

ACTUALS IO

Interview questions

Introduction

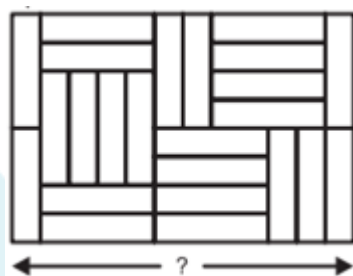
In this document you will find a list of interview questions and we kindly ask you to answer them. This will help us to understand your current knowledge but more importantly your potential. This document is not an (objective) exam. We are far more interested in the reasoning towards an answer and on top of that some of the questions can have multiple valid answers.

General questions

1. A farmer has 1 horse, 2 cows and 3 pigs. He wants half of the animals to be cows. How many more cows does he have to buy?
2. Stefan and his mother are both born in January. Today, the 21st of March 2018, Stefan adds his year of birth, the birth year of his mother, his age, and his mother age. What is the result of that sum?
3. Jan glues 4 little blocks together and paints them afterwards. For which building does he need the least paint?



4. The floor below is laid with similar rectangular boards of 1 meter wide. How long is the side with the question mark?



5. Adam, Bob, Clair, and Dave are out walking: They come to rickety old wooden bridge. The bridge is weak and only able to carry the weight of two of them at a time. Because they are in a rush and the light is fading, they must cross in the minimum time possible and must carry a torch (flashlight,) on each crossing.

They only have one torch, and it cannot be thrown. Because of their different fitness levels and some minor injuries, they can all cross at different speeds. Adam can cross in 1 minute, Bob in 2 minutes, Clair in 6 minutes and Dave in 11 minutes. What is the minimum time required for all 4 to cross the bridge?

MySQL questions

Assume we have a table `transactions` with the following columns:

- ID (Primary key, Integer)
 - Timestamp (Datetime)
 - Source (Varchar)
 - Label (Varchar)
 - Transactionid (Varchar)
 - Cardid (Varchar)
 - Transactioncategory (Varchar)
 - Amount (Integer)
 - Matchingstatus (Integer)
6. Provide a query that answers the question: What is the total number of transactions per source?
 7. Provide a query that answers the question: What is the average amount size for transactions in January?
 8. Write a query that updates the Matchingstatus field to 1 if a transaction (identified by transactionid) located in one source is also present in the other source. You may assume there are 2 possible sources (possible values for the source column): "accounting_system", "payment_service_provider".

Reconciliation

The core of what we do at Actuals is reconciliation of transactions. This means that on transaction level (so per transaction id) we determine the total amount per source. If the total amount in the first source is the same as the total amount in the second source, we consider the rows matched. If the total amount is not equal, the rows are unmatched. Below an example

Rows of transactions

source	transactionid	amount
web_app	45645	2050
web_app	45646	2150
accounting_system	45646	2150
payment_service_provider	45646	2150
payment_service_provider	45646	300
payment_service_provider	45646	-300

When comparing web_app with accounting_system we would consider transaction 45645 unmatched as the transaction has an amount of 2050 in the source web_app but does not occur (so amount 0) in the accounting_system. Similarly transactionid 45646 does match as the amount is 2150 in both sources.

When comparing accounting_system with payment service provider we only have one transactionid to consider. The total amount is 2150 in both cases ($2150+300-300=2150$) so the transaction is matched. This results in the following summary

Comparison web_app – accounting_system

source	Matched rows	Unmatched rows
web_app	1	1
accounting_system	1	0

Note 0 unmatched transactions for accounting system as there is no record for 12345 for source accounting_system

Comparison accounting_system – payment_service_provider

source	Matched rows	Unmatched rows
accounting_system	1	0
payment_service_provider	3	0

Question

Please populate this summary

Comparison web_app – accounting_system

source	Matched rows	Unmatched rows
web_app		
accounting_system		

Comparison accounting_system – payment_service_provider

source	Matched rows	Unmatched rows
accounting_system		
payment_service_provider		

Based on this data

source	transactionid	amount
web_app	12345	2050
web_app	12346	2100
web_app	12347	2150
web_app	12348	2200
web_app	12349	2250
web_app	12350	2300
web_app	12353	2450
web_app	12354	2500
web_app	12355	2550
web_app	12356	2600
web_app	12357	2650
web_app	12358	2700
accounting_system	12347	2150
accounting_system	12345	2050
accounting_system	12352	2400

accounting_system	12353	2450
accounting_system	12354	2500
accounting_system	12351	2350
accounting_system	12355	2550
accounting_system	12355	-2550
accounting_system	12356	2600
accounting_system	12357	2650
accounting_system	12357	-2650
accounting_system	12358	2700
accounting_system	12350	2300
accounting_system	12349	2250
accounting_system	12346	2100
payment_service_provider	12347	2150
payment_service_provider	12348	2200
payment_service_provider	12345	2050
payment_service_provider	12353	2500
payment_service_provider	12358	2700
payment_service_provider	12356	2600
payment_service_provider	12349	2700
payment_service_provider	12357	2650
payment_service_provider	12352	2400
payment_service_provider	12355	2550
payment_service_provider	12357	-2650
payment_service_provider	12350	2300
payment_service_provider	12351	2350