

```

1 C:\ProgramData\Anaconda3\python.exe Z:/Documentos/GitHub/
  ProjetoBB/Projeto-Final/Main.py
2 Found Numpy. Will be used for storing data
3 Começando a leitura...
4 leu
5
6 saída: tempo x Vout
7
8
9
10
11 samples dos números aleatórios escolhidos: '          0
          1          2          3          4          5
          6          \
12 0   -0.137454  0.517669 -0.607186 -0.642495 -0.544930  1.
    000461 -0.602136
13 1   -1.539589 -1.662958 -0.904044 -0.584208 -0.632593 -1.
    823004 -0.099554
14 2   -1.433088 -1.268932 -1.620027 -1.650731 -1.635928 -1.
    144853 -1.629283
15 3    1.380453  1.449399  1.749187  2.313034  2.058468  1.
    424193  2.344976
16 4    0.054706  0.057827  0.064666  0.052996  0.056977  0.
    060401  0.051938
17 5    0.024793 -0.323291  0.628700  0.827146  0.714792 -0.
    863270  1.045445
18 6    0.460960 -0.106638  1.680779  1.643991  1.405558 -0.
    555069  1.678007
19 7   -0.586835 -0.142666 -0.458930 -0.423061 -0.585366  0.
    211623 -0.315562
20 8    1.501752  0.350404  1.495902  1.501357  1.687584  0.
    089320  1.412450
21 9   -0.499999 -0.551231 -0.303421 -0.194980 -0.239485 -0.
    678390 -0.033434
22 10  0.054706  0.057827  0.064666  0.052996  0.056977  0.
    060401  0.051938
23 11  0.054706  0.057827  0.064666  0.052996  0.056977  0.
    060401  0.051938
24 12 -2.524217 -2.509535 -2.169642 -1.995409 -2.045378 -2.
    319361 -1.850553
25 13 -1.500885 -1.510614 -1.409310 -1.362523 -1.395212 -1.
    522844 -1.277850
26 14 -0.051206 -0.012934  0.039623  0.147774  0.063752 -0.
    069791  0.167991
27 15 -0.575273 -0.538182 -0.047029  0.010991 -0.347383 -0.

```

27	341789	0.082080					
28	16	0.249173	0.282492	0.049375	-0.004540	0.143149	0.
	287508	-0.012646					
29	17	0.054706	0.057827	0.064666	0.052996	0.056977	0.
	060401	0.051938					
30	18	0.054706	0.057827	0.064666	0.052996	0.056977	0.
	060401	0.051938					
31	19	0.054706	0.057827	0.064666	0.052996	0.056977	0.
	060401	0.051938					
32	20	-0.064194	0.009218	-0.664097	-0.848478	-0.250820	0.
	034575	-0.891671					
33	21	0.338399	0.238583	0.195817	0.111932	0.302383	0.
	170754	0.080347					
34	22	-0.736964	-1.231651	0.090509	0.006616	-0.235735	-1.
	369099	0.174081					
35	23	1.380453	1.449399	1.749187	2.313034	2.058468	1.
	424193	2.344976					
36	24	0.054706	0.057827	0.064666	0.052996	0.056977	0.
	060401	0.051938					
37	25	0.000000	0.000000	0.000000	0.000000	0.000000	0.
	000000	0.000000					
38	26	1.467197	1.389296	1.669140	1.745133	1.629483	1.
	385033	1.832341					
39	27	0.013919	0.061889	-0.171335	-0.345803	0.002375	0.
	137459	-0.389377					
40	28	0.054706	0.057827	0.064666	0.052996	0.056977	0.
	060401	0.051938					
41	29	-0.064194	0.009218	-0.664097	-0.848478	-0.250820	0.
	034575	-0.891671					
42	..	...	...	...	...	...
					
43	93	0.054706	0.057827	0.064666	0.052996	0.056977	0.
	060401	0.051938					
44	94	-1.608461	-0.915664	-1.957430	-1.824206	-2.092768	-0.
	625504	-1.804400					
45	95	0.493728	0.814882	-0.023243	-0.247473	0.135886	0.
	908478	-0.261677					
46	96	-1.504697	-1.538045	-2.143924	-2.453635	-2.346877	-1.
	325449	-2.594151					
47	97	0.839081	0.773894	-0.000548	-0.231639	-0.199527	1.
	148626	-0.586705					
48	98	-1.785972	-2.069744	-1.123076	-0.721665	-1.604432	-1.
	606296	-0.711398					
49	99	0.013919	0.061889	-0.171335	-0.345803	0.002375	0.
	137459	-0.389377					

50	100	-2.524217	-2.509535	-2.169642	-1.995409	-2.045378	-2.319361	-1.850553
51	101	-0.051206	-0.012934	0.039623	0.147774	0.063752	-0.069791	0.167991
52	102	-0.137454	0.517669	-0.607186	-0.642495	-0.544930	1.000461	-0.602136
53	103	1.467197	1.389296	1.669140	1.745133	1.629483	1.385033	1.832341
54	104	0.080087	0.083407	0.090293	0.078648	0.082659	0.085774	0.077712
55	105	0.338399	0.238583	0.195817	0.111932	0.302383	0.170754	0.080347
56	106	0.054706	0.057827	0.064666	0.052996	0.056977	0.060401	0.051938
57	107	0.249173	0.282492	0.049375	-0.004540	0.143149	0.287508	-0.012646
58	108	0.054706	0.057827	0.064666	0.052996	0.056977	0.060401	0.051938
59	109	0.054706	0.057827	0.064666	0.052996	0.056977	0.060401	0.051938
60	110	0.054706	0.057827	0.064666	0.052996	0.056977	0.060401	0.051938
61	111	1.467197	1.389296	1.669140	1.745133	1.629483	1.385033	1.832341
62	112	0.054706	-0.088588	0.064666	0.052996	0.056977	-0.141558	0.051938
63	113	-1.214041	-1.385727	-0.579840	-0.608432	-0.841382	-1.376749	-0.354817
64	114	0.054706	0.057827	0.064666	0.052996	0.056977	0.060401	0.051938
65	115	0.054706	0.057827	0.064666	0.052996	0.056977	0.060401	0.051938
66	116	0.895068	0.756521	0.656393	0.661503	0.765662	0.454636	0.270926
67	117	0.960083	0.627546	0.702466	0.390160	0.871613	-0.163982	0.371670
68	118	0.249173	0.282492	0.049375	-0.004540	0.143149	0.287508	-0.012646
69	119	0.054706	0.057827	0.064666	0.052996	0.056977	0.060401	0.051938
70	120	-1.539589	-1.662958	-0.904044	-0.584208	-0.632593	-1.823004	-0.099554
71	121	0.054706	0.057827	0.064666	0.052996	0.056977	-0.039621	0.051938
72	122	0.845492	0.905874	0.310178	0.042930	0.504645	0.000000	0.000000

72	731082	0.017183					
73							
74		7	8	9	...	3290	
		3291	3292 \				
75	0	-0.105138	-0.680297	-0.614529	...	0.578264	0.
	496678	0.588397					
76	1	-0.750747	-0.477958	-0.726344	...	1.762360	1.
	621566	1.723797					
77	2	-1.629128	-1.649423	-1.506318	...	-1.643591	-1.
	731895	-1.723864					
78	3	1.950860	2.096976	1.858517	...	1.845889	1.
	920495	1.903958					
79	4	0.047103	0.058972	0.050531	...	-0.005519	-0.
	025743	-0.005040					
80	5	0.554190	0.793373	0.664688	...	0.614349	0.
	750194	0.904269					
81	6	0.392303	1.671831	1.572699	...	-0.644683	0.
	297002	-0.321480					
82	7	-0.563469	-0.547338	-0.467634	...	0.139677	0.
	628645	0.355009					
83	8	1.443817	1.572762	1.581732	...	-0.920853	-0.
	670572	-0.910261					
84	9	-0.294941	-0.230870	-0.389197	...	0.245126	0.
	135922	0.201915					
85	10	0.047103	0.058972	0.050531	...	-0.005519	-0.
	025743	-0.005040					
86	11	0.047103	0.058972	0.050531	...	-0.005519	-0.
	025743	-0.005040					
87	12	-2.072468	-2.013177	-2.067829	...	-0.383328	-0.
	617379	-0.611181					
88	13	-1.427144	-1.384927	-1.488689	...	-1.116172	-1.
	210127	-1.184460					
89	14	0.042671	0.002630	0.040475	...	0.568422	0.
	459395	0.551222					
90	15	-0.601945	-0.103623	-0.072963	...	-0.210681	0.
	253968	-0.086921					
91	16	0.292612	0.027212	0.024631	...	-1.417120	-1.
	833313	-1.603151					
92	17	0.047103	0.058972	0.050531	...	-0.005519	-0.
	025743	-0.005040					
93	18	0.047103	0.058972	0.050531	...	-0.005519	-0.
	025743	-0.005040					
94	19	0.047103	0.058972	0.050531	...	-0.005519	-0.
	025743	-0.005040					
95	20	-0.020471	-0.891790	-0.655391	...	0.769700	-0.

95	282592	0.125926					
96	21	0.346994	0.143601	0.154953	...	-1.859782	-1.
	980144	-2.009284					
97	22	-0.768600	0.070665	-0.082445	...	1.121708	1.
	391794	1.244039					
98	23	1.950860	2.096976	1.858517	...	1.845889	1.
	920495	1.903958					
99	24	0.047103	0.058972	0.050531	...	-0.005519	-0.
	025743	-0.005040					
100	25	0.000000	0.000000	0.000000	...	0.000000	0.
	000000	0.000000					
101	26	1.543891	1.751188	1.484902	...	1.463471	1.
	340449	1.472366					
102	27	0.001728	-0.370365	-0.167103	...	-0.301234	-0.
	916412	-0.641590					
103	28	0.047103	0.058972	0.050531	...	-0.005519	-0.
	025743	-0.005040					
104	29	-0.020471	-0.891790	-0.655391	...	0.769700	-0.
	282592	0.125926					
105	..	...	...	...	...	...
					
106	93	0.047103	0.058972	0.050531	...	-0.005519	-0.
	025743	-0.005040					
107	94	-1.305777	-1.810209	-2.056029	...	0.653736	1.
	191667	0.934471					
108	95	0.485751	-0.201866	0.054597	...	-0.005519	-0.
	025743	-0.005040					
109	96	-2.291014	-2.368806	-2.258936	...	-1.362526	-1.
	488551	-1.480201					
110	97	-0.102151	-0.193836	0.082765	...	-1.919358	-1.
	686331	-1.659363					
111	98	-1.841333	-0.660093	-1.433375	...	-0.475975	0.
	114804	-0.449209					
112	99	0.001728	-0.370365	-0.167103	...	-0.301234	-0.
	916412	-0.641590					
113	100	-2.072468	-2.013177	-2.067829	...	-0.383328	-0.
	617379	-0.611181					
114	101	0.042671	0.002630	0.040475	...	0.568422	0.
	459395	0.551222					
115	102	-0.105138	-0.680297	-0.614529	...	0.578264	0.
	496678	0.588397					
116	103	1.543891	1.751188	1.484902	...	1.463471	1.
	340449	1.472366					
117	104	0.072504	0.084489	0.076350	...	0.022944	0.
	002356	0.023617					

118	105	0.346994	0.143601	0.154953	...	-1.859782	-1.
	980144	-2.009284					
119	106	0.047103	0.058972	0.050531	...	-0.005519	-0.
	025743	-0.005040					
120	107	0.292612	0.027212	0.024631	...	-1.417120	-1.
	833313	-1.603151					
121	108	0.047103	0.058972	0.050531	...	-0.005519	-0.
	025743	-0.005040					
122	109	0.047103	0.058972	0.050531	...	-0.005519	-0.
	025743	-0.005040					
123	110	0.047103	0.058972	0.050531	...	-0.005519	-0.
	025743	-0.005040					
124	111	1.543891	1.751188	1.484902	...	1.463471	1.
	340449	1.472366					
125	112	0.047103	0.058972	0.050531	...	-0.005519	-0.
	025743	-0.005040					
126	113	-1.243292	-0.527133	-0.768721	...	1.409659	1.
	415951	1.409606					
127	114	0.047103	0.058972	0.050531	...	-0.005519	-0.
	025743	-0.005040					
128	115	0.047103	0.058972	0.050531	...	-0.005519	-0.
	025743	-0.005040					
129	116	0.951827	0.467628	0.794930	...	-1.142787	-1.
	101028	-1.079309					
130	117	0.975104	0.538280	0.754904	...	-0.005519	-0.
	025743	-0.005040					
131	118	0.292612	0.027212	0.024631	...	-1.417120	-1.
	833313	-1.603151					
132	119	0.047103	0.058972	0.050531	...	-0.005519	-0.
	025743	-0.005040					
133	120	-0.750747	-0.477958	-0.726344	...	1.762360	1.
	621566	1.723797					
134	121	0.047103	0.058972	0.050531	...	-0.005519	-0.
	025743	-0.005040					
135	122	0.868915	0.138362	0.377331	...	-0.005519	-0.
	025743	-0.005040					
136							
137		3293	3294	3295	3296	3297	
		3298	3299				
138	0	0.596570	0.596846	0.559518	0.612639	0.547689	0.
	615039	0.617435					
139	1	1.608951	1.458276	1.611034	1.624778	1.493630	1.
	748958	1.711274					
140	2	-1.707238	-1.656345	-1.747904	-1.751360	-1.698744	-1.
	685526	-1.793150					

141	3	1.922166	1.849339	1.956706	1.926280	1.923657	1.869918	2.006954
142	4	-0.006067	0.003170	-0.017056	-0.019184	-0.001403	-0.007868	-0.015609
143	5	1.002380	1.130513	0.763279	0.607772	1.114219	0.706142	0.696512
144	6	-0.381065	-0.279326	0.184658	0.002671	0.040417	-0.411813	-0.161036
145	7	0.315716	0.352827	0.608972	0.429573	0.507003	0.268138	0.476292
146	8	-0.916476	-0.901797	-0.778310	-0.874697	-0.810849	-0.937775	-0.931327
147	9	0.208069	0.285819	0.060392	0.086324	0.202714	0.189377	0.021805
148	10	-0.006067	0.003170	-0.017056	-0.019184	-0.001403	-0.007868	-0.015609
149	11	-0.006067	0.003170	-0.017056	-0.019184	-0.001403	-0.007868	-0.015609
150	12	-0.665672	-0.707297	-0.554160	-0.557490	-0.715322	-0.537078	-0.525147
151	13	-1.177889	-1.103730	-1.228006	-1.234848	-1.175092	-1.159837	-1.285644
152	14	0.558660	0.651236	0.414369	0.436597	0.550547	0.531419	0.437086
153	15	-0.122642	-0.114537	0.127315	-0.072028	0.087486	-0.160684	-0.025027
154	16	-1.534666	-1.680464	-1.730352	-1.578668	-1.789183	-1.526271	-1.634160
155	17	-0.006067	0.003170	-0.017056	-0.019184	-0.001403	-0.007868	-0.015609
156	18	-0.006067	0.003170	-0.017056	-0.019184	-0.001403	-0.007868	-0.015609
157	19	-0.006067	0.003170	-0.017056	-0.019184	-0.001403	-0.007868	-0.015609
158	20	0.419662	-0.075638	-0.045962	0.411323	-0.047870	0.388000	0.175148
159	21	-1.992165	-1.999939	-2.039651	-1.993193	-1.958574	-1.986299	-2.034944
160	22	1.210353	1.214822	1.394097	1.357277	1.323508	1.225624	1.308274
161	23	1.922166	1.849339	1.956706	1.926280	1.923657	1.869918	2.006954
162	24	-0.006067	0.003170	-0.017056	-0.019184	-0.001403	-0.007868	-0.015609
163	25	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

```

163 000000 0.000000
164 26 1.395352 1.520419 1.351581 1.376339 1.393942 1.
    501130 1.367658
165 27 -0.531092 -0.783706 -0.753770 -0.496078 -0.800582 -0.
    543538 -0.669684
166 28 -0.006067 0.003170 -0.017056 -0.019184 -0.001403 -0.
    007868 -0.015609
167 29 0.419662 -0.075638 -0.045962 0.411323 -0.047870 0.
    388000 0.175148
168 .. ... ... ... ...
    ... ...
169 93 -0.006067 0.003170 -0.017056 -0.019184 -0.001403 -0.
    007868 -0.015609
170 94 0.836281 1.045610 1.076436 0.818909 1.043103 0.
    843494 0.933416
171 95 -0.006067 0.003170 -0.017056 -0.019184 -0.001403 -0.
    007868 -0.015609
172 96 -1.490875 -1.513193 -1.470294 -1.475165 -1.538084 -1.
    431346 -1.431662
173 97 -1.645897 -1.633820 -1.834499 -1.832672 -1.619795 -1.
    712315 -1.765807
174 98 -0.523112 -0.188661 -0.078322 -0.431648 -0.211892 -0.
    590305 -0.458243
175 99 -0.531092 -0.783706 -0.753770 -0.496078 -0.800582 -0.
    543538 -0.669684
176 100 -0.665672 -0.707297 -0.554160 -0.557490 -0.715322 -0.
    537078 -0.525147
177 101 0.558660 0.651236 0.414369 0.436597 0.550547 0.
    531419 0.437086
178 102 0.596570 0.596846 0.559518 0.612639 0.547689 0.
    615039 0.617435
179 103 1.395352 1.520419 1.351581 1.376339 1.393942 1.
    501130 1.367658
180 104 0.022871 0.031793 0.011137 0.009033 0.027262 0.
    020616 0.012929
181 105 -1.992165 -1.999939 -2.039651 -1.993193 -1.958574 -1.
    986299 -2.034944
182 106 -0.006067 0.003170 -0.017056 -0.019184 -0.001403 -0.
    007868 -0.015609
183 107 -1.534666 -1.680464 -1.730352 -1.578668 -1.789183 -1.
    526271 -1.634160
184 108 -0.006067 0.003170 -0.017056 -0.019184 -0.001403 -0.
    007868 -0.015609
185 109 -0.006067 0.003170 -0.017056 -0.019184 -0.001403 -0.
    007868 -0.015609

```



```
186 110 -0.006067  0.003170 -0.017056 -0.019184 -0.001403 -0.
    007868 -0.015609
187 111  1.395352  1.520419  1.351581  1.376339  1.393942  1.
    501130  1.367658
188 112 -0.006067  0.003170 -0.017056 -0.019184 -0.001403 -0.
    007868 -0.015609
189 113  1.384177  1.374207  1.438151  1.446366  1.384340  1.
    411921  1.416876
190 114 -0.006067  0.003170 -0.017056 -0.019184 -0.001403 -0.
    007868 -0.015609
191 115 -0.006067  0.003170 -0.017056 -0.019184 -0.001403 -0.
    007868 -0.015609
192 116 -0.978281 -0.933707 -1.093982 -1.178776 -0.838594 -1.
    131125 -1.134703
193 117 -0.006067  0.003170 -0.017056 -0.019184 -0.001403 -0.
    007868 -0.015609
194 118 -1.534666 -1.680464 -1.730352 -1.578668 -1.789183 -1.
    526271 -1.634160
195 119 -0.006067  0.003170 -0.017056 -0.019184 -0.001403 -0.
    007868 -0.015609
196 120  1.608951  1.458276  1.611034  1.624778  1.493630  1.
    748958  1.711274
197 121 -0.006067  0.003170 -0.017056 -0.019184 -0.001403 -0.
    007868 -0.015609
198 122 -0.006067  0.003170 -0.017056 -0.019184 -0.001403 -0.
    007868 -0.015609
199
200 [123 rows x 3300 columns]':
201 Variância total dos primeiros 1 componentes: 0.
    330469098197
202 Variância total dos primeiros 2 componentes: 0.
    552606945184
203 Variância total dos primeiros 3 componentes: 0.
    727552848867
204 Variância total dos primeiros 4 componentes: 0.
    801729226434
205 Variância total dos primeiros 5 componentes: 0.
    859966666594
206 Variância total dos primeiros 6 componentes: 0.
    899966215427
207
```