* The code starts by importing necessary libraries: os, pandas, matplotlib.pyplot, and datetime.
* The sales data is collected by reading a CSV file using Pandas: sales\_data = pd.read\_csv('developed\_data/createdData.csv').
* The weekly sales data is analyzed by converting the 'Date' column to datetime format and grouping the data by 'Date' and 'Product Name' to get the total sales quantity for each product on each date.
* The week number is extracted from the 'Date' column and added as a new 'Week' column. The data is then grouped by 'Product Name', 'Week', and 'Date', and the total sales quantity for each product in each week is calculated.
* The demand per week is calculated by summing the weekly sales quantity for each product. The Economic Order Quantity (EOQ) is also calculated for each row using the EOQ formula with assumed carrying cost and ordering cost.
* The demand and EOQ data are exported to an Excel file in a worksheet named 'Demand and EOQ'. The Excel file is saved with a filename containing the current date.
* Line plots are created for each product by iterating over unique product names. The sales data for each product is filtered, and a line plot is created using the dates and quantities. The line plots are saved as images in the 'line\_plots' folder, and each image is added to the Excel file as a new worksheet.
* A pie chart is created to visualize the total sales distribution. The chart represents the percentage of total sales for each product. The pie chart is saved as an image and added to the Excel file as a new worksheet.
* A line plot is created to compare the demand and EOQ values over the weeks. The demand and EOQ data are grouped by week, and the lines are plotted on the graph. The line plot is saved as an image and added to the Excel file as a new worksheet.
* The Excel file is saved and closed, and a message is printed to indicate the successful export of demand analysis, line plots, charts, and the EOQ graph.

EOQ = Economic Order Quantity

1. The EOQ is a formula used in inventory management to determine the optimal order quantity that minimizes the total cost of inventory, taking into account both ordering costs and carrying costs. It helps in finding the balance between holding too much inventory (incurring high carrying costs) and holding too little inventory (resulting in frequent ordering and high ordering costs).
2. In the code, the EOQ is calculated using the following formula:
3. EOQ = sqrt((2 \* C \* D) / H)
4. Where:
5. EOQ: Economic Order Quantity
6. C: Ordering cost per order
7. D: Annual demand (sales) quantity
8. H: Carrying cost per unit per year
9. Explanation with an example: Let's consider an example to illustrate the calculation of EOQ. Assume we have a product with the following data:
10. Ordering cost per order (C): $100
11. Annual demand (sales) quantity (D): 1000 units
12. Carrying cost per unit per year (H): $10
13. Using the formula, we can calculate the EOQ as follows:
14. EOQ = sqrt((2 \* 100 \* 1000) / 10) = sqrt(2000000 / 10) = sqrt(200000) = 447.21 (approx.)
15. So, the EOQ for this product is approximately 447.21 units. This means that ordering around 447 units at a time would minimize the total cost of inventory for this product, considering the given ordering cost and carrying cost.
16. By calculating the EOQ for different products based on their specific ordering costs, annual demand, and carrying costs, businesses can optimize their inventory management and make informed decisions about order quantities. The code in the example calculates the EOQ for each product based on its demand and assumed ordering and carrying costs.