Task A.

1. Prior-probebilities:

':('	':)'
0.001	0.999

---liklihood-probebilities:

'+|:('	'+|:)'	'-|:('	'-|:)'
0.99	0.05	0.01	0.95

2. posterior probebilities via Bayes rule:

$$\underbrace{p(\theta|D)}_{\text{posterior}} = \underbrace{p(D|\theta)}_{\text{likelihood}} \underbrace{p(\theta)}_{\text{prior}} / \underbrace{p(D)}_{\text{evidence}}$$

$$p(D) = \sum_{\theta^*} p(D|\theta^*)p(\theta^*)$$

$$p(\theta = \ddot{\frown} \,|\, T = +) = \frac{p(T = + | \theta = \ddot{\frown}\,)\, p(\theta = \ddot{\frown}\,)}{\sum_\theta p(T = + | \theta)\, p(\theta)}$$

results:

p('+')	p('-')	p(':)|+')	p(':)|-')	p(':(|+')	p(':(|-')
0.05094	0.94906	0.9805	0.9999	0.01943	1.0537e-05

3. take posterior probebilities as prior and run again:

results: 0: test is negative, 1:test is positive

T =

0 1 0 0 0

healthy =

0.0000 0.2818 0.0000 0.0000 0.0000

desease =

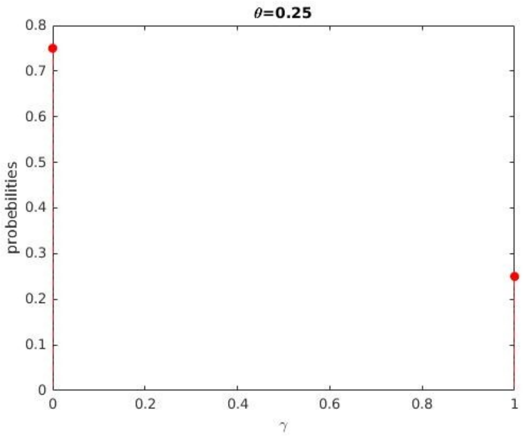
1.0000 0.1495 1.0000 1.0000 1.0000

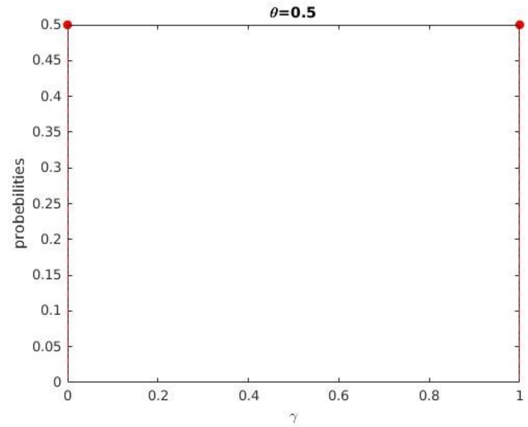
Task B.

Bernoulli_ Distibution:

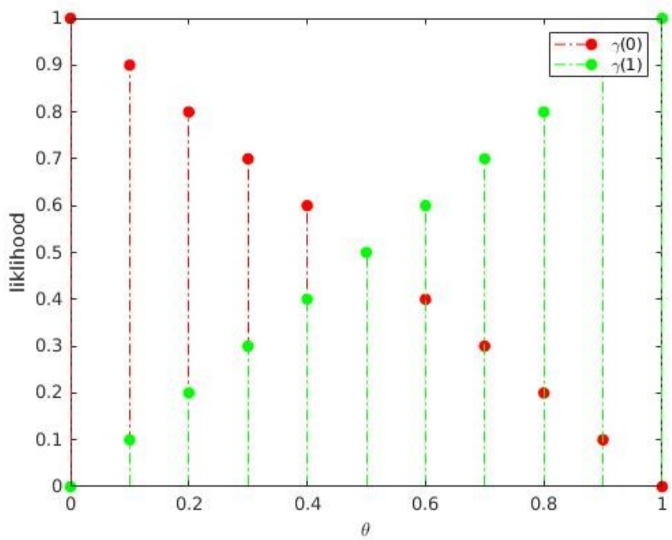
$$p(y|\theta) = \theta^{y}\,(1-\theta)^{(1-y)} \tag{6.1}$$

results: ϴ=0.5, ϴ=0.25 γ=0, γ=1





likelihood function for set of input 0<ϴ<1



likelihood function for Ө=0.5 for N [10, 1000, 10000] : number of coin flip

gama =

0 1

N =

10 1000 10000

10

likelihood: 9.765625e-04 **N**

log-ikelihood:-6.931472e+00

1000

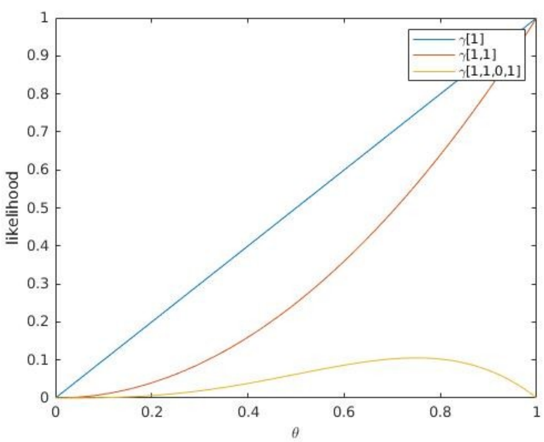
9.332636e-302

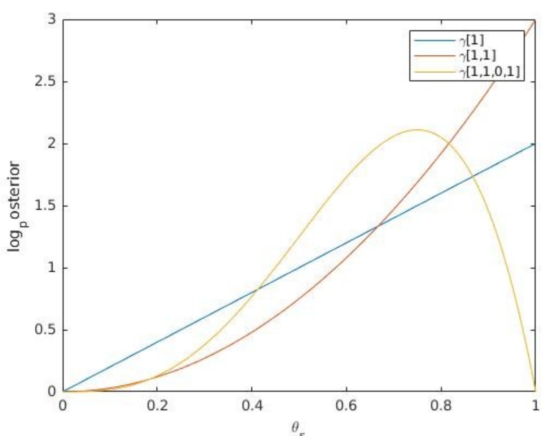
-6.931472e+02

10000

0

plot likelihood,log likelihood function for 0<Ө<1 for γ [1], [1,1] [1,1,0,1]





plot posterior distribution.