C Programming Guide

Advanced Level

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1 Introduction to C Language

- History and origin
- Features and uses of C
- Where C is used (OS, embedded, compilers, etc.)

2. Advanced Pointers

- Pointer to Pointer
- Function Pointers
- Pointer Casting

3. Dynamic Memory Management

- Advanced Memory Allocation Techniques
- Detecting and Preventing Memory Leaks

4. Data Structures in C

- Linked Lists
- Trees
- Hash Tables

5. Advanced File Handling

- Working with Binary Files
- File Locking Mechanisms

6. Concurrency in C

- Using Threads
- Synchronization Techniques

7. Network Programming

- Socket Programming
- Client-Server Model

8. Debugging and Optimization

- Using Debugging Tools
- Code Optimization Techniques

9. Advanced Projects

- Simple Compiler Design
- Basic OS Development

10. Resources

- Books: “Advanced Programming in the UNIX Environment”, “C Interfaces and Implementations”
- Online: Stack Overflow, Cprogramming.com, Linux Journal
- GitHub links (advanced projects and libraries)

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