	Doc	Words	Author
Training	1	W1 W2 W3 W4 W5	C (Christopher Marlowe)
	2	W1 W1 W4 W3	C (Christopher Marlowe)
	3	W1 W2 W5	C (Christopher Marlowe)
	4	W5 W6 W1 W2 W3	W (William Stanley)
	5	W4 W5 W6	W (William Stanley)
	6	W4 W6 W3	F (Francis Bacon)
	7	W2 W2 W4 W3 W5 W5	F (Francis Bacon)
Test	8 (Hamlet)	W1 W4 W6 W5 W3	?

P(C) = Nc / N
= Number of class C / Total number of classes = 3/7

P(W) = Nw / N
= Number of class W / Total number of classes = 2/7

P(F) = Nf / N
= Number of class F / Total number of classes = 2/7

P(W1|C) = The probability that the word W1 appears on the class C document
= (count(W1, C) + 1) / (count(C)+|V|)
= (4+1) / (12+6)
= 5/18

P(W1|W) = The probability that the word W1 appears on the class W document
= (count(W1, W) + 1) / (count(W)+|V|)
= (1+1) / (8+6)
= 2/14

P(W1|F) = The probability that the word W1 appears on the class F document
= (count(W1, F) + 1) / (count(F)+|V|)
= (0+1) / (9+6)
= 1/15

P(W3|C) = The probability that the word W3 appears on the class C document
= (count(W3, C) + 1) / (count(C)+|V|)
= (2+1) / (12+6)
= 3/18

P(W3|W) = The probability that the word W3 appears on the class W document
= (count(W3, W) + 1) / (count(W)+|V|)
= (1+1) / (8+6)
= 2/14

P(W3|F) = The probability that the word W3 appears on the class F document
= (count(W3, F) + 1) / (count(F)+|V|)
= (2+1) / (9+6)
= 3/15

P(W4|C) = The probability that the word W4 appears on the class C document
= (count(W4, C) + 1) / (count(C)+|V|)
= (2+1) / (12+6)
= 3/18

P(W4|W) = The probability that the word W4 appears on the class W document
= (count(W4, W) + 1) / (count(W)+|V|)
= (1+1) / (8+6)
= 2/14

P(W4|F) = The probability that the word W4 appears on the class F document
= (count(W4, F + 1) / (count(F)+|V|)
= (2+1) / (9+6)
= 3/15

P(W5|C) = The probability that the word W5 appears on the class C document
= (count(W5, C) + 1) / (count(C)+|V|)
= (2+1) / (12+6)
= 3/18

P(W5|W) = The probability that the word W5 appears on the class W document
= (count(W5, W) + 1) / (count(W)+|V|)
= (2+1) / (8+6)
= 3/14

P(W5|F) = The probability that the word W5 appears on the class F document
= (count(W5, F) + 1) / (count(F)+|V|)
= (2+1) / (9+6)
= 3/15

P(W6|C) = The probability that the word W6 appears on the class C document
= (count(W6, C) + 1) / (count(C)+|V|)
= (0+1) / (12+6)
= 1/18

P(W6|W) = The probability that the word W6 appears on the class W document
= (count(W6, W) + 1) / (count(W)+|V|)
= (2+1) / (8+6)
= 3/14

P(W6|F) = The probability that the word W6 appears on the class F document
= (count(W6, F) + 1) / (count(F)+|V|)
= (1+1) / (9+6)
= 2/15

P(C)	P(W)	P(F)
3/7	2/7	2/7
P(W1|C)	P(W1|W)	P(W1|F)
5/18	2/14	1/15
P(W2|C)	P(W2|W)	P(W2|F)
3/18	2/14	3/15
P(W3|C)	P(W3|W)	P(W3|F)
3/18	2/14	3/15
P(W4|C)	P(W4|W)	P(W4|F)
3/18	2/14	3/15
P(W5|C)	P(W5|W)	P(W5|F)
3/18	3/14	3/15
P(W6|C)	P(W6|W)	P(W6|F)
1/18	3/14	2/15

P(C|d8) = P(C) * P(W1|C) * P(W4|C) * P(W6|C) * P(W5|C) * P(W3|C)
= 3/7 * 5/18 * 3/18 * 1/18 * 3/18 * 3/18
= 0.00003061924

P(W|d8) = P(W) * P(W1|W) * P(W4|W) * P(W6|W) * P(W5|W) * P(W3|W)
= 2/7 * 2/14 * 2/14 * 3/14 * 3/14 * 2/14
= 0.00003824936

P(F|d8) = P(F) * P(W1|F) * P(W4|F) * P(W6|F) * P(W5|F) * P(W3|F)
= 2/7 * 1/15 * 3/15 * 2/15 * 2/15 * 3/15
= 0.00001354497

- **Does d8 belong to C or W or F?**

Compare P(C|d8), P(W|d8), P(F|d8):

P(C|d8) = 0.00003061924

P(W|d8) = 0.00003824936 => Largest

P(F|d8) = 0.00001354497

So, d8 belongs to W.