

IMM - DTU

02405 Probability
2004-4-17
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Question a) Assuming that the total number of families is n

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 $i \cdot P(T = i) \cdot n$

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Question a) Assuming that the total number of families is n we can deduce that we have $i \cdot P(T = i) \cdot n$ tickets from families with

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Question a) Assuming that the total number of families is n we can deduce that we have $i \cdot P(T = i) \cdot n$ tickets from families with i children, giving a total of

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Question a) Assuming that the total number of families is n we can deduce that we have $i \cdot P(T = i) \cdot n$ tickets from families with i children, giving a total of $0 \cdot 0.1 \cdot n + 1 \cdot 0.2 \cdot n + 2 \cdot 0.4 \cdot n + 3 \cdot 0.2 \cdot n + 4 \cdot 0.1 \cdot n = 2n$ tickets,

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Question b) The probability in question is

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Question b) The probability in question is $P(U = 3, G = 2)$,

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- Question b) The probability in question is $P(U = 3, G = 2)$, we find this probability sequentially

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Question b) The probability in question is $P(U = 3, G = 2)$, we find this probability sequentially like in example 1.

$$P(U = 3, G = 2) = P(U = 3)P(G = 2|U = 3)$$

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Question b) The probability in question is $P(U = 3, G = 2)$, we find this probability sequentially like in example 1.

$$P(U = 3, G = 2) = P(U = 3)P(G = 2|U = 3) = 0.3 \cdot \binom{3}{2} 2^{-3}$$

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Question b) The probability in question is $P(U = 3, G = 2)$, we find this probability sequentially like in example 1.

$$P(U = 3, G = 2) = P(U = 3)P(G = 2|U = 3) = 0.3 \cdot \binom{3}{2} 2^{-3} = \frac{9}{80}$$

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Question b) The probability in question is $P(U = 3, G = 2)$, we find this probability sequentially like in example 1.

$$P(U = 3, G = 2) = P(U = 3)P(G = 2|U = 3) = 0.3 \cdot \binom{3}{2} 2^{-3} = \frac{9}{80}$$

Question c) $P(T = 3, G = 2) = P(T = 3)P(G = 2|T = 3)$

- Question a) Assuming that the total number of families is n we can deduce that we have $i \cdot P(T = i) \cdot n$ tickets from families with i children, giving a total of $0 \cdot 0.1 \cdot n + 1 \cdot 0.2 \cdot n + 2 \cdot 0.4 \cdot n + 3 \cdot 0.2 \cdot n + 4 \cdot 0.1 \cdot n = 2n$ tickets, $3 \cdot 0.2 \cdot n$ of those from families with 3 children. Using equally likely outcomes (section 1.1) we get $P(U = 3) = 0.3$.
- Question b) The probability in question is $P(U = 3, G = 2)$, we find this probability sequentially like in example 1.
$$P(U = 3, G = 2) = P(U = 3)P(G = 2|U = 3) = 0.3 \cdot \binom{3}{2}2^{-3} = \frac{9}{80}$$
- Question c) $P(T = 3, G = 2) = P(T = 3)P(G = 2|T = 3) = 0.2 \cdot \binom{3}{2}2^{-3}$

- Question a) Assuming that the total number of families is n we can deduce that we have $i \cdot P(T = i) \cdot n$ tickets from families with i children, giving a total of $0 \cdot 0.1 \cdot n + 1 \cdot 0.2 \cdot n + 2 \cdot 0.4 \cdot n + 3 \cdot 0.2 \cdot n + 4 \cdot 0.1 \cdot n = 2n$ tickets, $3 \cdot 0.2 \cdot n$ of those from families with 3 children. Using equally likely outcomes (section 1.1) we get $P(U = 3) = 0.3$.
- Question b) The probability in question is $P(U = 3, G = 2)$, we find this probability sequentially like in example 1.
$$P(U = 3, G = 2) = P(U = 3)P(G = 2|U = 3) = 0.3 \cdot \binom{3}{2}2^{-3} = \frac{9}{80}$$
- Question c) $P(T = 3, G = 2) = P(T = 3)P(G = 2|T = 3) = 0.2 \cdot \binom{3}{2}2^{-3} = \frac{3}{40}$