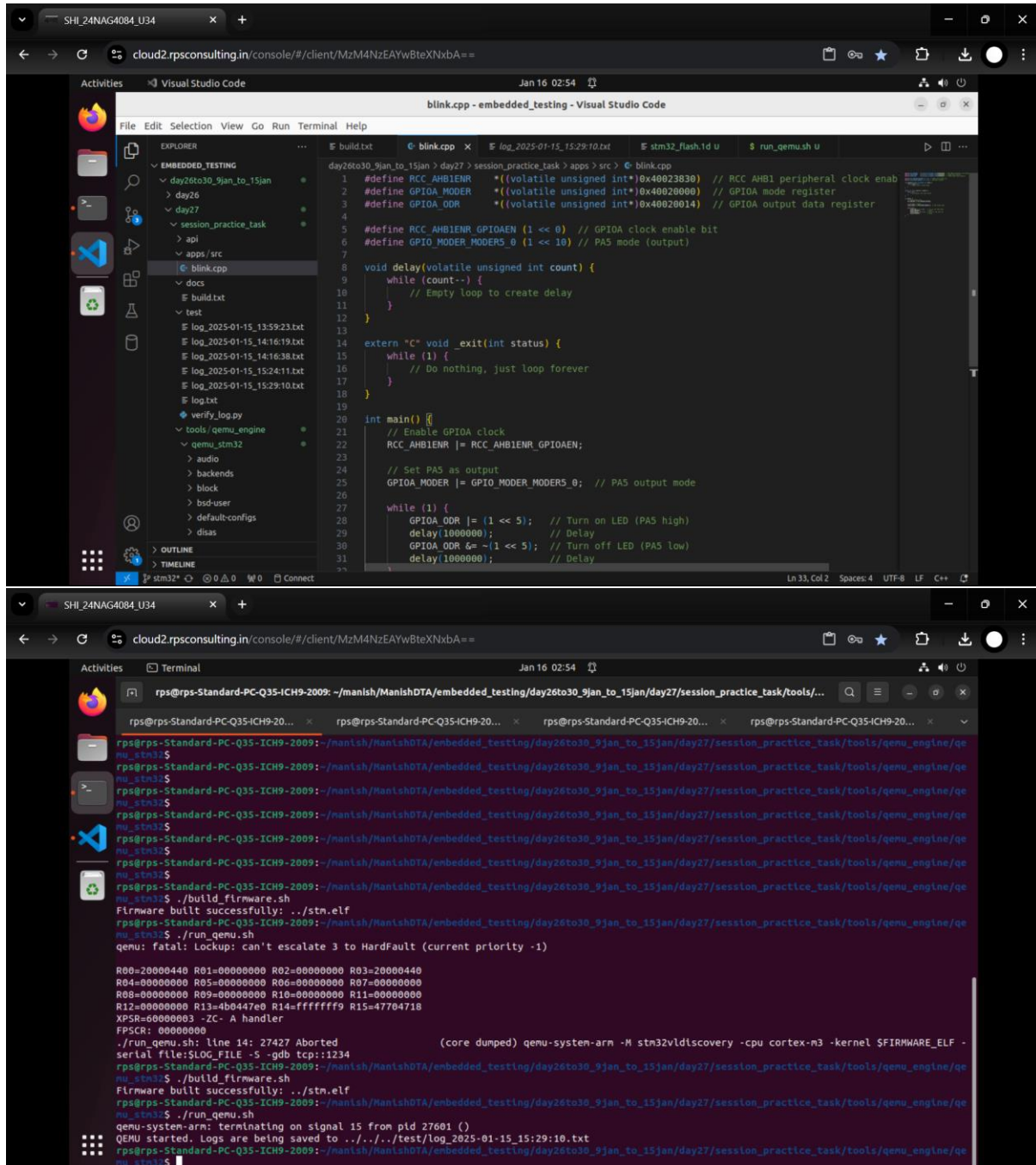


Given Presentation on basic debugging with GDB with qemu-arm-system and with localhost server and cover all test scenario to generate log file and generate the test case report .



The image shows a Visual Studio Code editor window with the file `blink.cpp` open. The file contains C code for a microcontroller, including definitions for RCC and GPIO registers, a delay function, and a main function that configures the GPIO pin and toggles it in a loop.

```
1 #define RCC_AHB1ENR *((volatile unsigned int*)0x40023830) // RCC AHB1 peripheral clock enable register
2 #define GPIOA_MODER *((volatile unsigned int*)0x40020000) // GPIOA mode register
3 #define GPIOA_ODR *((volatile unsigned int*)0x40020014) // GPIOA output data register
4
5 #define RCC_AHB1ENR_GPIOAEN (1 << 0) // GPIOA clock enable bit
6 #define GPIO_MODER_MODER5_0 (1 << 10) // PA5 mode (output)
7
8 void delay(volatile unsigned int count) {
9     while (count-- > 0) {
10         // Empty loop to create delay
11     }
12 }
13
14 extern "C" void _exit(int status) {
15     while (1) {
16         // Do nothing, just loop forever
17     }
18 }
19
20 int main() {
21     // Enable GPIOA clock
22     RCC_AHB1ENR |= RCC_AHB1ENR_GPIOAEN;
23
24     // Set PA5 as output
25     GPIOA_MODER |= GPIO_MODER_MODER5_0; // PA5 output mode
26
27     while (1) {
28         GPIOA_ODR |= (1 << 5); // Turn on LED (PA5 high)
29         delay(1000000); // Delay
30         GPIOA_ODR &= ~(1 << 5); // Turn off LED (PA5 low)
31         delay(1000000); // Delay
32     }
33 }
```

The terminal window shows the execution of the program using QEMU. It displays the successful building of the firmware and the execution of the QEMU system. The output includes memory dump information and a message indicating that the QEMU system is terminated on signal 15 from pid 27601.

```
rps@rps-Standard-PC-Q35-ICH9-2009: ~/manish/ManishDTA/embedded_testing/day26to30_9jan_to_15jan/day27/session_practice_task/tools/qemu_engine/qemu_stm32$ ./build_firmware.sh
Firmware built successfully: ../stm.elf
rps@rps-Standard-PC-Q35-ICH9-2009: ~/manish/ManishDTA/embedded_testing/day26to30_9jan_to_15jan/day27/session_practice_task/tools/qemu_engine/qemu_stm32$ ./run_qemu.sh
qemu: fatal: Lockup: can't escalate 3 to HardFault (current priority -1)
R00=20000440 R01=00000000 R02=00000000 R03=20000440
R04=00000000 R05=00000000 R06=00000000 R07=00000000
R08=00000000 R09=00000000 R10=00000000 R11=00000000
R12=00000000 R13=4b0447e0 R14=ffffff9f R15=47704718
FPSCR= 00000000
./run_qemu.sh: line 14: 27427 Aborted (core dumped) qemu-system-arm -M stm32vldiscovery -cpu cortex-m3 -kernel $FIRMWARE.ELF -
serial file:$LOG_FILE -S -gdb tcp::1234
rps@rps-Standard-PC-Q35-ICH9-2009: ~/manish/ManishDTA/embedded_testing/day26to30_9jan_to_15jan/day27/session_practice_task/tools/qemu_engine/qemu_stm32$ ./build_firmware.sh
Firmware built successfully: ../stm.elf
rps@rps-Standard-PC-Q35-ICH9-2009: ~/manish/ManishDTA/embedded_testing/day26to30_9jan_to_15jan/day27/session_practice_task/tools/qemu_engine/qemu_stm32$ ./run_qemu.sh
qemu-system-arm: terminating on signal 15 from pid 27601 ()
QEMU started. Logs are being saved to ../test/log_2025-01-15_15:29:10.txt
rps@rps-Standard-PC-Q35-ICH9-2009: ~/manish/ManishDTA/embedded_testing/day26to30_9jan_to_15jan/day27/session_practice_task/tools/qemu_engine/qemu_stm32$
```

```
SHI_24NAG4084_U34 x +
cloud2.rpsconsulting.in/console/#/client/MzM4NzEAYwBteXNxbA==
Jan 16 02:55

rps@rps-Standard-PC-Q35-ICH9-2009: ~/manish/ManishDTA/embedded_testing/day26to30_9jan_to_15jan/day27/session_practice_task/tools/...
(gdb) quit
rps@rps-Standard-PC-Q35-ICH9-2009: ~/manish/ManishDTA/embedded_testing/day26to30_9jan_to_15jan/day27/session_practice_task/tools/qemu_engine/qe
mu_stm32$ gdb-multiarch ./stm.elf
GNU gdb (Ubuntu 12.1-0ubuntu1~22.04.2) 12.1
Copyright (C) 2022 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.
Type "show copying" and "show warranty" for details.
This GDB was configured as "x86_64-linux-gnu".
Type "show configuration" for configuration details.
For bug reporting instructions, please see:
<https://www.gnu.org/software/gdb/bugs/>.
Find the GDB manual and other documentation resources online at:
<http://www.gnu.org/software/gdb/documentation/>.

For help, type "help".
Type "apropos word" to search for commands related to "word"...
Reading symbols from ./stm.elf...
(gdb) target remote localhost:1234
Remote debugging using localhost:1234
0x00000000 in ?? ()
(gdb) load
Loading section .text, size 0x438 lma 0x00000000
Loading section .init, size 0xc lma 0x00000438
Loading section .fini, size 0xc lma 0x00000444
Loading section .eh_frame, size 0x4 lma 0x00000450
Loading section .ARM.exidx, size 0x8 lma 0x00000454
Loading section .data, size 0x438 lma 0x0000045c
Loading section .init_array, size 0x4 lma 0x00000894
Loading section .fini_array, size 0x4 lma 0x00000898
Loading section .init_array.00000, size 0x4 lma 0x0000089c
Start address 0x00000000, load size 2208
Transfer rate: 718 KB/sec, 245 bytes/write.
(gdb) break main
Breakpoint 1 at 0x0000012e: file ../../apps/src/blink.cpp, line 22.
(gdb) quit
```

```
SHI_24NAG4084_U34 x +
cloud2.rpsconsulting.in/console/#/client/MzM4NzEAYwBteXNxbA==
Jan 16 02:55

rps@rps-Standard-PC-Q35-ICH9-2009: ~/manish/ManishDTA/embedded_testing/day26to30_9jan_to_15jan/day27/session_practice_task/tools/...
Remote debugging using localhost:1234
0x00000000 in ?? ()
(gdb) load
Loading section .text, size 0x438 lma 0x00000000
Loading section .init, size 0xc lma 0x00000438
Loading section .fini, size 0xc lma 0x00000444
Loading section .eh_frame, size 0x4 lma 0x00000450
Loading section .ARM.exidx, size 0x8 lma 0x00000454
Loading section .data, size 0x438 lma 0x0000045c
Loading section .init_array, size 0x4 lma 0x00000894
Loading section .fini_array, size 0x4 lma 0x00000898
Loading section .init_array.00000, size 0x4 lma 0x0000089c
Start address 0x00000000, load size 2208
Transfer rate: 718 KB/sec, 245 bytes/write.
(gdb) break main
Breakpoint 1 at 0x0000012e: file ../../apps/src/blink.cpp, line 22.
(gdb) step
Single stepping until exit from function deregister_tm_clones,
which has no line number information.
0x00000000 in ?? ()
(gdb) next
Cannot find bounds of current function
(gdb) print RCC_AHB1ENR
No symbol "RCC_AHB1ENR" in current context.
(gdb) continue
Continuing.
stepRemote connection closed
(gdb) step
The program is not being run.
(gdb) quit
The program is not being run.
(gdb) quit
rps@rps-Standard-PC-Q35-ICH9-2009: ~/manish/ManishDTA/embedded_testing/day26to30_9jan_to_15jan/day27/session_practice_task/tools/qemu_engine/qe
mu_stm32$ gdb-multiarch ./stm.elf
GNU gdb (Ubuntu 12.1-0ubuntu1~22.04.2) 12.1
```

```
cloud2.rpsconsulting.in/console/#/client/MzM4NzEAYwBteXNxbA==

rps@rps-Standard-PC-Q35-ICH9-2009: ~/manish/ManishDTA/embedded_testing/day26to30_9jan_to_15jan/day27/session_practice_task/test
rps@rps-Standard-PC-Q35-ICH9-2009:~/manish/ManishDTA/embedded_testing/day26to30_9jan_to_15jan/day27/session_practice_task/tools/qemu_engine/qemu_stn32$ cd ../../..
rps@rps-Standard-PC-Q35-ICH9-2009:~/manish/ManishDTA/embedded_testing/day26to30_9jan_to_15jan/day27/session_practice_task$ cd test/
rps@rps-Standard-PC-Q35-ICH9-2009:~/manish/ManishDTA/embedded_testing/day26to30_9jan_to_15jan/day27/session_practice_task/test$ python3 verify_log.py
Test Failed: Output mismatch!
rps@rps-Standard-PC-Q35-ICH9-2009:~/manish/ManishDTA/embedded_testing/day26to30_9jan_to_15jan/day27/session_practice_task/test$ python3 verify_log.py
Test Failed: Output mismatch!
rps@rps-Standard-PC-Q35-ICH9-2009:~/manish/ManishDTA/embedded_testing/day26to30_9jan_to_15jan/day27/session_practice_task/test$
```

```
cloud2.rpsconsulting.in/console/#/client/MzM4NzEAYwBteXNxbA==

rps@rps-Standard-PC-Q35-ICH9-2009: ~/manish/ManishDTA/embedded_testing/day26to30_9jan_to_15jan/day27/session_practice_task/tools/...
rps@rps-Standard-PC-Q35-ICH9-2009:~/manish/ManishDTA/embedded_testing/day26to30_9jan_to_15jan/day27/session_practice_task/tools/qemu_engine/qemu_stn32$ kill qemu-system-arm
rps@rps-Standard-PC-Q35-ICH9-2009:~/manish/ManishDTA/embedded_testing/day26to30_9jan_to_15jan/day27/session_practice_task/tools/qemu_engine/qemu_stn32$ kill qemu-system-arm
rps@rps-Standard-PC-Q35-ICH9-2009:~/manish/ManishDTA/embedded_testing/day26to30_9jan_to_15jan/day27/session_practice_task/tools/qemu_engine/qemu_stn32$ kill qemu-system-arm
rps@rps-Standard-PC-Q35-ICH9-2009:~/manish/ManishDTA/embedded_testing/day26to30_9jan_to_15jan/day27/session_practice_task/tools/qemu_engine/qemu_stn32$
```