The final output report generated from the provided code will include an **Excel file** with multiple sheets, each containing different types of analysis results and data related to sentiment analysis, emoji sentiment scores, and other features. Here's a breakdown of what each sheet in the report will contain:

**1. report (Main Sheet)**

This sheet includes a summary of each tweet processed, along with various sentiment-related features extracted from the tweets.

* **Columns:**
  + **Tweets**: The raw text of the tweet.
  + **Processed Text**: The tweet after preprocessing (e.g., text normalization, removing non-Arabic characters).
  + **Positive Words Count**: The number of positive words in the tweet based on the lexicon.
  + **Negative Words Count**: The number of negative words in the tweet based on the lexicon.
  + **Positive Emojis Count**: The count of positive emojis in the tweet.
  + **Negative Emojis Count**: The count of negative emojis in the tweet.
  + **Total Emojis Count**: The total number of emojis present in the tweet.
  + **Positive Score**: The calculated sentiment score based on positive features.
  + **Negative Score**: The calculated sentiment score based on negative features.
  + **Emojis**: The list of emojis found in the tweet.
  + **Sentiment**: The overall sentiment classification (positive, negative, or neutral).
  + **Positive Emojis**: The specific positive emojis identified.
  + **Negative Emojis**: The specific negative emojis identified.
* **Example:**
  + Tweet: "أنا سعيد 😊"
  + Processed Text: "أنا سعيد"
  + Positive Words Count: 1
  + Negative Words Count: 0
  + Positive Emojis Count: 1
  + Negative Emojis Count: 0
  + Total Emojis Count: 1
  + Positive Score: 0.8
  + Negative Score: 0.2
  + Emojis: "😊"
  + Sentiment: Positive
  + Positive Emojis: "😊"
  + Negative Emojis: None

**2. total\_positive\_emojis**

This sheet tracks all the emojis identified as positive in the tweets, along with their counts.

* **Columns:**
  + **Emoji**: The emoji character.
  + **Count**: The total number of occurrences of this emoji across all processed tweets.
* **Example:**
  + Emoji: "😊", Count: 5
  + Emoji: "👍", Count: 3

**3. total\_negative\_emojis**

This sheet tracks all the emojis identified as negative in the tweets, along with their counts.

* **Columns:**
  + **Emoji**: The emoji character.
  + **Count**: The total number of occurrences of this emoji across all processed tweets.
* **Example:**
  + Emoji: "😢", Count: 2
  + Emoji: "😡", Count: 4

**4. emoji\_sentiment\_scores**

This sheet contains the sentiment scores calculated for each emoji based on their occurrences in positive and negative tweets.

* **Columns:**
  + **Emoji**: The emoji character.
  + **Score**: The calculated sentiment score for the emoji (between -1 and 1).
* **Example:**
  + Emoji: "😊", Score: 0.9 (positive sentiment)
  + Emoji: "😢", Score: -0.8 (negative sentiment)

**5. Classification\_Results**

This sheet contains the results of the sentiment classification for specific words or phrases in the tweets, using the sentiment lexicons and other features.

* **Columns:**
  + **Word**: The word or phrase being classified.
  + **Sentiment**: The sentiment classification of the word (positive, negative, or neutral).
* **Example:**
  + Word: "happy", Sentiment: "positive"
  + Word: "sad", Sentiment: "negative"
  + Word: "angry", Sentiment: "negative"

**6. VADER Sentiment Scores**

This sheet tracks the sentiment scores calculated using the **VADER sentiment analysis** (mocked in this case, but generally used to analyze English text sentiment).

* **Columns:**
  + **Word**: The word or phrase for which the VADER score is calculated.
  + **Score**: The VADER sentiment score (ranging from -1 to 1, where negative values indicate negative sentiment and positive values indicate positive sentiment).
* **Example:**
  + Word: "love", Score: 0.95 (positive sentiment)
  + Word: "hate", Score: -0.85 (negative sentiment)
  + Word: "neutral", Score: 0.0 (neutral sentiment)

**Excel File Structure**

* **File Name**: The file name will be dynamically generated based on the current date and time, for example:
  + report\_2025\_1\_28\_14\_30\_45.xlsx
* **Sheets**: The Excel file will have 6 sheets:
  + report: Contains tweet details and extracted features.
  + total\_positive\_emojis: Tracks positive emoji occurrences.
  + total\_negative\_emojis: Tracks negative emoji occurrences.
  + emoji\_sentiment\_scores: Contains sentiment scores for emojis.
  + Classification\_Results: Lists sentiment classification results for specific words.
  + VADER Sentiment Scores: Displays VADER sentiment analysis results.
* **Output Folder**: The Excel file will be saved in an output folder, and if the folder does not exist, it will be created.

**Final Report Process:**

1. **Data Collection**: The report collects raw tweet data and performs sentiment analysis, extracting features like emoji counts, sentiment classification, and sentiment scores for emojis and words.
2. **Excel Output**: The results are compiled into structured data in an Excel file with the aforementioned sheets, which can be opened and analyzed later.

This final output provides a comprehensive view of how emojis, word sentiment, and other features contribute to the sentiment classification of Arabic tweets. It can be used for further analysis or reporting purposes.