



*Alexandria University
Faculty of Engineering
Computer and Systems Engineering Dept.
CSE233: Computer Organization*

Lab #6 Report

Debugger

Names:

1. Mohamed Abdalla Yassen Mohamed (23010765)
2. Ahmed Mohamed Saied Mohamed (23011684)

1. Problem Statement

This lab aims to help students practice hardware debugging using Virtual Micro by interfacing a latch button with the Arduino built-in LED. The LED should change its state only when the button state changes. A breakpoint must be placed at the line that increments a counter, and whenever the button toggles, the program should pause and print the LED state.

2. Code “GitHub Rebo”

GitHub:

<https://github.com/Mohamed-Abdalla-Yassen/Computer-Organization-Projects.git>

Arduino web editor:

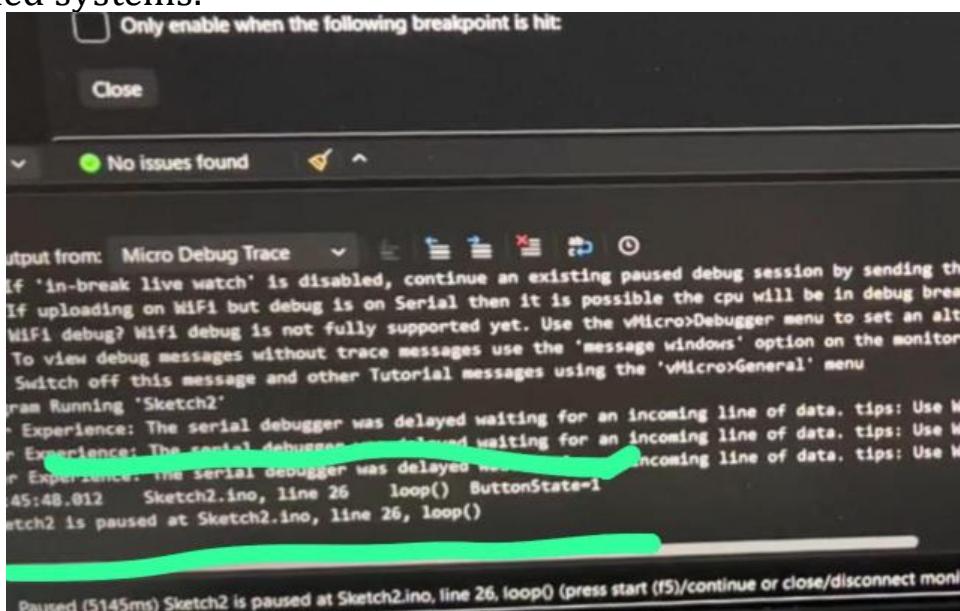
<https://app.arduino.cc/sketches/7b2f736a-124e-425d-b2a9-e6aa7f08c19b?view-mode=preview>

3. Video “YouTube”

<https://youtu.be/XjtX-Zz5YYM?si=3tLn19s8tcC1Fa15>

4. Description & Challenges

This lab introduces the use of Virtual Micro for debugging an Arduino sketch by monitoring button state transitions, setting breakpoints, and observing variables during execution. The task requires understanding latch behavior, handling the effect of the initial button state, managing long loop delays, and ensuring correct Serial output when the program halts. It also involves detecting state changes accurately, addressing potential input fluctuations, and using the debugger to follow program flow, providing practical exposure to software-based debugging in embedded systems.



The screenshot shows the Virtual Micro debugger's serial monitor window. At the top, there is a message: "Only enable when the following breakpoint is hit:" followed by a checkbox and a "Close" button. Below this is a status bar with a green circle icon and the text "No issues found". The main area is a terminal window titled "Output from: Micro Debug Trace". It displays several lines of text, including a warning about WiFi debug support and a stack trace indicating a breakpoint was hit at line 26 of Sketch2.ino. The bottom of the window shows a status bar with the text "Paused (5145ms) Sketch2 is paused at Sketch2.ino, line 26, loop() (press start (F5)/continue or close/disconnect mon". A large green rectangular box highlights the stack trace in the terminal window.

```
Only enable when the following breakpoint is hit:  
Close  
No issues found  
Output from: Micro Debug Trace  
If 'in-break live watch' is disabled, continue an existing paused debug session by sending th  
If uploading on WiFi but debug is on Serial then it is possible the CPU will be in debug brea  
WiFi debug? WiFi debug is not fully supported yet. Use the vMicro>Debugger menu to set an alt  
To view debug messages without trace messages use the 'message windows' option on the monitor  
Switch off this message and other Tutorial messages using the 'vMicro>General' menu  
ram Running 'Sketch2'  
- Experience: The serial debugger was delayed waiting for an incoming line of data. tips: Use W  
- Experience: The serial debugger was delayed waiting for an incoming line of data. tips: Use W  
- Experience: The serial debugger was delayed waiting for an incoming line of data. tips: Use W  
45:48.012 Sketch2.ino, line 26 loop() ButtonState=1  
Sketch2 is paused at Sketch2.ino, line 26, loop()  
Paused (5145ms) Sketch2 is paused at Sketch2.ino, line 26, loop() (press start (F5)/continue or close/disconnect mon
```