

```
1: library(MASS)
2: library(gsl)
3:
4: a <- as.integer(argv[1])
5: b <- as.integer(argv[2])
6: df <- data.frame(a = c(1, 8, 7, 3),
7:                  b = c(1, 8, 13, 29))
8:
9: beta.mean <- function(a,b) {
10:   return(a/(a+b))
11: }
12: beta.mode <- function(a,b) {
13:   return((a-1)/(a+b-2))
14: }
15: beta.var <- function(a,b) {
16:   return((a*b)/((a+b)*(a+b)*(a+b+1)))
17: }
18:
19: beta.entropy <- function(a,b) {
20:   psi_sum <- psi(a) + psi(b)
21:   entropy <- log(beta(a, b)) - (a - 1) * psi(a) - (b - 1) * psi(b) + (a + b - 2) * psi_sum
22:   return(entropy)
23: }
24:
25: summarise_beta <- function(params){
26:   a <- params[1]
27:   b <- params[2]
28:   cat("a =",a,"", b = "", b,"\n")
29:   conf_interval <- qbeta(c(0.025, 0.975),a,b)
30:
31:   cat("Mean:",      beta.mean(a,b), "\n")
32:   cat("Mode:",      beta.mode(a,b), "\n")
33:   cat("Variance:",  beta.var(a,b),  "\n")
34:   # cat("Entropy:",  beta.entropy(a,b),  "\n")
35:   cat("95% Confidence Interval: |", conf_interval[1], "-", conf_interval[2], "| = ", conf_interval[2] - conf_interval[1], "\n\n")
36: }
37:
38: for (i in 1:nrow(df)) {
39:   pair <- df[i,]
40:   summarise_beta(c(pair$a, pair$b))
41: }
```