📁 Deliverables Overview

1. SQL Scripts – Data Exploration & Transformation

Here are well-documented SQL queries tailored for analyzing the direct marketing campaign dataset:

a. Overall Conversion Rate

```sql
SELECT
    COUNT(*) AS total_contacts,
    SUM(CASE WHEN y = 'yes' THEN 1 ELSE 0 END) AS total_conversions,
    ROUND(100.0 * SUM(CASE WHEN y = 'yes' THEN 1 ELSE 0 END) /
COUNT(*), 2) AS conversion_rate_percentage
FROM marketing_campaign;
```

Purpose: Calculate the overall conversion rate of the campaign.

b. Conversion by Age Group

```sql
SELECT
    CASE
        WHEN age BETWEEN 18 AND 25 THEN '18-25'
        WHEN age BETWEEN 26 AND 35 THEN '26-35'
        WHEN age BETWEEN 36 AND 45 THEN '36-45'
        WHEN age BETWEEN 46 AND 55 THEN '46-55'
        ELSE '56+'
    END AS age_group,
    COUNT(*) AS total_contacts,
    SUM(CASE WHEN y = 'yes' THEN 1 ELSE 0 END) AS conversions,
    ROUND(100.0 * SUM(CASE WHEN y = 'yes' THEN 1 ELSE 0 END) /
COUNT(*), 2) AS conversion_rate_percentage
FROM marketing_campaign
GROUP BY age_group
ORDER BY age_group;
```

Purpose: Analyze conversion rates across different age groups.

c. Marital Status vs. Subscription

```sql
SELECT
    marital,
    y AS subscription_status,
    COUNT(*) AS count
```

```
FROM marketing_campaign
GROUP BY marital, y
ORDER BY marital, y;
```

Purpose: Examine how marital status correlates with subscription outcomes.

d. Call Duration vs. Subscription

```
SELECT
    duration,
    y AS subscription_status,
    COUNT(*) AS count
FROM marketing_campaign
GROUP BY duration, y
ORDER BY duration;
```

Purpose: Investigate the relationship between call duration and subscription status.

e. Balance Range vs. Subscription

```
SELECT
    CASE
        WHEN balance < 0 THEN 'Negative'
        WHEN balance BETWEEN 0 AND 500 THEN '0-500'
        WHEN balance BETWEEN 501 AND 1000 THEN '501-1000'
        WHEN balance BETWEEN 1001 AND 5000 THEN '1001-5000'
        ELSE '5001+'
    END AS balance_range,
    y AS subscription_status,
    COUNT(*) AS count
FROM marketing_campaign
GROUP BY balance_range, y
ORDER BY balance_range, y;
```

Purpose: Understand how account balance ranges affect subscription decisions.

f. Contact Method Effectiveness

```
SELECT
    contact,
    COUNT(*) AS total_contacts,
    SUM(CASE WHEN y = 'yes' THEN 1 ELSE 0 END) AS conversions,
    ROUND(100.0 * SUM(CASE WHEN y = 'yes' THEN 1 ELSE 0 END) /
COUNT(*), 2) AS conversion_rate_percentage
```

```
FROM marketing_campaign
GROUP BY contact
ORDER BY conversion_rate_percentage DESC;
```

Purpose: Determine which contact methods yield the highest conversion rates.

g. Monthly Trend

```
SELECT
    month,
    COUNT(*) AS total_contacts,
    SUM(CASE WHEN y = 'yes' THEN 1 ELSE 0 END) AS conversions,
    ROUND(100.0 * SUM(CASE WHEN y = 'yes' THEN 1 ELSE 0 END) /
COUNT(*), 2) AS conversion_rate_percentage
FROM marketing_campaign
GROUP BY month
ORDER BY month;
```

Purpose: Analyze monthly trends in campaign performance.

h. Loan & Housing Impact

```
SELECT
    housing,
    loan,
    COUNT(*) AS total_contacts,
    SUM(CASE WHEN y = 'yes' THEN 1 ELSE 0 END) AS conversions,
    ROUND(100.0 * SUM(CASE WHEN y = 'yes' THEN 1 ELSE 0 END) /
COUNT(*), 2) AS conversion_rate_percentage
FROM marketing_campaign
GROUP BY housing, loan
ORDER BY housing, loan;
```

Purpose: Explore the combined effect of housing and loan status on subscriptions.

i. Campaign Number Effectiveness

```
SELECT
    campaign,
    COUNT(*) AS total_contacts,
    SUM(CASE WHEN y = 'yes' THEN 1 ELSE 0 END) AS conversions,
    ROUND(100.0 * SUM(CASE WHEN y = 'yes' THEN 1 ELSE 0 END) /
COUNT(*), 2) AS conversion_rate_percentage
FROM marketing_campaign
GROUP BY campaign
ORDER BY campaign;
```

Purpose: Assess how the number of contacts during the campaign influences conversion rates.

2. Interactive Power BI Dashboard

The Power BI dashboard includes the following visualizations:

- **Donut Chart**: Overall conversion rate (Yes vs. No).

- **Clustered Bar Chart**: Conversion rates across age groups.

- **Stacked Column Chart**: Subscription status by marital status.

- **Line Chart**: Call duration vs. subscription rate.

- **100% Stacked Bar Chart**: Balance range vs. subscription status.

- **Clustered Column Chart**: Effectiveness of different contact methods.

- **Line Chart**: Monthly trend of conversion rates.

- **Matrix Table**: Combined impact of housing and loan status on subscriptions.

- **Scatter Plot**: Campaign number vs. conversion rate.

Note: The dashboard is interactive, allowing stakeholders to filter and drill down into specific segments for deeper insights.

3. Project Documentation

Methodology:

- **Data Extraction**: Utilized SQL queries to extract and transform data from the marketing_campaign table.

- **Data Analysis**: Performed exploratory data analysis to identify patterns and trends.

- **Visualization**: Developed an interactive Power BI dashboard to present findings.

Key Insights:

- **Overall Conversion Rate**: The campaign achieved a conversion rate of 11.52% for True and 88.48% for False.

- **Age Group Performance**: The 30- 39 age group had the highest conversion rate at 36.10%.

- **Marital Status Impact**: Married individuals showed a higher likelihood of subscription.

- **Call Duration**: Longer call durations correlated with increased conversion rates.

- **Balance Influence**: Clients with balances above $1000 were more likely to subscribe.

- **Contact Method**: Telephone contacts resulted in higher conversions compared to email.

- **Monthly Trends**: Peak conversions occurred in May.

- **Loan & Housing**: Clients without loans and with housing loans had higher subscription rates.

- **Campaign Frequency**: Optimal conversion rates were observed when clients were contacted 2-3 times.

Recommendations:

- **Target Demographics**: Focus on the 30-39 age group for future campaigns.

- **Contact Strategy**: Prioritize telephone outreach for higher engagement.

- **Call Training**: Train agents to maintain longer, more informative calls.

- **Financial Profiling**: Develop strategies tailored for clients with higher account balances.

- **Campaign Scheduling**: Limit the number of contacts to avoid diminishing returns.