SQL Queries & Outputs

Question 1

Find investors who are making on average a loss across all their portfolios in 2024.

Query:

```sql
SELECT i.investor_name, AVG(u.gainloss_amount) AS total_loss
FROM Investor i
JOIN Portfolio p ON i.investor_phone_number = p.phone_number
JOIN UnrealisedGainLoss u ON p.portfolio_id = u.portfolio_id
WHERE u.gainloss_date BETWEEN '2024-01-01' AND '2024-12-31'
GROUP BY i.investor_name
HAVING AVG(u.gainloss_amount) < 0;
```

Query Output:

	investor_name	total_loss
1	Ariana Knowles	-3759.443333
2	Gustavo Perell	-2690.758333
3	Gwenette Lambert	-3345.310416
4	Jonell Broadbury	-6537.925000
5	Karalynn Nanninini	-6668.672000
6	Lina Guerrero	-613.432083
7	Mommy Diggin	-10175.480909
8	Nikolaus Jewster	-18449.840000
9	Rachel Farrow	-12447.998947
10	Shaine Sandeman	-6842.635833
11	Tildi Maling	-2029.768421

Description:
This query joins the `Investor`, `Portfolio`, and `UnrealisedGainLoss` tables to calculate each investor's total loss in 2024.
It groups the data by investor and portfolio, then filters only those with a negative total gain/loss.
The result identifies investors who experienced an overall loss in 2024 across their portfolios.

Question 2

Find investors who are seeing an annualized return of more than 10% from their portfolios in 2024.

Query:

```
SELECT i.investor_name, p.portfolio_id, p.annual_return
FROM Investor i
JOIN Portfolio p ON i.investor_phone_number = p.phone_number
WHERE p.annual_return > 10
AND p.created_date BETWEEN '2024-01-01' AND '2024-12-31';
```

Query Output:

	investor_name	portfolio_id	annual_return
1	Bridgette Lowdyane	IXNBJh01j0ohz8ycTMhM	12.82
2	Serena Macias	shcRa2KeqoWPNMV5o9hF	10.09
3	Camilla Goodier	TKgSuh2GZzzbFYlttHJe	12.77

Description:
This query retrieves investor names, portfolio IDs, and annual returns for portfolios created in 2024 with returns over 10%. It joins the `Investor` and `Portfolio` tables on phone number and filters by the annual return and portfolio creation date. The output includes only relevant portfolios from 2024.

Question 3

Find the monthly average unrealized gain/loss of portfolios for each month in 2024.

Query:

```sql
SELECT YEAR(gainloss_date) AS year,
       MONTH(gainloss_date) AS month,
       AVG(gainloss_amount) AS average_gainloss
FROM UnrealisedGainLoss
WHERE YEAR(gainloss_date) = 2024
GROUP BY YEAR(gainloss_date),
         MONTH(gainloss_date)
```

Query output:

	year	month	average_gainloss
1	2024	1	430.520740
2	2024	2	-7193.023103
3	2024	3	292.787241
4	2024	4	8092.058620
5	2024	5	-1996.106000
6	2024	6	-4128.630000
7	2024	7	2645.196363
8	2024	8	2788.639142
9	2024	9	-2537.239428
10	2024	10	86.409142
11	2024	11	-885.559428
12	2024	12	-3599.244166

Description:

It selects the year and month from the `gainloss_date`, calculates the average of gainloss_amount for each month, and filters the data for the year 2024. The results are grouped by year and month to show the monthly averages.

Question 4

What is the top three most popular first financial goals for investors in 2024?

Query:

```
SELECT TOP 3 G.goal , COUNT(G.goal) AS goal_count
FROM FinancialGoal AS G
WHERE EXISTS (
        SELECT *
        FROM Portfolio AS P
        WHERE P.created_date < '2025-01-01' AND
                P.created_date >= '2024-01-01' AND
                P.portfolio_id = G.portfolio_id)
GROUP BY G.goal
ORDER BY goal_count DESC
```

Query output:

	goal	goal_count
1	Buy a house	6
2	Generate sufficient monthly cash after retirement	2
3	Fund children's education	1

Description:
This query filters financial goals linked to portfolios created in 2024.
It counts how often each financial goal was chosen and ranks them.
Only the top 3 most common goals are shown: "Buy a house", "Generate sufficient monthly cash after retirement" and "Fund children's education"

Question 5

Find investors who consistently top up their investment at the beginning of every month (dollar-cost averaging) in 2024 for at least one of their portfolios.

Query:

```sql
WITH TopUpInvestors AS (
    SELECT
        ia.portfolio_id,
        i.investor_phone_number,
        ia.transaction_date,
            i.investor_name

    FROM Transactions ia
    JOIN Portfolio p ON ia.portfolio_id = p.portfolio_id
    JOIN Investor i ON p.phone_number = i.investor_phone_number
    WHERE YEAR(ia.transaction_date) = 2024
      AND DAY(ia.transaction_date) BETWEEN 1 AND 5
      AND ia.transaction_type='Topup'

)
SELECT investor_name
FROM TopUpInvestors
GROUP BY investor_phone_number, investor_name, portfolio_id
HAVING COUNT(DISTINCT MONTH(transaction_date)) = 12;
```

Query output:

	investor_name
1	Shaine Sandeman
2	Marcellus Brodie
3	Jonell Broadbury
4	Jarred Spreull
5	Rachel Farrow

Description:
A CTE `TopUpInvestors` is created to find investments made in the first 5 days of each month in 2024. The outer query groups by investor and portfolio to find those who did this for all 12 months.

Question 6

Find the most popular financial goals for investors working in the same company and whose age is between 30 to 40 years old.

Query:

```sql
WITH PopularFinancialGoals AS (
      SELECT I.investor_company ,
              G.Goal AS investor_goal,
              COUNT(G.Goal) AS goal_count
      FROM FinancialGoal AS G, Portfolio AS P, Investor AS I
      WHERE G.portfolio_id = P.portfolio_id AND
            P.phone_number = I.investor_phone_number AND
            DATEDIFF(year, investor_dob, GETDATE()) >= 30 AND
            DATEDIFF(year, investor_dob, GETDATE()) <= 40
      GROUP BY I.investor_company, G.Goal)

SELECT investor_company , investor_goal, goal_count
FROM PopularFinancialGoals AS G1
WHERE goal_count = (SELECT MAX(goal_count)
                    FROM PopularFinancialGoals AS G2
                    WHERE G1.investor_company =  G2.investor_company)
ORDER BY investor_company ASC
```

Query output:

	investor_company	investor_goal	goal_count
1	AhmadBaba Logistics	Buy a car	1
2	AhmadBaba Logistics	Fund children's education	1
3	AhmadBaba Logistics	Fund holiday vacations	1
4	GammaQuant	Buy a house	1
5	GammaQuant	Generate sufficient monthly cash after retirement	1
6	Genovate Labs	Buy a house	2
7	SpaceY Technologies	Buy a house	4

Description:
A CTE `PopularFinancialGoals` is used to filter investors aged 30 to 40 and counts the frequency of each goal within each company.
Then, for each company, the most popular goal is selected by taking the maximum count.

Question 7

Are male investors in their 20s making more money from their investments than their female counterparts in 2024?
Query:

```sql
SELECT investor_gender, AVG(p.market_value - p.total_fund) AS avg_income
FROM Investor i, Portfolio p
WHERE i.investor_phone_number = p.phone_number AND
            DATEDIFF(year, investor_dob, GETDATE()) >= 20 AND
            DATEDIFF(year, investor_dob, GETDATE()) < 30
GROUP BY i.investor_gender
```

Query output:

	investor_gender	avg_income
1	F	13592.694000
2	M	2732.170000

Description:
This query filters investors aged from 20-29, groups the investors by gender and computes the average income from investments.
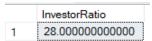
Question 8 (BONUS)

Find the percentage of investors with financial goals of 'Fund children's education' purchases during the past 20 years.
Query:

```sql
SELECT
    COUNT(I.investor_phone_number) * 1.0 /
    (SELECT COUNT(*) FROM Investor)*100 AS InvestorRatio
FROM FinancialGoal G
JOIN Portfolio P ON G.portfolio_id = P.portfolio_id
JOIN Investor I ON I.investor_phone_number = P.phone_number
WHERE goal = 'Fund children's education'
  AND DATEDIFF(year, created_date, GETDATE()) < 20;
```

Query output:

	InvestorRatio
1	28.000000000000

Description:
We first join the `FinancialGoal`, `Portfolio` and `Investor` tables on the `portfolio_id` and apply the "fund children's education" goal during the past 20 years. We can obtain the percentage of investors by dividing the investors who satisfy the condition by the total unique investors.