

1. What terminal commands do you need to connect to a remote server and copy code to it?

- To connect: `ssh user@hostname` -- Secure Shell to log into the remote server
- To copy: `scp local_file.c user@hostname:/path/to/remote/dir` -- Secure copy to push code to remote servers

2. What commands on a remote server do you use to edit, compile, and run a C program?

- Edit: Use terminal based text editors like vim or nano.
- Compile: Use C compilers like GCC with instructions like: `gcc -Wall main.c -o my_program`
- Run: Execute the compiled binary from the current directory: `./my_program`

3. How can you return an array from a function in C?

In C, functions cannot directly return an array type, and returning a pointer to a local stack array (`int arr[10]; return arr;`) causes undefined behavior because the local memory is deallocated when the function returns. So to avoid undefined behavior, we have a few ways to allow a function to return a head pointer:

- **Dynamic Memory Allocation (Return a Heap Pointer):** Allocate memory on the heap with `malloc()`, return a pointer to the first element (`int *`), and let the caller `free()` it.
- **Pass an Output Array as a Parameter:** Let the caller allocate memory (on the stack or heap) and pass the pointer and buffer size into the function to be populated.
- **Wrap the Array in a struct (Return by Value):** Since C allows structs to be copied and returned by value, you can wrap fixed-size arrays inside a structure.