UNIT - V: Unions and Files

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Union Introduction

A union is a user-defined data type similar to a structure, but all members share the same memory location. Only one member can store a value at a time.

Programs Using Structures and Unions

Structures and unions allow efficient memory management and data representation in C programming.
Example:
[struct student { int id; char name[50]; };]
[union data { int i; float f; char str[20]; };]

Introduction to File Handling

File handling in C enables reading and writing operations on files, ensuring data persistence beyond program execution.

File Operations

Basic file operations in C include:
• Creating a file
• Opening a file
• Reading from a file
• Writing to a file
• Closing a file

File Input and Output Functions

Common file I/O functions:
• fopen(): Opens a file
• fclose(): Closes a file
• fprintf(): Writes formatted data to a file
• fscanf(): Reads formatted data from a file
• fgetc() / fputc(): Reads/writes a single character

Random Access to Files

Random file access enables reading/writing at arbitrary positions using:
• fseek(): Moves file pointer to a specific location.
• ftell(): Returns current file position.
• rewind(): Moves file pointer to the beginning.

File System Functions

Functions that assist in file manipulation include:
• remove(): Deletes a file.
• rename(): Renames a file.

Command Line Arguments

Arguments passed to main() at runtime:
[int main(int argc, char *argv[])]

Storage Classes

Defines variable scope and lifetime:
• auto
• extern
• static
• register

Pre-Processor Directives

Preprocessor directives start with # and modify source code before compilation.
Examples:
• #define
• #include
• #ifdef / #ifndef

Dynamic Memory Functions

Dynamic memory allocation enables runtime memory management using:
• malloc(): Allocates memory block.
• calloc(): Allocates multiple blocks.
• realloc(): Resizes allocated memory.
• free(): Deallocates memory.