BAYES THEOREM Date
* If one condition is given then
apply conditional probability
* I more than one conditioning
given Then apply bayes theorem
Suppose A, Az An represent n
mutually exclusive & collectively
exhaustive events with probabilities
P(As), P(As), P(An), Let B be an
arbitrary event with P(B) == +(
for which conditional probabilities
P(B/A,) , P(B/A), P(B/An) are
also known. Given The information
that outcome B has occulred, The
revited probabilités P(A1/B) are
revised probabilities $P(A_1/B)$ are determined with the help of Bayes Theorem using the formula
Theorem using the formula
P/A·101 - P/A: OR)
$\frac{P(Ai/B) = P(Ai \cap B)}{P(Ai) P(B/Ai)}$
22 (M2) (O/M)

In a certain anempty plant Three machines B, B, B, B, on ake 30%, 75%, 25% Geom post o experience hat 2%, 3% from post o experience hat 2%, 3% machine respectively are defective. Now suppose that a finished prod is randomly selected. (a) What is the probability that it is defective? (b) It a prod were chosen randomly se found to be defective, what is the probability that it was made by machine B3? Consider following dreuts: A = the product is defective. B1 = The product is defective. B2 = 0.3 P(A/B) = 0.6 P(B2) = 0.45 P(A/B) = 0.6 P(B3) = 0.25 P(A/B) = 0.6 P(B3) = 0.25 P(A/B) = 0.6 P(B3) = 0.25 P(A/B) = 0.6	
machines B, B, B, B, sonake 30% 45% 25% 25% 25% 25% 25% 25% 25% 25% 25% 2	Date
respectively of the products It is known from post o experience—that 2/31/21/21/21/21/21/21/21/21/21/21/21/21/21	
from post o experience—that 21, 31, 21, 31, 31, 31, 31, 31, 31, 31, 31, 31, 3	A B B B B B B B B B B B B B B B B B B B
machine respectively are defective. Now suppose that a finished pard is randomly selected. (a) What is the probability that it is defective? (b) If a prod were chosen randomly E found to be defective, what is the persociability that it was made by machine B3? Roll Roll B1 = the product is defective. B1 = the product is defective. B2 = 100 B2 P(B1) = 0.3 P(A B1) = 0.02 P(B2) = 0.45 P(A B2) - 0.03	Lispectiven of the product (1)
machine respectively are defective. Now suppose that a finished purd is randomly selected. (a) What is the probability that it is defective? (b) It a peod were chosen randomly Exposed to be defective, what is the persolability that it was made by machine B3? Roll Ro	from past o experience - that is known
machine respectively are defective. Now suppose that a finished pard is randomly selected. (a) What is tree probability that it is defective? (b) It a peod were chosen randomly Exposed to be defective, what is tree persoability that it was made by machine B3? Sol Lonsider following events: A = the product is defective. B1 = the product is defective. B2 = the product is made by making B1 B2 > the product is made by making B2 B3 = B3 P(B1) = 0.3 P(A B1) = 0.02 P(B2) - 0.45 P(A B1) = 0.03	21. of plods on
suppose that a finished prod is randomly selected. (a) What is the probability that it is defective? (b) It a peod were chosen randomly a found to be defective, what is the personability that it was made by machine B3? (c) (a) (b) (b) (c) (c) (c) (c) (c) (c	machine in and
a) what is the probability that it is defective of the product is defective. B) It a produce chosen grandomly a found to be defective, what is the product in the machine B3? Rolling the product is defective. B1 = the product is defective. B2 = the product is made by making B1 B2 is the prod is made by making B2 B3	NOW SWARM THE THE CUVO
is defectives By a peod were chosen randomly a found to be defective, what is the people billity that it was made by machine B3? Sol Lonsider following events: A = the product is defective. By = the product is defective. By = the prod is made by making By B2 > 1 cm B3 > 1 cm P(B1) = 0.3 P(A B1) = 0.02 P(B2) = 0.45 P(A B1) = 0.03	
is defective a B) If a peod were chosen randomly B found to be defective, what is the people billing that it was made by machine B3? Sol Lonsider following events: A = the product is defective. B1 = The product is defective. B2 = 4 the product is made by machine B1 B2 = 4 the product is made by machine B1 B3 = 4 the product is made by machine B1 B2 = 4 the product is made by machine B1 B2 = 4 the product is made by B3 = 4 the product is made by B4 = 4 the product is made by B	
B) It a peod were chosen gandomlus & found to be defective, what is the probability that it was made by mochine B3? Sol Lonsider following events: A = the product is defective, B1 = the product is made by making B1 B2 > 4	0.00
Solution to be defective, what is the personability that it was made by machine B3? Lonsider following dents: A = the product is defective. B1 = the product is made by making B1 B2 2 44 B2 B3. P(B1) = 0.3 P(A/B1) = 0.2 P(B2) = 0.45 P(A/B2)-0.3	
personability that it was made by machine B3? Sol Lonsider following events: A = the product is defective. B1 = the product is made by marking B1 B2 > 1 cm B3 = B3 P(B1) = 0.3 P(A B1) = 0.02 P(B2) = 0.45 P(A B2) - 0.03	a market
Machine B3? Sol Listister following events: A = the product is defective. B1 = The product is made by machie B1 B2 = Un B3 = B3 P(B1) = 0.3 P(A/B1) = 0.02 P(B2) = 0.45 P(A/B2) - 0.03	what is the
Sol Listinisides following events: A = the product is defective. B1 = the product is made by machie B1 B2 = 4	machine & that it was made by
A = the product is defective. B1 = the product is defective. B2 = the product is defective. B2 = B2	D37
A = the product is defective. B1 = the product is defective. B2 = the product is defective. B2 = B2	Sol Cotton
P(B ₁) = 0.3 P(A/B ₁) = 0.02 P(B ₂) = 0.45 P(A/B ₂) - 0.03	Consider following dreuts.
$B_1 = 1000$ The proof is made by machie B_1 $B_2 = 100$ $B_3 = 100$ $B_3 = 100$ $B_4 = 100$ $B_5 = 100$ $B_6 =$	
$B_{3} = 0.3 P(A B_{1}) = 0.02$ $P(B_{2}) = 0.45 P(A B_{3}) = 0.03$	
Plant Office	B ₂ 2 1 ch B
Plant Office	B3 2 - B3
Plant Office	
Plant Office	P(B1) = 0.3 P(A/B1) - 0.00
Plant Office	P(B2) - 0.45 P(A/B)
	P. C.

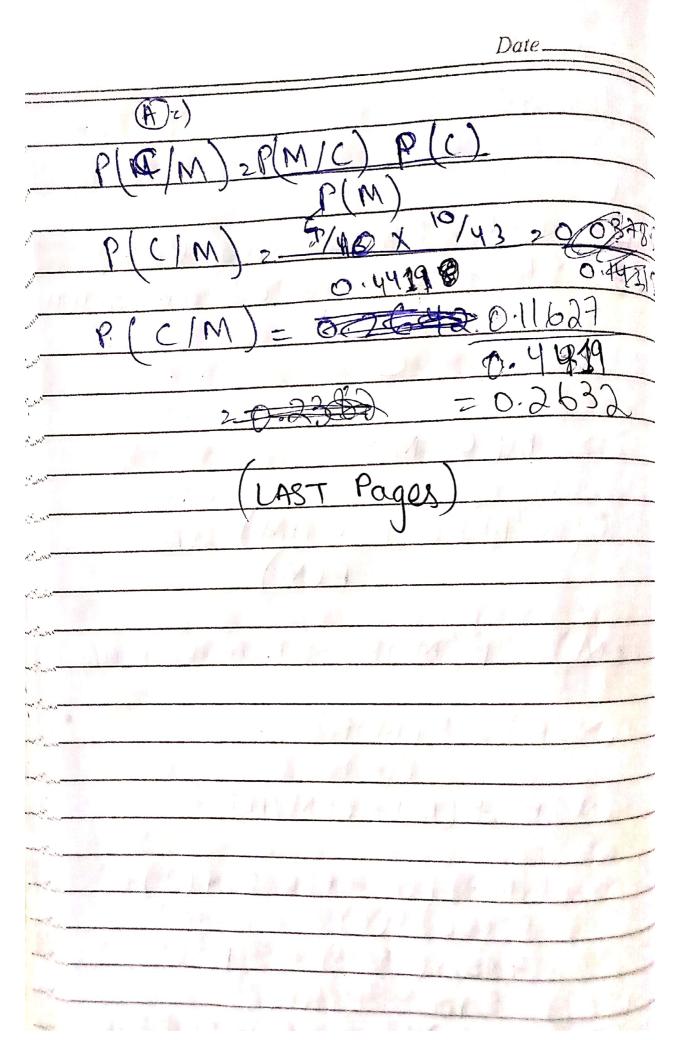
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Date	 12.,.

$$\frac{P(A \cap B_1)}{P(A \cap B_2)} = \frac{P(A \mid B_1)}{P(A \mid B_2)} \times \frac{P(B_1)}{P(B_2)} \times \frac{P(B_2)}{P(B_2)} \times \frac{P(B_2)$$

$$P(A \cap B_1) = 6.02 \times 0.3 = 3/500$$

 $P(A \cap B_2) = 0.03 \times 0.45 = \frac{27}{2000}$
 $P(A \cap B_3) = 0.08 \times 0.25 = \frac{1}{200}$

Date
Da Handout
42 19
1 at
ME = malfunction was reported by human A B = Station A reported malfondion
Station A reported malls to
12 3 11 B
C 2 C
Q=> P(C/M)
P(C/M) = P(C nM) -A)
P(M)
P(M) = P(MNA) + P(MNB)+P(MAC)
The state of the s
P(M A) = P(M)A
P(A)
P(MNA)=P(A) xP(M/A)
P(M), P(M/A) P(A) + P(M/B) P(B)+
P(M/C)P(C)
P(M) ~ (7/48) x (18/43) + (7/45) (15/43)
P(M) = (7/48) x (18/43) + (7/45) (15/43) + (5/40) x (10/43)
PEROLOT FRANCE (FIREDIES O FAMILY
P(M) = 0.4983 0.4419
3C. No



Failure John pr depend konga > P(E/J)
John fried pe depend touga > P(E/J) Date Date
Date U (S/E)
Bayes
Q1.
JA = John stamps & 20%.
T = 10m stamps 60%
= Jett Stamps. 15%
P = Post starryn 5%.
E = Fail to stamp the expiration
P(E/J) = 500 = 5x 103
P(J) = 0.2 # P(J) SANO.
P(T) = 0-6 / P(E/T) = /10020.01
$P(F) \leq 0.15$ $P(E/F) = 190 = 0.01$
$P(P) = 0.05 \qquad P(E/P) = \frac{1}{200} = 5xD$
= $(2A3)7+6301$
C(2/E) = b(20E) = b(E/2)b(2)
$\frac{P(E)}{P(E)}$
P(E) = P(EMJ) +P(ENT) + P(ENF)
TYP(ENP)
P(E) = P(E/J)P(J) + P(E/T)P(T) +
P(F/F) P(F) + P(E/P) P(P)
P(E) 5×103 × 0.2 + 0.01× 0.6 +
0.15 x 0.01/ + 0.05 x 5 x 10-3
P(E) = 8.98 ×10-3
P[J/E) = 5x10-3 x 0.2 = 0.11238
Q.08x10-3
No

	and the second second second
	Date
Q2.95	
•	100
C = A. pe	son how comper with
D = . A. pa	son how compels with conversion is diagonased with conver.
トレック	
N. A.	
P(C) = 0.00	
P(B) = 0	18 (C)
P(C)=0.0	6 P/D = 0.06
1000 P(C') = 1-000	0.95 (0)
1100 P P = P	1 21.0 : 6 11. 15
(1)	(1)1
P(D) = P(Dnc) + P(Dnc)
2/(0	() P(c) + P(o c') P(c')
(1) z 10.	096.
Q 3, 1, 1 (T)	the follow
P(M,) :	
	0.3 (P/M2) = 0.02
P(M3)	> 0.5 P[D/M3] 20.03
@ P/M2/=	
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P	Ma ND)
	P(D)
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