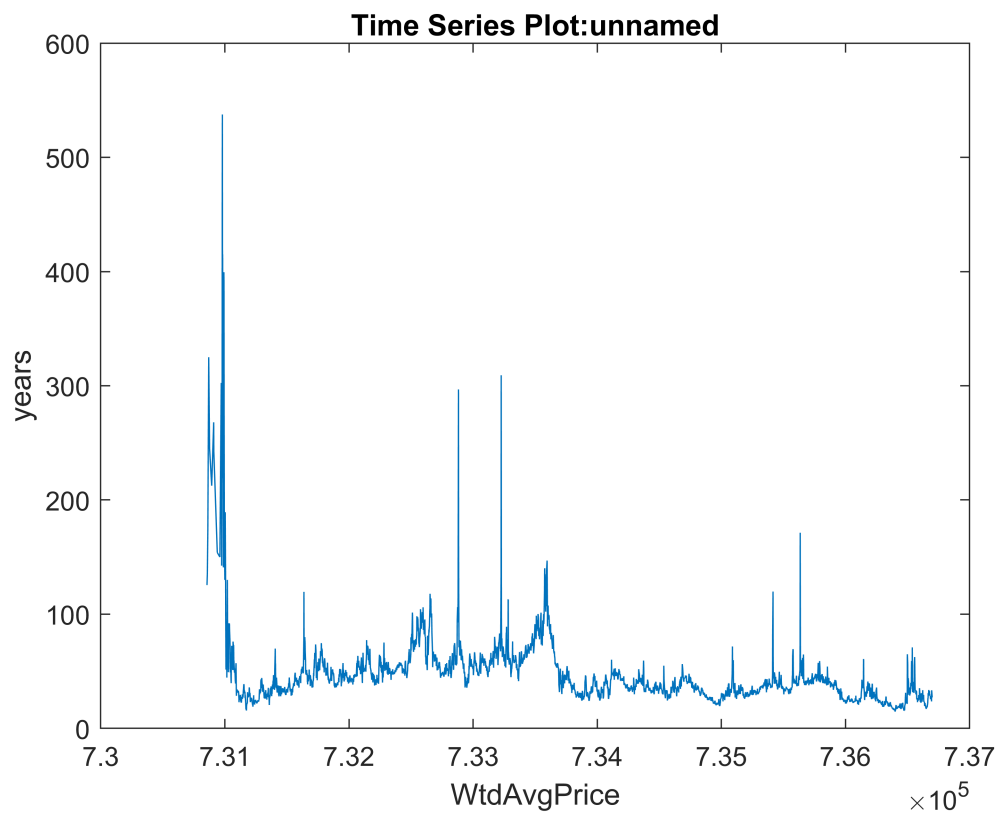
Timeseries contains duplicate times.

Common Properties:

```
    Name: 'unnamed'
    Time: [3895x1 double]
    TimeInfo: [1x1 tsdata.timemetadata]
    Data: [3895x1 double]
    DataInfo: [1x1 tsdata.datametadata]
```

More properties, Methods

```
plot(time_series)
xlabel("WtdAvgPrice");
ylabel("years");
```

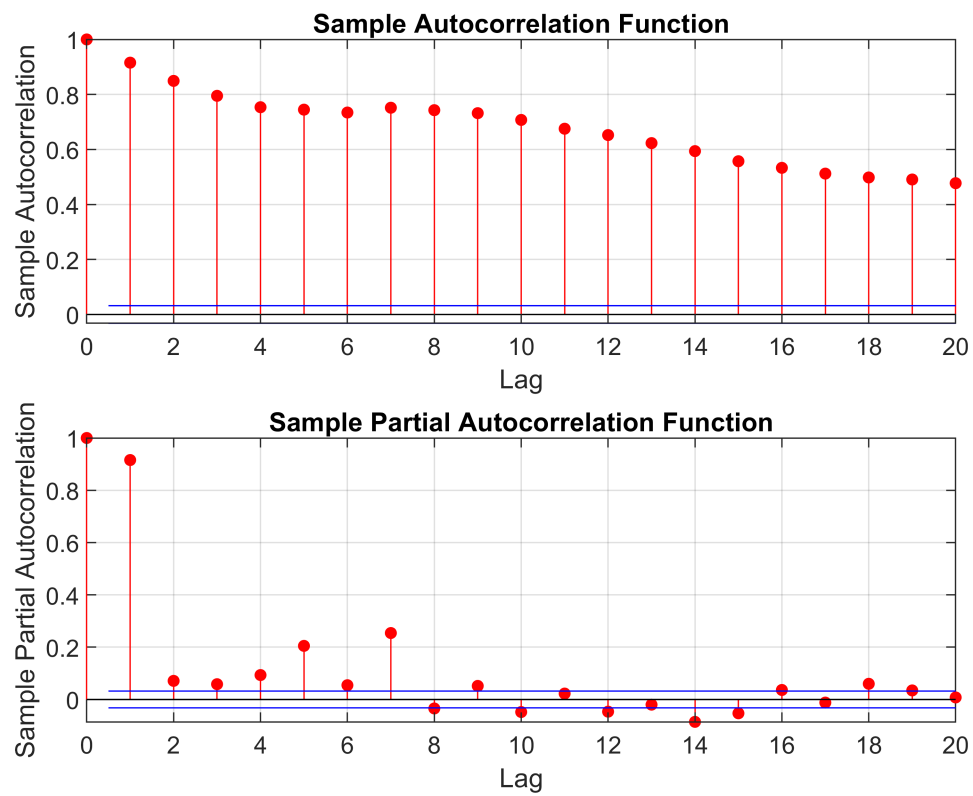


Check for Stationarity, Plot and interpret ACF and PACF plots to identify AR and MA orders

```
st_test = adftest(data1.WtdAvgPrice)
```

```
st_test = logical  
1
```

```
subplot(2,1,1)  
autocorr(data1.WtdAvgPrice)  
subplot(2,1,2)  
parcorr(data1.WtdAvgPrice)
```



Fitting arima model was done using the econometrics toolbox.