

Below is a Python program implementing a ****Bike Rental System**** using Object-Oriented Programming (OOP) concepts. The system allows the user to view the total stock of bikes, request bikes for rent, and exit the program.

Python Code:

```
```python
class BikeRental:

 def __init__(self, stock):

 # Initialize the total stock of bikes

 self.stock = stock

 def display_stock(self):

 # Display the total number of bikes available for rent

 print(f"Total bikes available: {self.stock}")

 return self.stock

 def rent_bike(self, quantity):

 # Rent bikes if available in the required quantity

 if quantity <= 0:

 print("Invalid input. Quantity should be positive.")

 elif quantity > self.stock:

 print(f"Sorry, we only have {self.stock} bikes available for rent.")

 else:

 self.stock -= quantity

 print(f"You have rented {quantity} bike(s).")

 print(f"Bikes remaining in stock: {self.stock}")

 def exit_program(self):

 # Exit the program

 print("Thank you for using the Bike Rental System. Goodbye!")
```

```

def main():

 # Create a BikeRental object with an initial stock of 10 bikes

 bike_rental = BikeRental(10)

 while True:

 # Display menu options

 print("\n===== Bike Rental System =====")

 print("1. Display available bikes")

 print("2. Rent a bike")

 print("3. Exit")

 # Get user input for their choice

 choice = input("Enter your choice (1/2/3): ")

 if choice == '1':

 # Display the available bikes

 bike_rental.display_stock()

 elif choice == '2':

 # Rent a bike, ask the user for the number of bikes they want to rent

 try:

 quantity = int(input("How many bikes would you like to rent? "))

 bike_rental.rent_bike(quantity)

 except ValueError:

 print("Invalid input. Please enter a number.")

 elif choice == '3':

 # Exit the program

 bike_rental.exit_program()

 break

```

```

else:

 # Handle invalid input

 print("Invalid choice. Please select a valid option.")

Run the program

if __name__ == "__main__":
 main()
'''

```

### Explanation:

1. **Class `BikeRental`:**

- **`\_\_init\_\_(self, stock)`:** Initializes the bike stock when an instance of the class is created.
- **`display\_stock(self)`:** Displays the total number of bikes available for rent.
- **`rent\_bike(self, quantity)`:** Handles the process of renting bikes. It checks if the requested number of bikes is valid and updates the stock.
- **`exit\_program(self)`:** Ends the program with a message.

2. **Function `main()`:**

- Displays a menu for the user to interact with the system.
- Users can choose to:
  1. View available bikes.
  2. Rent bikes by specifying the quantity.
  3. Exit the program.

### Example of a Possible Interaction:

```

'''

===== Bike Rental System =====

1. Display available bikes

```

2. Rent a bike

3. Exit

Enter your choice (1/2/3): 1

Total bikes available: 10

===== Bike Rental System =====

1. Display available bikes

2. Rent a bike

3. Exit

Enter your choice (1/2/3): 2

How many bikes would you like to rent? 3

You have rented 3 bike(s).

Bikes remaining in stock: 7

===== Bike Rental System =====

1. Display available bikes

2. Rent a bike

3. Exit

Enter your choice (1/2/3): 3

Thank you for using the Bike Rental System. Goodbye!

'''

This program allows the user to manage a bike rental system easily and uses OOP concepts like classes and methods for better structure.