Code Functionality & Advantages

# Explanation:

## Database Connection:

The code starts by defining parameters to connect to a SQL Server database, which contains datasets related to chemical products.

## Functionality:

A function `week\_number\_to\_month\_and\_week` is defined that converts a week number and year into the corresponding month and week of the month.

## API Creation:

An API is created using the FastAPI framework. The main endpoint `/generate\_summary/` performs the following actions:  
- Retrieves datasets from the SQL database.  
- Filters the data based on user-provided parameters.  
- Calculates various statistics like average, median, highest, lowest prices, etc.  
- Provides insights on market situation, demand, supply, and plant shutdowns.  
- Decomposes time series data to analyze trend and seasonality.  
- Generates an HTML summary of the analysis.

## Server Deployment:

The FastAPI app is made publicly accessible using `ngrok`, which provides a temporary public URL for the app.

# Advantages:

Real-time Analysis: The API fetches real-time data from the database and provides up-to-date insights.

Easy Accessibility: Using `ngrok`, stakeholders can access the API from anywhere without needing a permanent server setup.

Flexibility: The code can be easily modified to analyze different products and variants, making it versatile for various scenarios.

Automated Insights: The code automatically generates market insights, eliminating manual analysis and reducing the chance of human errors.

Structured Output: The generated HTML summary provides a structured and easily readable format for users to understand the analysis.

Real time Fixes: The whole code structured is running on PyCharm which is connected with GitHub that allows the real time logs, if any breakdown happens it intimate the end developer real time.