

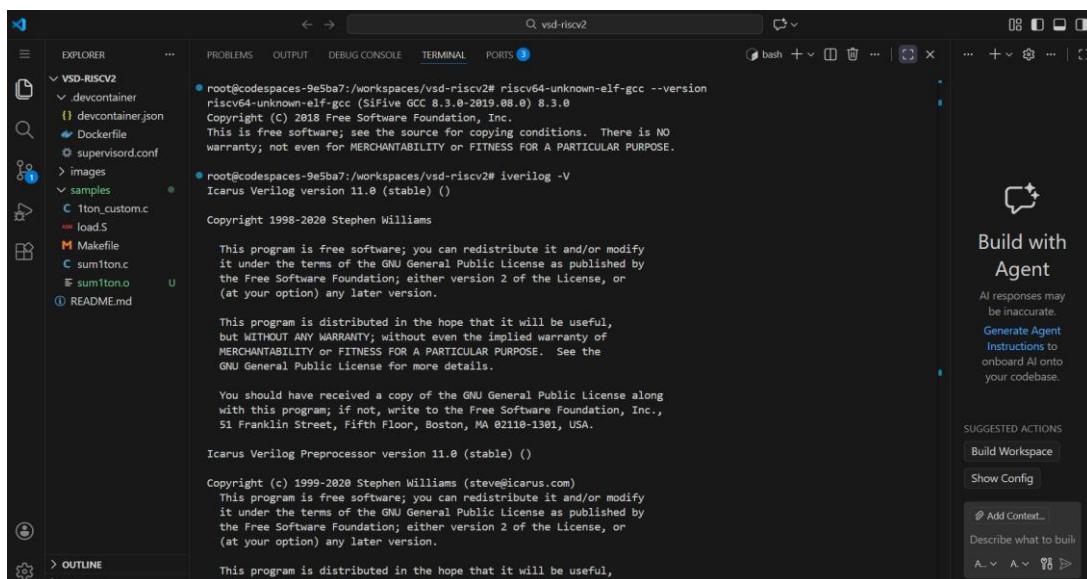
On Day 1, a cloud-based RISC-V development environment was set up using GitHub Codespaces. The RISC-V GCC toolchain, Spike simulator, and Icarus Verilog were verified, and a sample C program was successfully compiled and executed on both the native system and the RISC-V simulator. A GUI Linux desktop via noVNC was also used for editing and running programs, establishing the foundation for further RISC-V and hardware development

1. A new GitHub Codespace was created, the environment was built, and the RISC-V toolchain setup was verified.

```
→ riscv64-unknown-elf-gcc --version
```

```
→ spike --version
```

```
→ iverilog -V
```



The screenshot shows the GitHub Codespace interface with the terminal tab active. The output from the terminal shows the version of the RISC-V GCC compiler, the Spike simulator, and the Icarus Verilog tool. The terminal window has a dark background with white text. The right side of the interface includes a sidebar with build and configuration options.

```
root@codespaces-9e5ba7:/workspaces/vsd-riscv2# riscv64-unknown-elf-gcc --version
riscv64-unknown-elf-gcc (Sifive GCC 8.3.0-2019.08.0) 8.3.0
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root@codespaces-9e5ba7:/workspaces/vsd-riscv2# iverilog -V
Icarus Verilog version 11.0 (stable) ()

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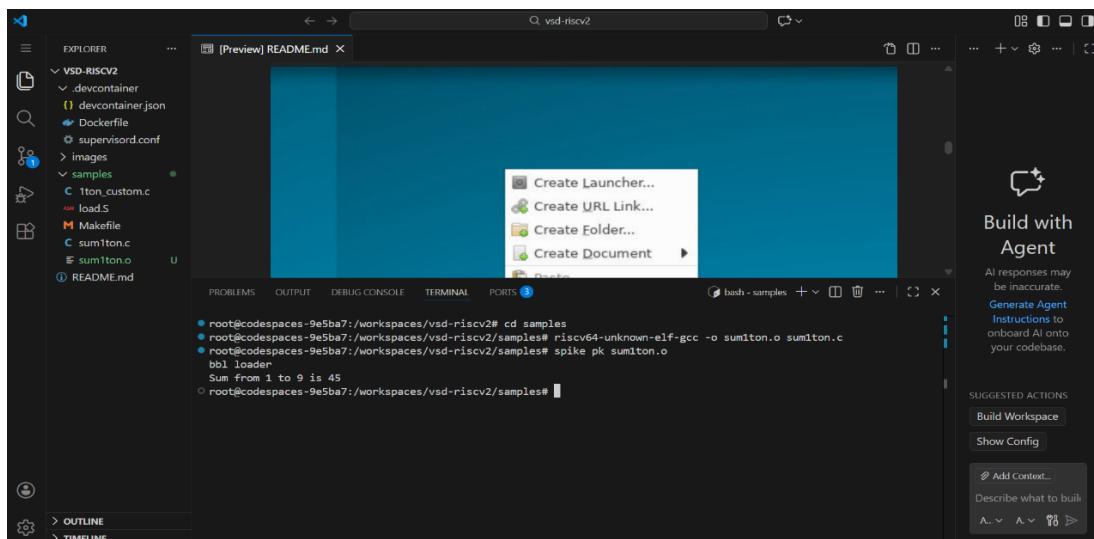
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Icarus Verilog Preprocessor version 11.0 (stable) ()

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```

2. A sample C program was compiled using the RISC-V GCC cross-compiler and executed on the Spike simulator inside the Codespace, confirming that the RISC-V development environment was functioning correctly.



The screenshot shows the GitHub Codespace interface with the terminal tab active. The output from the terminal shows the compilation of a sample C program (sum1ton.c) using the RISC-V GCC compiler and its execution on the Spike simulator. The terminal window has a dark background with white text. The right side of the interface includes a sidebar with build and configuration options.

```
root@codespaces-9e5ba7:/workspaces/vsd-riscv2# cd samples
root@codespaces-9e5ba7:/workspaces/vsd-riscv2/samples# riscv64-unknown-elf-gcc -o sum1ton.o sum1ton.c
root@codespaces-9e5ba7:/workspaces/vsd-riscv2/samples# spike pk sum1ton.o bbl loader
Sum from 1 to 9 is 45
root@codespaces-9e5ba7:/workspaces/vsd-riscv2/samples#
```

3. Opened the Linux desktop interface through Codespaces by navigating to the **PORTS** tab and accessing the forwarded **noVNC Desktop (6080)** address in the browser.

---

**Directory listing for /**

```
• app/
• core/
• include/
• utils/
• vendor/
• vnc.html
• vnc_auto.html @@
• vnc_lite.html@
```

4. Linux Desktop Window A new browser tab opens showing the Linux GUI environment after clicking on the **vnc\_lite.html**.

