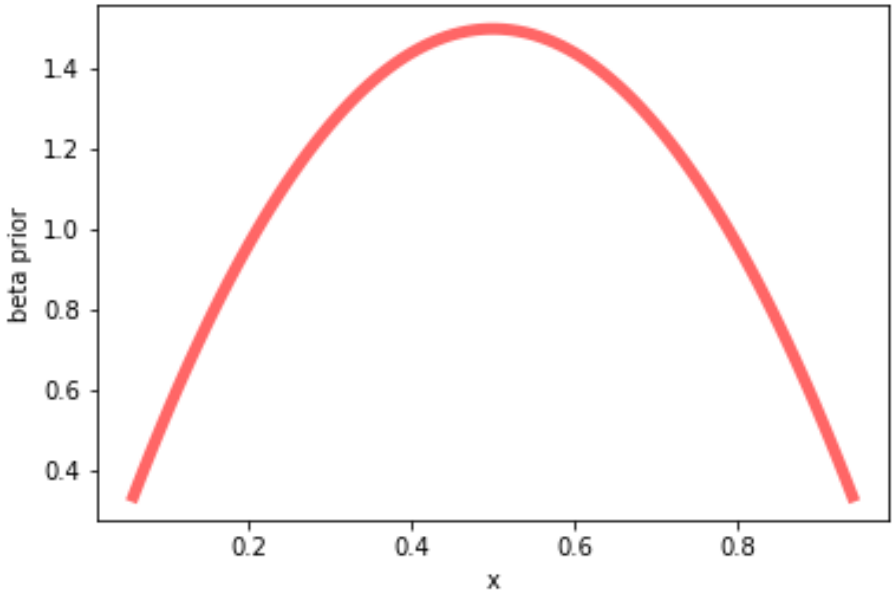
# CISC 863 Quiz -1

Submitted by: Sagar Kukreja

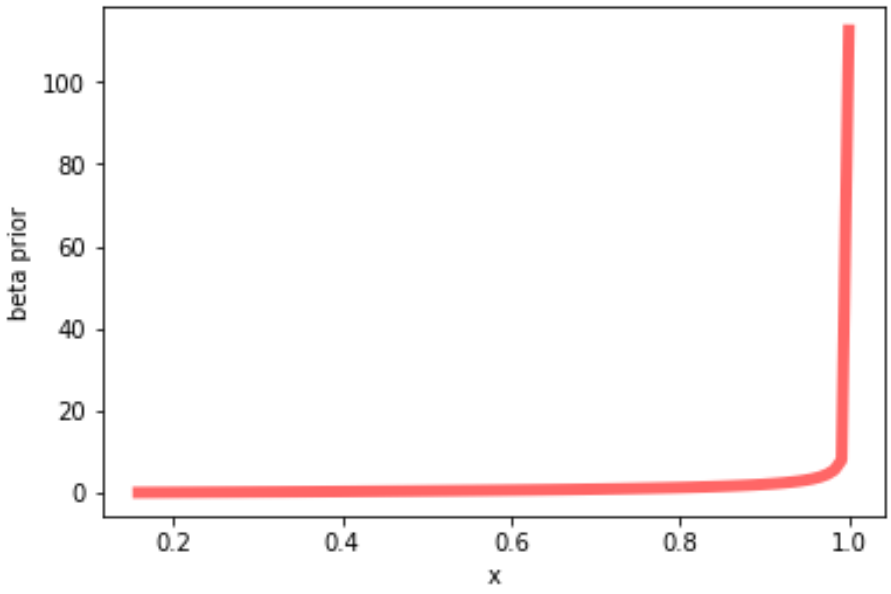
1) Beta Prior Distribution

Initially we assume coin to be fair and hence we take a and b to be same and hence, we get a peak at 0.5

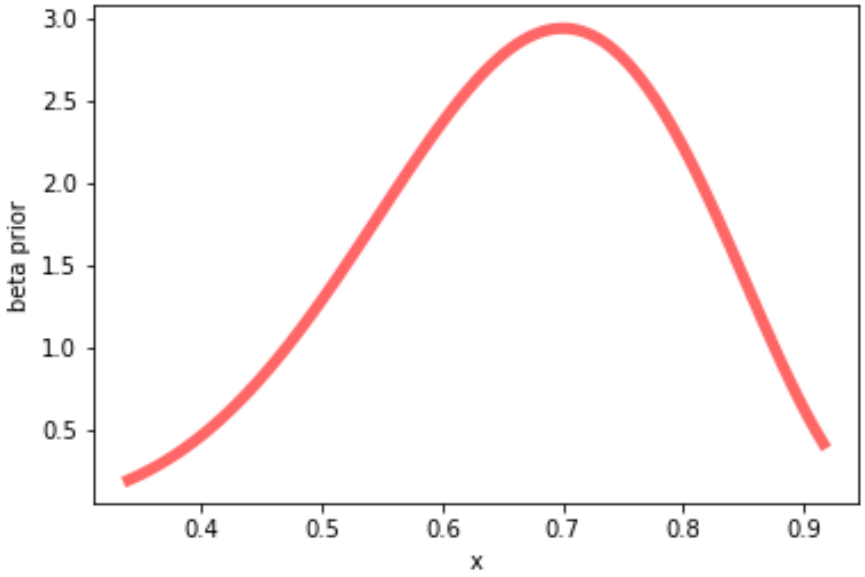
Beta(2,2)




Beta (2, 0.5)

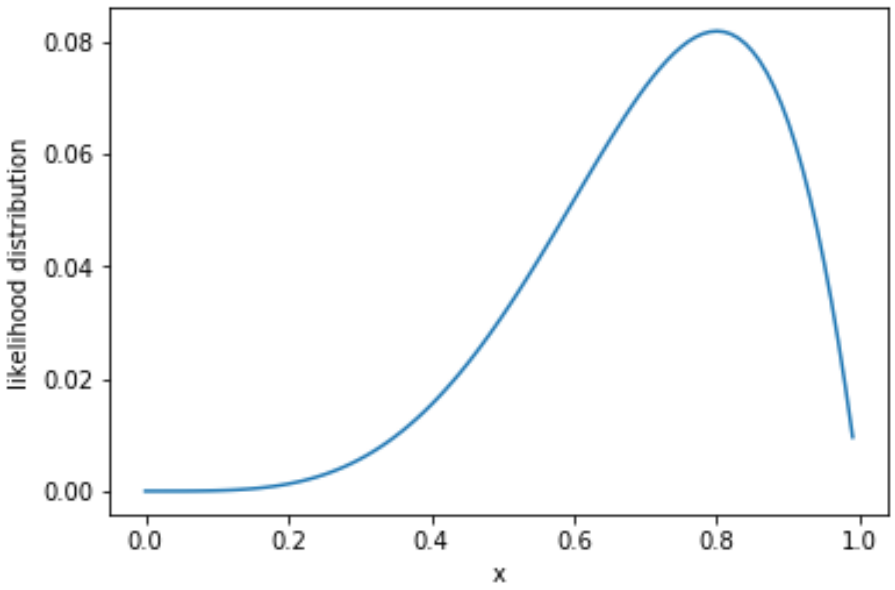


Beta(8,4)

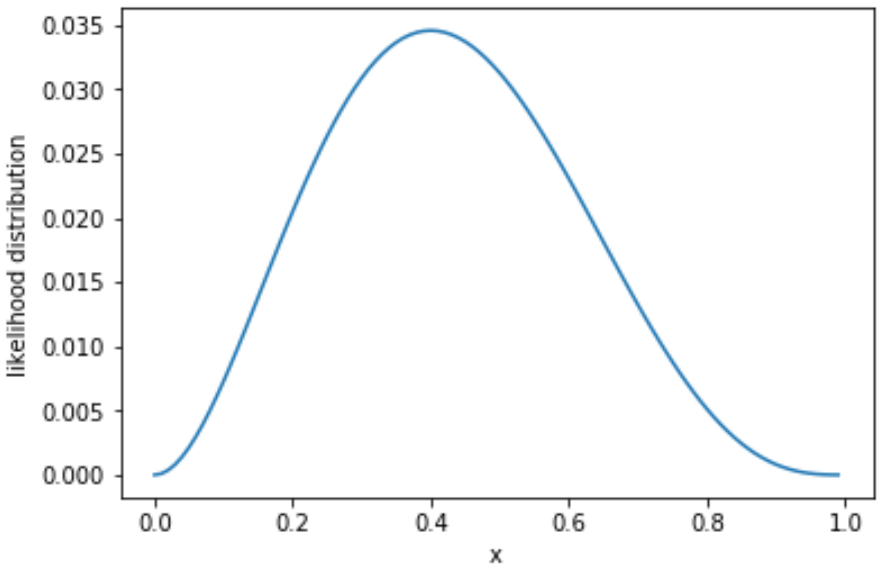



2) Bernoulli Likelihood
Ber('HHTHH'|θ)

But when we calculate the distribution from N= 5 trials , we observe that the coin is biased and hence the peak favors occurrence of head.



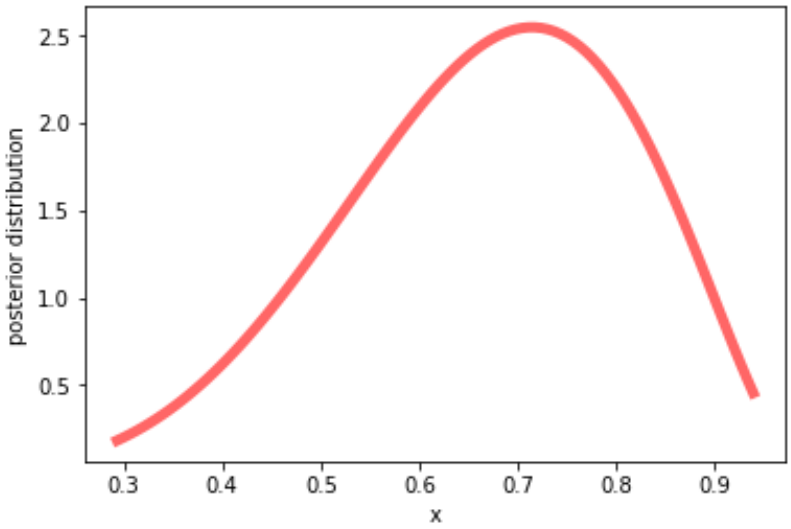
Ber('HHTTT'|θ)


0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
likelihood distribution
0.0
0.2
0.4
0.6
0.8
1.0
x

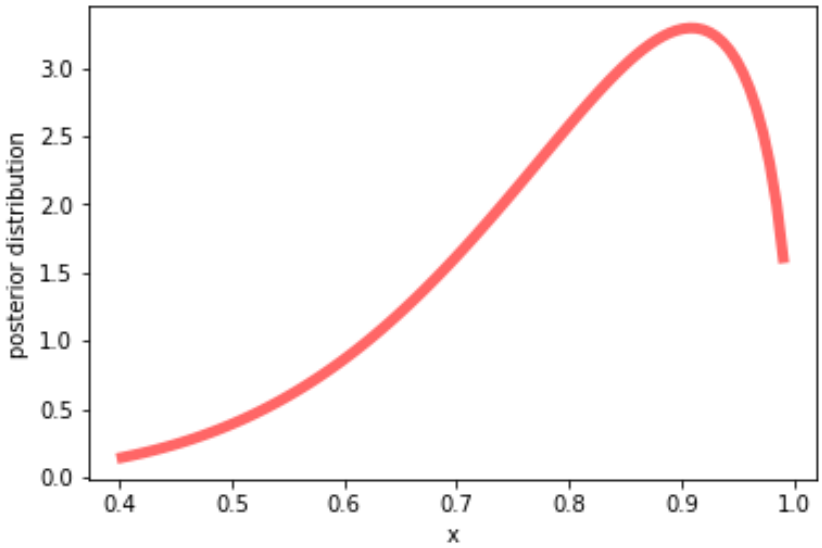
3) Posterior for beta prior is posterior only , hence,

For posterior, we sum up NH + FH and NT + FT, which now gives the peak at around 0.7.

FH = 2, NH = 4
FT = 2, NH = 1




FH = 2, NH = 4
FT = 0.5, NH = 1



FH = 8, NH = 4

FT = 4, NH = 1