

## Steps to Debug Assembly Code in GDB and See Register Values

*Information provided by Isabella Steinebach (CMSC216 Summer 2025 TA)*

1. Run GDB for your file:
  - Ex: make palindrome\_s.gdb
2. Set a breakpoint wherever you want to start debugging
  - Ex: b is\_palindrome
3. Type “layout regs” in the gdb command line.
4. Continue typing “layout next” until you see two tabs with the register group as one window, and your source code (palindrome.S) in the next window.

The screenshot shows a GDB terminal window with a dark background. At the top, there's a title bar with a dropdown menu showing 'ssh' and some icons. The main content is divided into two panes. The top pane, titled 'Register group: general', displays the values of registers r0 through r8. The bottom pane, titled 'palindrome.S', shows the source code of the file. The code includes a .text section, a .global declaration for is\_palindrome, and the definition of is\_palindrome which ends with a ret instruction. A breakpoint is set at line 5, indicated by 'B+>'. The status bar at the bottom shows 'remote Thread <main> In: is\_palindrome', 'L5', and 'PC: 0xea'. The command '(gdb) layout next' is visible in the terminal input area.

```
Register group: general
r0      0x1      1
r1      0x0      0
r2      0x0      0
r3      0x0      0
r4      0x0      0
r5      0x0      0
r6      0x0      0
r7      0x0      0
r8      0x0      0

palindrome.S
1      .text
2
3      .global is_palindrome
4      is_palindrome:
B+> 5      ret^?
6
7
8
9

remote Thread <main> In: is_palindrome      L5      PC: 0xea
(gdb) layout next
(gdb) layout next
```

Now you can see the content of each register as you are stepping through your source code. This is very helpful to be able to debug your code.

Note: The white border around the palindrome.S window in the above screenshot means I am currently “focused” on that window. This allows me to scroll in that window through my code, but all other windows are frozen. To focus on the register window and scroll through it, run “focus regs” and then you can scroll through the register window. To return the focus back to the source code window, run “focus src”.