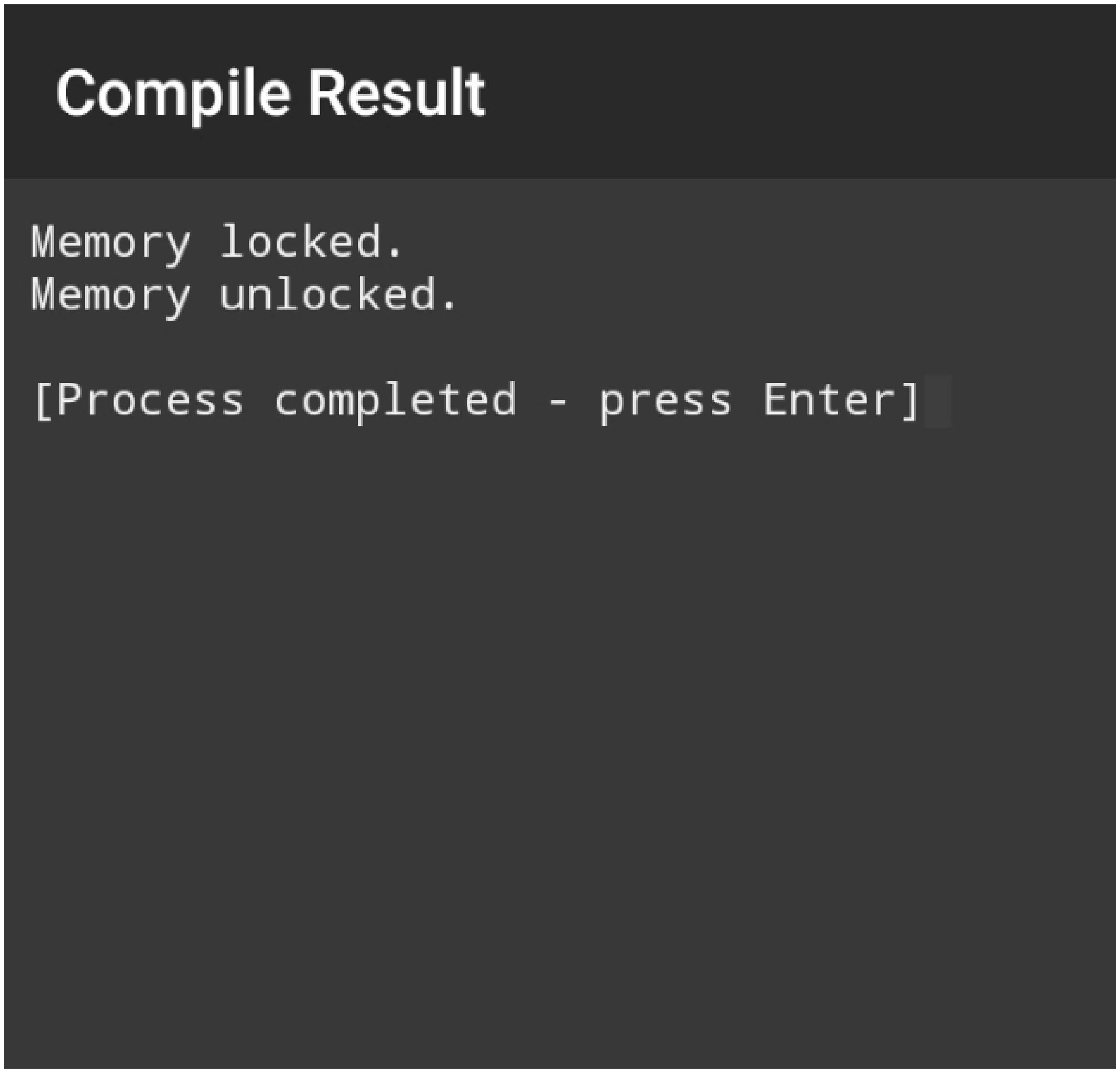
# Implement a system call munlock() on Ubuntu-24.04.1

- In Ubuntu 24.04.1, which is based on the Linux kernel 6.8 series, the munlock() system call is implemented within the kernel's memory management subsystem.
- If the munlock_custom syscall is not implemented in your kernel, you cannot use syscall() with a custom syscall number. However, you can still use the existing munlock() syscall provided by Linux in user-space via the standard C library. Here is the correct user-space program to use on Ubuntu 24.04.1 desktop or laptop, written directly on the Desktop monitor, using the existing munlock() system call.
- The munlock() system call is used in Linux to unlock a range of memory that was previously locked using mlock(). This allows the operating system to swap the memory to disk if necessary.
- Prototype: int munlock(const void *addr, size_t len); - addr: Starting address of the memory region. - len: Length of the memory region to unlock. Useful in applications that no longer need to keep sensitive or real-time memory locked. Code Example: munlock()
- Here is a minimal example demonstrating how to use munlock():

```
#include <stdio.h>

#include <stdlib.h>

#include <sys/mman.h>

#include <string.h>

#include <unistd.h>
```

```
int main() {

size_t len = 4096; // One memory page

void *buf = malloc(len);

if (buf == NULL) {

perror("malloc");

return 1;

}

memset(buf, 0, len); // Touch memory

if (mlock(buf, len) != 0) {

perror("mlock");

free(buf);

return 1;

}

printf("Memory locked.\n");

if (munlock(buf, len) != 0) {

perror("munlock");

free(buf);

return 1;

}

printf("Memory unlocked.\n");

free(buf);

return 0;

}
```

- This is the expected output when compiling and running the program:



```
Memory locked.
Memory unlocked.

[Process completed - press Enter]
```

- To compile the program, use the gcc compiler:

gcc munlock_example.c -o munlock_example

To run it: ./munlock_example

Ensure that you have sufficient memory lock privileges:

```
ulimit -l
```

To allow larger locks, configure /etc/security/limits.conf with:

```
your_username soft memlock unlimited

your_username hard memlock unlimited
```

munlock() is used when: - Sensitive data has been processed and should now be eligible for swapping. - Applications need to free up locked memory after real-time use. - Security policies require minimizing locked memory regions. It's good practice to unlock memory when it's no longer critical to keep it resident in RAM.

**THANK YOU !!!**