1. Use your decoder to decode the provided compressed file, producing ASCII English text.

--See in-text file

1. 2. Calculate the probability of each symbol in the source ASCII English text file by dividing the number of occurrences for each symbol by the total symbol count.

--See-in text file

3. Calculate the theoretical entropy of the source message in bits per symbol using the symbol

probabilities from part 2. What is this value?

--See-in text file [4.5317035]

4. What is the compressed entropy achieved by the provided compressed file in bits per symbol?

--[168.4550560360094]

5. Use your encoder to re-encode the raw English text.

-- See-in text file

6. What is the compressed entropy achieved by the Huffman code produced by your encoder?

--[108.96960076519258]

7. Using your entropy value calculations as evidence, does your encoder achieve better

compression or worse compression then the original compressed file?

-- Because the value of 6 is lower than 7, my encoder achieved better compression

-----------------------Question 2-------------------

The probability of \_ or ASCII0 is 0.0%

The probability of \_ or ASCII1 is 0.0%

The probability of \_ or ASCII2 is 0.0%

The probability of \_ or ASCII3 is 0.0%

The probability of \_ or ASCII4 is 0.0%

The probability of \_ or ASCII5 is 0.0%

The probability of \_ or ASCII6 is 0.0%

The probability of \_ or ASCII7 is 0.0%

The probability of \_ or ASCII8 is 0.0%

The probability of or ASCII9 is 0.0%

The probability of

or ASCII10 is 0.02199508808553219%

The probability of \_ or ASCII11 is 0.0%

The probability of \_ or ASCII12 is 0.0%

The probability of

or ASCII13 is 0.02199508808553219%

The probability of \_ or ASCII14 is 0.0%

The probability of \_ or ASCII15 is 0.0%

The probability of \_ or ASCII16 is 0.0%

The probability of \_ or ASCII17 is 0.0%

The probability of \_ or ASCII18 is 0.0%

The probability of \_ or ASCII19 is 0.0%

The probability of \_ or ASCII20 is 0.0%

The probability of \_ or ASCII21 is 0.0%

The probability of \_ or ASCII22 is 0.0%

The probability of \_ or ASCII23 is 0.0%

The probability of \_ or ASCII24 is 0.0%

The probability of \_ or ASCII25 is 0.0%

The probability of \_ or ASCII26 is 0.0%

The probability of \_ or ASCII27 is 0.0%

The probability of \_ or ASCII28 is 0.0%

The probability of \_ or ASCII29 is 0.0%

The probability of \_ or ASCII30 is 0.0%

The probability of \_ or ASCII31 is 0.0%

The probability of or ASCII32 is 0.16466838121414185%

The probability of ! or ASCII33 is 6.000083521939814E-4%

The probability of " or ASCII34 is 0.008857514709234238%

The probability of # or ASCII35 is 0.0%

The probability of $ or ASCII36 is 0.0%

The probability of % or ASCII37 is 0.0%

The probability of & or ASCII38 is 8.695773431099951E-6%

The probability of ' or ASCII39 is 0.002598297083750367%

The probability of ( or ASCII40 is 8.695773431099951E-6%

The probability of ) or ASCII41 is 8.695773431099951E-6%

The probability of \* or ASCII42 is 0.0%

The probability of + or ASCII43 is 0.0%

The probability of , or ASCII44 is 0.013285402208566666%

The probability of - or ASCII45 is 0.0019878537859767675%

The probability of . or ASCII46 is 0.010794932954013348%

The probability of / or ASCII47 is 1.7391546407452552E-6%

The probability of 0 or ASCII48 is 1.4261067553889006E-4%

The probability of 1 or ASCII49 is 1.095667394110933E-4%

The probability of 2 or ASCII50 is 6.087041037972085E-5%

The probability of 3 or ASCII51 is 2.6087320293299854E-5%

The probability of 4 or ASCII52 is 3.826140164164826E-5%

The probability of 5 or ASCII53 is 2.7826474251924083E-5%

The probability of 6 or ASCII54 is 2.434816451568622E-5%

The probability of 7 or ASCII55 is 3.130478216917254E-5%

The probability of 8 or ASCII56 is 6.434872193494812E-5%

The probability of 9 or ASCII57 is 2.2609010557061993E-5%

The probability of : or ASCII58 is 1.0434928117319942E-4%

The probability of ; or ASCII59 is 3.5130922333337367E-4%

The probability of < or ASCII60 is 0.0%

The probability of = or ASCII61 is 0.0%

The probability of > or ASCII62 is 0.0%

The probability of ? or ASCII63 is 0.0012817569077014923%

The probability of @ or ASCII64 is 0.0%

The probability of A or ASCII65 is 0.0013234966900199652%

The probability of B or ASCII66 is 8.330550626851618E-4%

The probability of C or ASCII67 is 5.687035736627877E-4%

The probability of D or ASCII68 is 3.7217908538877964E-4%

The probability of E or ASCII69 is 4.087013367097825E-4%

The probability of F or ASCII70 is 3.3043939038179815E-4%

The probability of G or ASCII71 is 2.678298042155802E-4%

The probability of H or ASCII72 is 0.0021635084412992%

The probability of I or ASCII73 is 0.0065635694190859795%

The probability of J or ASCII74 is 1.9826363131869584E-4%

The probability of K or ASCII75 is 1.3565405970439315E-4%

The probability of L or ASCII76 is 5.060940166004002E-4%

The probability of M or ASCII77 is 0.0012730611488223076%

The probability of N or ASCII78 is 5.287030362524092E-4%

The probability of O or ASCII79 is 5.426162388175726E-4%

The probability of P or ASCII80 is 3.182652872055769E-4%

The probability of Q or ASCII81 is 3.4783093724399805E-5%

The probability of R or ASCII82 is 3.5478753852657974E-4%

The probability of S or ASCII83 is 0.0013252358185127378%

The probability of T or ASCII84 is 0.0019808970391750336%

The probability of U or ASCII85 is 8.000111120054498E-5%

The probability of V or ASCII86 is 1.4782814832869917E-4%

The probability of W or ASCII87 is 0.0013182791881263256%

The probability of X or ASCII88 is 1.3913237125962041E-5%

The probability of Y or ASCII89 is 7.913153385743499E-4%

The probability of Z or ASCII90 is 3.4783092814905103E-6%

The probability of [ or ASCII91 is 0.0%

The probability of \ or ASCII92 is 0.0%

The probability of ] or ASCII93 is 0.0%

The probability of ^ or ASCII94 is 0.0%

The probability of \_ or ASCII95 is 0.0%

The probability of ` or ASCII96 is 0.0%

The probability of a or ASCII97 is 0.05978170037269592%

The probability of b or ASCII98 is 0.010231446474790573%

The probability of c or ASCII99 is 0.01769068092107773%

The probability of d or ASCII100 is 0.03191174939274788%

The probability of e or ASCII101 is 0.09193693101406097%

The probability of f or ASCII102 is 0.015278473496437073%

The probability of g or ASCII103 is 0.013448882848024368%

The probability of h or ASCII104 is 0.04835371673107147%

The probability of i or ASCII105 is 0.04585454985499382%

The probability of j or ASCII106 is 5.878342781215906E-4%

The probability of k or ASCII107 is 0.006026170682162046%

The probability of l or ASCII108 is 0.029311712831258774%

The probability of m or ASCII109 is 0.019226353615522385%

The probability of n or ASCII110 is 0.04935372993350029%

The probability of o or ASCII111 is 0.05773993209004402%

The probability of p or ASCII112 is 0.011568856425583363%

The probability of q or ASCII113 is 7.060967618599534E-4%

The probability of r or ASCII114 is 0.04226841405034065%

The probability of s or ASCII115 is 0.04596933349967003%

The probability of t or ASCII116 is 0.0658130869269371%

The probability of u or ASCII117 is 0.02273075096309185%

The probability of v or ASCII118 is 0.007594888098537922%

The probability of w or ASCII119 is 0.01827503740787506%

The probability of x or ASCII120 is 9.408826590515673E-4%

The probability of y or ASCII121 is 0.015610652044415474%

The probability of z or ASCII122 is 2.5565573014318943E-4%

The probability of { or ASCII123 is 0.0%

The probability of | or ASCII124 is 0.0%

The probability of } or ASCII125 is 0.0%

The probability of ~ or ASCII126 is 0.0%

The probability of  or ASCII127 is 0.0%

The probability of  or ASCII128 is 0.0%

The probability of  or ASCII129 is 0.0%

The probability of  or ASCII130 is 0.0%

The probability of  or ASCII131 is 0.0%

The probability of  or ASCII132 is 0.0%

The probability of  or ASCII133 is 0.0%

The probability of  or ASCII134 is 0.0%

The probability of  or ASCII135 is 0.0%

The probability of  or ASCII136 is 0.0%

The probability of  or ASCII137 is 0.0%

The probability of  or ASCII138 is 0.0%

The probability of  or ASCII139 is 0.0%

The probability of  or ASCII140 is 0.0%

The probability of  or ASCII141 is 0.0%

The probability of  or ASCII142 is 0.0%

The probability of  or ASCII143 is 0.0%

The probability of  or ASCII144 is 0.0%

The probability of  or ASCII145 is 0.0%

The probability of  or ASCII146 is 0.0%

The probability of  or ASCII147 is 0.0%

The probability of  or ASCII148 is 0.0%

The probability of  or ASCII149 is 0.0%

The probability of  or ASCII150 is 0.0%

The probability of  or ASCII151 is 0.0%

The probability of  or ASCII152 is 0.0%

The probability of  or ASCII153 is 0.0%

The probability of  or ASCII154 is 0.0%

The probability of  or ASCII155 is 0.0%

The probability of  or ASCII156 is 0.0%

The probability of  or ASCII157 is 0.0%

The probability of  or ASCII158 is 0.0%

The probability of  or ASCII159 is 0.0%

The probability of   or ASCII160 is 1.7391546407452552E-6%

The probability of ¡ or ASCII161 is 0.0%

The probability of ¢ or ASCII162 is 1.7391546407452552E-6%

The probability of £ or ASCII163 is 0.0%

The probability of ¤ or ASCII164 is 0.0%

The probability of ¥ or ASCII165 is 0.0%

The probability of ¦ or ASCII166 is 0.0%

The probability of § or ASCII167 is 0.0%

The probability of ¨ or ASCII168 is 1.7391546407452552E-6%

The probability of © or ASCII169 is 2.086985477944836E-5%

The probability of ª or ASCII170 is 0.0%

The probability of « or ASCII171 is 0.0%

The probability of ¬ or ASCII172 is 0.0%

The probability of ­ or ASCII173 is 0.0%

The probability of ® or ASCII174 is 0.0%

The probability of ¯ or ASCII175 is 0.0%

The probability of ° or ASCII176 is 0.0%

The probability of ± or ASCII177 is 0.0%

The probability of ² or ASCII178 is 0.0%

The probability of ³ or ASCII179 is 0.0%

The probability of ´ or ASCII180 is 0.0%

The probability of µ or ASCII181 is 0.0%

The probability of ¶ or ASCII182 is 0.0%

The probability of · or ASCII183 is 0.0%

The probability of ¸ or ASCII184 is 0.0%

The probability of ¹ or ASCII185 is 0.0%

The probability of º or ASCII186 is 0.0%

The probability of » or ASCII187 is 0.0%

The probability of ¼ or ASCII188 is 0.0%

The probability of ½ or ASCII189 is 0.0%

The probability of ¾ or ASCII190 is 0.0%

The probability of ¿ or ASCII191 is 0.0%

The probability of À or ASCII192 is 0.0%

The probability of Á or ASCII193 is 0.0%

The probability of Â or ASCII194 is 0.0%

The probability of Ã or ASCII195 is 2.6087320293299854E-5%

The probability of Ä or ASCII196 is 0.0%

The probability of Å or ASCII197 is 0.0%

The probability of Æ or ASCII198 is 0.0%

The probability of Ç or ASCII199 is 0.0%

The probability of È or ASCII200 is 0.0%

The probability of É or ASCII201 is 0.0%

The probability of Ê or ASCII202 is 0.0%

The probability of Ë or ASCII203 is 0.0%

The probability of Ì or ASCII204 is 0.0%

The probability of Í or ASCII205 is 0.0%

The probability of Î or ASCII206 is 0.0%

The probability of Ï or ASCII207 is 0.0%

The probability of Ð or ASCII208 is 0.0%

The probability of Ñ or ASCII209 is 0.0%

The probability of Ò or ASCII210 is 0.0%

The probability of Ó or ASCII211 is 0.0%

The probability of Ô or ASCII212 is 0.0%

The probability of Õ or ASCII213 is 0.0%

The probability of Ö or ASCII214 is 0.0%

The probability of × or ASCII215 is 0.0%

The probability of Ø or ASCII216 is 0.0%

The probability of Ù or ASCII217 is 0.0%

The probability of Ú or ASCII218 is 0.0%

The probability of Û or ASCII219 is 0.0%

The probability of Ü or ASCII220 is 0.0%

The probability of Ý or ASCII221 is 0.0%

The probability of Þ or ASCII222 is 0.0%

The probability of ß or ASCII223 is 0.0%

The probability of à or ASCII224 is 0.0%

The probability of á or ASCII225 is 0.0%

The probability of â or ASCII226 is 0.0%

The probability of ã or ASCII227 is 0.0%

The probability of ä or ASCII228 is 0.0%

The probability of å or ASCII229 is 0.0%

The probability of æ or ASCII230 is 0.0%

The probability of ç or ASCII231 is 0.0%

The probability of è or ASCII232 is 0.0%

The probability of é or ASCII233 is 0.0%

The probability of ê or ASCII234 is 0.0%

The probability of ë or ASCII235 is 0.0%

The probability of ì or ASCII236 is 0.0%

The probability of í or ASCII237 is 0.0%

The probability of î or ASCII238 is 0.0%

The probability of ï or ASCII239 is 0.0%

The probability of ð or ASCII240 is 0.0%

The probability of ñ or ASCII241 is 0.0%

The probability of ò or ASCII242 is 0.0%

The probability of ó or ASCII243 is 0.0%

The probability of ô or ASCII244 is 0.0%

The probability of õ or ASCII245 is 0.0%

The probability of ö or ASCII246 is 0.0%

The probability of ÷ or ASCII247 is 0.0%

The probability of ø or ASCII248 is 0.0%

The probability of ù or ASCII249 is 0.0%

The probability of ú or ASCII250 is 0.0%

The probability of û or ASCII251 is 0.0%

The probability of ü or ASCII252 is 0.0%

The probability of ý or ASCII253 is 0.0%

The probability of þ or ASCII254 is 0.0%

The probability of ÿ or ASCII255 is 0.0%

-----------------------The end of question 2-------------------

-----------------------Question 3-------------------

The theoretical entropy is 4.5317035

-----------------------The end of question 3-------------------

-----------------------Question 4-------------------

The compressed entropy is 168.4550560360094

-----------------------The end of question 4-------------------

-----------------------Question 6-------------------

The compressed entropy is 108.96960076519258