Import data from text file

Script for importing data from the following text file:

```
filename: C:\Users\keski\OneDrive\Masaüstü\Rüzgar Projesi\T1.csv
```

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Set up the Import Options and import the data

```
opts = delimitedTextImportOptions("NumVariables", 5, "Encoding", "UTF-8");

% Specify range and delimiter
opts.DataLines = [2, Inf];
opts.Delimiter = ",";

% Specify column names and types
opts.VariableNames = ["Date_Time", "LVActivePower_kW_", "WindSpeed_m_s_",
"Theoretical_Power_Curve_KWh_", "WindDirection___"];
opts.VariableTypes = ["string", "double", "double", "double", "double"];

% Specify file level properties
opts.ExtraColumnsRule = "ignore";
opts.EmptyLineRule = "read";

% Specify variable properties
opts = setvaropts(opts, "Date_Time", "WhitespaceRule", "preserve");
opts = setvaropts(opts, "Date_Time", "EmptyFieldRule", "auto");

% Import the data
T1 = readtable("C:\Users\keski\OneDrive\Masaüstü\Rüzgar Projesi\T1.csv", opts)
```

```
T1 = 50530×5 table
```

...

	Date_Time	LVActivePower_kW_	WindSpeed_m_s_
1	"01 01 2018 00:00"	380.0478	5.3113
2	"01 01 2018 00:10"	453.7692	5.6722
3	"01 01 2018 00:20"	306.3766	5.2160
4	"01 01 2018 00:30"	419.6459	5.6597
5	"01 01 2018 00:40"	380.6507	5.5779
6	"01 01 2018 00:50"	402.3920	5.6041
7	"01 01 2018 01:00"	447.6057	5.7930
8	"01 01 2018 01:10"	387.2422	5.3060
9	"01 01 2018 01:20"	463.6512	5.5846
10	"01 01 2018 01:30"	439.7257	5.5232
11	"01 01 2018 01:40"	498.1817	5.7241

	Date_Time	LVActivePower_kW_	WindSpeed_m_s_
12	"01 01 2018 01:50"	526.8162	5.9342
13	"01 01 2018 02:00"	710.5873	6.5474
14	"01 01 2018 02:10"	655.1943	6.1997
15	"01 01 2018 02:20"	754.7625	6.5054
16	"01 01 2018 02:30"	790.1733	6.6341
17	"01 01 2018 02:40"	742.9853	6.3789
18	"01 01 2018 02:50"	748.2296	6.4467
19	"01 01 2018 03:00"	736.6478	6.4151
20	"01 01 2018 03:10"	787.2462	6.4375
21	"01 01 2018 03:20"	722.8641	6.2200
22	"01 01 2018 03:30"	935.0334	6.8980
23	"01 01 2018 03:40"	1.2206e+03	7.6097
24	"01 01 2018 03:50"	1.0538e+03	7.2884
25	"01 01 2018 04:00"	1.4938e+03	7.9431
26	"01 01 2018 04:10"	1.7245e+03	8.3762
27	"01 01 2018 04:20"	1.6369e+03	8.2370
28	"01 01 2018 04:30"	1.3855e+03	7.8796
29	"01 01 2018 04:40"	1.0989e+03	7.1014
30	"01 01 2018 04:50"	1.0215e+03	6.9553
31	"01 01 2018 05:00"	1.1649e+03	7.0983
32	"01 01 2018 05:10"	1.0733e+03	6.9536
33	"01 01 2018 05:20"	1.1653e+03	7.2496
34	"01 01 2018 05:30"	1.1780e+03	7.2947
35	"01 01 2018 05:40"	1.1705e+03	7.3764
36	"01 01 2018 05:50"	1.1455e+03	7.4486
37	"01 01 2018 06:00"	1.1140e+03	7.2393
38	"01 01 2018 06:10"	1.1532e+03	7.3292
39	"01 01 2018 06:20"	1.1253e+03	7.1397
40	"01 01 2018 06:30"	1.2287e+03	7.4742
41	"01 01 2018 06:40"	1.0218e+03	7.0332
42	"01 01 2018 06:50"	957.3782	6.8865
43	"01 01 2018 07:00"	909.8878	6.8878
44	"01 01 2018 07:10"	1.0010e+03	7.2164

	Date_Time	LVActivePower_kW_	WindSpeed_m_s_
45	"01 01 2018 07:20"	1.0245e+03	7.0686
46	"01 01 2018 07:30"	1.0095e+03	6.9383
47	"01 01 2018 07:40"	899.4930	6.5367
48	"01 01 2018 07:50"	725.1101	6.1806
49	"01 01 2018 08:00"	585.2594	5.8168
50	"01 01 2018 08:10"	443.9139	5.4502
51	"01 01 2018 08:20"	565.2538	5.8181
52	"01 01 2018 08:30"	644.0378	6.1303
53	"01 01 2018 08:40"	712.0589	6.3471
54	"01 01 2018 08:50"	737.3948	6.3474
55	"01 01 2018 09:00"	725.8681	6.1944
56	"01 01 2018 09:10"	408.9974	4.9772
57	"01 01 2018 09:20"	628.4368	5.9591
58	"01 01 2018 09:30"	716.1006	6.2114
59	"01 01 2018 09:40"	711.4956	6.1115
60	"01 01 2018 09:50"	838.1519	6.4563
61	"01 01 2018 10:00"	881.0621	6.6667
62	"01 01 2018 10:10"	663.7031	6.1629
63	"01 01 2018 10:20"	578.2616	6.0132
64	"01 01 2018 10:30"	465.6201	5.5612
65	"01 01 2018 10:40"	311.0509	4.9607
66	"01 01 2018 10:50"	230.0555	4.6039
67	"01 01 2018 11:00"	233.9906	4.5545
68	"01 01 2018 11:10"	175.5922	4.2636
69	"01 01 2018 11:20"	118.1331	3.8941
70	"01 01 2018 11:30"	142.2025	4.0388
71	"01 01 2018 11:40"	212.5662	4.5057
72	"01 01 2018 11:50"	222.6100	4.5434
73	"01 01 2018 12:00"	194.1812	4.3238
74	"01 01 2018 12:10"	82.6407	3.6344
75	"01 01 2018 12:20"	75.8952	3.7055
76	"01 01 2018 12:30"	41.9472	3.2540
77	"01 01 2018 12:40"	118.5346	3.7751

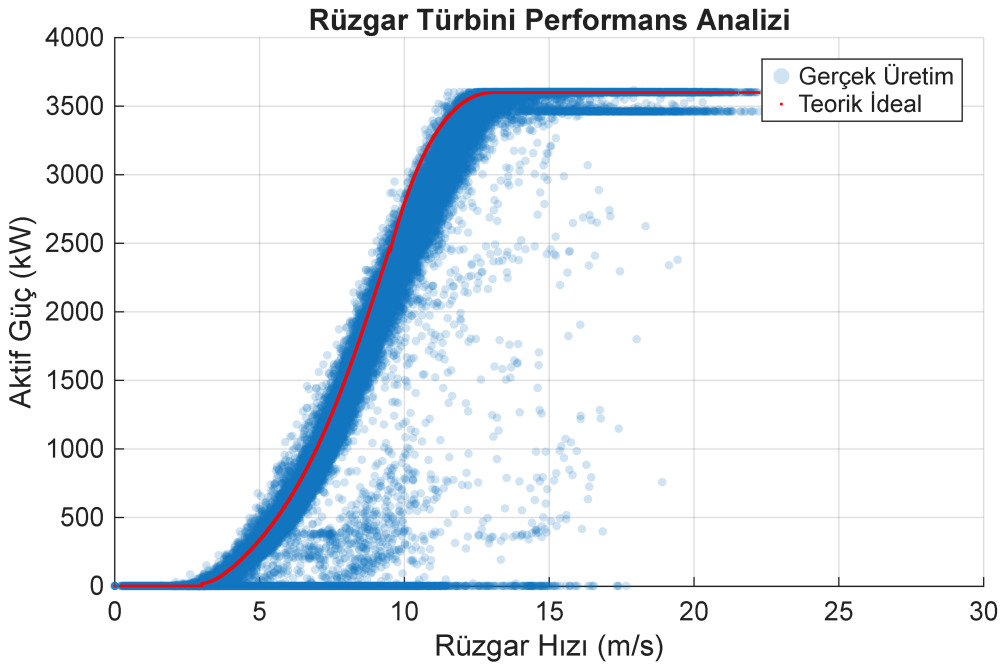
	Date_Time	LVActivePower_kW_	WindSpeed_m_s_
78	"01 01 2018 12:50"	250.7559	4.6935
79	"01 01 2018 13:00"	346.8644	5.0029
80	"01 01 2018 13:10"	416.4179	5.3647
81	"01 01 2018 13:20"	331.9415	5.0162
82	"01 01 2018 13:30"	583.4799	5.9704
83	"01 01 2018 13:40"	776.5527	6.6555
84	"01 01 2018 13:50"	752.7264	6.6009
85	"01 01 2018 14:00"	589.0731	5.9814
86	"01 01 2018 14:10"	1.1091e+03	7.4246
87	"01 01 2018 14:20"	1.4825e+03	8.1865
88	"01 01 2018 14:30"	1.5234e+03	8.2749
89	"01 01 2018 14:40"	1.5722e+03	8.4492
90	"01 01 2018 14:50"	1.6989e+03	8.5760
91	"01 01 2018 15:00"	1.6168e+03	8.2823
92	"01 01 2018 15:10"	1.7968e+03	8.7346
93	"01 01 2018 15:20"	1.8859e+03	8.7641
94	"01 01 2018 15:30"	2.3275e+03	9.6694
95	"01 01 2018 15:40"	2.4992e+03	10.1411
96	"01 01 2018 15:50"	2.8205e+03	10.7724
97	"01 01 2018 16:00"	2.8123e+03	10.6475
98	"01 01 2018 16:10"	2.5304e+03	9.9827
99	"01 01 2018 16:20"	2.3991e+03	9.8744
100	"01 01 2018 16:30"	2.3356e+03	9.7855

⋮

Clear temporary variables

```
clear opts

%% --- MÜHENDİSLİK ANALİZLERİ BAŞLANGICI ---

% 1. İlk Grafik: Güç Eğrisi (Gerçek vs Teorik)
figure;
scatter(T1.WindSpeed_m_s_, T1.LVActivePower_kW_, 10, 'filled', 'MarkerFaceAlpha',
0.2);
hold on;
plot(T1.WindSpeed_m_s_, T1.Theoretical_Power_Curve_KWh_, 'r.', 'MarkerSize', 2);
```

```
xlabel('Rüzgar Hızı (m/s)'); ylabel('Aktif Güç (kW)');
title('Rüzgar Türbini Performans Analizi');
legend('Gerçek Üretim', 'Teorik İdeal'); grid on;
```




```
% 2. Veri Onarımı (Hocanın Beklediği İnterpolasyon)
% Hatalı (0 veya altı) değerleri temizleyip Spline ile dolduruyoruz
T1.OnarilmisGuc = T1.LVActivePower_kW_;
T1.OnarilmisGuc(T1.OnarilmisGuc <= 0) = NaN;
T1.OnarilmisGuc = fillmissing(T1.OnarilmisGuc, 'spline');
disp('Veri onarımı (Kübik Spline) tamamlandı.');
```

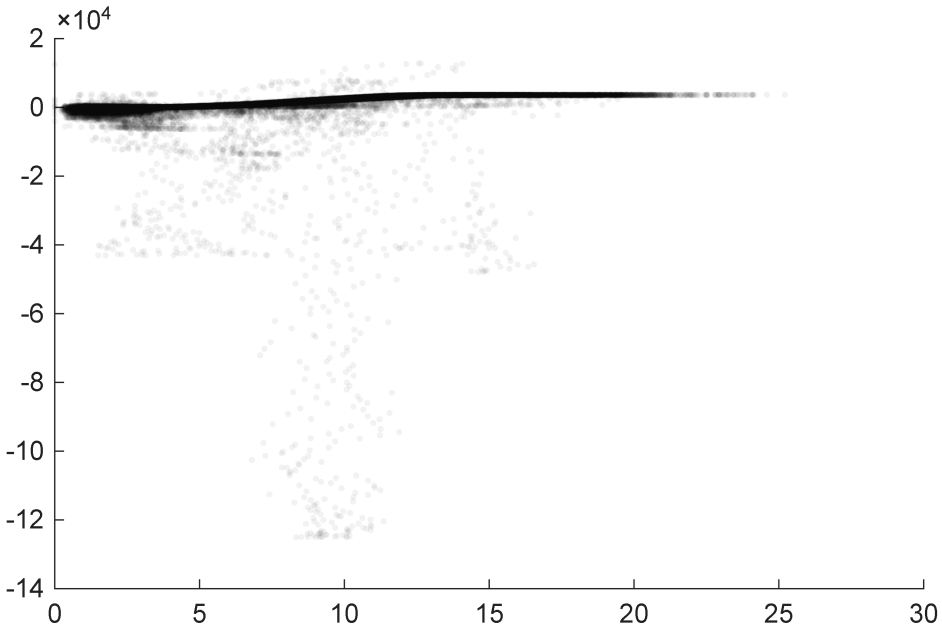
```
Veri onarımı (Kübik Spline) tamamlandı.
```

```
% Hatalı (0 veya negatif) değerleri NaN (boş) yapıp spline ile doldur
T1.OnarilmisGuc = T1.LVActivePower_kW_;
T1.OnarilmisGuc(T1.OnarilmisGuc <= 10) = NaN; % 10 kW altı genelde hatadır
T1.OnarilmisGuc = fillmissing(T1.OnarilmisGuc, 'spline');

disp('Veri onarımı (Kübik Spline) başarıyla tamamlandı.');
```

```
Veri onarımı (Kübik Spline) başarıyla tamamlandı.
```

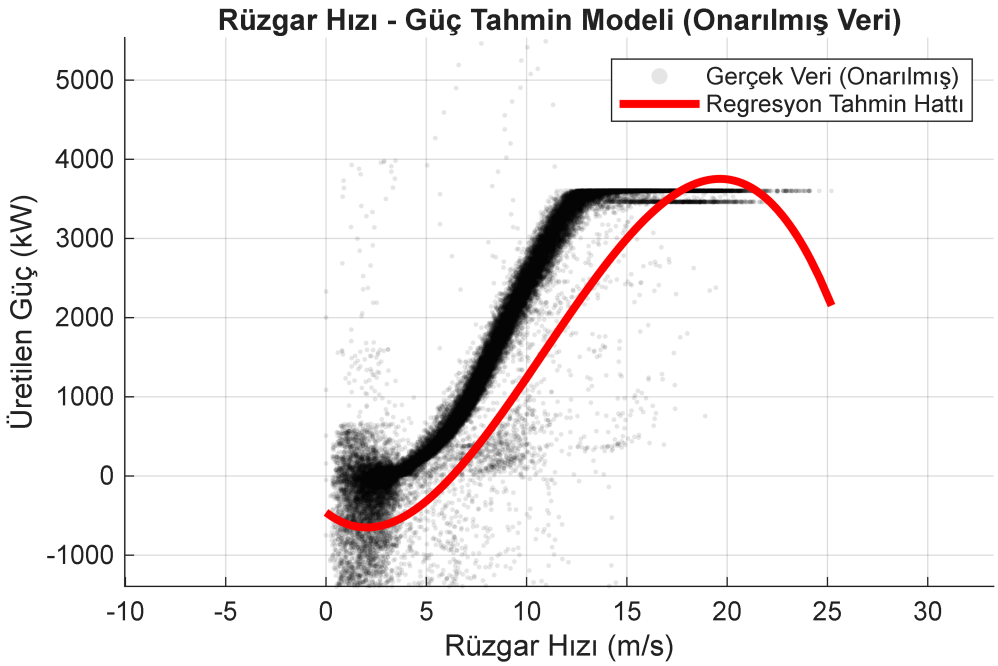
```
% Rüzgar hızına göre güç tahmini yapan 3. derece bir model
p = polyfit(T1.WindSpeed_m_s_, T1.OnarilmisGuc, 3);
tahmin_guc = polyval(p, T1.WindSpeed_m_s_);

% --- GÜNCEL TAHMİN GRAFİĞİ (HATASIZ) ---
figure;
```

```
% Scatter ile şeffaf noktalar çiziyoruz (MarkerAlpha burada çalışır)
scatter(T1.WindSpeed_m_s_, T1.OnarilmisGuc, 5, 'black', 'filled',
'MarkerFaceAlpha', 0.05);
hold on;
```




```
% Tahmin çizgisi için düzgün bir hat oluşturalım
[sirali_hiz, idx] = sort(T1.WindSpeed_m_s_);
sirali_tahmin = tahmin_guc(idx);

% --- GÜNCEL TAHMİN GRAFİĞİ (DAHA NET GÖRÜNÜM) ---
figure;
% Verileri siyah noktalar olarak çizelim
scatter(T1.WindSpeed_m_s_, T1.OnarilmisGuc, 3, 'black', 'filled',
'MarkerFaceAlpha', 0.1);
hold on;

% Kırmızı tahmin çizgisini rüzgar hızına göre sıralayıp çizdirelim
[sirali_hiz, idx] = sort(T1.WindSpeed_m_s_);
sirali_tahmin = tahmin_guc(idx);
plot(sirali_hiz, sirali_tahmin, 'r-', 'LineWidth', 3);

% Grafik sınırlarını veriye göre sabitleyelim (0-25 m/s rüzgar, 0-4000 kW güç)
axis([0 25 0 4000]);

title('Rüzgar Hızı - Güç Tahmin Modeli (Onarılmış Veri)');
xlabel('Rüzgar Hızı (m/s)');
ylabel('Üretilen Güç (kW)');
legend('Gerçek Veri (Onarılmış)', 'Regresyon Tahmin Hattı');
```

```
grid on;
```


Rüzgar Hızı - Güç Tahmin Modeli (Onarılmış Veri)
Gerçek Veri (Onarılmış)
Regresyon Tahmin Hattı
Üretilen Güç (kW)
5000
4000
3000
2000
1000
0
-1000
-10
-5
0
5
10
15
20
25
30
Rüzgar Hızı (m/s)