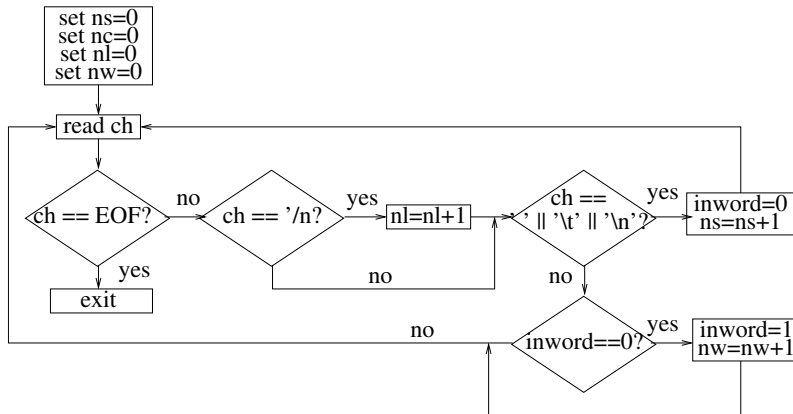


# Programming with Character Types

## Counting Words



# Programming with Character Types

## Counting Words

```
#include <stdio.h>
int main() {
    char ch;
    int nw = 0, nc = 0, ns = 0, nl = 0, inword;

    // Main loop for counting different characters

    printf("number_of_words=%d\n", nw);
    printf("number_of_spaces=%d\n", ns);
    printf("number_of_other_characters=%d\n", nc);
    printf("number_of_lines=%d\n", nl);
}
```

# Programming with Character Types

## Counting Words

```
while ((ch = getchar()) != EOF) {  
    nc++;  
    if (ch == '\n') {  
        nl++;  
    }  
    if (ch == '_' || ch == '\t' || ch == '\n') {  
        ns++;  
        inword = 0;  
    } else  
        if (!inword) {  
            inword = 1;  
            nw++;  
        }  
}
```

# Functions in C

## Program in C

- Program is written by combining user-defined function with library functions.
- C library functions are provided for following different tasks
  - Common mathematical functions.
  - String manipulations.
  - Character manipulations.
  - I/O

# Functions in C

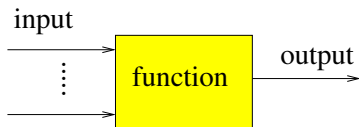
## Why Functions?

- A C program is a collection of functions.
- **main()** is the only mandatory function.
- **Functions** in C are more general than mathematical functions.
- Functions in C used for several reasons:
  - Reusability of code
  - Easy understanding and maintainability
  - Simplifies debugging.
- Collection of std lib functions makes C programming easy.
- Often related functions collected in libraries like BLAS, LAPACK, etc.

# Functions in C

## Definition

- A function is essentially a block of code.
- A function is invoked to perform some specific task.
- The view of a C function quite similar to that of math function.



# Functions in C

## Using Functions

- To execute programs function should be executed
- A function can be executed by invoking it.
  - Providing **function name** and needed **parameters**.
  - Function then executes its block of code
  - There must be a mechanism to return the result.
- So three important aspect of using a C function are: **function prototype** (name), **parameter passing**, and **return**