C Language Notes (A to Z)

1. Introduction to C

C is a general-purpose, procedural programming language. Developed by Dennis Ritchie in 1972. It is the base of many modern languages.

2. Variables and Data Types

Variables store data. Data types: int, float, char, double. Example: int x = 5;

3. Input/Output

Use scanf() to take input, printf() to print output.

Example: scanf("%d", &x); printf("%d", x);

4. Operators

Arithmetic (+ - * / %), Relational (== != > <), Logical (&& || !), Assignment (=, +=, -=), Bitwise (& | ^ ~ << >>).

5. Conditional Statements

Use if, else if, else, and switch.

Example:

if(x > 0) {...} else {...}

6. Loops

Three types: for, while, do-while.

Example:

for(int i=0; i<5; i++) {...}

7. Functions

Reusable blocks of code. Syntax:

returnType functionName(parameters) {...}

8. Arrays

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Collection of similar data types. Example:

int a[5] = {1, 2, 3, 4, 5};

9. Strings

Array of characters ending with '\0'. Use string.h functions like strlen(), strcpy(), strcat().

10. Pointers

Stores address of another variable. Example:

int* p; p = &x;

11. Structures & Unions

Structures: group different data types.

struct Student {int id; char name[20];};

12. File Handling

Use FILE*, fopen(), fprintf(), fscanf(), fclose().

13. Dynamic Memory

Use malloc(), calloc(), free().

Example: int* p = (int*) malloc(5 * sizeof(int));

14. Preprocessor Directives

#include <stdio.h>, #define SIZE 10

15. Sample Program

#include<stdio.h>

int main() {

  printf("Hello, World!");

  return 0;

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}