Datasets y visualización

Importar con readtable y readmatrix

```
%readmatrix
area_mm = readmatrix("..\..\Utils4SP\Datasets\areaMM.txt",'Delimiter','    ')
```

```
area_mm = 1×181
  340.4277  324.3750  308.9114  293.6813  277.8073  261.0772  245.9019  232.8705 ···
```

```
%readtable
PSD_bands = readtable("..\..\Utils4SP\Datasets\2021.10.04_IntensidadBobinas.xlsx")
```

```
PSD_bands = 630×13 table
```

	Dist_cm_	PSD_B1	PSD_B2	PSD_B3	PSD_B4	PSD_B5	PSD_B6	PSD_B7
1	0.5000	0.5480	0.0129	0.0052	0.0046	0.0205	1.1388	0.0107
2	0.5000	0.5042	0.0017	0.0022	0.0024	0.0057	0.5872	0.0015
3	0.5000	0.4539	0.0061	0.0016	0.0049	0.0121	0.5663	0.0060
4	0.5000	0.3205	0.0055	0.0052	0.0017	0.0082	0.6285	0.0053
5	0.5000	0.3859	0.0032	0.0026	0.0024	0.0066	0.5744	0.0035
6	0.5000	0.8591	0.0051	0.0020	0.0019	0.0073	0.6579	0.0061
7	0.5000	0.5021	0.0044	0.0020	0.0018	0.0075	0.5880	0.0027
8	0.5000	0.3402	0.0063	0.0067	0.0062	0.0097	0.5597	0.0118
9	0.5000	0.3661	0.0046	0.0020	0.0049	0.0085	0.5586	0.0043
10	0.5000	0.5464	0.0037	0.0016	0.0024	0.0075	0.5924	0.0011
11	0.5000	0.8342	0.0094	0.0025	0.0071	0.0063	0.9233	0.0042
12	0.5000	0.3870	0.0050	0.0017	0.0033	0.0124	1.1173	0.0029
13	0.5000	0.4425	0.0021	0.0005	0.0013	0.0038	0.6084	0.0020
14	0.5000	0.4923	0.0034	0.0009	0.0022	0.0069	0.5943	0.0012
15	0.5000	0.4754	0.0075	0.0031	0.0016	0.0057	0.6152	0.0041
16	0.5000	0.8079	0.0093	0.0061	0.0068	0.0129	0.5341	0.0059
17	0.5000	0.5346	0.0051	0.0023	0.0059	0.0127	1.1668	0.0032
18	0.5000	0.5067	0.0043	0.0012	0.0030	0.0106	0.5533	0.0025
19	0.5000	0.8112	0.0069	0.0026	0.0027	0.0089	1.0308	0.0035
20	0.5000	0.3734	0.0105	0.0032	0.0030	0.0104	0.5804	0.0105
21	0.5000	0.8587	0.0058	0.0016	0.0038	0.0091	0.5660	0.0061
22	0.5000	0.4835	0.0057	0.0019	0.0041	0.0094	1.1545	0.0046

	Dist_cm_	PSD_B1	PSD_B2	PSD_B3	PSD_B4	PSD_B5	PSD_B6	PSD_B7
23	0.5000	0.8285	0.0040	0.0012	0.0015	0.0032	0.6117	0.0010
24	0.5000	0.3315	0.0088	0.0024	0.0045	0.0142	0.5920	0.0092
25	0.5000	0.3778	0.0022	0.0028	0.0028	0.0095	0.5773	0.0039
26	0.5000	0.8786	0.0069	0.0030	0.0015	0.0057	0.5947	0.0021
27	0.5000	0.3387	0.0133	0.0038	0.0030	0.0119	1.1238	0.0079
28	0.5000	0.3665	0.0025	0.0020	0.0027	0.0069	0.5948	0.0029
29	0.5000	0.4544	0.0034	0.0014	0.0023	0.0062	0.5773	0.0021
30	0.5000	0.4900	0.0041	0.0018	0.0017	0.0069	0.5792	0.0037
31	1	0.2387	0.0014	0.0009	0.0011	0.0017	0.2785	0.0009
32	1	0.2504	0.0021	0.0007	0.0008	0.0035	0.2713	0.0009
33	1	0.1724	0.0040	0.0022	0.0030	0.0066	0.2501	0.0055
34	1	0.1677	0.0011	0.0014	0.0016	0.0042	0.2514	0.0012
35	1	0.2057	0.0011	0.0016	0.0015	0.0040	0.2621	0.0008
36	1	0.2314	0.0013	0.0011	0.0012	0.0034	0.2647	0.0010
37	1	0.1701	0.0088	0.0019	0.0021	0.0092	0.5130	0.0034
38	1	0.1603	0.0028	0.0016	0.0033	0.0030	0.2530	0.0031
39	1	0.1963	0.0016	0.0011	0.0017	0.0030	0.2707	0.0018
40	1	0.2290	0.0011	0.0013	0.0009	0.0018	0.2797	0.0012
41	1	0.3656	0.0020	0.0012	0.0009	0.0034	0.2679	0.0009
42	1	0.3659	0.0026	0.0014	0.0022	0.0062	0.5110	0.0017
43	1	0.2240	0.0018	0.0008	0.0017	0.0035	0.3988	0.0024
44	1	0.2277	0.0014	0.0011	0.0015	0.0030	0.2608	0.0010
45	1	0.2343	0.0016	0.0009	0.0019	0.0019	0.2597	0.0024
46	1	0.1665	0.0036	0.0025	0.0018	0.0038	0.2443	0.0053
47	1	0.3936	0.0029	0.0020	0.0015	0.0039	0.2721	0.0029
48	1	0.2194	0.0043	0.0017	0.0022	0.0063	0.5222	0.0027
49	1	0.1574	0.0043	0.0031	0.0017	0.0042	0.2535	0.0020
50	1	0.3545	0.0027	0.0018	0.0030	0.0050	0.5417	0.0013
51	1	0.1749	0.0029	0.0015	0.0024	0.0042	0.2704	0.0015
52	1	0.4112	0.0031	0.0020	0.0011	0.0029	0.2712	0.0025
53	1	0.1711	0.0081	0.0028	0.0059	0.0072	0.5122	0.0035
54	1	0.1674	0.0013	0.0013	0.0015	0.0035	0.2569	0.0038
55	1	0.2030	0.0009	0.0012	0.0012	0.0033	0.2683	0.0012

	Dist_cm_	PSD_B1	PSD_B2	PSD_B3	PSD_B4	PSD_B5	PSD_B6	PSD_B7
56	1	0.2181	0.0012	0.0012	0.0011	0.0026	0.2769	0.0009
57	1	0.3756	0.0020	0.0007	0.0017	0.0024	0.2707	0.0019
58	1	0.3148	0.0051	0.0017	0.0022	0.0068	0.5535	0.0038
59	1	0.2341	0.0018	0.0021	0.0050	0.0047	0.3379	0.0020
60	1	0.2213	0.0016	0.0013	0.0017	0.0027	0.2913	0.0012
61	2	0.0810	0.0006	0.0011	0.0013	0.0026	0.1160	0.0007
62	2	0.0966	0.0007	0.0007	0.0011	0.0017	0.1379	0.0007
63	2	0.1720	0.0018	0.0015	0.0013	0.0016	0.1063	0.0017
64	2	0.0728	0.0024	0.0012	0.0021	0.0041	0.2147	0.0026
65	2	0.0689	0.0011	0.0012	0.0007	0.0020	0.1132	0.0015
66	2	0.0801	0.0011	0.0008	0.0009	0.0009	0.1078	0.0006
67	2	0.0877	0.0016	0.0007	0.0008	0.0014	0.1149	0.0009
68	2	0.1692	0.0014	0.0007	0.0011	0.0023	0.1131	0.0012
69	2	0.1421	0.0012	0.0011	0.0011	0.0055	0.2270	0.0017
70	2	0.0902	0.0016	0.0009	0.0017	0.0019	0.1504	0.0011
71	2	0.1028	0.0010	0.0009	0.0004	0.0010	0.1181	0.0005
72	2	0.0760	0.0024	0.0012	0.0016	0.0037	0.2117	0.0019
73	2	0.1751	0.0018	0.0009	0.0015	0.0032	0.1133	0.0018
74	2	0.1134	0.0028	0.0007	0.0026	0.0038	0.2193	0.0015
75	2	0.0970	0.0008	0.0008	0.0007	0.0021	0.1172	0.0005
76	2	0.1652	0.0019	0.0015	0.0006	0.0017	0.1403	0.0017
77	2	0.0942	0.0016	0.0009	0.0017	0.0018	0.1218	0.0015
78	2	0.1653	0.0018	0.0007	0.0012	0.0026	0.1150	0.0018
79	2	0.0749	0.0010	0.0006	0.0013	0.0019	0.1139	0.0008
80	2	0.0919	0.0008	0.0013	0.0010	0.0022	0.1018	0.0014
81	2	0.0983	0.0016	0.0012	0.0017	0.0019	0.1269	0.0010
82	2	0.0862	0.0011	0.0008	0.0005	0.0016	0.1159	0.0006
83	2	0.0644	0.0019	0.0009	0.0008	0.0021	0.1134	0.0021
84	2	0.0897	0.0012	0.0014	0.0014	0.0036	0.1824	0.0019
85	2	0.0995	0.0012	0.0010	0.0007	0.0022	0.1161	0.0005
86	2	0.1048	0.0010	0.0010	0.0009	0.0023	0.1094	0.0009
87	2	0.0674	0.0029	0.0015	0.0012	0.0048	0.1114	0.0021
88	2	0.1447	0.0015	0.0013	0.0015	0.0034	0.2079	0.0020

	Dist_cm_	PSD_B1	PSD_B2	PSD_B3	PSD_B4	PSD_B5	PSD_B6	PSD_B7
89	2	0.0980	0.0012	0.0011	0.0013	0.0027	0.1431	0.0019
90	2	0.1030	0.0007	0.0010	0.0007	0.0014	0.1137	0.0006
91	3	0.0625	0.0009	0.0007	0.0014	0.0022	0.0681	0.0012
92	3	0.0449	0.0017	0.0010	0.0015	0.0020	0.0666	0.0012
93	3	0.0376	0.0010	0.0014	0.0008	0.0016	0.0637	0.0020
94	3	0.0472	0.0008	0.0013	0.0011	0.0010	0.0639	0.0008
95	3	0.0927	0.0019	0.0008	0.0011	0.0011	0.0772	0.0016
96	3	0.0548	0.0006	0.0008	0.0009	0.0019	0.0633	0.0010
97	3	0.0355	0.0020	0.0012	0.0007	0.0015	0.0638	0.0018
98	3	0.0429	0.0013	0.0012	0.0011	0.0021	0.0606	0.0013
99	3	0.0639	0.0011	0.0008	0.0007	0.0011	0.0666	0.0006
100	3	0.0547	0.0007	0.0009	0.0007	0.0010	0.0666	0.0009

⋮

Función Custom de Import File

```
%Pasa sonda Cassini
%Cassini = importfile_cassini("Utils4SP\Datasets\05358_mrdcd_sdfgmc_krtp_1s.asc")
Cassini = importfile_cassini("..\..\Utils4SP\Datasets\05358_mrdcd_sdfgmc_krtp_1s.asc",88,3000)
```

Cassini = 2913×8 table

...

	FechaHora	Bx_nT	By_nT	Bz_nT	Bmag_nT	X_km	Y_km
1	2005 12 24 00 00 ...	-2.7452	5.0172	1.3641	5.8797	-464080	-584230
2	2005 12 24 00 00 ...	-2.7440	5.0013	1.3821	5.8698	-464160	-584160
3	2005 12 24 00 00 ...	-2.7611	4.9922	1.3620	5.8654	-464240	-584080
4	2005 12 24 00 00 ...	-2.7872	4.9906	1.3063	5.8637	-464330	-584000
5	2005 12 24 00 00 ...	-2.8236	4.9870	1.2626	5.8684	-464420	-583920
6	2005 12 24 00 00 ...	-2.8287	4.9841	1.2417	5.8640	-464510	-583850
7	2005 12 24 00 00 ...	-2.8538	4.9836	1.2323	5.8736	-464590	-583770
8	2005 12 24 00 00 ...	-2.8580	4.9615	1.2184	5.8541	-464680	-583690
9	2005 12 24 00 00 ...	-2.8415	4.9557	1.1967	5.8366	-464770	-583610
10	2005 12 24 00 00 ...	-2.7741	4.9748	1.1646	5.8140	-464850	-583540
11	2005 12 24 00 00 ...	-2.8048	4.9845	1.1225	5.8288	-464940	-583460
12	2005 12 24 00 00 ...	-2.8923	4.9205	1.1999	5.8326	-465030	-583380
13	2005 12 24 00 00 ...	-2.9075	4.8933	1.2754	5.8332	-465110	-583300

	FechaHora	Bx_nT	By_nT	Bz_nT	Bmag_nT	X_km	Y_km
14	2005 12 24 00 00 ...	-2.9303	4.8529	1.3249	5.8219	-465200	-583220
15	2005 12 24 00 00 ...	-2.9347	4.8460	1.3296	5.8194	-465290	-583150
16	2005 12 24 00 00 ...	-2.9579	4.8148	1.3541	5.8109	-465370	-583070
17	2005 12 24 00 00 ...	-2.9816	4.7599	1.3418	5.7748	-465460	-582990
18	2005 12 24 00 00 ...	-2.9126	4.7513	1.3469	5.7337	-465550	-582910
19	2005 12 24 00 00 ...	-2.8409	4.8043	1.3264	5.7370	-465630	-582840
20	2005 12 24 00 00 ...	-2.8691	4.8267	1.3019	5.7642	-465720	-582760
21	2005 12 24 00 00 ...	-2.9297	4.7841	1.3030	5.7594	-465810	-582680
22	2005 12 24 00 00 ...	-2.9946	4.7423	1.3109	5.7600	-465890	-582600
23	2005 12 24 00 00 ...	-2.9878	4.7390	1.3237	5.7566	-465980	-582520
24	2005 12 24 00 00 ...	-2.9775	4.7496	1.3253	5.7604	-466070	-582450
25	2005 12 24 00 00 ...	-2.9716	4.7970	1.2988	5.7905	-466150	-582370
26	2005 12 24 00 00 ...	-2.9384	4.8151	1.3138	5.7920	-466240	-582290
27	2005 12 24 00 00 ...	-2.8968	4.8244	1.3222	5.7808	-466330	-582210
28	2005 12 24 00 00 ...	-2.8433	4.8753	1.2954	5.7908	-466410	-582140
29	2005 12 24 00 00 ...	-2.9122	4.8649	1.3238	5.8226	-466500	-582060
30	2005 12 24 00 00 ...	-2.9448	4.8771	1.3651	5.8587	-466580	-581980
31	2005 12 24 00 00 ...	-3.0486	4.8369	1.3735	5.8804	-466670	-581900
32	2005 12 24 00 00 ...	-3.0631	4.8625	1.3254	5.8982	-466760	-581820
33	2005 12 24 00 00 ...	-3.0008	4.8654	1.2729	5.8565	-466840	-581750
34	2005 12 24 00 00 ...	-2.9791	4.8810	1.2320	5.8497	-466930	-581670
35	2005 12 24 00 00 ...	-3.0248	4.8975	1.2472	5.8901	-467020	-581590
36	2005 12 24 00 00 ...	-3.0354	4.9115	1.2692	5.9119	-467100	-581510
37	2005 12 24 00 00 ...	-3.0336	4.9295	1.2456	5.9210	-467190	-581430
38	2005 12 24 00 00 ...	-2.9487	5.0208	1.2831	5.9626	-467280	-581360
39	2005 12 24 00 00 ...	-2.9833	5.1079	1.2657	6.0494	-467360	-581280
40	2005 12 24 00 00 ...	-3.1305	5.0810	1.2299	6.0939	-467450	-581200
41	2005 12 24 00 00 ...	-3.2171	5.0642	1.2027	6.1191	-467540	-581120
42	2005 12 24 00 00 ...	-3.1869	5.1366	1.1921	6.1615	-467620	-581040
43	2005 12 24 00 00 ...	-3.1529	5.2051	1.1585	6.1949	-467710	-580960
44	2005 12 24 00 00 ...	-3.1157	5.2555	1.1823	6.2231	-467790	-580890
45	2005 12 24 00 00 ...	-3.1088	5.2468	1.2264	6.2208	-467880	-580810
46	2005 12 24 00 00 ...	-3.0881	5.2290	1.2692	6.2042	-467970	-580730

	FechaHora	Bx_nT	By_nT	Bz_nT	Bmag_nT	X_km	Y_km
47	2005 12 24 00 00 ...	-3.0929	5.2107	1.3454	6.2072	-468050	-580650
48	2005 12 24 00 00 ...	-3.0682	5.1899	1.4009	6.1898	-468140	-580570
49	2005 12 24 00 00 ...	-2.9944	5.1812	1.4599	6.1599	-468230	-580500
50	2005 12 24 00 00 ...	-2.9423	5.1864	1.4653	6.1403	-468310	-580420
51	2005 12 24 00 00 ...	-2.8783	5.1954	1.4232	6.1077	-468400	-580340
52	2005 12 24 00 00 ...	-2.8518	5.2087	1.3559	6.0913	-468480	-580260
53	2005 12 24 00 00 ...	-2.8743	5.2247	1.2694	6.0969	-468570	-580180
54	2005 12 24 00 00 ...	-2.8789	5.2399	1.2303	6.1041	-468660	-580100
55	2005 12 24 00 00 ...	-2.8179	5.2423	1.1945	6.0704	-468740	-580030
56	2005 12 24 00 00 ...	-2.7992	5.2566	1.1308	6.0620	-468830	-579950
57	2005 12 24 00 00 ...	-2.7462	5.2590	1.0423	6.0239	-468920	-579870
58	2005 12 24 00 00 ...	-2.8060	5.2291	1.0344	6.0241	-469000	-579790
59	2005 12 24 00 00 ...	-2.8285	5.2342	0.9778	6.0298	-469090	-579710
60	2005 12 24 00 01 ...	-2.7358	5.2443	0.8649	5.9781	-469170	-579630
61	2005 12 24 00 01 ...	-2.8257	5.1677	0.9094	5.9601	-469260	-579560
62	2005 12 24 00 01 ...	-2.9202	5.1316	0.9559	5.9814	-469350	-579480
63	2005 12 24 00 01 ...	-2.8955	5.1758	0.8217	5.9878	-469430	-579400
64	2005 12 24 00 01 ...	-2.8439	5.1952	0.6808	5.9619	-469520	-579320
65	2005 12 24 00 01 ...	-2.8271	5.2301	0.5547	5.9712	-469600	-579240
66	2005 12 24 00 01 ...	-2.8648	5.2181	0.5894	5.9821	-469690	-579160
67	2005 12 24 00 01 ...	-2.9792	5.1543	0.5860	5.9825	-469780	-579090
68	2005 12 24 00 01 ...	-3.1606	5.0790	0.5809	6.0107	-469860	-579010
69	2005 12 24 00 01 ...	-3.1631	5.0743	0.5619	6.0059	-469950	-578930
70	2005 12 24 00 01 ...	-3.1335	5.0907	0.5843	6.0064	-470030	-578850
71	2005 12 24 00 01 ...	-3.1010	5.0800	0.5804	5.9801	-470120	-578770
72	2005 12 24 00 01 ...	-3.0324	5.1168	0.6123	5.9794	-470210	-578690
73	2005 12 24 00 01 ...	-3.0399	5.1338	0.5743	5.9940	-470290	-578620
74	2005 12 24 00 01 ...	-3.1055	5.1105	0.5137	6.0023	-470380	-578540
75	2005 12 24 00 01 ...	-3.1384	5.0656	0.4825	5.9786	-470460	-578460
76	2005 12 24 00 01 ...	-3.1519	5.0034	0.4394	5.9299	-470550	-578380
77	2005 12 24 00 01 ...	-3.1807	4.9360	0.4094	5.8866	-470630	-578300
78	2005 12 24 00 01 ...	-3.2827	4.8782	0.3735	5.8920	-470720	-578220
79	2005 12 24 00 01 ...	-3.3598	4.8462	0.3376	5.9069	-470810	-578140

	FechaHora	Bx_nT	By_nT	Bz_nT	Bmag_nT	X_km	Y_km
80	2005 12 24 00 01 ...	-3.4188	4.7852	0.3368	5.8908	-470890	-578060
81	2005 12 24 00 01 ...	-3.4363	4.7716	0.3279	5.8895	-470980	-577990
82	2005 12 24 00 01 ...	-3.5468	4.7228	0.3931	5.9196	-471060	-577910
83	2005 12 24 00 01 ...	-3.5558	4.7192	0.4095	5.9233	-471150	-577830
84	2005 12 24 00 01 ...	-3.5397	4.7730	0.4180	5.9572	-471240	-577750
85	2005 12 24 00 01 ...	-3.5655	4.8207	0.4169	6.0108	-471320	-577670
86	2005 12 24 00 01 ...	-3.5571	4.8737	0.4512	6.0508	-471410	-577590
87	2005 12 24 00 01 ...	-3.6784	4.8493	0.4834	6.1059	-471490	-577510
88	2005 12 24 00 01 ...	-3.7312	4.8767	0.4899	6.1601	-471580	-577440
89	2005 12 24 00 01 ...	-3.7673	4.9058	0.5065	6.2062	-471660	-577360
90	2005 12 24 00 01 ...	-3.7945	4.9502	0.5046	6.2577	-471750	-577280
91	2005 12 24 00 01 ...	-3.7556	5.0164	0.4914	6.2858	-471840	-577200
92	2005 12 24 00 01 ...	-3.7531	4.9587	0.4755	6.2372	-471920	-577120
93	2005 12 24 00 01 ...	-3.7456	4.9857	0.4804	6.2546	-472010	-577040
94	2005 12 24 00 01 ...	-3.7070	5.0934	0.4551	6.3165	-472100	-576960
95	2005 12 24 00 01 ...	-3.5846	5.2323	0.4404	6.3578	-472180	-576880
96	2005 12 24 00 01 ...	-3.5387	5.2648	0.4785	6.3616	-472270	-576800
97	2005 12 24 00 01 ...	-3.5689	5.2588	0.4976	6.3750	-472350	-576720
98	2005 12 24 00 01 ...	-3.5481	5.2905	0.5089	6.3906	-472440	-576650
99	2005 12 24 00 01 ...	-3.3928	5.4474	0.5260	6.4395	-472520	-576570
100	2005 12 24 00 01 ...	-3.3156	5.5496	0.5386	6.4871	-472610	-576490

⋮

Importar audio

```
%audio read necesita dos salidas
% la primera son las muestras de audio
% y la segunda es la frecuencia de muestreo
[buho,fs_buho] = audioread("..\..\Utils4SP\Datasets\Owl.wav")
```

```
buho = 38920×2
   -0.0084   -0.0084
   -0.0085   -0.0085
   -0.0088   -0.0087
   -0.0085   -0.0085
   -0.0083   -0.0083
   -0.0084   -0.0083
   -0.0084   -0.0084
   -0.0088   -0.0088
   -0.0088   -0.0089
   -0.0089   -0.0094
```

```
fs_buho = 22050
```

```
%mostramos el sonido
%sound(buho,fs)
```

Datastore

```
% Le indicamos que una carpeta es un datastore, es decir,
% es una carpeta donde hay varios datasets y esto nos
% sirve para que, en lugar de andar concatenando archivo por arhchivo,
% lo hagamos todo al mismo tiempo:
ds = datastore("..\..\Utils4SP\Datasets\atmosfera_Logger_V2\")
```

```
ds =
  TabularTextDatastore with properties:

                     Files: {
                            ' ...\Documents\Escuela\Utils4SP\Datasets\AtmosferaLogger_V2\210722.TXT';
                            ' ...\Documents\Escuela\Utils4SP\Datasets\AtmosferaLogger_V2\210723.TXT';
                            ' ...\Documents\Escuela\Utils4SP\Datasets\AtmosferaLogger_V2\210724.TXT'
                             ... and 3 more
                            }
                   Folders: {
                            'C:\Users\AxelE\Documents\Escuela\Utils4SP\Datasets\AtmosferaLogger_V2'
                            }
              FileEncoding: 'UTF-8'
   AlternateFileSystemRoots: {}
         VariableNamingRule: 'modify'
          ReadVariableNames: false
              VariableNames: {'Var1', 'Var2', 'Var3' ... and 3 more}
             DatetimeLocale: en_US

  Text Format Properties:
             NumHeaderLines: 0
                  Delimiter: {' ', '\t'}
               RowDelimiter: '\r\n'
             TreatAsMissing: ''
               MissingValue: NaN

  Advanced Text Format Properties:
            TextscanFormats: {'%f', '%T', '%f' ... and 3 more}
                   TextType: 'char'
          ExponentCharacters: 'eEdD'
                CommentStyle: ''
                  Whitespace: '\b'
    MultipleDelimitersAsOne: true

  Properties that control the table returned by preview, read, readall:
      SelectedVariableNames: {'Var1', 'Var2', 'Var3' ... and 3 more}
            SelectedFormats: {'%f', '%T', '%f' ... and 3 more}
                   ReadSize: 20000 rows
                 OutputType: 'table'
                   RowTimes: []

  Write-specific Properties:
     SupportedOutputFormats: ["txt"    "csv"    "xlsx"    "xls"    "parquet"    "parq"]
        DefaultOutputFormat: "txt"
```

```
% Cambiamos el nombre de los encabezados de cada columna:
```

```
ds.VariableNames = ["Fecha" "Hora" "Pres_kpa" "Temp_C" "Hum_perc" "Bat_V"];
%Le cambiamos el tipo de formato de cada columna:
ds.TextscanFormats = ["%s" "%s" "%f" "%f" "%f" "%f"];

%Leemos todas las entradas
atmosfera = readall(ds)
```

atmosfera = 84572×6 table

	Fecha	Hora	Pres_kpa	Temp_C	Hum_perc	Bat_V
1	'210722'	'22:25:18'	78.5700	27.1800	48.4000	4.4800
2	'210722'	'22:25:23'	78.5800	27.3500	48.5300	4.4900
3	'210722'	'22:25:28'	78.5800	27.2800	48.4300	4.4600
4	'210722'	'22:25:33'	78.5800	27.0700	47.9800	4.4500
5	'210722'	'22:25:38'	78.5800	27.0100	48.2000	4.4500
6	'210722'	'22:25:43'	78.5900	26.9100	47.8900	4.4900
7	'210722'	'22:25:48'	78.5800	26.8600	48.7200	4.4700
8	'210722'	'22:25:53'	78.5800	26.8100	48.0300	4.4500
9	'210722'	'22:25:58'	78.5800	26.7700	48.4800	4.4800
10	'210722'	'22:26:03'	78.5800	26.7200	48.3000	4.4700
11	'210722'	'22:26:08'	78.5800	26.6800	48.5600	4.4300
12	'210722'	'22:26:13'	78.5700	26.6400	48.7000	4.4500
13	'210722'	'22:26:18'	78.5700	26.5900	48.4800	4.4500
14	'210722'	'22:26:23'	78.5800	26.5600	48.7100	4.4900
15	'210722'	'22:26:28'	78.5800	26.5100	48.4500	4.4400
16	'210722'	'22:26:33'	78.5700	26.4800	48.5400	4.4500
17	'210722'	'22:26:38'	78.5800	26.4400	48.3600	4.4800
18	'210722'	'22:26:43'	78.5800	26.3900	48.4700	4.4700
19	'210722'	'22:26:48'	78.5800	26.3500	48.8800	4.4500
20	'210722'	'22:26:53'	78.5800	26.3000	48.9000	4.4300
21	'210722'	'22:26:58'	78.5800	26.2500	48.0400	4.4600
22	'210722'	'22:27:03'	78.5800	26.2000	48.8800	4.4500
23	'210722'	'22:27:08'	78.5900	26.1500	48.7600	4.4800
24	'210722'	'22:27:13'	78.5900	26.1000	48.9700	4.4900
25	'210722'	'22:27:18'	78.5800	26.0600	49.1700	4.4800
26	'210722'	'22:27:23'	78.5800	26.0300	49.4500	4.4500
27	'210722'	'22:27:28'	78.5900	25.9900	49.4300	4.4300
28	'210722'	'22:27:33'	78.5900	25.9400	49.3200	4.4500
29	'210722'	'22:27:38'	78.5800	25.9000	49.3400	4.4500

	Fecha	Hora	Pres_kpa	Temp_C	Hum_perc	Bat_V
30	'210722'	'22:27:43'	78.5900	25.8500	49.3700	4.4500
31	'210722'	'22:27:48'	78.5900	25.8100	49.1700	4.4500
32	'210722'	'22:27:53'	78.5900	25.7600	49.5200	4.4800
33	'210722'	'22:27:58'	78.5900	25.7200	49.9800	4.4700
34	'210722'	'22:28:03'	78.5900	25.6600	49.1600	4.4300
35	'210722'	'22:28:08'	78.5900	25.6100	49.9300	4.4500
36	'210722'	'22:28:13'	78.5900	25.5800	49.7900	4.4500
37	'210722'	'22:28:18'	78.5800	25.5200	49.5900	4.4800
38	'210722'	'22:28:23'	78.5900	25.4900	49.9600	4.4600
39	'210722'	'22:28:28'	78.5900	25.4500	50.0400	4.4800
40	'210722'	'22:28:33'	78.5900	25.4200	50.0900	4.4500
41	'210722'	'22:28:38'	78.5900	25.3700	50.1700	4.4800
42	'210722'	'22:28:43'	78.5900	25.3400	49.9100	4.4600
43	'210722'	'22:28:48'	78.5900	25.3000	49.6700	4.4600
44	'210722'	'22:28:53'	78.5900	25.2300	50.8700	4.4800
45	'210722'	'22:28:58'	78.5900	25.2000	50.4600	4.4500
46	'210722'	'22:29:03'	78.5900	25.1500	50.9800	4.4700
47	'210722'	'22:29:08'	78.5900	25.1400	50.5900	4.4500
48	'210722'	'22:29:13'	78.5900	25.0900	50.7900	4.4300
49	'210722'	'22:29:18'	78.6000	25.0600	50.7000	4.4500
50	'210722'	'22:29:23'	78.5900	25.0300	50.9100	4.4500
51	'210722'	'22:29:28'	78.6000	25.0100	50.9700	4.4800
52	'210722'	'22:29:33'	78.6000	24.9700	51.0600	4.4800
53	'210722'	'22:29:38'	78.6000	24.9100	51.1600	4.4800
54	'210722'	'22:29:43'	78.5900	24.8700	52.0100	4.4600
55	'210722'	'22:29:48'	78.6000	24.8100	51.3300	4.4800
56	'210722'	'22:29:53'	78.6000	24.7900	51.4600	4.4500
57	'210722'	'22:29:58'	78.6000	24.7700	51.4800	4.4400
58	'210722'	'22:30:04'	78.6000	24.7500	51.3400	4.4400
59	'210722'	'22:30:09'	78.5900	24.7300	51.6300	4.4900
60	'210722'	'22:30:14'	78.6000	24.6900	51.6100	4.4700
61	'210722'	'22:30:19'	78.6000	24.6400	51.8100	4.4500
62	'210722'	'22:30:24'	78.5900	24.6000	51.9400	4.4500

	Fecha	Hora	Pres_kpa	Temp_C	Hum_perc	Bat_V
63	'210722'	'22:30:29'	78.5900	24.5500	51.6100	4.4600
64	'210722'	'22:30:34'	78.6000	24.5200	52.1700	4.4700
65	'210722'	'22:30:39'	78.6000	24.4900	51.9800	4.5100
66	'210722'	'22:30:44'	78.6000	24.4600	52.8800	4.4500
67	'210722'	'22:30:49'	78.6000	24.4100	52.0100	4.4600
68	'210722'	'22:30:54'	78.6000	24.3800	52.4300	4.4500
69	'210722'	'22:30:59'	78.6000	24.3300	52.2700	4.4500
70	'210722'	'22:31:04'	78.6000	24.2900	52.8000	4.4600
71	'210722'	'22:31:09'	78.6000	24.2500	52.8800	4.4500
72	'210722'	'22:31:14'	78.5900	24.2200	52.6800	4.4300
73	'210722'	'22:31:19'	78.6000	24.2200	52.7400	4.4500
74	'210722'	'22:31:24'	78.6000	24.1800	52.6600	4.4500
75	'210722'	'22:31:29'	78.6000	24.1500	52.9500	4.4600
76	'210722'	'22:31:34'	78.6000	24.1200	52.9400	4.4800
77	'210722'	'22:31:39'	78.6000	24.1000	53.3700	4.4500
78	'210722'	'22:31:44'	78.6000	24.0800	53.0700	4.4500
79	'210722'	'22:31:49'	78.6000	24.0800	52.8300	4.4600
80	'210722'	'22:31:54'	78.5900	24.0500	53.0500	4.4700
81	'210722'	'22:31:59'	78.5900	24.0400	52.6200	4.4800
82	'210722'	'22:32:04'	78.6000	24.0200	53.4400	4.4600
83	'210722'	'22:32:09'	78.6000	24	53.3800	4.4600
84	'210722'	'22:32:14'	78.6000	23.9800	53.2800	4.4500
85	'210722'	'22:32:19'	78.6000	23.9600	53.7100	4.4700
86	'210722'	'22:32:24'	78.6000	23.9300	53.2900	4.4800
87	'210722'	'22:32:29'	78.5900	23.9000	53.1400	4.4500
88	'210722'	'22:32:34'	78.5900	23.8700	53.8100	4.4300
89	'210722'	'22:32:39'	78.6000	23.8500	53.7200	4.4600
90	'210722'	'22:32:44'	78.6100	23.8200	53.9000	4.4500
91	'210722'	'22:32:49'	78.6100	23.8000	54.0100	4.4600
92	'210722'	'22:32:54'	78.6000	23.7900	53.4300	4.4800
93	'210722'	'22:32:59'	78.6000	23.7600	54.2400	4.4900
94	'210722'	'22:33:04'	78.6000	23.7500	53.9000	4.4900
95	'210722'	'22:33:09'	78.6000	23.7500	54.2800	4.4900

	Fecha	Hora	Pres_kpa	Temp_C	Hum_perc	Bat_V
96	'210722'	'22:33:14'	78.6000	23.7500	54	4.4900
97	'210722'	'22:33:19'	78.6000	23.7200	54.6900	4.4300
98	'210722'	'22:33:24'	78.5900	23.7100	54.2100	4.4300
99	'210722'	'22:33:29'	78.6000	23.6700	53.9700	4.4500
100	'210722'	'22:33:34'	78.6000	23.6400	54.3700	4.4700

⋮

Primeras lecturas atmosféricas

```
ds = datastore("..\..\Utils4SP\Datasets\atmosfera_Logger\");
ds.VariableNames = ["Fecha" "Hora" "Pres_kpa" "Temp_C" "Hum_perc"];
ds.TextscanFormats = ["%s" "%s" "%f" "%f" "%f"];
atmosfera_part = readall(ds);
```

Reordenando

```
%Si importamos fecha y hora en dos columnas, la convertimos en una columna de strings
atmosfera.DateTime = string(atmosfera.Fecha) + " " + string(atmosfera.Hora);

%Pasar el texto a formato fecha-hora:
atmosfera.DateTime = datetime(atmosfera.DateTime,'Format',"yyyyMMdd HH:mm:ss");

% Lo siguiente es por si queremos cambiar el nombre de los encabezados
% después de importar las tablas:
% atmosfera.Properties.VariableNames = ["Fecha" "Hora" "Pres_kpa" "Temp_C" "Hum_perc" "Bat_V"]
```

Hay una función importante para la **command windows**. save("nombre_archivo") nos guarda el workspace actual. Con load <nombre_archivo>.mat cargamos ese workspace que guardamos

Selección de un subconjunto de datos

Tomaremos los datos entre el 18 de mayo y el 26 de mayo a las 6am

```
%Puntos inicial y final en el tiempo
T1 = datetime(2021,5,18,6,0,0)
```

```
T1 = datetime
   18-May-2021 06:00:00
```

```
T2 = datetime(2021,5,26,6,0,0)
```

```
T2 = datetime
   26-May-2021 06:00:00
```

```
index = atmosfera.DateTime > T1 & atmosfera.DateTime< T2;
```

```
atmosfera_part = atmosfera(index,:);
```

Limpieza de NAN's

```
sum(ismissing(atmosfera_part)) %Cuántos NAN's en cada columna
```

```
ans = 1×6
     0     0     0    11    61     0
```

```
summary(atmosfera_part)
```

```
Variables:

    Fecha: 137522×1 cell array of character vectors

    Hora: 137522×1 cell array of character vectors

    Pres_kpa: 137522×1 double

        Values:

            Min        77.55
            Median     78.06
            Max        78.46

    Temp_C: 137522×1 double

        Values:

            Min             13.38
            Median          21.01
            Max             100
            NumMissing      11

    Hum_perc: 137522×1 double

        Values:

            Min             15.27
            Median          50.16
            Max             99.97
            NumMissing      61

    DateTime: 137522×1 datetime

        Values:

            Min       20210518 06:00:03
            Median    20210522 05:59:48
            Max       20210526 05:59:55
```

```
% Remover filas con NANs
%
atmosfera_noNaNs =rmmissing(atmosfera_part);
summary(atmosfera_noNaNs)
```

```
Variables:

    Fecha: 137450×1 cell array of character vectors

    Hora: 137450×1 cell array of character vectors
```

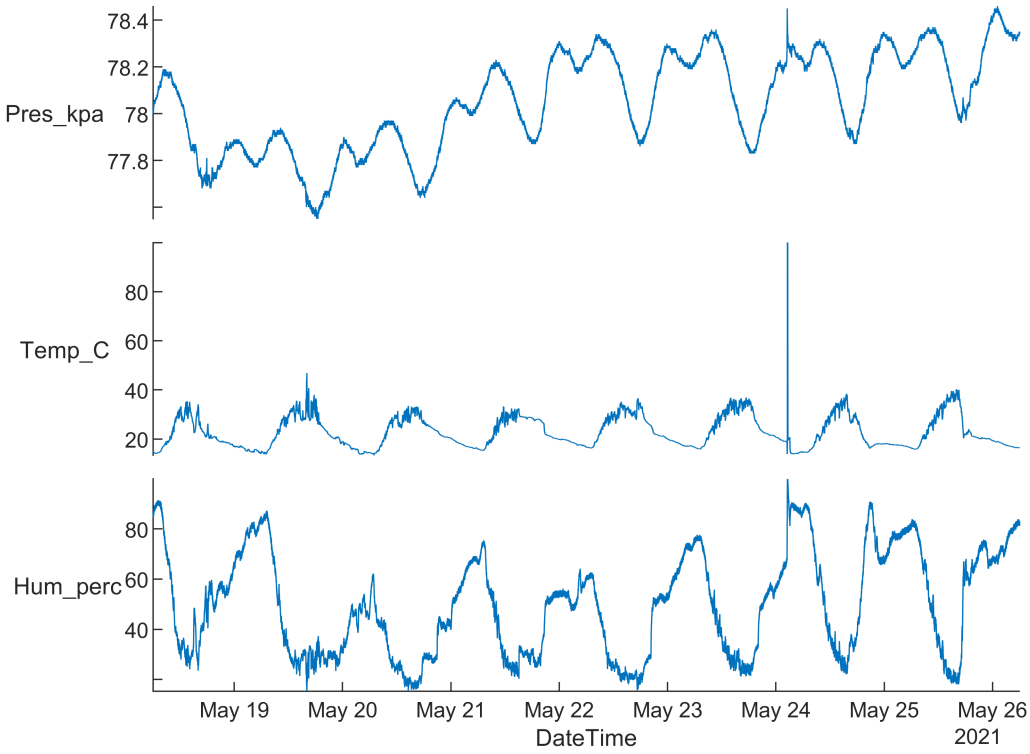
```
Pres_kpa: 137450×1 double

    Values:

        Min        77.55
        Median     78.06
        Max        78.46

Temp_C: 137450×1 double

    Values:

        Min        13.38
        Median     21.01
        Max        46.86

Hum_perc: 137450×1 double

    Values:

        Min         15.27
        Median     50.155
        Max         99.97

DateTime: 137450×1 datetime

    Values:

        Min       20210518 06:00:03
        Median    20210522 05:57:17
        Max       20210526 05:59:55
```

Ploteo exploratorio(Primero se hicieron con datastore de atmosferaloggerv2, después con atmosferalogger

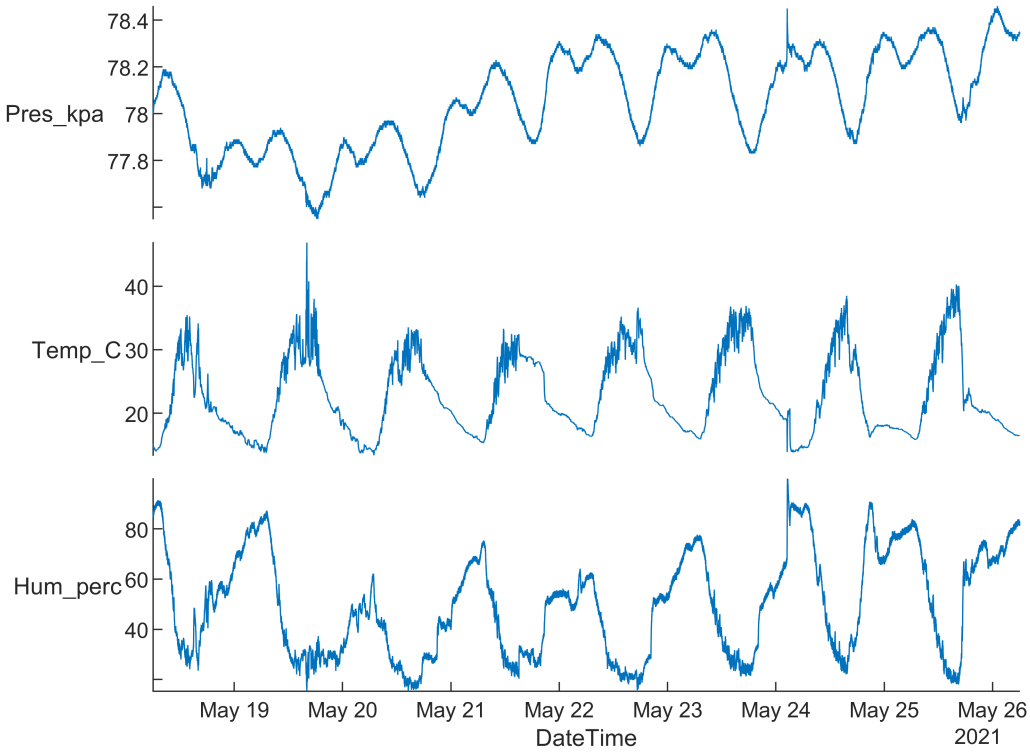
y al final con atmosfera_part)

- Stackedplot

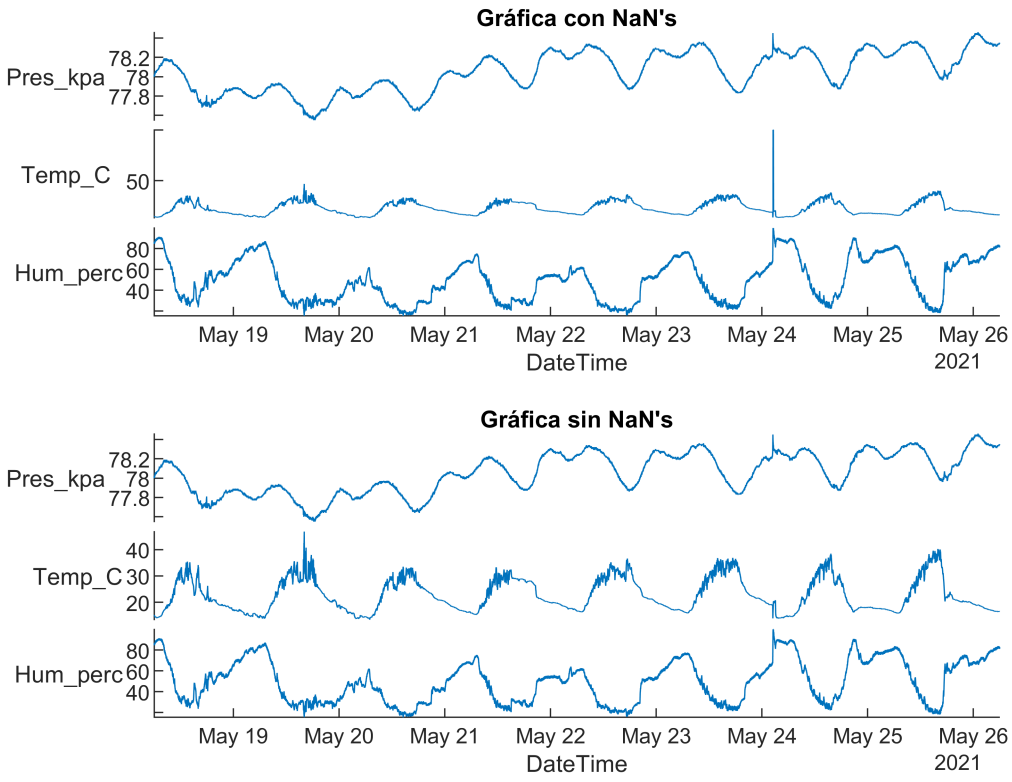
```
% Este plot es util para hacer gráficos de tablas tomando una de las
% columnas dentro de la tabla como eje x y el resto como eje y
figure
stackedplot(atmosfera_part, 'XVariable','DateTime')
```




```
%Sin Nan's
figure
stackedplot(atmosfera_noNaNs, 'XVariable','DateTime')
```



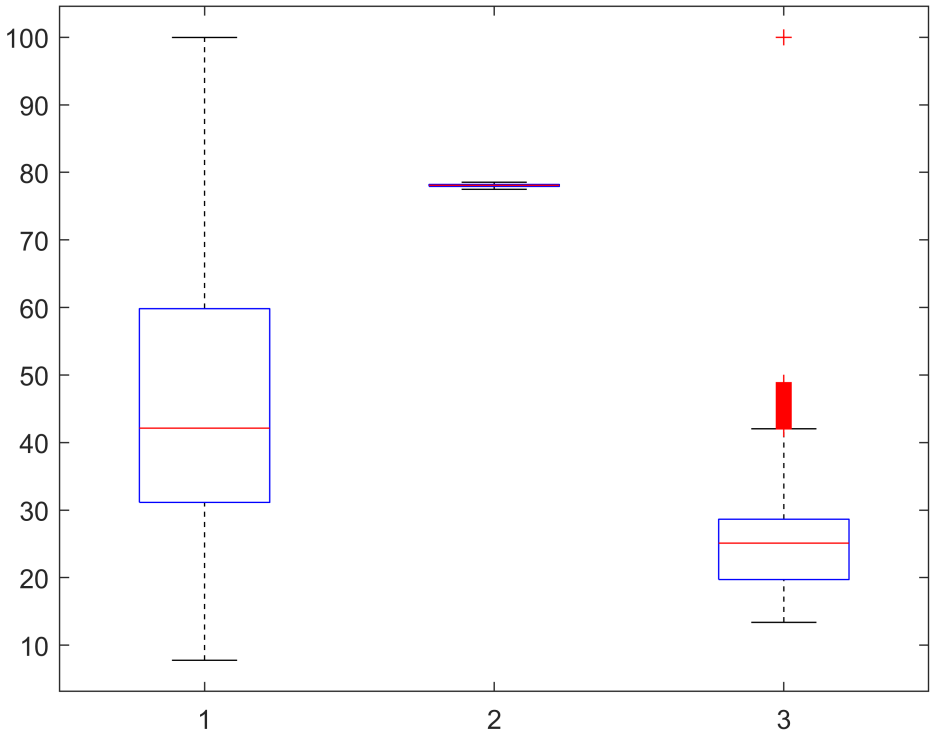

```
%Para comparar las dos gráficas anteriores:
tiledlayout(2,1)

nexttile
stackedplot(atmosfera_part, 'XVariable','DateTime')
title("Gráfica con NaN's")

nexttile
stackedplot(atmosfera_noNaNs, 'XVariable','DateTime')
title("Gráfica sin NaN's")
```



- Boxplot

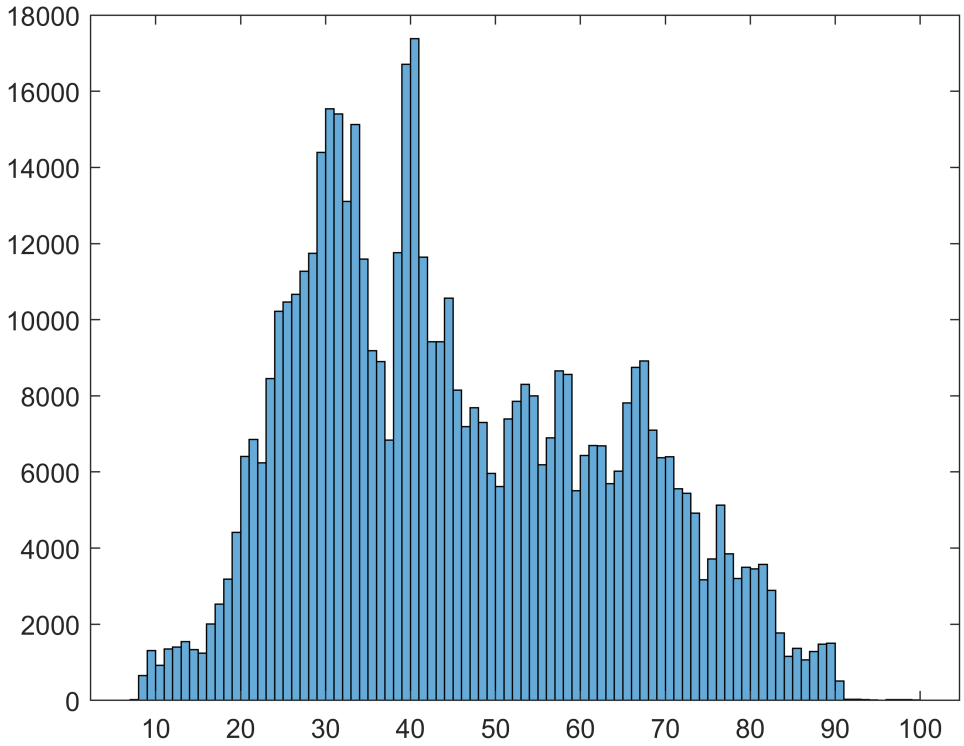
Nos da el valor mediano y nos puestra dentro de un cuadro los datos que se encuentran en el 1er y 3er cuartil. Todos los datos que no son valores atípicos se encuentran dentro de las barritas en el límite superior e inferior.

```
figure
boxplot(atmosfera_part{:,["Hum_perc" "Pres_kpa" "Temp_C"]})
```

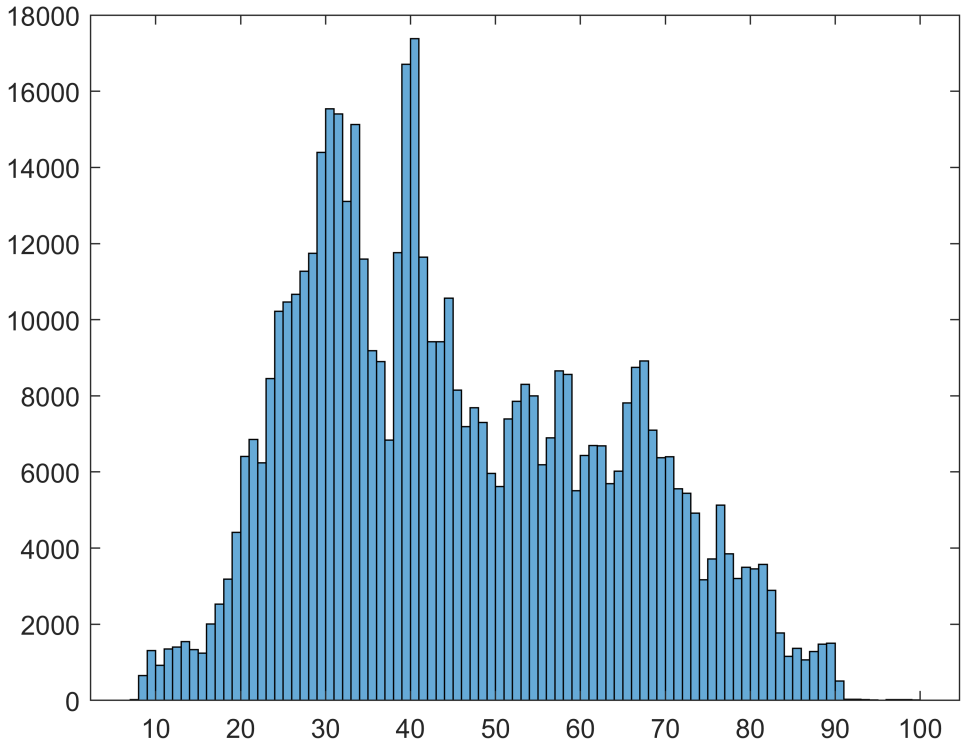


Histograma

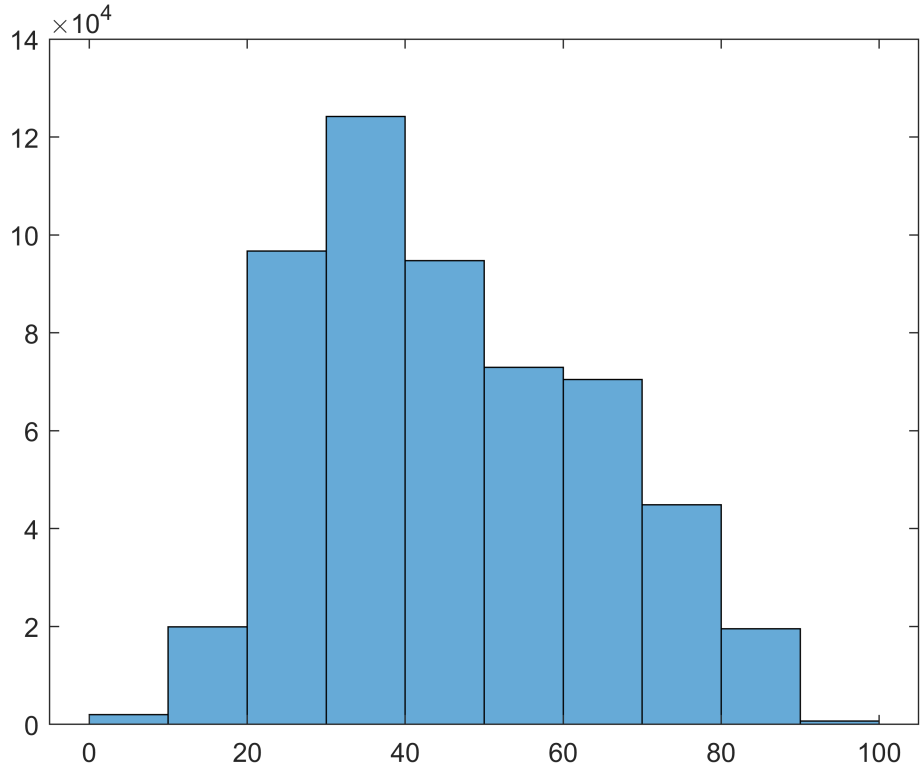
```
figure
%Mostramos el istograma de la columna "Hum_perc" en la tabla "atmosfera_part"
histogram(atmosfera_part.Hum_perc)
```




```
figure
% Modificamos el ancho de las barras
histogram(atmosfera_part.Hum_perc,'BinWidth',1)
```

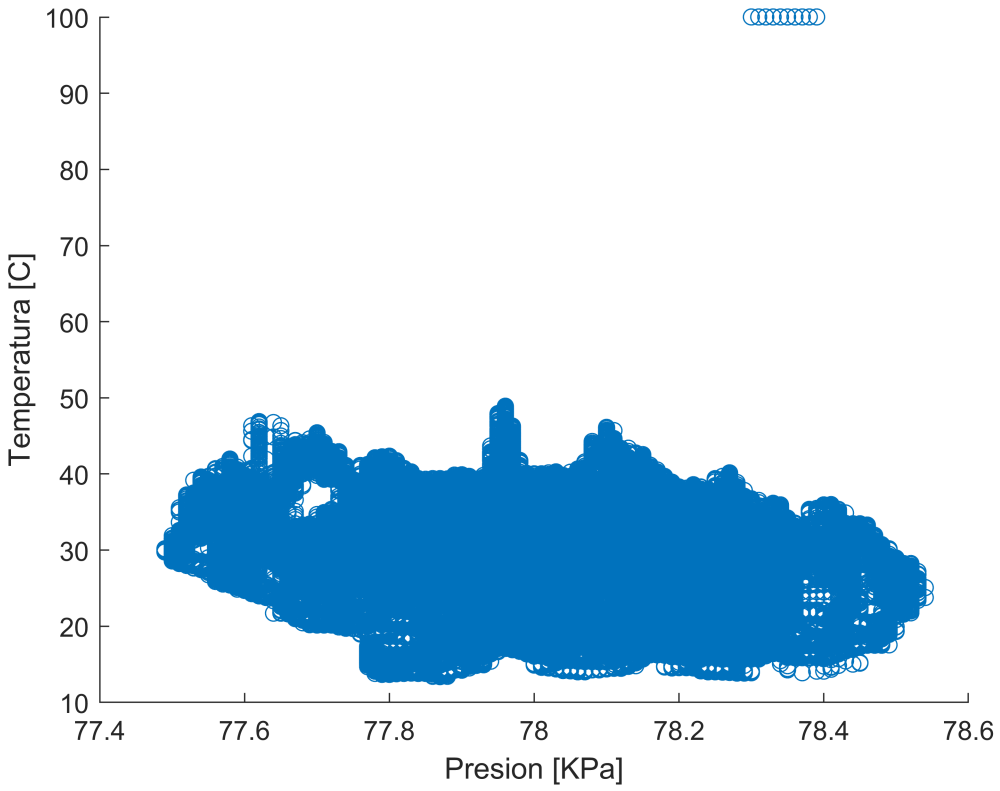



```
figure
%nuevament cambiamos el ancho de las barras
histogram(atmosfera_part.Hum_perc,'BinWidth',10)
```

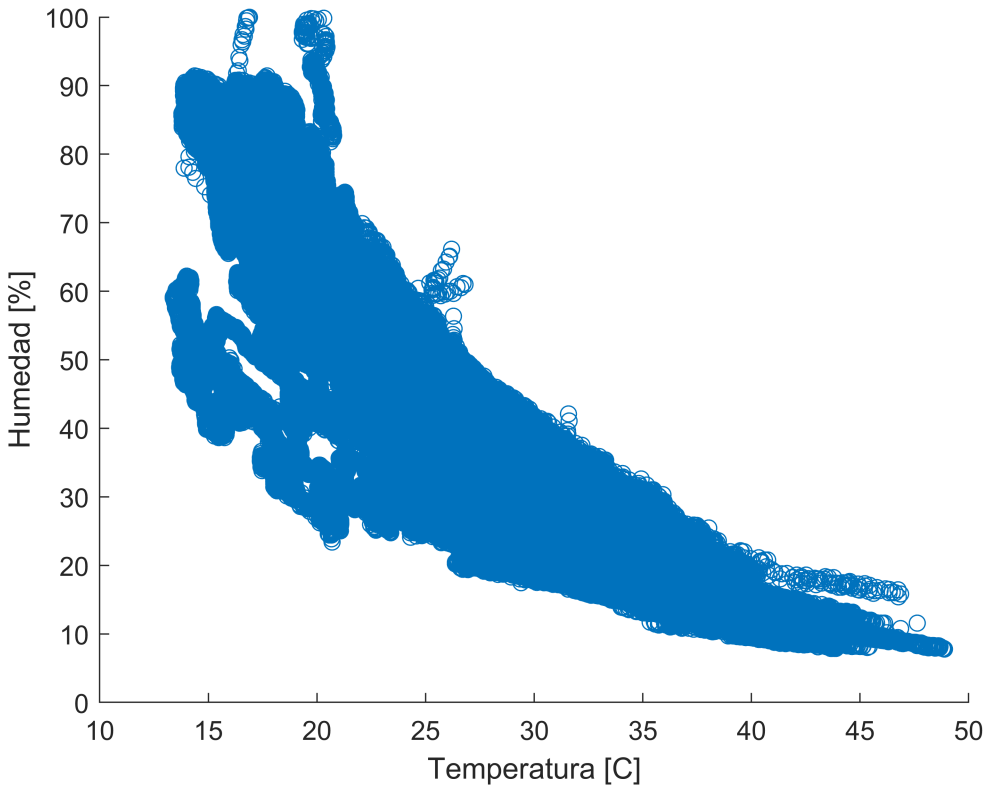


Dispersión

```
figure
% Utilizando dos series de datos (en este caso, 2 columnas de la tabla
% atmosfera_part), se orden los datos formando tuplas y esto se plotea
scatter(atmosfera_part.Pres_kpa,atmosfera_part.Temp_C)
xlabel("Presion [KPa]")
ylabel("Temperatura [C]")
```

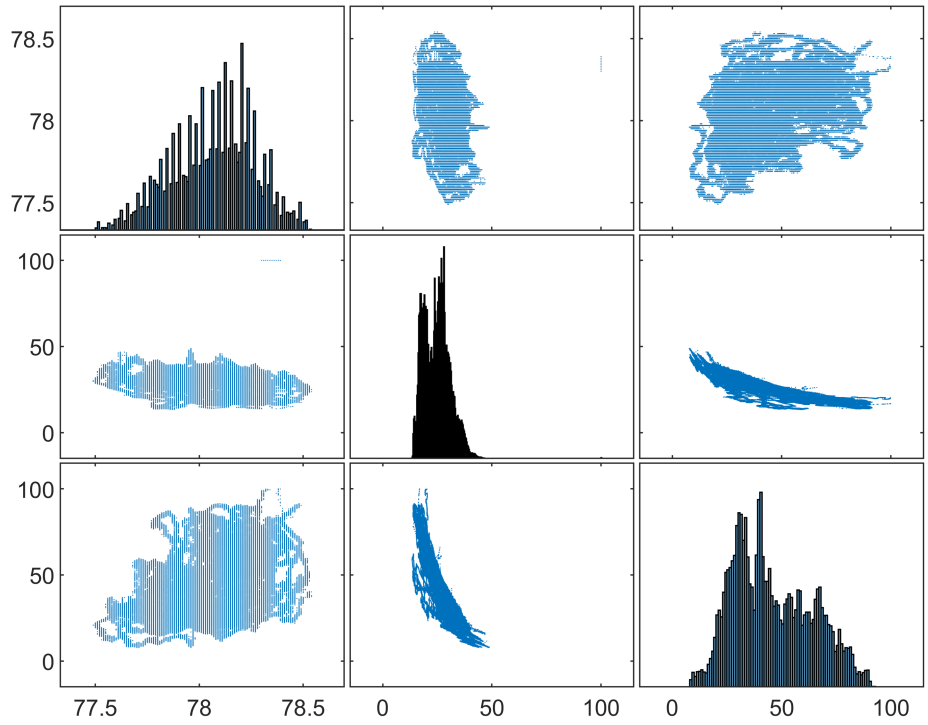



```
figure
scatter(atmosfera_part.Temp_C,atmosfera_part.Hum_perc)
xlabel("Temperatura [C]")
ylabel("Humedad [%]")
```



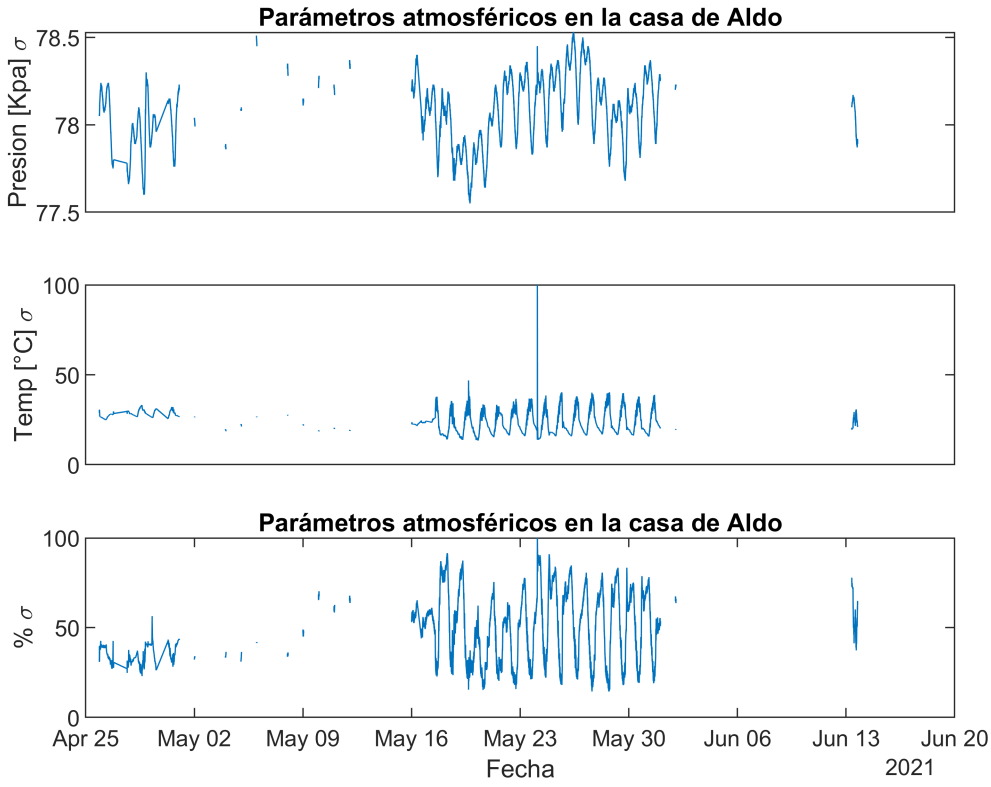
Plot matrix

```
figure
plotmatrix(atmosfera_part{:,["Pres_kpa" "Temp_C" "Hum_perc"]})
```



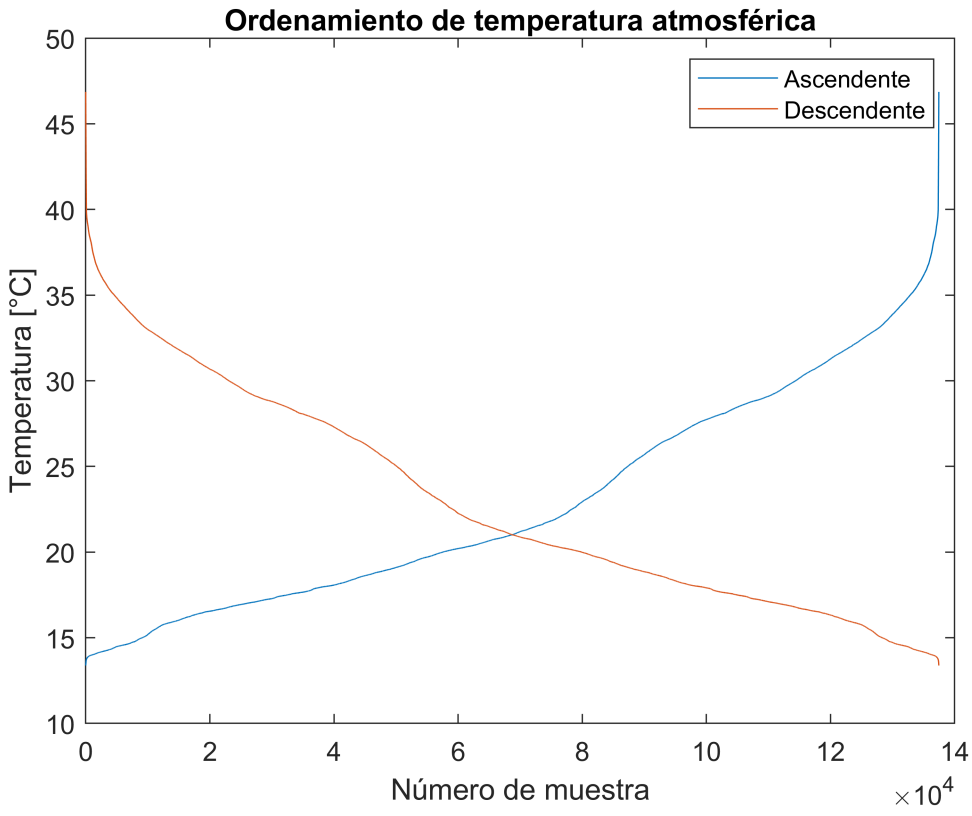
Tiledlayout

```
%tiledlayout("flow")
tiledlayout(3,1)

nexttile
plot(atmosfera_part.DateTime,atmosfera_part.Pres_kpa)
ylabel("Presion [Kpa] \sigma") %podemos hacer escritura en LaTex
%Podemos ocultar las marcas de los ejes horizontales y poner en su lugar
%uno hasta abajo:
%xlabel("Fecha")
%gca = get current axis. define que los 'xticks' sean vacíos
set(gca,'xtick',[])
title("Parámetros atmosféricos en la casa de Aldo")

nexttile
plot(atmosfera_part.DateTime,atmosfera_part.Temp_C)
ylabel("Temp [°C] \sigma") %podemos hacer escritura en LaTex
%xlabel("Fecha")
set(gca,'xtick',[])

nexttile
plot(atmosfera_part.DateTime,atmosfera_part.Hum_perc)
ylabel("% \sigma") %podemos hacer escritura en LaTex
xlabel("Fecha")
title("Parámetros atmosféricos en la casa de Aldo")
```



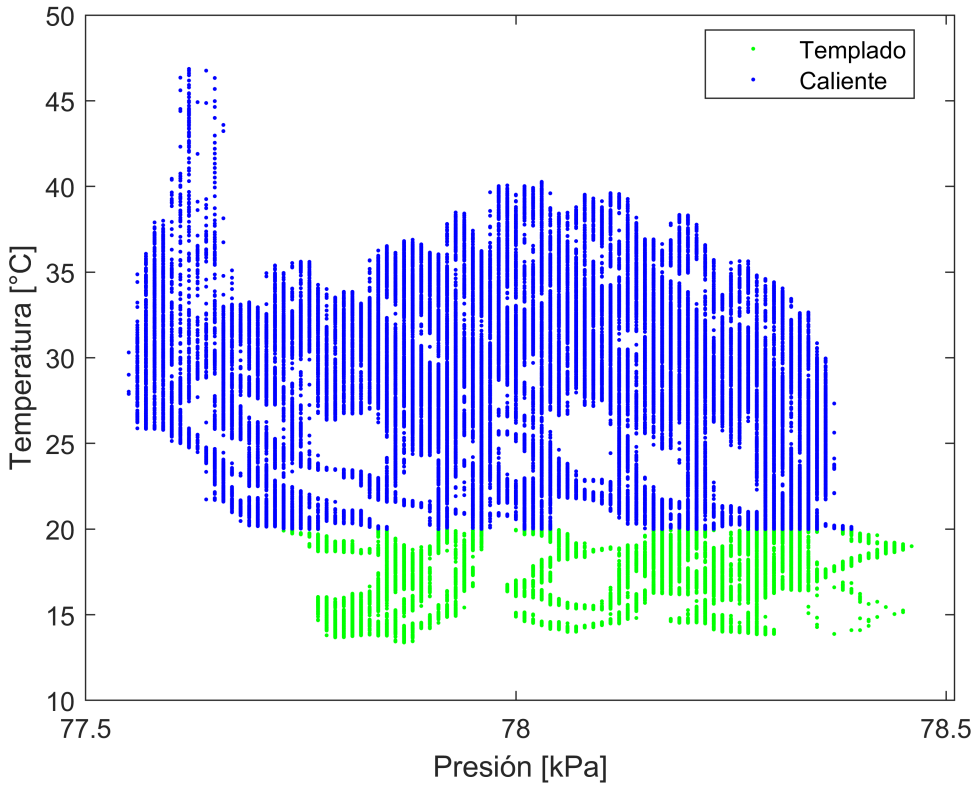
Agrupación y órden

```
% Darle categorias a la temperatura

%Fromteras de las categorías, en este caso, temperatura
edges = [-30 10 20 55];

%Categorías
categorias = ["Frío" "Templado" "Caliente"];
temp_cats = discretize(atmosfera_noNaNs.Temp_C,edges,'categorical',categorias);

%Agregamos esta tabla a la de atmosfera_noNans
atmosfera_noNaNs.Temp_cats = temp_cats;

%Ordenamiento
temp_descend = sort(atmosfera_noNaNs.Temp_C,'descend');
temp_ascend = sort(atmosfera_noNaNs.Temp_C,'ascend');

figure
plot([temp_ascend temp_descend])
ylabel("Temperatura [°C]")
xlabel("Número de muestra")
legend("Ascendente","Descendente")
title("Ordenamiento de temperatura atmosférica")
```

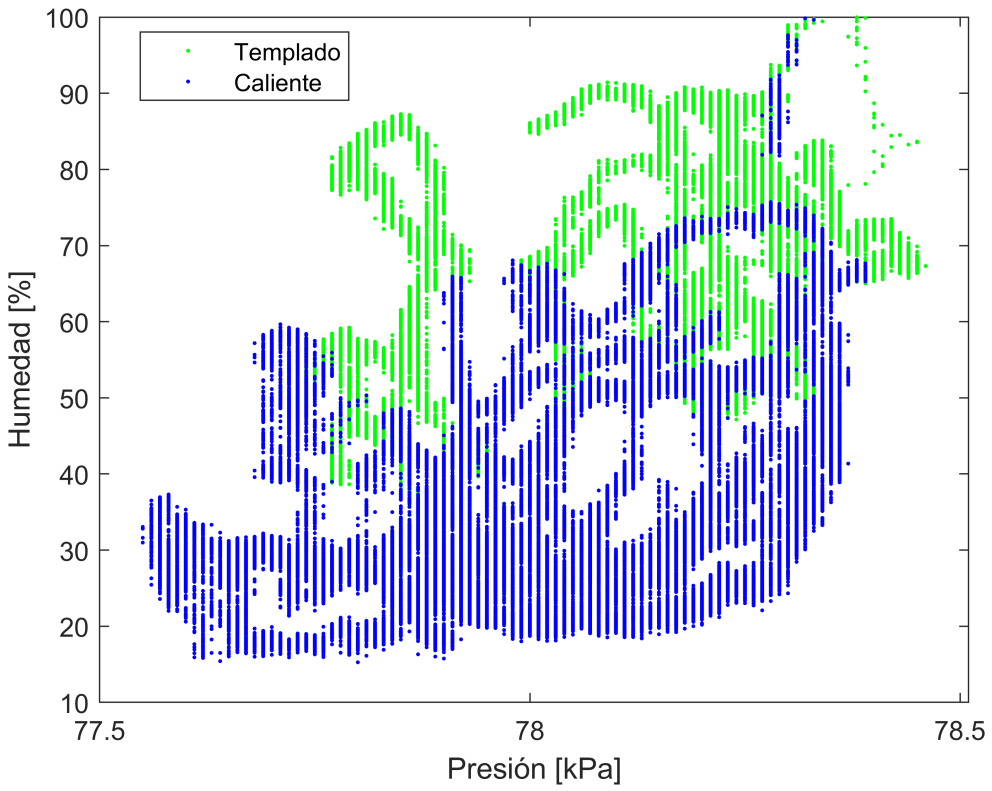


G scatter y pareto chart

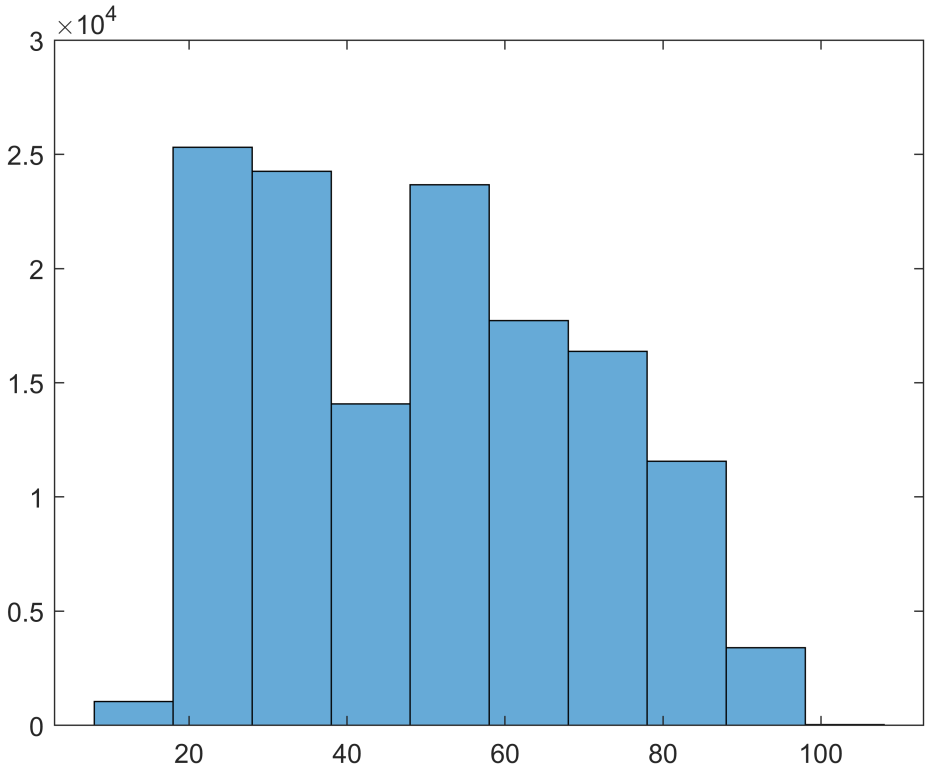
```
figure
gscatter(atmosfera_noNaNs.Pres_kpa,atmosfera_noNaNs.Temp_C,atmosfera_noNaNs.Temp_cats)
xlabel("Presión [kPa]")
ylabel("Temperatura [°C]")
```




```
figure
gscatter(atmosfera_noNaNs.Pres_kpa,atmosfera_noNaNs.Hum_perc,atmosfera_noNaNs.Temp_cats)
xlabel("Presión [kPa]")
ylabel("Humedad [%]")
```




```
h = histogram(atmosfera_noNaNs.Hum_perc,10);
```




```
cuentas = h.BinCounts;
```

```
figure
pareto(cuentas)
```