**Experiment Report - 63 - test10\_SmartAirPurifier**

1. **Summary Table of Errors Found**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Error ID | Line Number | Error Type | Self-Detected? | Peer 1 Found? | Peer 2 Found? |
| E01 | line 15 | Semantic | √ | √ | × |
| E02 | line 23 | Logic | √ | √ | √ |
| E03 | line 35 | Semantic | √ | × | √ |
| E04 | line 55 | Semantic | √ | × | × |

Additional Errors Found by Self: 0

Self-Review Detection Rate: 100%

Peer 1 Detection Rate: 40%

Peer 2 Detection Rate: 40%

1. **Source Code**
2. package a;
3. public class c111\_SmartAirPurifier {
4. private double normalAQIThreshold; // 空气质量正常的最大 AQI 阈值
5. private double hazardousAQIThreshold; // 极端污染的 AQI 阈值
6. private double currentAQI; // 当前空气质量指数
7. private int fanSpeed; // 风扇转速（0 代表关闭，1 代表正常，2 代表高速）
8. // 构造函数：初始化空气质量阈值和风扇转速
9. public c111\_SmartAirPurifier(double normalAQIThreshold, double hazardousAQIThreshold, double initialAQI) {
10. this.normalAQIThreshold = normalAQIThreshold;
11. this.hazardousAQIThreshold = hazardousAQIThreshold;
12. this.currentAQI = initialAQI;
13. this.fanSpeed = 0; // 默认风扇转速为正常
14. }
15. // 更新空气质量指数，并根据数值条件调整风扇转速
16. public void updateAQI(double newAQI) {
17. currentAQI = newAQI;
18. adjustFanSpeed();
19. System.out.printf("Current AQI: %.2f, Fan Speed: %d%n", currentAQI, fanSpeed);
20. if (currentAQI > hazardousAQIThreshold) {
21. System.out.println("ALERT: Hazardous air quality detected! Take protective measures.");
22. } else if (currentAQI > normalAQIThreshold) {
23. System.out.println("WARNING: Poor air quality. Increasing fan speed.");
24. } else {
25. System.out.println("Air quality is good. Operating at normal speed.");
26. }
27. }
28. // 根据当前 AQI 调整风扇转速
29. private void adjustFanSpeed() {
30. if (currentAQI >= hazardousAQIThreshold) {
31. fanSpeed = 0; // 极端污染情况下，风扇高速运行
32. } else if (currentAQI > normalAQIThreshold) {
33. fanSpeed = 2; // 轻度污染情况下，提高风扇转速
34. } else {
35. fanSpeed = 1; // 良好空气质量情况下，风扇保持正常速度
36. }
37. }
38. // 获取当前空气质量指数
39. public double getCurrentAQI() {
40. return currentAQI;
41. }
42. // 获取当前风扇转速
43. public int getFanSpeed() {
44. return fanSpeed;
45. }
46. public static void main(String[] args) {
47. // 初始化空气净化器：正常 AQI 阈值 100，极端污染 AQI 阈值 200，初始 AQI 80
48. c111\_SmartAirPurifier purifier = new c111\_SmartAirPurifier(100.0, 200.0, 90.0);
49. // 测试用例
50. purifier.updateAQI(90.0); // 90，空气质量良好，风扇保持正常
51. purifier.updateAQI(150.0); // 150，空气质量较差，提高风扇转速
52. purifier.updateAQI(220.0); // 220，空气极端污染，风扇高速运转并触发警报
53. }
54. }