1. In a database table, it has account balance information. When a loan is created in the system, a record of original account balance is inserted into the table. With the install payment setup, corresponding records of payments are inserted into the table. With this information, it is possible to calculate the account balance on the monthly end.

   For example,

   Table name: table_transaction

   Table columns: account_id, calendar_day, transaction_amount

account_id	calendar_day	transaction_amount
11111	2023-09-30	50000.00
11111	2023-10-31	-800.00
11111	2023-11-30	-800.00
11111	2023-12-31	-800.00
11111	2024-01-31	-800.00
11111	2024-02-29	-800.00
11111	2024-03-31	-800.00

   Question:

   Please use the sample table and data to write a query or SQL script to show the account balance of the monthly end on 2024-03-31.

   Hint:

   The result should be

account_id	calendar_day	transaction_amount
11111	2024-03-31	45200.00

2. In a database table, it has account balance information. When a loan is created in the system, a record of original account balance is inserted into the table. With the install payment setup, corresponding records of payments are inserted into the table. With this information, it is possible to calculate the account balance on the monthly end.

   For example,

   Table name: table_transaction

   Table columns: account_id, calendar_day, transaction_amount

account_id	calendar_day	transaction_amount
11111	2023-09-30	50000.00
11111	2023-10-31	-800.00
11111	2023-11-30	-800.00
11111	2023-12-31	-800.00
11111	2024-01-31	-800.00
11111	2024-02-29	-800.00
11111	2024-03-31	-800.00

   Question:

   Please use the sample table and data to write a query or SQL script to show the account balance of the monthly end.

   Hint:
   The result should be

account_id	calendar_day	transaction_amount
11111	2023-09-30	50000.00
11111	2023-10-31	49200.00
11111	2023-11-30	48400.00
11111	2023-12-31	47600.00
11111	2024-01-31	46800.00
11111	2024-02-29	46000.00
1111	2024-03-31	45200.00

3. In a database table, it has account product group information. With the product group information, it is able to determine the type of account. If the product group is 5, then it is a “business” account. If the product group is 10, then it is a “personal” account. If the product group is 15, then it is a “wealth” account. If the product group has other values, then it is an “other” account.

   For example,

   Table name: table_account

   Table columns: account_id, product_group

account_id	product_group
11111	5
22222	10
33333	15
44444	20
55555	25

   Question:

   Please use the sample table and data to write a query or SQL script to show the actual account type with the above logic.

   Hint:

   The result should be

account_id	product_group	account_type
11111	5	business
22222	10	personal
33333	15	wealth
44444	20	other
55555	25	other

4. In a database table, it has account product group information and account balance. With product group information, it is able to determine the type of account. If the product group is 5, then it is a “business” account. If the product group is 10, then it is a “personal” account. If the product group is 15, then it is a “wealth” account. If the product group has other values, then it is an “other” account.

   For example,

   Table name: table_account

   Table columns: account_id, product_group, account_balance

account_id	product_group	account_balance
11111	5	2500.00
22222	10	1500.00
33333	15	2000.00
44444	20	1500.00
55555	25	1800.00

   Question:

   Please use the sample table and data to write a query or SQL script to show the account balance of each account type.

   Hint:

   The result should be

account_type	account_balance
business	2500.00
personal	1500.00
wealth	2000.00
other	3300.00

5. In a database table, it has account type information. Sometimes, when the monthly end record was generated, it is missing the account type information. In order to make the data consistent, the logic is to use the previous non-null value to replace the null value.

For example,

Table name: table_account

Table columns: account_id, calendar_day, account_type

account_id	calendar_day	account_type
11111	2023-09-30	business
11111	2023-10-31	**NULL**
11111	2023-11-30	**NULL**
11111	2023-12-31	personal
11111	2024-01-31	personal
11111	2024-02-29	**NULL**
11111	2024-03-31	**NULL**

After adjustment

account_id	calendar_day	account_type	account_type_adjusted
11111	**2023-09-30**	business	business
11111	2023-10-31	**NULL**	business
11111	**2023-11-30**	**NULL**	business
11111	**2023-12-31**	personal	personal
11111	2024-01-31	personal	personal
11111	2024-02-29	**NULL**	personal
11111	**2024-03-31**	**NULL**	personal

Question a:

Please use the sample table and data to write a query or SQL script to show the **SINGLE** version of each account type with start date and end date

Hint:

The result should be

account_id	account_type	row_effective_from	row_effective_to
11111	business	**2023-09-30**	**2023-11-30**
11111	personal	**2023-12-31**	**2024-03-31**

Question b:

Please use the sample table and data to write a query or SQL script to show the **adjusted** monthly end account type data.

Hint:

You could use the query from the previous question.

The result should be

account_id	calendar_day	account_type	account_type_adjusted
11111	2023-09-30	business	business
11111	2023-10-31	**NULL**	business
11111	2023-11-30	**NULL**	business
11111	2023-12-31	personal	personal
11111	2024-01-31	personal	personal
11111	2024-02-29	**NULL**	personal
11111	2024-03-31	**NULL**	personal

6. In a database table, it has rating and date of rating of group members on monthly end. In order to calculate the rating of group on monthly end, the logic are following:

   First, the rating within 365 days (including 365 days) from the monthly end is valid, otherwise the rating is not valid.

   Second, If the rating of the primary member is valid, then it is the rating of the group on the monthly end.

   Third, if the rating of the primary member is not valid, then the **lowest valid** rating of the non-primary member is the rating of the group on the monthly end.

   For example,

   Table name: table_group

   Table columns: group_id, calendar_day, member_id, is_primary, rating, rated_on

group_id	calendar_day	member_id	is_primary	rating	rated_on
g111	2023-09-30	m111	yes	200	2022-10-15
g111	2023-09-30	m222	no	185	2023-05-31
g111	2023-09-30	m333	no	190	2023-06-20
g111	2023-10-31	m111	yes	200	2022-10-15
g111	2023-10-31	m222	no	185	2023-05-31
g111	2023-10-31	m333	no	190	2023-06-20
g111	2023-11-30	m111	yes	200	2022-10-15
g111	2023-11-30	m222	no	185	2023-05-31
g111	2023-11-30	m333	no	190	2023-06-20

Question a:

Please use the sample table and data to write a query or SQL script to show whether the rating of members on the monthly end is valid or not.

Hint:

The result should be

group_id	calendar_day	member_id	is_primary	rating	rated_on	is_valid
g111	2023-09-30	m111	yes	200	2022-10-15	yes
g111	2023-09-30	m222	no	185	2023-05-31	yes
g111	2023-09-30	m333	no	190	2023-06-20	yes
g111	2023-10-31	m111	yes	200	2022-10-15	no
g111	2023-10-31	m222	no	185	2023-05-31	yes
g111	2023-10-31	m333	no	190	2023-06-20	yes
g111	2023-11-30	m111	yes	200	2022-10-15	no
g111	2023-11-30	m222	no	185	2023-05-31	yes
g111	2023-11-30	m333	no	190	2023-06-20	yes

Question b:

Please use the sample table and data to write a query or SQL script to show the rating of the group on the monthly end.

Hint:

The result should be

group_id	calendar_day	member_id	rating	rated_on
g111	2023-09-30	m111	200	2022-10-15
g111	2023-10-31	m222	185	2023-05-31
g111	2023-11-30	m222	185	2023-05-31