

C Language and Data Structures Cheat Sheet

1. Basic Structure

Basic Structure Example

```
#include <stdio.h>

int main() {

    printf("Hello, World!");

    return 0;

}
```

2. Data Types

Common Data Types

Common Data Types:

1. int - Integer values (e.g., 1, 100)
2. float - Floating-point numbers (e.g., 3.14)
3. char - Single characters (e.g., 'a', 'Z')
4. double - Double-precision floating numbers
5. boolean- Logical values (true/false)

Example:

```
int age = 20; // Data Type: int, Variable: age, Value: 20
```

3. Variables and Operators

Variables and Operators

C Language and Data Structures Cheat Sheet

Variables are containers for storing data values.

Syntax: `data_type variable_name = value;`

Example:

```
int num = 5;
```

Operators:

- Arithmetic: `+`, `-`, `*`, `/`, `%`
- Relational: `==`, `!=`, `>`, `<`, `>=`, `<=`
- Logical: `&&`, `||`, `!`

4. Control Statements

Control Statements

Decision-making statements in C:

1. `if (condition) {...}`
2. `if-else`
3. `switch-case`
4. `while loop`
5. `for loop`

Example:

```
for (int i = 0; i < 5; i++) {  
    printf("%d ", i);  
}
```

C Language and Data Structures Cheat Sheet

5. Arrays

Arrays

Arrays store multiple values of the same data type.

Syntax: `data_type array_name[size];`

Example:

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

```
printf("%d", numbers[0]); // Outputs: 1
```

6. Pointers

Pointers

Pointers store the memory address of another variable.

Syntax: `data_type *pointer_name;`

Example:

```
int num = 10;
```

```
int *ptr = &num;
```

```
printf("%d", *ptr); // Outputs: 10
```

7. Structures

Structures

Structures group different data types under a single name.

C Language and Data Structures Cheat Sheet

Syntax:

```
struct Person {  
  
    char name[50];  
  
    int age;  
  
};
```

Example:

```
struct Person p1;  
  
p1.age = 30;
```

8. Data Structures - Stack and Queue

Stack and Queue

Stack:

- Follows Last In First Out (LIFO).
- Common Operations: push, pop, peek.

Queue:

- Follows First In First Out (FIFO).
- Common Operations: enqueue, dequeue.

Example:

Stack:

push(1), push(2), pop() -> 2 is removed.

C Language and Data Structures Cheat Sheet

Queue:

enqueue(1), enqueue(2), dequeue() -> 1 is removed.

9. File Handling

File Handling

File Handling allows C programs to read/write data to files.

Syntax:

```
FILE *fptr;
```

```
fptr = fopen("file.txt", "w");
```

Example:

```
fprintf(fptr, "Hello File");
```

```
fclose(fptr);
```