Detailed Explanatory Document

TASK 1

Data Preprocessing & Cleaning

Task 1.1: Remove duplicates Tesla posts

- In this specific task, I first made a copy of a data (posts).
- Then, I searched for duplicates using Conditional Formatting by highlighting duplicate Post ID.
- As I found no duplicates in the Posts data, if there was it would have highlighted.
- If there were duplicates in the data, we could have drop them using these steps: *Select data > Data tab > Remove Duplicates > select column > enter OK*

Task 1.2: Standardize date & Platform names

- In this task, the goal is the standardize the dates & platform names from Posts data.
- Standardize means the data should be consistent, all dates should be in one format and similar for platform names
- e.g. – platform names: 'Instagram', 'Insta', 'Twitter', 'X', etc. so here insta and Instagram are same also X and twitter are same. So, where there is insta we will be replacing it with Instagram and similar for twitter & X.
- So, for this task I copied the first data into the sheet named Task 1.2.
- First, I checked for Unique values, it will return us all unique values, like insta, Instagram, twitter, X, YouTube, etc. So, it returned me only four Platforms which were there in the dataset, which were, Instagram, Twitter, Facebook, YouTube.
- So, I kept all the unique platforms and set the datatype of Platform names as Text

Task 1.3: Format Numeric Columns ((Likes, Reach, Impressions, Ad Spend)

- Here in this task, I made two sheets 1.3 and 1.3 ad spend, as the data was in different sheets
- For numeric columns like Likes, Reach, Impressions I used format cells and then set their datatype as number.
- For Numeric column like ad spend, I used format cells and set its datatype as currency and specifically dollar ($).

Task 1.4: Split hashtags (e.g., #Cybertruck, #EVRevolution, #TeslaEnergy) into individual tags.

- In this task, first I shifted the column to right most side, and then split it.

- I could also have used insert column, but I didn't actually know how many hashtags were there, after splitting how many columns were going to add I didn't know.
- Used Text-to-column to split the hashtags.
- Steps: *select data > Data tab > Text-to-columns > Select delimiter > Finish*

TASK 2

Engagement Analysis

Task 2.1: Calculate average engagement rate per platform

- In this specific task, I first created a new variable named 'Engagement rate' using the formula:

  Engagement Rate = (Likes + Shares + Comments) / Impressions

- Then I used *AVERAGEIF* to calculate the average engagement rate per platform.

	Average engagement rate per platform
Instagram	19.33%
Twitter	14.37%
Facebook	12.20%
YouTube	13.12%

- So, the above is the average engagement rate per platform that I copied from my worksheet.

Task 2.2 Identify Top 10 Tesla posts with highest engagement.

- In this task, I have been told to identify the top 10 Tesla posts with highest engagement.
- So, we have calculated Engagement rate column, with the help of conditional formatting, I highlighted top 10 posts with highest engagement rate.
- In the highlighted area, there are some engagement rates which are greater than 100, which indicates that the number of impressions is less than the sum of Likes, Shares, Comments.
- As per the formula it is unrealistic to get engagement rate of 181, after checking it I got that shares are greater than reach, impressions.
- So, if we Drop shares from our it can work, as 1 person can share it 5-10 times.
- I took the help of ChatGPT to understand it, so it returned:

  "Every engagement came from someone who saw the post."

- *But if **shares spread your post beyond the original reach**, that assumption fails.*

  → Your engagement rate (based on reach) looks >100%,
  → But in reality, your post expanded reach *via shares (so reach metric just hasn't caught up yet).*

- So, we can't remove shares from the formula, as per ChatGPT shares can be higher than reach and impressions.

Task 2.3: Create a pivot table showing:

- **Total Likes, Shares, Comments by Content Type & Platform**
- **Average Clicks per post by Hashtag**

- Total Likes, Shares, Comments by Content Type & Platform
- In this task, I simply used pivot table and slicers.
- Selected all data, Inserted pivot table.
- Added Platform and Content type in Rows, Sum of shares, likes, comments in Values.
- Created a Slicer for Filtering Platform and Content Type.
- So, now when we select Facebook, it will show me the total likes, comments, shares in Facebook, and similar for all 3 remaining Platform names.
- Also same for Content type, when I select Reels it will show me for reels.
- We can also do multi-select and then note the data.

- Average Clicks per post by Hashtag
- In this again, I have created a pivot table, but I copied the data and then I used the data in the other sheet.
- Here I have put Hashtag 1, Hashtag 2, Hashtag 3 in Rows, and Clicks in values, setting the math function to Average.

Task 2.4: Highlight top-performing hashtags (#Cybertruck, #ModelY, #EVAdoption, etc.).

- In this task, I just highlighted top 25 best performing hashtags.
- I highlighted them on the basis of Reach.
- I can also use Impressions but reach tells that unique users who saw that post/reel.
- For identifying top-performing hashtags
- Used Conditional formatting to highlight the cells.
- I could have used Engagement rate, but it tells us that how many people interacted with the post/reels, reach defines that till how many people it went.
- So, if a person searches for such terms or terms related to the hashtags, the post or the reel will be reached to that person.

TASK 3

Platform Analysis

Task 3.1: Identify the platform with highest engagement (e.g., Twitter for announcements vs. YouTube for product demos).

- In this task, with help of Pivot Table I identify the platform with the highest engagement.
- First, I need to calculate Engagement which is Noting but:

$$Engagement = Likes + Shares + Comments$$

- So, after adding the new column of engagement in Posts data, I created Pivot table.
- In the pivot table, placed Platforms in rows, Sun of Engagement in Values, and it gave me the result for platform with highest engagement.

Task 3.2: Compare follower growth rates across platforms.

- In this task, I used Engagement summary data, as new followers and unfollows were given in that.
- Follower growth rate has a simple formula which I searched on ChatGPT and it returned me the formula which is:

$$Follower\ growth\ rate = \frac{New\ Followers - Unfollows}{Total\ Followers}$$

- With the help of this column I calculated and added a new column named as Follower growth rate.
- And then using the pivot table with average follower rate in values and platforms in rows, it returned the comparison of follower growth rate across different platforms.

Task 3.3: Visualize Engagement vs. Ad Spend per platform.

- This task was a little tricky, as we had Engagement in Posts data and ad spend in Engagement summary data.
- So, to tackle this task first I tried using VLOOKUP, but later realized that in engagement summary data week start date were provided, and in posts data that date was there which was the day posted. So, no matching columns I had to use.

- Later I matched them using platform, but then realized that it will return the first value when it will look for Platform, which means it will return the same value over and over for that specific platform.
  Ex.- Instagram – 2709
  Facebook – 3652
  Twitter – 5698
  YouTube – 9563
  If the values provided above were the first value while going Vertically, then for all the rows where there is Instagram it will return the value of 2709.
- Then after thinking for a while, used two different Pivot tables, one for Platform vs Engagement and other for Platform vs Ad Spend.
- Then using VLOOKUP added values in a table where there were three columns named Platform, Avg Engagement, Avg Ad Spend.
- Later using that table I inserted Column chart, Visualizing Avg Engagement vs Avg Ad Spend.

Task 3.4: Advise: Should Tesla focus on Twitter + YouTube (product announcements + demos) or maintain a multi-platform strategy?

- In this task, I followed the previous task but with another Pivot tables but with same values of columns and rows.
- Inserted a table with Columns Platform, Avg Engagement, Avg Ad Spend and Avg Engagement per Dollar.
- In this, the last column I calculated using the formula:

$$\frac{Avg\ Engagement}{Avg\ Ad\ Spend}$$

- This cleared me that, the Ad Spend across Platforms were equally distributed.
- And with the highest Average engagement YouTube, it explains that a testing video, test drive video or Elon talks impacts more on engagement.

TASK 4

Hashtag & Content Strategy

Task 4.1: Identify most frequently used Tesla hashtags.

- For identifying the most frequent used Tesla hashtags, I used the posts data, as it had hashtags variable.
- This is the variable in which there are hashtags used.
- So, in the task 1, I split the hashtags into separate columns.
- So, in posts data there are 3 variables related to hashtags which are hashtag 1, hashtag 2 and hashtag 3.
- So, the post with only 1 hashtag will have the other 2 columns i.e. hashtag 2, hashtag 3 will be blank, similar if a post with 2 hashtags will have the hashtag 3 column blank.
- For identifying the most used Tesla hashtag, I first used the UNIQUE function to get the unique hashtags from all three columns.
- Then later created a table with all unique hashtags and their count, which returns me that which hashtag is used for how many times.
- This helped me to identify the most frequently used Tesla hashtags.

Task 4.2 Compare average performance of posts containing each hashtag.

- For this task I created different data from posts data.
- I just copied all the hashtags from hashtag 1, and pasted it in the sheet named Task 4.2 data.
- With that I also copied likes, shares, comments, Impressions, reach, clicks, engagement, and engagement rate and pasted it in front of all the hashtags from hashtag 1.
- Then I stacked the hashtags from hashtag 2, also the data that I mentioned above I stacked it.
- Similar for hashtag 3, also the data that I mentioned (likes, shares, etc.)
- Now this was the data with all the hashtags and likes, shares, comments, etc. it has blanks so filtered it and unchecked blanks, so now it made me easy to compare the performance of posts containing each hashtag.
- To identify it I used Pivot table with hashtags in rows and averages of likes, shares, comments, reach, impressions in columns.
- These steps helped me to recognize that the hashtag #BetterWithTesla have the highest reach as well as impression.

Task 4.3: Compare content performance:

- For this task I have all the data present in a single sheet, so, I don’t need to create data or more than 1 pivot tables.

- In this task I used posts data, it has Content type and the parameters on which we are going to compare performance.
- I simply created a Pivot table, with Content type in rows, and averages of Likes, comments, shares, reach, impression, engagement, engagement rate in columns.
- This simply return me that for reel I got how many likes, shares, comments, reach, etc.

Task 4.4: Recommend content type priorities per platform (e.g., videos on YouTube, car images on Instagram).

- For content type priorities per platform, again I used the posts data, it has everything that I ned for this task.
- I created a pivot table with platforms in rows and content type in columns with average engagement in values.
- It returns me the avg engagement of each content type per platform.
- After this analysis I can say that for Instagram the priority should be given to image, as it has the highest engagement as comparted to video, text, etc.

TASK 5

Campaign Effectiveness

Task 5.1: Calculate:

Total & Average Impressions, Likes, Clicks per Campaign.

Engagement uplift during vs. before campaigns (e.g., Cybertruck launch spike)

- In this task, I created 3 pivot tables for Total and averages of likes, clicks, impressions and one for engagement uplift during vs before campaigns.
- So, for total of impressions, clicks, and likes I added campaign name in rows and all this in columns and set their function to sum.
- Similar for average just the difference is set their function to Average now the first pivot table will return me the sum of impressions, likes, clicks and the second will return the averages of all that are mentioned.
- In the third pivot table, inserted campaign name in rows, and engagement in column and average of engagement in values.
- So, the campaign means, if there is some campaign running then it is checked as campaign otherwise it is blank.
- So, I just filtered the pivot table and unchecked the blank, so it will return me those entries which are having campaign.
- And for before campaigns, again go in filter and uncheck all the campaign except blank.
- This returns me the data of engagement uplift before campaigns.

Task 5.2: Insights:

1. **Which campaign had the highest ROI (engagement vs. spend)?**

- In this task I need to check for ROI (return on investment) so here again I created 2 pivot tables as I don't have data in the same sheet and there are no matching values in two sheets.
- In first pivot table, I put platform names in rows, campaign names in columns and sum of engagement in values.
- And in second pivot table, I put platform names in rows, and sum of a spend in values.
- And then using this pivot table created a table in which added campaign names in rows, and in columns engagement, % of engagement, estimated spend with their specific values.
- For % of total engagement we have formula:

$$\frac{total\ engagement\ for\ that\ campaign}{total\ engagement}$$

- And for estimated spend we have formula:

$$\frac{\%\ of\ total\ engagement}{Sum\ of\ total\ ad\ spend}$$

- And inserted a column chart.

2. Which campaign drove the strongest follower growth?

- In this I created 6 pivot tables, on for platform vs follower growth rate, which will return me the follower growth rate for each platform.
- Second one for Campaign vs count of platforms, which will return me the count of campaign per platform.
- And then the remaining 4 pivot tables I created for each campaign name, with platform names in rows, and count of campaign names.
- Then created a table with that data, in which I created 2 tables one with platform vs Follower growth rate. And other with campaign vs Platform.
- Here I calculated the Weighted growth score using the formula for all the campaign names, just showing the formula for CybertruckLaunch campaign and the formula is:

*(CybertruckLaunch used in Facebook * facebook follower growth rate*

*+ CybertruckLaunch used in Instagram * Instagram follower growth rate*

*+ CybertruckLaunch used in Twitter * Twitter follower growth rate*

*+ CybertruckLaunch used in YouTube * YouTube follower growth rate)*

- And with this weighted growth score I can identify the strongest follower growth.

TASK 6

Follower Retention & Loyalty

Task 6.1: Visualize weekly follower growth per platform (line chart).

- For this task I created a pivot table which is created using the engagement summary data.
- In rows I have placed week start date, in columns I have platform names and I values I have sum of follower growth rate.
- This will return me the total growth rate of each platform of each week.
- Now, I inserted a line chart to visualize it and note the insights.
- Now the line chart visualizes the weekly follower growth per platform.

Task 6.2: Identify the peak week of follower gain.

- For this task I again created a pivot table from engagement summary data, with week start date in rows and Sum of new followers in values.
- It will return me the follower that got added in a specific week. Simply it will return the total followers added in that week.
- Now I applied sorting on sum of new followers from largest to smallest, so it will return me the largest values first.
- After I applied conditional formatting to sum of new followers and select the option of highlight top 10 items.
- So, it highlighted the top 10 and the first one is the peak week.

Task 6.3: Use moving averages to smooth growth trends.

- In this task I created a pivot table using the engagement summary data, where in rows I put week start date and in columns I put platform names with Averages of follower growth rate in values.
- This returns me average of follower growth rate for each platform for each week.
- After I inserted a line chart, same as task 6.1.
- Now on the top right side of chart there is an icon of plus (+) clicked on it and checked on trendlines and click on moving averages, defined the window or period of 4.
- Now this will give me the line chart with moving averages.

Task 6.4: Correlate ad spends vs. follower growth using scatter plots.

- For this task I first filtered the platform column in engagement summary data, so I will get a single platform, then copied ad spend, follower growth rate and platform

and pasted it to the sheet named task 6.1. Repeated same for all platforms and copied and pasted, simply created a stack of Facebook, Instagram, Twitter, YouTube.

- Then inserted a Scatterplot and defined series by naming it the names of platforms, I had total 4 series, ex.- for Facebook, named the series Facebook and selected the data till the entry where Instagram starts. And same for every series.
- This way I got 4 series and then I inserted a trendlines and set it on linear because we want correlation (linear).
- Also checked on display formula and R^2 score so in the chart it will display the linear equation and R2 score for the same series.

With this I completed all the tasks and for some tasks I took the help of ChatGPT for understanding concept, formulas.

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