Task 1

Consider influenza epidemics for 2-person families. The probability is 21% that at least one has the disease. The probability that the husband has contracted influenza is 15% while the probability that both the wife and husband have contracted the disease is 10%. What is the probability that the wife has influenza?

The illness of both wife and husband belongs to mutually inclusive events, namely events that overlap with each other.

According to the formula of mutually inclusive probability:

P(A or B) = P(A) + P(B) - P(A and B)
P(A) = P(A or B) - P(B) + P(A and B)
P(wife fell ill) = P(husband or wife fell ill) - P(husband fell ill) + P(husband and wife fell ill)
P(wife fell ill) = 21% - 15% + 10% = 16%

Answer: 16%

Task 2

Here's an example of database structures:

FRUITS_EXPORT (Schema):

seller_info (table):
- seller_id
- fruit_id
- fruit_weight (tons)

consumption_info (table):
- fruit_id
- seller_id
- client_id
- quantity_purchased_fruit (tons)

How many tons worth of fruit does an average seller have?
Answer:

SELECT
AVG(fruit_weight) AS average_amount
FROM
seller_info

How many sellers have at least one client who purchased their fruit?
Answer:

SELECT
COUNT(DISTINCT seller_id) AS number_of_sellers
FROM
consumption_info