```r
  1: library(gsl)
  2: library(ggplot2)
  3:
  4: beta_entropy <- function(params) {
  5:   a <- params[1]
  6:   b <- params[2]
  7:
  8:   if (a <= 0 || b <= 0) {
  9:     stop("Parameters 'a' and 'b' must be greater than zero.")
 10:   }
 11:
 12:   psi_sum <- psi(a) + psi(b)
 13:   entropy <- log(beta(a, b)) - (a - 1) * psi(a) - (b - 1) * psi(b) + (a + b - 2) * psi_sum
 14:
 15:   cat(a,b,a+b,entropy,"\n")
 16:   return(entropy)
 17: }
 18:
 19: pairs <- expand.grid(a= 1:10, b=1:10)
 20: pairs$entropy <- apply(pairs, 1, beta_entropy)
 21:
 22: ggplot(pairs, aes(x = a + b, y = entropy)) +
 23:   geom_point() +
 24:   labs(x = "a + b", y = "Entropy") +
 25:   ggtitle("Entropy of Beta Distribution vs. a + b")
 26:
 27: ggsave(argv[1])
```