--- Q2_CFIX: Fixed-Length Coding ---
Alphabet size M = 2
Bits per symbol L = 1

--- Q2_CHUF: Empirical model ---
Level   p(level)
 -0.7995   0.5000
  0.7918   0.5000
Entropy H(A) = 1.0000 bits/symbol

--- Q2_CHUF: Huffman Coding ---
Level   p(level)   Code

 -0.80   0.5000   1
  0.79   0.5000   0

Average code length = 1.0000 bits/symbol
M = 8
  thresholds (7): -2.8839 -1.81244 -0.74098 0.330482 1.40194 2.47341 3.54487
  levels   (8): -3.41964 -2.34817 -1.27671 -0.205249 0.866213 1.93768 3.00914 4.0806
  MSE = 0.0948097

--- QU8_CFIX: Fixed-Length Coding ---
Alphabet size M = 8
Bits per symbol L = 3

--- QU8_CHUF: Empirical model ---
Level   p(level)
 -3.4196   0.0023
 -2.3482   0.0327
 -1.2767   0.1944
 -0.2052   0.4009
  0.8662   0.2914
  1.9377   0.0718
  3.0091   0.0062
  4.0806   0.0004
Entropy H(A) = 2.0097 bits/symbol

--- QU8_CHUF: Huffman Coding ---
Level   p(level)   Code

 -3.42   0.0023   0011110
 -2.35   0.0327   00110
 -1.28   0.1944   000
 -0.21   0.4009   1
  0.87   0.2914   01
  1.94   0.0718   0010
  3.01   0.0062   001110
  4.08   0.0004   0011111

Average code length = 2.0728 bits/symbol

M = 16
  thresholds (15): -3.41964 -2.8839 -2.34817 -1.81244 -1.27671 -0.74098 -0.205249 0.330482 0.866213 1.40194 1.93768 2.47341 3.00914 3.54487 4.0806
  levels   (16): -3.6875 -3.15177 -2.61604 -2.08031 -1.54458 -1.00885 -0.473114 0.0626168 0.598348 1.13408 1.66981 2.20554 2.74127 3.277 3.81273 4.34847
  MSE = 0.0238791

--- QU16_CFIX: Fixed-Length Coding ---
Alphabet size M = 16
Bits per symbol L = 4

--- QU16_CHUF: Empirical model ---
Level   p(level)
 -3.6875   0.0003
 -3.1518   0.0019
 -2.6160   0.0076
 -2.0803   0.0251
 -1.5446   0.0665
 -1.0088   0.1279
 -0.4731   0.1885
  0.0626   0.2125
  0.5983   0.1781
  1.1341   0.1133
  1.6698   0.0535
  2.2055   0.0183
  2.7413   0.0051
  3.2770   0.0011
  3.8127   0.0003
  4.3485   0.0001
Entropy H(A) = 2.9608 bits/symbol

--- QU16_CHUF: Huffman Coding ---
Level   p(level)   Code

 -3.69   0.0003   000000101111
 -3.15   0.0019   0000001010
 -2.62   0.0076   00000011
 -2.08   0.0251   000001
 -1.54   0.0665   0001
 -1.01   0.1279   010
 -0.47   0.1885   11
  0.06   0.2125   10
  0.60   0.1781   001
  1.13   0.1133   011
  1.67   0.0535   00001
  2.21   0.0183   0000000
  2.74   0.0051   000000100
  3.28   0.0011   00000010110
  3.81   0.0003   0000001011100
  4.35   0.0001   0000001011101

Average code length = 3.0181 bits/symbol

--- QL8_CFIX: Fixed-Length Coding ---

Alphabet size M = 8
Bits per symbol L = 3

--- QL8_CHUF: Empirical model ---
Level   p(level)
 -2.1802   0.0390
 -1.3463   0.1107
 -0.7413   0.1644
 -0.2186   0.1999
  0.2791   0.1905
  0.7920   0.1592
  1.3744   0.1003
  2.1814   0.0361
Entropy H(A) = 2.8099 bits/symbol

--- QL8_CHUF: Huffman Coding ---
Level   p(level)   Code

 -2.18   0.0390   00010
 -1.35   0.1107   011
 -0.74   0.1644   001
 -0.22   0.1999   10
  0.28   0.1905   11
  0.79   0.1592   010
  1.37   0.1003   0000
  2.18   0.0361   00011

Average code length = 2.8601 bits/symbol

--- QL16_CFIX: Fixed-Length Coding ---
Alphabet size M = 16
Bits per symbol L = 4

```
--- QL16_CHUF: Empirical model ---
Level    p(level)
 -2.7886    0.0075
 -2.0943    0.0250
 -1.6055    0.0471
 -1.2196    0.0679
 -0.8864    0.0841
 -0.5796    0.0967
 -0.3006    0.1055
 -0.0307    0.1085
  0.2398    0.1035
  0.5067    0.0951
  0.7841    0.0856
  1.0790    0.0691
  1.4006    0.0498
  1.7677    0.0333
  2.2354    0.0167
  2.9558    0.0046
Entropy H(A) = 3.7183 bits/symbol

--- QL16_CHUF: Huffman Coding ---
Level    p(level)    Code
--------------------------------
 -2.79    0.0075        1010010
```

```
 -2.09    0.0250        10101
 -1.61    0.0471        00110
 -1.22    0.0679        0101
 -0.89    0.0841        0010
 -0.58    0.0967        111
 -0.30    0.1055        100
 -0.03    0.1085        011
  0.24    0.1035        110
  0.51    0.0951        0000
  0.78    0.0856        0001
  1.08    0.0691        0100
  1.40    0.0498        1011
  1.77    0.0333        00111
  2.24    0.0167        101000
  2.96    0.0046        1010011
--------------------------------
Average code length = 3.7611 bits/symbol
    quantizerName    quantizerID    M     coderType    coderID     Nsymbols    signalPower      mse_q      SNRdB_q    mse_total    SNRdB_total    totalBits     bitsPerSym    latencySym    latencySec
modelTime     encTime     decTime     EbN0dB_chan    L_rep_chan    ber_uncoded_chan    ber_coded_chan
    _____________    ___________    __    _________    ________    ________    ____________    _________    _______    _________    ___________    __________    __________    __________    __________
_________    _________    _______    ___________    _________    _________________    _____________

    {'two_level'}     {'Q2'  }       2    {'fixed'}    {'CFIX'}     50000        0.99678        0.36374     4.378       0.36374       4.378           50000          1           1
1               0     0.031054    0.50258         6             3              0.00238               2e-05
    {'two_level'}     {'Q2'  }       2    {'huff' }    {'CHUF'}     50000        0.99678        0.36374     4.378       0.36374       4.378           50000          1        50000         50000
0.013692     0.014196    0.41705         6             3              0.00248               2e-05
    {'uniform'  }     {'QU8' }       8    {'fixed'}    {'CFIX'}     50000        0.99678        0.09481    10.217       0.09481      10.217          1.5e+05         3           1
1               0     0.029157    0.35551         6             3              0.00236          3.3333e-05
    {'uniform'  }     {'QU8' }       8    {'huff' }    {'CHUF'}     50000        0.99678        0.09481    10.217       0.09481      10.217         1.0364e+05     2.0728        50000         50000
0.0042331     0.007102    0.51544         6              3            0.0023543          9.6486e-06
    {'uniform'  }     {'QU16'}      16    {'fixed'}    {'CFIX'}     50000        0.99678        0.023879    16.206      0.023879      16.206           2e+05          4           1
1               0     0.031054    0.38171         6             3              0.00235               2e-05
    {'uniform'  }     {'QU16'}      16    {'huff' }    {'CHUF'}     50000        0.99678        0.023879    16.206      0.023879      16.206         1.5091e+05     3.0181        50000         50000
0.004807     0.005645    0.61192         6             3              0.0023723          2.6506e-05
    {'lloydmax' }     {'QL8' }       8    {'fixed'}    {'CFIX'}     50000        0.99678        0.035291    14.509      0.035291      14.509           1.5e+05          3           1
1               0     0.028329    0.39044         6             3              0.00266           1.3333e-05
    {'lloydmax' }     {'QL8' }       8    {'huff' }    {'CHUF'}     50000        0.99678        0.035291    14.509      0.035291      14.509         1.4301e+05     2.8601        50000         50000
0.0040818    0.0052511    0.60006         6              3             0.0021607          2.0978e-05
    {'lloydmax' }     {'QL16'}      16    {'fixed'}    {'CFIX'}     50000        0.99678      0.0097518     20.095     0.0097518      20.095           2e+05          4           1
1               0     0.026858    0.42971         6             3             0.002265               2e-05
    {'lloydmax' }     {'QL16'}      16    {'huff' }    {'CHUF'}     50000        0.99678      0.0097518     20.095     0.0097518      20.095         1.8805e+05     3.7611        50000         50000
0.0048894    0.0053215    0.63348         6              3             0.0022547          2.127e-05


Saved results to full_chain_results.mat
>>
```