1**. Introduction:**

The Coffee Machine project is a Python-based program that simulates a simple coffee vending machine. Users can choose from a menu of coffee options, place an order, make payment, and receive their desired coffee. The program also provides a report on the current status of available resources and profits.

2**. Features:**

Menu: The coffee machine offers a variety of coffee options, including latte, espresso, and cappuccino, each with its own set of ingredients and cost.

Resource Management: The program keeps track of the available resources such as water, milk, and coffee grounds. It checks if there are enough resources to fulfill a user's order.

Payment Processing: Users can insert coins to make payment for their selected coffee. The program calculates the total payment and checks if it's sufficient. If successful, it provides change and updates the profit.

Order Fulfillment: Once the payment is successful and resources are available, the program prepares the selected coffee and deducts the used resources.

Reporting: Users can request a report to see the current status of resources and profits.

**3**. **Code Structure:**

Menu Definition: The menu is defined as a dictionary, with each coffee type containing ingredients and cost.

Resource Management: The program tracks the quantity of water, milk, and coffee grounds using a resources dictionary.

**Functions:**

check\_resources(order\_ingredients): Checks if there are enough resources for a given order.

process\_coins(): Takes user input for coins and calculates the total payment.

is\_payment\_successful(money\_received, coffee\_cost): Checks if the payment is sufficient and updates profit.

make\_coffee(coffee\_name, coffee\_ingredients): Prepares and serves the selected coffee, updating resources.

User Interaction: The program uses a while loop to continuously prompt the user for input until they choose to turn off the machine.

4**. Usage:**

Users can choose a coffee type from the menu.

They can request a report to check resource levels and profits.

The machine processes payments and provides change.

Coffee is prepared and served if resources are available and the payment is successful.

5. Improvements:

The program could be extended to handle more complex transactions, such as handling multiple orders in a single session.

Adding a graphical user interface (GUI) could enhance the user experience.

Error handling can be improved to provide more informative messages to users.

6. Conclusion:

The Coffee Machine project demonstrates the basic functionality of a coffee vending machine. It covers order processing, payment handling, and resource management. The modular structure of the code allows for easy maintenance and future enhancements.

7. **Acknowledgments:**

The project is a result of individual effort and may be extended or modified based on specific requirements.

This project provides a foundation for a simple coffee machine simulation and can be expanded to include more features for a richer user experience.