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Answers

Task 1.

1. P(Maine | T1 < 80o) = 0.296
2. P(T2 < 80o | T1 < 80o) = 0.3072
3. P(T3 < 80o | T1 < 80o, T2 < 80o) = 0.6397

Task 2.

Possibly a probability function because P(A) and P(B) are both greater than 0 and less than 1, which satisfies the axiom that the probabilities have to be greater than or equal to zero and less than or equal to 1. Also, P(A or B) is less than 1. If P(C) and P(D) are such that P(A or B or C or D) = 1 then it satisfies the condition that the probability of event, .

Task 3.

P is not a probability density function because = 3 > 1. Since P cannot be less than zero, integrating over all of the real numbers will not lead P(x) to be 1. That violates one of the axioms of the probability that is the sum of probability of events in the sample space be equal to 1.

Task 4.

p (B = r | F = a) = p (F = a | B = r) \* p (B = r) / p (F = a) = 0.25 \* 0.4 / 0.55 = 0.182

p (B = b | F = a) = p (F = a | B = b) \* p (B = b) / p (F = a) = 0.75 \* 0.6 / 0.55 = 0.82

82% of the time , the fruit is apple is the box is blue.

p (B = r | F = o) = p (F = o | B = r) \* p (B = r) / p (F = o) = 0.75 \* 0.4 / 0.45 = 0.667

p (B = b | F = o) = p (F = o | B = b) \* p (B = b) / p (F = o) = 0.25 \* 0.6 / 0.45 = 0.333

66.7% of the time, the fruit is orange when the box is red.

Task 5.

Class 1, attribute 1, mean 0.52, std 0.10

Class 1, attribute 2, mean 0.54, std 0.10

Class 1, attribute 3, mean 0.52, std 0.07

Class 1, attribute 4, mean 0.41, std 0.17

Class 1, attribute 5, mean 0.50, std 0.01

Class 1, attribute 6, mean 0.00, std 0.01

Class 1, attribute 7, mean 0.50, std 0.05

Class 1, attribute 8, mean 0.24, std 0.05

Class 2, attribute 1, mean 0.45, std 0.11

Class 2, attribute 2, mean 0.45, std 0.10

Class 2, attribute 3, mean 0.53, std 0.06

Class 2, attribute 4, mean 0.23, std 0.11

Class 2, attribute 5, mean 0.50, std 0.04

Class 2, attribute 6, mean 0.00, std 0.01

Class 2, attribute 7, mean 0.49, std 0.06

Class 2, attribute 8, mean 0.33, std 0.14

Class 3, attribute 1, mean 0.43, std 0.10

Class 3, attribute 2, mean 0.48, std 0.11

Class 3, attribute 3, mean 0.36, std 0.06

Class 3, attribute 4, mean 0.22, std 0.08

Class 3, attribute 5, mean 0.51, std 0.05

Class 3, attribute 6, mean 0.00, std 0.01

Class 3, attribute 7, mean 0.51, std 0.04

Class 3, attribute 8, mean 0.27, std 0.09

Class 4, attribute 1, mean 0.79, std 0.07

Class 4, attribute 2, mean 0.76, std 0.07

Class 4, attribute 3, mean 0.38, std 0.06

Class 4, attribute 4, mean 0.32, std 0.11

Class 4, attribute 5, mean 0.50, std 0.01

Class 4, attribute 6, mean 0.00, std 0.01

Class 4, attribute 7, mean 0.51, std 0.07

Class 4, attribute 8, mean 0.27, std 0.09

Class 5, attribute 1, mean 0.74, std 0.15

Class 5, attribute 2, mean 0.62, std 0.12

Class 5, attribute 3, mean 0.42, std 0.08

Class 5, attribute 4, mean 0.30, std 0.12

Class 5, attribute 5, mean 0.50, std 0.01

Class 5, attribute 6, mean 0.00, std 0.01

Class 5, attribute 7, mean 0.51, std 0.06

Class 5, attribute 8, mean 0.24, std 0.04

Class 6, attribute 1, mean 0.54, std 0.14

Class 6, attribute 2, mean 0.50, std 0.12

Class 6, attribute 3, mean 0.51, std 0.05

Class 6, attribute 4, mean 0.24, std 0.10

Class 6, attribute 5, mean 0.50, std 0.01

Class 6, attribute 6, mean 0.49, std 0.38

Class 6, attribute 7, mean 0.51, std 0.03

Class 6, attribute 8, mean 0.24, std 0.05

Class 7, attribute 1, mean 0.48, std 0.11

Class 7, attribute 2, mean 0.47, std 0.09

Class 7, attribute 3, mean 0.54, std 0.06

Class 7, attribute 4, mean 0.22, std 0.12

Class 7, attribute 5, mean 0.50, std 0.04

Class 7, attribute 6, mean 0.00, std 0.03

Class 7, attribute 7, mean 0.50, std 0.06

Class 7, attribute 8, mean 0.26, std 0.09

Class 8, attribute 1, mean 0.74, std 0.10

Class 8, attribute 2, mean 0.73, std 0.11

Class 8, attribute 3, mean 0.49, std 0.05

Class 8, attribute 4, mean 0.29, std 0.07

Class 8, attribute 5, mean 0.50, std 0.01

Class 8, attribute 6, mean 0.00, std 0.01

Class 8, attribute 7, mean 0.46, std 0.08

Class 8, attribute 8, mean 0.23, std 0.02

Class 9, attribute 1, mean 0.55, std 0.14

Class 9, attribute 2, mean 0.56, std 0.15

Class 9, attribute 3, mean 0.51, std 0.06

Class 9, attribute 4, mean 0.20, std 0.06

Class 9, attribute 5, mean 0.50, std 0.01

Class 9, attribute 6, mean 0.00, std 0.01

Class 9, attribute 7, mean 0.53, std 0.05

Class 9, attribute 8, mean 0.24, std 0.04

Class 10, attribute 1, mean 0.78, std 0.05

Class 10, attribute 2, mean 0.73, std 0.11

Class 10, attribute 3, mean 0.48, std 0.09

Class 10, attribute 4, mean 0.33, std 0.06

Class 10, attribute 5, mean 1.00, std 0.01

Class 10, attribute 6, mean 0.00, std 0.01

Class 10, attribute 7, mean 0.55, std 0.02

Class 10, attribute 8, mean 0.23, std 0.01

classification accuracy=0.4483