```
 1 "C:\Users\squal\Dropbox\Engenharia Informatica\Projetos\PYTHON\
   TI\Ficha 2\venv\Scripts\python.exe" "C:/Users/squal/Dropbox/
   Engenharia Informatica/Projetos/PYTHON/TI/Ficha 2/main.py"
 2 Escolha o ficheiro a ler:
 3 1 - "lena.bmp"
 4 2 - "binaria.bmp"
 5 3 - "ct1.bmp"
 6 4 - "texto.txt"
 7 5 - "saxriff.wav"
 8 OPÇÃO: 1
 9 NOME DO FICHEIRO: "lena.bmp"
10 ---------------------------
11 EX 1 a 3
12 Entropia: 6.9153359855589525
13 ---------------------------
14 EX 4
15 Média ponderada: 6.9425048828125
16 Variância ponderada: 0.6393945068120956
17 ---------------------------
18 EX 5
19 Entropia pares: 5.596516148711308
20 ---------------------------
21 EX 6a
22 QUERY: Exemplo --- TARGET: Exemplo
23 infoMutua: [2.12192809 1.92192809 1.64643934 2.17095059 1.
   97095059 1.77095059
24  2.04643934 2.12192809 2.32192809 2.52192809 2.24643934 2.
   24643934
25  2.24643934 2.24643934 2.44643934 2.44643934 2.52192809 2.
   72192809
26  2.52192809 2.32192809 2.32192809 2.12192809 2.32192809 2.
   32192809
27  2.12192809 2.04643934 2.04643934 2.04643934 2.04643934 2.
   04643934
28  2.32192809 2.32192809 2.04643934 2.12192809 2.12192809 1.
   84643934
29  1.77095059 1.84643934 2.04643934 2.04643934 2.32192809]
30 ---------------------------
31 EX 6b
32 QUERY: saxwriff.wav --- TARGET: "target01 - repeat.wav"
33 infoMutua: [0.27915678 0.2702418  0.23025992 0.28440105 0.
   27076459 0.35523867
34  0.36262582 0.36270771 0.38070522 0.34035112 0.31365312 0.
   3214788
35  0.26728939 0.25933946 0.26961879 0.17617538 0.26715763 0.
   28324868
36  0.31036022 0.33878691 0.35136703 0.38509042 0.36342648 0.
```

```
36 33605899
37  0.30354469 0.28545328 0.25981794 0.28895392 0.25476496 0.
   23678984
38  0.28325069 0.26767434 0.35625649 0.36324267 0.36088674 0.
   38586747
39  0.33298546]
40
41 QUERY: saxwriff.wav --- TARGET: "target02 - repeatNoise.wav"
42 infoMutua: [0.3098031  0.29410717 0.28187348 0.33226548 0.
   31718176 0.38320454
43  0.38829606 0.38643374 0.42243891 0.37895978 0.33058733 0.
   30948079
44  0.26823424 0.25885922 0.26973809 0.16601108 0.27415898 0.
   26940962
45  0.31100185 0.34167682 0.34495582 0.38829146 0.3575454  0.
   33338077
46  0.32849493 0.34189952 0.33499536 0.31590094 0.28418754 0.
   29198149
47  0.32747431 0.31961926 0.39025241 0.38227861 0.38948818 0.
   42274719
48  0.38248497]
49
50 ---------------------------
51 EX 6c
52 QUERY: saxwriff.wav --- TARGET: "Song01.wav"
53 infoMutua: [0.85499353 0.82072112 0.82761067 0.79194774 0.
   74203689 0.82926618
54  0.8096933  0.82688386 0.85618266 0.82670315 0.85048192 0.
   83283694
55  0.83020999 0.85152128 0.83344071 0.83923229 0.83035247 0.
   81245114
56  0.80913127 0.82520247 0.81098008 0.82996034 0.8296176  0.
   85952081
57  0.82829404 0.83643227 0.80910974 0.78678239 0.76956467 0.
   72760208]
58 Inf mútua máxima: 0.8595208093544
59 Inf mútua ordem decrescente: [0.85952081 0.85618266 0.85499353
   0.85152128 0.85048192 0.83923229
60  0.83643227 0.83344071 0.83283694 0.83035247 0.83020999 0.
   82996034
61  0.8296176  0.82926618 0.82829404 0.82761067 0.82688386 0.
   82670315
62  0.82520247 0.82072112 0.81245114 0.81098008 0.8096933  0.
   80913127
63  0.80910974 0.79194774 0.78678239 0.76956467 0.74203689 0.
   72760208]
64
```

```
65  QUERY: saxwriff.wav --- TARGET: "Song02.wav"
66  infoMutua: [1.24672346 1.19397168 1.20976069 1.1754182  1.
    12560443 1.186445
67   1.15158041 1.20157888 1.19980291 1.16923486 1.19981368 1.
    15224235
68   1.13199771 1.17403378 1.1290249  1.16206282 1.21102696 1.
    15773963
69   1.20724931 1.20231673 1.2073802  1.24726671 1.21685658 1.
    20535663
70   1.18617533]
71  Inf mútua máxima: 1.2472667149778234
72  Inf mútua ordem decrescente: [1.24726671 1.24672346 1.21685658
     1.21102696 1.20976069 1.2073802
73   1.20724931 1.20535663 1.20231673 1.20157888 1.19981368 1.
    19980291
74   1.19397168 1.186445   1.18617533 1.1754182  1.17403378 1.
    16923486
75   1.16206282 1.15773963 1.15224235 1.15158041 1.13199771 1.
    1290249
76   1.12560443]
77
78  QUERY: saxwriff.wav --- TARGET: "Song03.wav"
79  infoMutua: [0.72460907 0.86231006 0.91645503 0.93564031 0.
    94221691 0.91056644
80   0.92258144 0.96163825 0.90824909 0.87909168 0.97830242 1.
    01394221
81   1.00882259 1.03358151 0.92043282 0.7891439  0.8907654  0.
    94708538
82   0.99064995 1.02653627 0.94576345 0.9119143  0.86094855 0.
    84137114
83   0.8040888  0.7594479  0.83265233 0.86272439 0.84774411 0.
    86271947
84   0.81856007 0.72068497]
85  Inf mútua máxima: 1.0335815135350461
86  Inf mútua ordem decrescente: [1.03358151 1.02653627 1.01394221
     1.00882259 0.99064995 0.97830242
87   0.96163825 0.94708538 0.94576345 0.94221691 0.93564031 0.
    92258144
88   0.92043282 0.91645503 0.9119143  0.91056644 0.90824909 0.
    8907654
89   0.87909168 0.86272439 0.86271947 0.86231006 0.86094855 0.
    84774411
90   0.84137114 0.83265233 0.81856007 0.8040888  0.7891439  0.
    7594479
91   0.72460907 0.72068497]
92
93  QUERY: saxwriff.wav --- TARGET: "Song04.wav"
```

```
 94 infoMutua: [1.31694676 1.33237954 1.33523446 1.33097166 1.
    3448029  1.340093
 95  1.32727912 1.33295289 1.34550233 1.34674904 1.3537126  1.
    34017632
 96  1.34388676 1.36470182 1.35153599 1.34790601 1.33244052 1.
    34430878
 97  1.33209665 1.33403487 1.32643893 1.32662992 1.33741913 1.
    31784261
 98  1.31188333 1.31225143 1.3086176  1.32523622 1.32839795]
 99 Inf mútua máxima: 1.3647018159980913
100 Inf mútua ordem decrescente: [1.36470182 1.3537126  1.35153599
     1.34790601 1.34674904 1.34550233
101  1.3448029  1.34430878 1.34388676 1.34017632 1.340093   1.
    33741913
102  1.33523446 1.33403487 1.33295289 1.33244052 1.33237954 1.
    33209665
103  1.33097166 1.32839795 1.32727912 1.32662992 1.32643893 1.
    32523622
104  1.31784261 1.31694676 1.31225143 1.31188333 1.3086176 ]
105
106 QUERY: saxwriff.wav --- TARGET: "Song05.wav"
107 infoMutua: [0.31243984 0.29539083 0.27790248 0.32330208 0.
    3142438  0.37127111
108  0.38648351 0.38634386 0.41997939 0.3851792 ]
109 Inf mútua máxima: 0.4199793932818142
110 Inf mútua ordem decrescente: [0.41997939 0.38648351 0.38634386
     0.3851792  0.37127111 0.32330208
111  0.3142438  0.31243984 0.29539083 0.27790248]
112
113 QUERY: saxwriff.wav --- TARGET: "Song06.wav"
114 infoMutua: [0.30909684 0.29919179 0.25360787 0.30501577 0.
    28569663 0.37559361
115  0.38313663 0.38082151 0.39666159 0.35495436]
116 Inf mútua máxima: 0.396661590918768
117 Inf mútua ordem decrescente: [0.39666159 0.38313663 0.38082151
     0.37559361 0.35495436 0.30909684
118  0.30501577 0.29919179 0.28569663 0.25360787]
119
120 QUERY: saxwriff.wav --- TARGET: "Song07.wav"
121 infoMutua: [0.28985576 0.28208989 0.23686261 0.28919093 0.
    26809688 0.35777048
122  0.36540403 0.36541791 0.37983985 0.33902472]
123 Inf mútua máxima: 0.3798398549691319
124 Inf mútua ordem decrescente: [0.37983985 0.36541791 0.36540403
     0.35777048 0.33902472 0.28985576
125  0.28919093 0.28208989 0.26809688 0.23686261]
126
```

```
127
128 Process finished with exit code 0
129
```