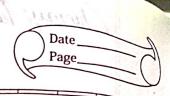
1	Chunnay Parekh
	Limbrary levent
	Date
	Trage_
B7	Given output = [H,T,H,H,H,H,H,H,H]
/	We can use the D
	of the coin part to the first the posterior probability
	We can me the Bayes rule to find the posterior probability distributor.
	P(x/data)= P(data(x) x P(x) 13 13 13 (2 Mex)
	P(data).
	to the same of the
E M	Ukelihood Prior probability.
	normalizing constant 12200 110 1200
	P(X=x/y=8) = P(y=8/x=x).P(X=x).P(X=x)
	P(Y=8).
	10 (5x-1) x & x (x-1) 3/22) =
	Utelihood of observing 8 heads.
	The prior distribution of X as given by the Kumasaswamy distribution with a = 2 and b= 3:
	with a = 2 and b=3:
	$P(x=x) = ab \times (a-1) \times (1-x^2)^2$ $= 236 \times (1-x^2)^2$
	$P(x=x) = ab \times (a-1) \times (1-x^a)^{(b-1)}$
	$=236 \times (1-x^2)^2$
$-\parallel$	A
	P (Y = 8 X = 5c) = 10 (8 x (1-X)2
\rightarrow	(x) 1) x9) = (2-4/2 x)
	lekelehood of observing & heads given the value of x can be
	Calculated using binomial distribution
	and the same the for the the first of the same south
	The marginal likelihood of observing 8 heads regardless of the value
_\	of x can be obtained by
4	
4	$P(y=p) = \int P(y=p x=x)P(x=x)dx$
	A.R.



This integral is not available in Closed form but it can be approximated.

Substituting these expressions into Bayes' rule, we get!

 $P(x=x|Y=8) = \frac{10C_8 \times 8(1-x)^2 \times 23x(1-x^2)^2}{P(Y=8)}$

To first P(Y=8), we can integrate the joint distribution of X & Y over all possible values of X:

P(Y=8) = SP(Y=81x=20) P(X=51) 8x1 = (0-V/X-1/9

= \int_{\text{g}} x\text{8} (1-x)^2 \times 23x (1-x^2)^2 dx.

= 12623 x 9 (1-x) 2(1-x2) dx - northeatral round on

This interphal is not available in closed

 $= 31S \qquad (1-x)^{2} \times (1-x) = (7)$

64-

 $P(X=x|Y=8) = 768x(1-x^2)^2$

This is the probability dustribution of a heads result from the coin which gave is 8 heads & 2 tails in ten coin flips