課堂作業4 05050545 魏靖珊

1. 從moodle下載所需程式及測試資料，然後完成下列表格。並根據結果進行比較分析。
   1. 適應性Huffman編碼：執行”ahuff-enc.exe infile outfile” 及執行” ahuff -dec.exe infile outfile” 進行壓縮及解壓縮
   2. 算術編碼法：執行”arith-enc.exe infile outfile”及執行”arith-dec.exe infile outfile”

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| --- | --- | --- | --- | --- |
| 檔案 | 原始大小(Bytes) | Huffman  壓縮比 | 適應性Huffman  壓縮比 | 算術編碼法  壓縮比 |
| world95.txt | 3,005,020 | 1.552 | 1.563 | 1.560 |
| water\_lilies.bmp | 1,440,054 | 1.129 | 1.158 | 1.132 |
| EXCEL.EXE | 34,482,256 | 1.296 | 1.412 | 1.301 |
| Bach-PartitaEmajor-44kHz-Stereo-16bit.wav | 9,580,594 | 1.067 | 1.079 | 1.070 |

1. 給定下表之符號機率及其分佈區間，請說明採用算術編碼法壓縮資料串”BAABA”之過程。並解碼數字0.6493所編碼的字串到第4字元。

|  |  |  |
| --- | --- | --- |
| 輸入符號 | 機率 | 範圍 |
| A | 0.4 | 0.0≤r<0.4 |
| B | 0.2 | 0.4≤r<0.6 |
| C | 0.2 | 0.6≤r<0.8 |
| D | 0.1 | 0.8≤r<0.9 |
| E | 0.1 | 0.9≤r<1.0 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 輸入符號 | 機率 | l | h |  | low | high | range | input |
| A | 0.4 | 0.0 | 0.4 |  | 0.0000 | 1.0000 | 1.0000 | B |
| B | 0.2 | 0.4 | 0.6 |  | 0.4000 | 0.6000 | 0.2000 | A |
| C | 0.2 | 0.6 | 0.8 |  | 0.4000 | 0.4800 | 0.0800 | A |
| D | 0.1 | 0.8 | 0.9 |  | 0.4000 | 0.4320 | 0.0320 | B |
| E | 0.1 | 0.9 | 1.0 |  | 0.4128 | 0.4192 | 0.0064 | A |
|  |  |  |  |  | 0.4128 | 0.4154 | 0.0026 |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 機率 |  |  |  |
| 0.6493 | 0.0493 |  |  |
| C | 0.2465 | 0.2465 |  |
| C | A | 0.61625 | 0.01625 |
| C | A | C | 0.08125 |
| C | A | C | A |