Phase 4: Submission

Tittle: Smart Public Restroom

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SOURCE CODE: python

import time

class Restroom:

def \_\_init\_\_(self):

self.occupancy = False

self.lighting = False

self.toilet\_paper\_level = 100 # Initial toilet paper level in percentage

self.water\_usage = 0 # Total water usage in liters

self.temperature = 25 # Initial temperature in Celsius

self.humidity = 40 # Initial humidity in percentage

def enter(self):

if not self.occupancy:

print("Welcome to the restroom. The door is now unlocked.")

self.occupancy = True

else:

print("The restroom is currently occupied. Please wait or try again later.")

def exit(self):

if self.occupancy:

print("Thank you for using the restroom. The door is now locked.")

self.occupancy = False

else:

print("The restroom is already vacant.")

def toggle\_lighting(self):

self.lighting = not self.lighting

if self.lighting:

print("Restroom lighting is now ON.")

else:

print("Restroom lighting is now OFF.")

def dispense\_toilet\_paper(self):

if self.toilet\_paper\_level > 0:

print("Toilet paper dispensed.")

self.toilet\_paper\_level -= 10 # Simulate dispensing 10% of the toilet paper

else:

print("Out of toilet paper. Please notify the staff.")

def flush\_toilet(self):

print("Toilet flushed.")

self.water\_usage += 3 # Simulate 3 liters of water usage

def adjust\_temperature\_humidity(self, temp, humidity):

self.temperature = temp

self.humidity = humidity

def status\_report(self):

print(f"Restroom Status:")

print(f"Occupancy: {'Occupied' if self.occupancy else 'Vacant'}")

print(f"Lighting: {'ON' if self.lighting else 'OFF'}")

print(f"Toilet Paper Level: {self.toilet\_paper\_level}%")

print(f"Water Usage: {self.water\_usage} liters")

print(f"Temperature: {self.temperature}°C")

print(f"Humidity: {self.humidity}%")

def main():

restroom = Restroom()

while True:

print("\nOptions:")

print("1. Enter the restroom")

print("2. Exit the restroom")

print("3. Toggle lighting")

print("4. Dispense toilet paper")

print("5. Flush toilet")

print("6. Adjust temperature and humidity")

print("7. Check restroom status")

print("8. Quit")

choice = input("Enter your choice (1-8): ")

if choice == '1':

restroom.enter()

elif choice == '2':

restroom.exit()

elif choice == '3':

restroom.toggle\_lighting()

elif choice == '4':

restroom.dispense\_toilet\_paper()

elif choice == '5':

restroom.flush\_toilet()

elif choice == '6':

temp = float(input("Enter new temperature (°C): "))

humidity = float(input("Enter new humidity (%): "))

restroom.adjust\_temperature\_humidity(temp, humidity)

elif choice == '7':

restroom.status\_report()

elif choice == '8':

print("Exiting the smart restroom system.")

break

else:

print("Invalid choice. Please enter a valid option (1-8).")

if \_\_name\_\_ == "\_\_mai

main()

output:

Options:

1. Enter the restroom

2. Exit the restroom

3. Toggle lighting

4. Dispense toilet paper

5. Flush toilet

6. Adjust temperature and humidity

7. Check restroom status

8. Quit

Enter your choice (1-8): 1

Welcome to the restroom. The door is now unlocked.

Options:

1. Enter the restroom

2. Exit the restroom

3. Toggle lighting

4. Dispense toilet paper

5. Flush toilet

6. Adjust temperature and humidity

7. Check restroom status

8. Quit

Enter your choice (1-8): 3

Restroom lighting is now ON.

Options:

1. Enter the restroom

2. Exit the restroom

3. Toggle lighting

4. Dispense toilet paper

5. Flush toilet

6. Adjust temperature and humidity

7. Check restroom status

8. Quit

Enter your choice (1-8): 7

Restroom Status:

Occupancy: Vacant

Lighting: ON

Toilet Paper Level: 100%

Water Usage: 0 liters

Temperature: 25°C

Humidity: 40%

Options:

1. Enter the restroom

2. Exit the restroom

3. Toggle lighting

4. Dispense toilet paper

5. Flush toilet

6. Adjust temperature and humidity

7. Check restroom status

8. Quit

Enter your choice (1-8): 2

Thank you for using the restroom. The door is now locked.

Options:

1. Enter the restroom

2. Exit the restroom

3. Toggle lighting

4. Dispense toilet paper

5. Flush toilet

6. Adjust temperature and humidity

7. Check restroom status

8. Quit

Enter your choice (1-8): 5

Toilet flushed.

Options:

1. Enter the restroom

2. Exit the restroom

3. Toggle lighting

4. Dispense toilet paper

5. Flush toilet

6. Adjust temperature and humidity

7. Check restroom status

8. Quit

Enter your choice (1-8): 4

Toilet paper dispensed.

Options:

1. Enter the restroom

2. Exit the restroom

3. Toggle lighting

4. Dispense toilet paper

5. Flush toilet

6. Adjust temperature and humidity

7. Check restroom status

8. Quit

Enter your choice (1-8): 7

Restroom Status:

Occupancy: Occupied

Lighting: ON

Toilet Paper Level: 90%

Water Usage: 3 liters

Temperature: 25°C

Humidity: 40%

Options:

1. Enter the restroom

2. Exit the restroom

3. Toggle lighting

4. Dispense toilet paper

5. Flush toilet

6. Adjust temperature and humidity

7. Check restroom status

8. Quit

Enter your choice (1-8): 8

Exiting the smart restroom system.

Source code: Java

import java.util.Scanner;

class Restroom {

private boolean occupancy;

private boolean lighting;

private int toiletPaperLevel;

private int waterUsage;

private int temperature;

private int humidity;

public Restroom() {

occupancy = false;

lighting = false;

toiletPaperLevel = 100;

waterUsage = 0;

temperature = 25;

humidity = 40;

}

public void enter() {

if (!occupancy) {

System.out.println("Welcome to the restroom. The door is now unlocked.");

occupancy = true;

} else {

System.out.println("The restroom is currently occupied. Please wait or try again later.");

}

}

public void exit() {

if (occupancy) {

System.out.println("Thank you for using the restroom. The door is now locked.");

occupancy = false;

} else {

System.out.println("The restroom is already vacant.");

}

}

public void toggleLighting() {

lighting = !lighting;

if (lighting) {

System.out.println("Restroom lighting is now ON.");

} else {

System.out.println("Restroom lighting is now OFF.");

}

}

public void dispenseToiletPaper() {

if (toiletPaperLevel > 0) {

System.out.println("Toilet paper dispensed.");

toiletPaperLevel -= 10;

} else {

System.out.println("Out of toilet paper. Please notify the staff.");

}

}

public void flushToilet() {

System.out.println("Toilet flushed.");

waterUsage += 3;

}

public void adjustTemperatureHumidity(int temp, int humidity) {

temperature = temp;

this.humidity = humidity;

}

public void statusReport() {

System.out.println("Restroom Status:");

System.out.println("Occupancy: " + (occupancy ? "Occupied" : "Vacant"));

System.out.println("Lighting: " + (lighting ? "ON" : "OFF"));

System.out.println("Toilet Paper Level: " + toiletPaperLevel + "%");

System.out.println("Water Usage: " + waterUsage + " liters");

System.out.println("Temperature: " + temperature + "°C");

System.out.println("Humidity: " + humidity + "%");

}

}

public class Main {

public static void main(String[] args) {

Restroom restroom = new Restroom();

Scanner scanner = new Scanner(System.in);

while (true) {

System.out.println("\nOptions:");

System.out.println("1. Enter the restroom");

System.out.println("2. Exit the restroom");

System.out.println("3. Toggle lighting");

System.out.println("4. Dispense toilet paper");

System.out.println("5. Flush toilet");

System.out.println("6. Adjust temperature and humidity");

System.out.println("7. Check restroom status");

System.out.println("8. Quit");

System.out.print("Enter your choice (1-8): ");

int choice = scanner.nextInt();

switch (choice) {

case 1:

restroom.enter();

break;

case 2:

restroom.exit();

break;

case 3:

restroom.toggleLighting();

break;

case 4:

restroom.dispenseToiletPaper();

break;

case 5:

restroom.flushToilet();

break;

case 6:

System.out.print("Enter new temperature (°C): ");

int temp = scanner.nextInt();

System.out.print("Enter new humidity (%): ");

int humidity = scanner.nextInt();

restroom.adjustTemperatureHumidity(temp, humidity);

break;

case 7:

restroom.statusReport();

break;

case 8:

System.out.println("Exiting the smart restroom system.");

scanner.close();

System.exit(0);

default:

System.out.println("Invalid choice. Please enter a valid option (1-8).");

}

}

}

}

Output:

Options:

1. Enter the restroom

2. Exit the restroom

3. Toggle lighting

4. Dispense toilet paper

5. Flush toilet

6. Adjust temperature and humidity

7. Check restroom status

8. Quit

Enter your choice (1-8): 1

Welcome to the restroom. The door is now unlocked.

Options:

1. Enter the restroom

2. Exit the restroom

3. Toggle lighting

4. Dispense toilet paper

5. Flush toilet

6. Adjust temperature and humidity

7. Check restroom status

8. Quit

Enter your choice (1-8): 7

Restroom Status:

Occupancy: Occupied

Lighting: OFF

Toilet Paper Level: 100%

Water Usage: 0 liters

Temperature: 25°C

Humidity: 40%

Options:

1. Enter the restroom

2. Exit the restroom

3. Toggle lighting

4. Dispense toilet paper

5. Flush toilet

6. Adjust temperature and humidity

7. Check restroom status

8. Quit

Enter your choice (1-8): 3

Restroom lighting is now ON.

Options:

1. Enter the restroom

2. Exit the restroom

3. Toggle lighting

4. Dispense toilet paper

5. Flush toilet

6. Adjust temperature and humidity

7. Check restroom status

8. Quit

Enter your choice (1-8): 4

Toilet paper dispensed.

Options:

1. Enter the restroom

2. Exit the restroom

3. Toggle lighting

4. Dispense toilet paper

5. Flush toilet

6. Adjust temperature and humidity

7. Check restroom status

8. Quit

Enter your choice (1-8): 5

Toilet flushed.

Options:

1. Enter the restroom

2. Exit the restroom

3. Toggle lighting

4. Dispense toilet paper

5. Flush toilet

6. Adjust temperature and humidity

7. Check restroom status

8. Quit

Enter your choice (1-8): 6

Enter new temperature (°C): 23

Enter new humidity (%): 45

Options:

1. Enter the restroom

2. Exit the restroom

3. Toggle lighting

4. Dispense toilet paper

5. Flush toilet

6. Adjust temperature and humidity

7. Check restroom status

8. Quit

Enter your choice (1-8): 7

Restroom Status:

Occupancy: Occupied

Lighting: ON

Toilet Paper Level: 90%

Water Usage: 3 liters

Temperature: 23°C

Humidity: 45%

Options:

1. Enter the restroom

2. Exit the restroom

3. Toggle lighting

4. Dispense toilet paper

5. Flush toilet

6. Adjust temperature and humidity

7. Check restroom status

8. Quit

Enter your choice (1-8): 2

Thank you for using the restroom. The door is now locked.

Options:

1. Enter the restroom

2. Exit the restroom

3. Toggle lighting

4. Dispense toilet paper

5. Flush toilet

6. Adjust temperature and humidity

7. Check restroom status

8. Quit

Enter your choice (1-8): 7

Restroom Status:

Occupancy: Vacant

Lighting: ON

Toilet Paper Level: 90%

Water Usage: 3 liters

Temperature: 23°C

Humidity: 45%

Options:

1. Enter the restroom

2. Exit the restroom

3. Toggle lighting

4. Dispense toilet paper

5. Flush toilet

6. Adjust temperature and humidity

7. Check restroom status

8. Quit

Enter your choice (1-8): 8

Exiting the smart restroom system.