Study customer churn analytics for the banking industry

1. **Query to identify Churned Customers with different age groups w.r.t Credit Score:-**

```
WITH categories AS (
 SELECT
  CASE
   WHEN "creditscore" BETWEEN 0 AND 500 THEN 'Poor'
   WHEN "creditscore" BETWEEN 501 AND 700 THEN 'Average'
   WHEN "creditscore" BETWEEN 701 AND 900 THEN 'Good'
   ELSE 'Excellent'
  END AS "CreditScoreCategory",
  CASE
   WHEN "age" BETWEEN 12 AND 18 THEN 'Adolescents'
   WHEN "age" BETWEEN 19 AND 34 THEN 'Young Adults'
   WHEN "age" BETWEEN 35 AND 64 THEN 'Middle Age Adult'  -- Corrected label
   WHEN "age" BETWEEN 65 AND 100 THEN 'Older Adults'
   ELSE 'GOD'
  END AS "AgeCategory"
 FROM "churn_modelling"
 WHERE "exited" = true
)

SELECT
 "CreditScoreCategory",
 SUM(CASE WHEN "AgeCategory" = 'Adolescents' THEN 1 ELSE 0 END) AS "Adolescents",
 SUM(CASE WHEN "AgeCategory" = 'Young Adults' THEN 1 ELSE 0 END) AS "Young Adults",
 SUM(CASE WHEN "AgeCategory" = 'Middle Age Adult' THEN 1 ELSE 0 END) AS "Middle Age
Adult", -- Corrected label
 SUM(CASE WHEN "AgeCategory" = 'Older Adults' THEN 1 ELSE 0 END) AS "Older Adults",
 SUM(CASE WHEN "AgeCategory" <> 'GOD' THEN 1 ELSE 0 END) AS "Grand Total"
```

```
FROM categories
GROUP BY "CreditScoreCategory"
UNION ALL
SELECT
 'Grand Total' AS "CreditScoreCategory",
 SUM(CASE WHEN "AgeCategory" = 'Adolescents' THEN 1 ELSE 0 END),
 SUM(CASE WHEN "AgeCategory" = 'Young Adults' THEN 1 ELSE 0 END),
 SUM(CASE WHEN "AgeCategory" = 'Middle Age Adult' THEN 1 ELSE 0 END), -- Corrected label
 SUM(CASE WHEN "AgeCategory" = 'Older Adults' THEN 1 ELSE 0 END),
 SUM(CASE WHEN "AgeCategory" <> 'GOD' THEN 1 ELSE 0 END)
FROM categories;
```

Output:-

	CreditScoreCategory text	Adolescents bigint	Young Adults bigint	Middle Age Adult bigint	Older Adults bigint	Grand Total bigint
1	Poor	0	22	127	3	152
2	Good	0	93	511	15	619
3	Average	2	173	1066	25	1266
4	Grand Total	2	288	1704	43	2037

2. Query to identify Churned Customers with different Geographic Locations w.r.t Credit Score:-

```
WITH geography_categories AS (
 SELECT
  "geography" AS "GeographyCategory",
  CASE
   WHEN "age" BETWEEN 12 AND 18 THEN 'Adolescents'
   WHEN "age" BETWEEN 19 AND 34 THEN 'Young Adults'
   WHEN "age" BETWEEN 35 AND 64 THEN 'Middle Age Adult'
   WHEN "age" BETWEEN 65 AND 100 THEN 'Older Adults'
   ELSE 'GOD'
  END AS "AgeCategory"
 FROM "churn_modelling"
```

```
 WHERE "exited" = true
)
SELECT
 "GeographyCategory",
 SUM(CASE WHEN "AgeCategory" = 'Adolescents' THEN 1 ELSE 0 END) AS "Adolescents",
 SUM(CASE WHEN "AgeCategory" = 'Young Adults' THEN 1 ELSE 0 END) AS "Young Adults",
 SUM(CASE WHEN "AgeCategory" = 'Middle Age Adult' THEN 1 ELSE 0 END) AS "Middle Age Adult",
 SUM(CASE WHEN "AgeCategory" = 'Older Adults' THEN 1 ELSE 0 END) AS "Older Adults",
 SUM(CASE WHEN "AgeCategory" <> 'GOD' THEN 1 ELSE 0 END) AS "Grand Total"
FROM geography_categories
GROUP BY "GeographyCategory"
UNION ALL
SELECT
 'Grand Total' AS "GeographyCategory",
 SUM(CASE WHEN "AgeCategory" = 'Adolescents' THEN 1 ELSE 0 END),
 SUM(CASE WHEN "AgeCategory" = 'Young Adults' THEN 1 ELSE 0 END),
 SUM(CASE WHEN "AgeCategory" = 'Middle Age Adult' THEN 1 ELSE 0 END),
 SUM(CASE WHEN "AgeCategory" = 'Older Adults' THEN 1 ELSE 0 END),
 SUM(CASE WHEN "AgeCategory" <> 'GOD' THEN 1 ELSE 0 END)
FROM geography_categories;FROM categories;
```

Output:-

	CreditScoreCategory text	Adolescents bigint	Young Adults bigint	Middle Age Adult bigint	Older Adults bigint	Grand Total bigint
1	Poor	0	22	127	3	152
2	Good	0	93	511	15	619
3	Average	2	173	1066	25	1266
4	Grand Total	2	288	1704	43	2037

3. Query to identify Top 5 Churned Customers Credit Score, Geographic Locations w.r.t Tenure:-

```
WITH churned_customers AS (
 SELECT
```

```
  "tenure",
  "creditscore",
  "churn_modelling"."geography", -- Specify the table name for the "geography" column
  CASE
   WHEN "tenure" BETWEEN 0 AND 3 THEN 'Established Customers'
   WHEN "tenure" BETWEEN 4 AND 6 THEN 'Loyal Customers'
   WHEN "tenure" BETWEEN 7 AND 10 THEN 'VIP Customers'
   ELSE 'Premium Customers'
  END AS "TenureCategory",
  CASE
   WHEN "creditscore" BETWEEN 0 AND 500 THEN 'Poor'
   WHEN "creditscore" BETWEEN 501 AND 700 THEN 'Average'
   WHEN "creditscore" BETWEEN 701 AND 900 THEN 'Good'
   ELSE 'Excellent'
  END AS "CreditScoreCategory",
  1 AS "CustomerCount"
 FROM "churn_modelling"
 WHERE "exited" = true
)
SELECT
 "geography",
 "CreditScoreCategory",
 "TenureCategory",
 SUM("CustomerCount") AS "ChurnedCustomers"
FROM churned_customers
GROUP BY "geography", "CreditScoreCategory", "TenureCategory"
ORDER BY "ChurnedCustomers" DESC
LIMIT 5;
```

Output:-

	geography text	CreditScoreCategory text	TenureCategory text	ChurnedCustomers bigint
1	France	Average	Established Customers	187
2	Germany	Average	Established Customers	187
3	France	Average	VIP Customers	177
4	Germany	Average	VIP Customers	162
5	France	Average	Loyal Customers	153

4. Query to identify Customers Stats Geographic Wise

```
WITH customer_counts AS (
 SELECT
  "geography" AS "Location",
  COUNT(*) AS "TotalCustomers",
  SUM(CASE WHEN "exited" = true THEN 1 ELSE 0 END) AS "ExitedCustomers",
  SUM(CASE WHEN "exited" = false THEN 1 ELSE 0 END) AS "NotExitedCustomers"
 FROM "churn_modelling"
 GROUP BY "geography"
)
SELECT
 "Location",
 "TotalCustomers",
 "ExitedCustomers",
 "NotExitedCustomers"
FROM customer_counts
UNION ALL
SELECT
 'Grand Total',
 SUM("TotalCustomers"),
 SUM("ExitedCustomers"),
 SUM("NotExitedCustomers")
FROM customer_counts;
```

Output :-

	Location text	TotalCustomers numeric	ExitedCustomers numeric	NotExitedCustomers numeric
1	Spain	2477	413	2064
2	France	5014	810	4204
3	Germany	2509	814	1695
4	Grand Total	10000	2037	7963

5. Query for Top Churned Customers Estimated Salary w.r.t Age

```
WITH customer_counts AS (
 SELECT
  CASE
   WHEN "estimatedsalary" BETWEEN 11 AND 100 THEN 'ENTRY_LEVEL'
   WHEN "estimatedsalary" BETWEEN 101 AND 1000 THEN 'JUNIOR_POSITIONS'
   WHEN "estimatedsalary" BETWEEN 1001 AND 10000 THEN 'MID-LEVEL'
   WHEN "estimatedsalary" BETWEEN 10001 AND 100000 THEN 'SENIOR_POSITIONS'
   ELSE 'SENIOR EXECUTIVE POSITIONS'
  END AS "EstimatedSalaryCategory",
  CASE
   WHEN "age" BETWEEN 12 AND 18 THEN 'Adolescents'
   WHEN "age" BETWEEN 19 AND 34 THEN 'Young Adults'
   WHEN "age" BETWEEN 35 AND 64 THEN 'Middle Age Adult'
   WHEN "age" BETWEEN 65 AND 100 THEN 'Older Adults'
   ELSE 'GOD'
  END AS "AgeCategory",
  1 AS "CustomerCount"
 FROM "churn_modelling"
 WHERE "exited" = true
)

SELECT
 "EstimatedSalaryCategory",
```

```
 SUM(CASE WHEN "AgeCategory" = 'Adolescents' THEN 1 ELSE 0 END) AS "Adolescents",
 SUM(CASE WHEN "AgeCategory" = 'Young Adults' THEN 1 ELSE 0 END) AS "Young Adults",
 SUM(CASE WHEN "AgeCategory" = 'Middle Age Adult' THEN 1 ELSE 0 END) AS "Middle Age Adult",
 SUM(CASE WHEN "AgeCategory" = 'Older Adults' THEN 1 ELSE 0 END) AS "Older Adults",
 SUM(CASE WHEN "AgeCategory" <> 'GOD' THEN 1 ELSE 0 END) AS "Grand Total"
FROM customer_counts
GROUP BY "EstimatedSalaryCategory"
UNION ALL
SELECT
 'Grand Total' AS "EstimatedSalaryCategory",
 SUM(CASE WHEN "AgeCategory" = 'Adolescents' THEN 1 ELSE 0 END),
 SUM(CASE WHEN "AgeCategory" = 'Young Adults' THEN 1 ELSE 0 END),
 SUM(CASE WHEN "AgeCategory" = 'Middle Age Adult' THEN 1 ELSE 0 END),
 SUM(CASE WHEN "AgeCategory" = 'Older Adults' THEN 1 ELSE 0 END),
 SUM(CASE WHEN "AgeCategory" <> 'GOD' THEN 1 ELSE 0 END)
FROM customer_counts;
```

Output:-

	EstimatedSalaryCategory text	Adolescents bigint	Young Adults bigint	Middle Age Adult bigint	Older Adults bigint	Grand Total bigint
1	MID-LEVEL	0	12	73	3	88
2	ENTRY_LEVEL	0	0	2	0	2
3	JUNIOR_POSITIONS	0	1	10	0	11
4	SENIOR_POSITIONS	2	120	755	15	892
5	SENIOR EXECUTIVE POSITIONS	0	155	864	25	1044
6	Grand Total	2	288	1704	43	2037

6. Query to identify Top Churned Customers Balance Wise w.r.t Salary Distribution

```
WITH exited_customer_categories AS (
 SELECT
  CASE
   WHEN "estimatedsalary" BETWEEN 11 AND 100 THEN 'ENTRY_LEVEL'
   WHEN "estimatedsalary" BETWEEN 101 AND 1000 THEN 'JUNIOR_POSITIONS'
```

```
    WHEN "estimatedsalary" BETWEEN 1001 AND 10000 THEN 'MID-LEVEL'
    WHEN "estimatedsalary" BETWEEN 10001 AND 100000 THEN 'SENIOR_POSITIONS'
    ELSE 'SENIOR_EXECUTIVE_POSITIONS'
   END AS "JobPosition",
   CASE
    WHEN "balance" BETWEEN 0 AND 100 THEN 'MICRO_BALANCE'
    WHEN "balance" BETWEEN 101 AND 1000 THEN 'MINI_BALANCE'
    WHEN "balance" BETWEEN 1001 AND 10000 THEN 'REGULAR_BALANCE'
    WHEN "balance" BETWEEN 10001 AND 100000 THEN 'ELITE_BALANCE'
    ELSE 'PREMIUM_CUSTOMER'
   END AS "BalanceCategory",
   1 AS "CustomerCount"
  FROM "churn_modelling"
  WHERE "exited" = true
)

SELECT
  "JobPosition",
  SUM(CASE WHEN "BalanceCategory" = 'MICRO_BALANCE' THEN "CustomerCount" ELSE 0 END)
AS "MICRO_BALANCE",
  SUM(CASE WHEN "BalanceCategory" = 'MINI_BALANCE' THEN "CustomerCount" ELSE 0 END)
AS "MINI_BALANCE",
  SUM(CASE WHEN "BalanceCategory" = 'REGULAR_BALANCE' THEN "CustomerCount" ELSE 0
END) AS "REGULAR_BALANCE",
  SUM(CASE WHEN "BalanceCategory" = 'ELITE_BALANCE' THEN "CustomerCount" ELSE 0 END)
AS "ELITE_BALANCE",
  SUM(CASE WHEN "BalanceCategory" = 'PREMIUM_CUSTOMER' THEN "CustomerCount" ELSE 0
END) AS "PREMIUM_CUSTOMER"
FROM exited_customer_categories
GROUP BY "JobPosition"
UNION ALL
SELECT
```

'Grand Total',

SUM(CASE WHEN "BalanceCategory" = 'MICRO_BALANCE' THEN "CustomerCount" ELSE 0 END),

SUM(CASE WHEN "BalanceCategory" = 'MINI_BALANCE' THEN "CustomerCount" ELSE 0 END),

SUM(CASE WHEN "BalanceCategory" = 'REGULAR_BALANCE' THEN "CustomerCount" ELSE 0 END),

SUM(CASE WHEN "BalanceCategory" = 'ELITE_BALANCE' THEN "CustomerCount" ELSE 0 END),

SUM(CASE WHEN "BalanceCategory" = 'PREMIUM_CUSTOMER' THEN "CustomerCount" ELSE 0 END)

FROM exited_customer_categories;

Output:-

	JobPosition text	MICRO_BALANCE bigint	MINI_BALANCE bigint	REGULAR_BALANCE bigint	ELITE_BALANCE bigint	PREMIUM_CUSTOMER bigint
1	SENIOR_EXECUTIVE_POSITIONS	256	0	1	175	612
2	MID-LEVEL	17	0	0	14	57
3	ENTRY_LEVEL	0	0	0	0	2
4	JUNIOR_POSITIONS	3	0	0	1	7
5	SENIOR_POSITIONS	224	0	0	135	533
6	Grand Total	500	0	1	325	1211

7. Query to Identify Top Churned Customers Balance Wise w.r.t Salary Distribution

```
WITH customer_categories AS (
 SELECT
  CASE
   WHEN "balance" BETWEEN 0 AND 100 THEN 'MICRO_BALANCE'
   WHEN "balance" BETWEEN 101 AND 1000 THEN 'MINI_BALANCE'
   WHEN "balance" BETWEEN 1001 AND 10000 THEN 'REGULAR_BALANCE'
   WHEN "balance" BETWEEN 10001 AND 100000 THEN 'ELITE_BALANCE'
   ELSE 'PREMIUM_CUSTOMER'
  END AS "BalanceCategory",
  CASE
   WHEN "numofproducts" BETWEEN 0 AND 1 THEN 'USER1'
   WHEN "numofproducts" = 2 THEN 'USER2'
   WHEN "numofproducts" = 3 THEN 'USER3'
```

```
    WHEN "numofproducts" = 4 THEN 'USER4'
    ELSE 'USER5'
  END AS "UserCategory",
  1 AS "CustomerCount"
 FROM "churn_modelling"
 WHERE "exited" = true
)

SELECT
 "UserCategory",
 SUM(CASE WHEN "BalanceCategory" = 'MICRO_BALANCE' THEN "CustomerCount" ELSE 0 END)
AS "MICRO_BALANCE",
 SUM(CASE WHEN "BalanceCategory" = 'MINI_BALANCE' THEN "CustomerCount" ELSE 0 END)
AS "MINI_BALANCE",
 SUM(CASE WHEN "BalanceCategory" = 'REGULAR_BALANCE' THEN "CustomerCount" ELSE 0
END) AS "REGULAR_BALANCE",
 SUM(CASE WHEN "BalanceCategory" = 'ELITE_BALANCE' THEN "CustomerCount" ELSE 0 END)
AS "ELITE_BALANCE",
 SUM(CASE WHEN "BalanceCategory" = 'PREMIUM_CUSTOMER' THEN "CustomerCount" ELSE 0
END) AS "PREMIUM_CUSTOMER"
FROM customer_categories
GROUP BY "UserCategory"
UNION ALL
SELECT
 'Grand Total',
 SUM(CASE WHEN "BalanceCategory" = 'MICRO_BALANCE' THEN "CustomerCount" ELSE 0
END),
 SUM(CASE WHEN "BalanceCategory" = 'MINI_BALANCE' THEN "CustomerCount" ELSE 0 END),
 SUM(CASE WHEN "BalanceCategory" = 'REGULAR_BALANCE' THEN "CustomerCount" ELSE 0
END),
 SUM(CASE WHEN "BalanceCategory" = 'ELITE_BALANCE' THEN "CustomerCount" ELSE 0 END),
 SUM(CASE WHEN "BalanceCategory" = 'PREMIUM_CUSTOMER' THEN "CustomerCount" ELSE 0
END)
```

FROM customer_categories;

Output:-

	UserCategory text	MICRO_BALANCE bigint	MINI_BALANCE bigint	REGULAR_BALANCE bigint	ELITE_BALANCE bigint	PREMIUM_CUSTOMER bigint
1	USER3	62	0	0	37	121
2	USER4	14	0	0	7	39
3	USER2	86	0	1	60	201
4	USER1	338	0	0	221	850
5	Grand Total	500	0	1	325	1211

Final Query :-

```
SELECT
 CASE
  WHEN creditscore BETWEEN 501 AND 700 THEN 'Average'
  ELSE 'Excellent'
 END AS credit_rating,
 AVG(creditscore) AS ag_creditscore,
 MAX(age) AS max_age,
 COUNT(DISTINCT numofproducts) AS num_product_categories,
 hascrcard,
 geography,
 customerid,
 COUNT(*) AS count_customers,
 CASE
  WHEN numofproducts BETWEEN 0 AND 1 THEN 'USER1'
  WHEN numofproducts BETWEEN 2 AND 4 THEN 'USER2'
  WHEN numofproducts BETWEEN 3 AND 4 THEN 'USER3'
  WHEN numofproducts BETWEEN 4 AND 5 THEN 'USER4'
  WHEN numofproducts BETWEEN 5 AND 6 THEN 'USER5'
  ELSE 'USER6'
 END AS user_category,
 CASE
  WHEN age BETWEEN 35 AND 64 THEN 'Middle Age Adult'
```

```
  ELSE 'Senior Old Adult'
 END AS age_category,
 CASE
  WHEN balance BETWEEN 10001 AND 100000 THEN 'GRADE_A'
  ELSE 'Premium_customer'
 END AS balance_category,
 CASE
  WHEN estimatedsalary BETWEEN 10001 AND 100000 THEN 'SENIOR_POSITIONS'
  ELSE 'EXECUTIVE_POSITIONS'
 END AS estimated_salary_category
FROM churn_modelling
GROUP BY
 credit_rating,
 hascrcard,
 user_category,
 age,
 balance_category,
 estimated_salary_category,
 geography,
 customerid
ORDER BY
 (AVG(creditscore) * 0.25) + (MAX(age) * 0.15) + (COUNT(DISTINCT numofproducts) * 0.15) +
(AVG(estimatedsalary) * 0.25) + (SUM(balance) * 0.20) DESC
LIMIT 10;
```

Description :-

The weight distribution reflects your specified criteria, with 25% weight on credit score, 15% weight on middle age adults, 20% weight on balance (considered as Premium), 25% weight on estimated salary (considered as Senior Position and Executive Position), and 15% weight on the number of products.