```
#include <OneWire.h>
#include <DallasTemperature.h>

// Pin connections
#define ONE_WIRE_BUS 4   // DS18B20 data pin
#define HEATER_LED 5     // Heater LED
#define STATUS_LED 19    // Status LED
#define BUZZER_PIN 18    // Buzzer

// Temperature limits
#define TARGET_TEMP 45
#define OVERHEAT_TEMP 70

OneWire oneWire(ONE_WIRE_BUS);
DallasTemperature sensors(&oneWire);

void setup() {
  Serial.begin(115200);
  sensors.begin();

  pinMode(HEATER_LED, OUTPUT);
  pinMode(STATUS_LED, OUTPUT);
  pinMode(BUZZER_PIN, OUTPUT);

  Serial.println("=== Basic Heater Control (ESP32 + DS18B20) ===");
}

void loop() {
  sensors.requestTemperatures();
  float tempC = sensors.getTempCByIndex(0);

  Serial.print("Temp = ");
  Serial.print(tempC);
  Serial.print(" °C, ");

  if (tempC < TARGET_TEMP) {
    Serial.println("state=HEATING, heater=ON");
    digitalWrite(HEATER_LED, HIGH);
    digitalWrite(STATUS_LED, LOW);
    digitalWrite(BUZZER_PIN, LOW);
  }
  else if (tempC >= TARGET_TEMP && tempC < OVERHEAT_TEMP) {
    Serial.println("state=TARGET_REACHED, heater=OFF");
    digitalWrite(HEATER_LED, LOW);
    digitalWrite(STATUS_LED, HIGH);
    digitalWrite(BUZZER_PIN, LOW);
  }
  else if (tempC >= OVERHEAT_TEMP) {
    Serial.println("state=OVERHEAT, buzzer=ON");
    digitalWrite(HEATER_LED, LOW);
    digitalWrite(STATUS_LED, HIGH);
    digitalWrite(BUZZER_PIN, HIGH);
  }
```

```
  delay(1000);
}
```