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**COMP 590 – A1 Questions**

1. Found in the data file under “uncompressed.txt.”
2. These are the probabilities for each symbol:

Probability of symbol at index 0 is 0.0

Probability of symbol at index 1 is 0.0

Probability of symbol at index 2 is 0.0

Probability of symbol at index 3 is 0.0

Probability of symbol at index 4 is 0.0

Probability of symbol at index 5 is 0.0

Probability of symbol at index 6 is 0.0

Probability of symbol at index 7 is 0.0

Probability of symbol at index 8 is 0.0

Probability of symbol at index 9 is 0.0

Probability of symbol at index 10 is 0.021995088627320032

Probability of symbol at index 11 is 0.0

Probability of symbol at index 12 is 0.0

Probability of symbol at index 13 is 0.021995088627320032

Probability of symbol at index 14 is 0.0

Probability of symbol at index 15 is 0.0

Probability of symbol at index 16 is 0.0

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Probability of symbol at index 18 is 0.0

Probability of symbol at index 19 is 0.0

Probability of symbol at index 20 is 0.0

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Probability of symbol at index 27 is 0.0

Probability of symbol at index 28 is 0.0

Probability of symbol at index 29 is 0.0

Probability of symbol at index 30 is 0.0

Probability of symbol at index 31 is 0.0

Probability of symbol at index 32 is 0.16466837799482428

Probability of symbol at index 33 is 6.000083479422323E-4

Probability of symbol at index 34 is 0.008857514539332721

Probability of symbol at index 35 is 0.0

Probability of symbol at index 36 is 0.0

Probability of symbol at index 37 is 0.0

Probability of symbol at index 38 is 8.695773158583076E-6

Probability of symbol at index 39 is 0.002598297019784623

Probability of symbol at index 40 is 8.695773158583076E-6

Probability of symbol at index 41 is 8.695773158583076E-6

Probability of symbol at index 42 is 0.0

Probability of symbol at index 43 is 0.0

Probability of symbol at index 44 is 0.013285402231683223

Probability of symbol at index 45 is 0.001987853744052091

Probability of symbol at index 46 is 0.010794932799065031

Probability of symbol at index 47 is 1.7391546317166151E-6

Probability of symbol at index 48 is 1.4261067980076244E-4

Probability of symbol at index 49 is 1.0956674179814675E-4

Probability of symbol at index 50 is 6.087041211008153E-5

Probability of symbol at index 51 is 2.6087319475749227E-5

Probability of symbol at index 52 is 3.8261401897765534E-5

Probability of symbol at index 53 is 2.7826474107465842E-5

Probability of symbol at index 54 is 2.4348164844032614E-5

Probability of symbol at index 55 is 3.130478337089907E-5

Probability of symbol at index 56 is 6.434872137351476E-5

Probability of symbol at index 57 is 2.2609010212316E-5

Probability of symbol at index 58 is 1.043492779029969E-4

Probability of symbol at index 59 is 3.513092356067563E-4

Probability of symbol at index 60 is 0.0

Probability of symbol at index 61 is 0.0

Probability of symbol at index 62 is 0.0

Probability of symbol at index 63 is 0.0012817569635751455

Probability of symbol at index 64 is 0.0

Probability of symbol at index 65 is 0.0013234966747363442

Probability of symbol at index 66 is 8.330550685922587E-4

Probability of symbol at index 67 is 5.687035645713332E-4

Probability of symbol at index 68 is 3.7217909118735567E-4

Probability of symbol at index 69 is 4.0870133845340455E-4

Probability of symbol at index 70 is 3.304393800261569E-4

Probability of symbol at index 71 is 2.678298132843587E-4

Probability of symbol at index 72 is 0.0021635083618554694

Probability of symbol at index 73 is 0.006563569580098506

Probability of symbol at index 74 is 1.9826362801569412E-4

Probability of symbol at index 75 is 1.3565406127389598E-4

Probability of symbol at index 76 is 5.06093997829535E-4

Probability of symbol at index 77 is 0.0012730611904165623

Probability of symbol at index 78 is 5.28703008041851E-4

Probability of symbol at index 79 is 5.426162450955839E-4

Probability of symbol at index 80 is 3.182652976041406E-4

Probability of symbol at index 81 is 3.47830926343323E-5

Probability of symbol at index 82 is 3.547875448701895E-4

Probability of symbol at index 83 is 0.0013252358293680607

Probability of symbol at index 84 is 0.001980897125525225

Probability of symbol at index 85 is 8.00011130589643E-5

Probability of symbol at index 86 is 1.478281436959123E-4

Probability of symbol at index 87 is 0.0013182792108411942

Probability of symbol at index 88 is 1.3913237053732921E-5

Probability of symbol at index 89 is 7.913153574310599E-4

Probability of symbol at index 90 is 3.4783092634332303E-6

Probability of symbol at index 91 is 0.0

Probability of symbol at index 92 is 0.0

Probability of symbol at index 93 is 0.0

Probability of symbol at index 94 is 0.0

Probability of symbol at index 95 is 0.0

Probability of symbol at index 96 is 0.0

Probability of symbol at index 97 is 0.059781701310626933

Probability of symbol at index 98 is 0.010231446698388847

Probability of symbol at index 99 is 0.01769068091382141

Probability of symbol at index 100 is 0.03191174833736817

Probability of symbol at index 101 is 0.09193693129643543

Probability of symbol at index 102 is 0.015278473439630465

Probability of symbol at index 103 is 0.013448882767064586

Probability of symbol at index 104 is 0.04835371622561705

Probability of symbol at index 105 is 0.045854551019840276

Probability of symbol at index 106 is 5.878342655202159E-4

Probability of symbol at index 107 is 0.006026170798898072

Probability of symbol at index 108 is 0.029311712162951833

Probability of symbol at index 109 is 0.019226354453627182

Probability of symbol at index 110 is 0.04935373013885411

Probability of symbol at index 111 is 0.05773993377299162

Probability of symbol at index 112 is 0.011568856610178924

Probability of symbol at index 113 is 7.060967804769458E-4

Probability of symbol at index 114 is 0.04226841416924062

Probability of symbol at index 115 is 0.04596933522553357

Probability of symbol at index 116 is 0.06581308957342015

Probability of symbol at index 117 is 0.02273075103653616

Probability of symbol at index 118 is 0.007594888276706458

Probability of symbol at index 119 is 0.01827503687007819

Probability of symbol at index 120 is 9.408826557586889E-4

Probability of symbol at index 121 is 0.015610651974288337

Probability of symbol at index 122 is 2.556557308623424E-4

Probability of symbol at index 123 is 0.0

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Probability of symbol at index 168 is 1.7391546317166151E-6

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Probability of symbol at index 255 is 0.0

1. The theoretical entropy is: 4.53 bits/symbols
2. The compressed entropy is: 14.16 bits/symbol
3. Encoded file is in the data folder under “recompressed.txt”
4. The compressed entropy is: 4.57 bits/symbol
5. The original compressed entropy is: 14.16 bits/sym. where my entropy is 4.57 bits/sym.