C Language

Chapter # 11

Decision Constructs

Lecture: 25

Today's Lecture

- Control Structure
  - Sequence
  - Selection
  - Repetition
  - Function Call
- if Statement

What is Control Structure

- A Statement that is used to control the flow of execution in a program is called control structure.

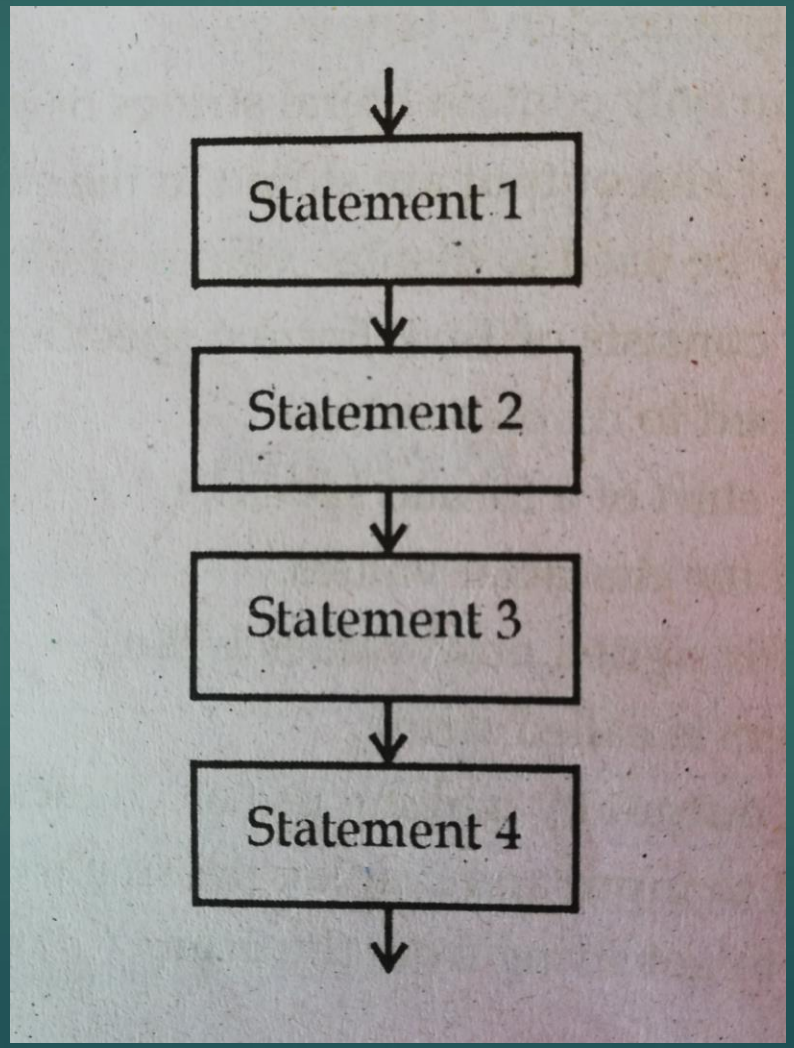
Types of Control Structures

1. Sequence
2. Selection
3. Repetition
4. Function call

1. *Sequence*:

- In sequential structure, the statements are executed in the same order in which they are specified in the program.
- The control flows from one statement to other in a logical sequence.
- All statements are executed exactly once.
- No statement is skipped and no statement is executed more than once.

Flowchart (Sequence structure)



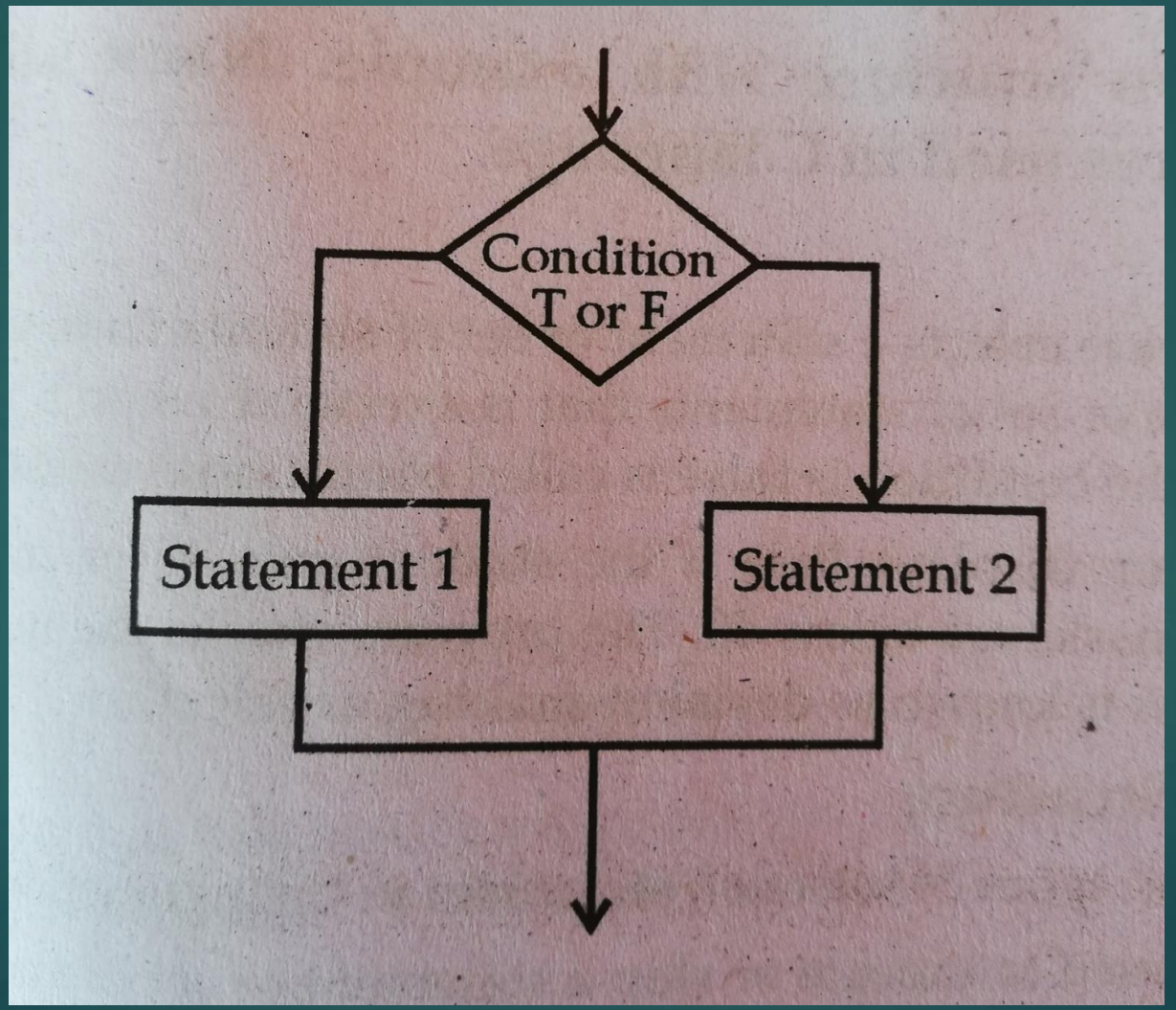
2. *Selection:*

- A selection structure selects a statement or set of statements to execute on the basis of a condition.
- Statement or set of statements is executed when a particular condition is true and ignored when the condition is false.

  There are different types of selection structures.

  - if
  - if-else
  - if else-if
  - switch

Flowchart (Selection structure)



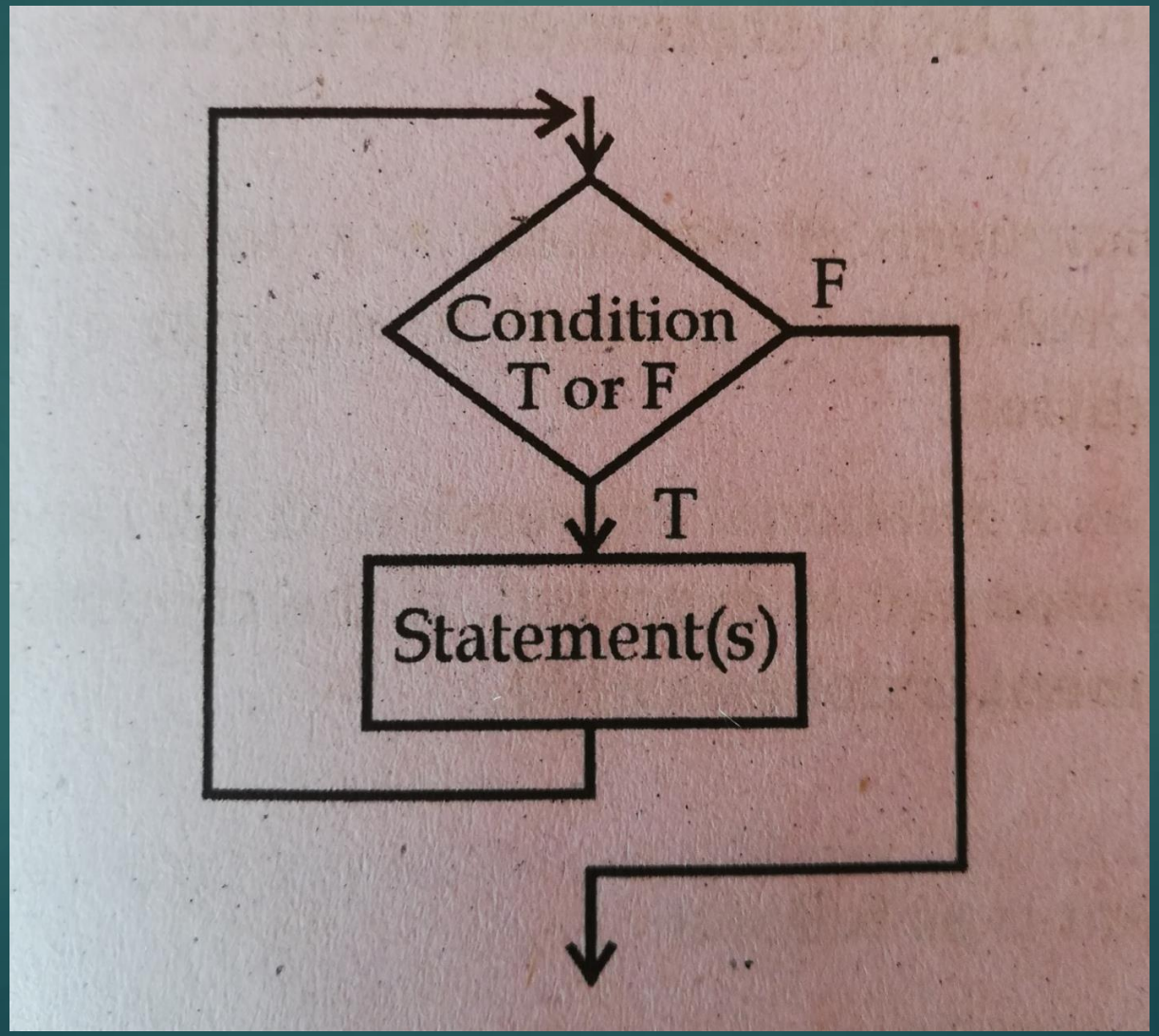
3. *Repetition:*

- A repetition structure execute a statement or set of statements repeatedly. It is also known as iteration structure or loop.

  There are different types of repetition structures.

  - while loop
  - do-while
  - for loop

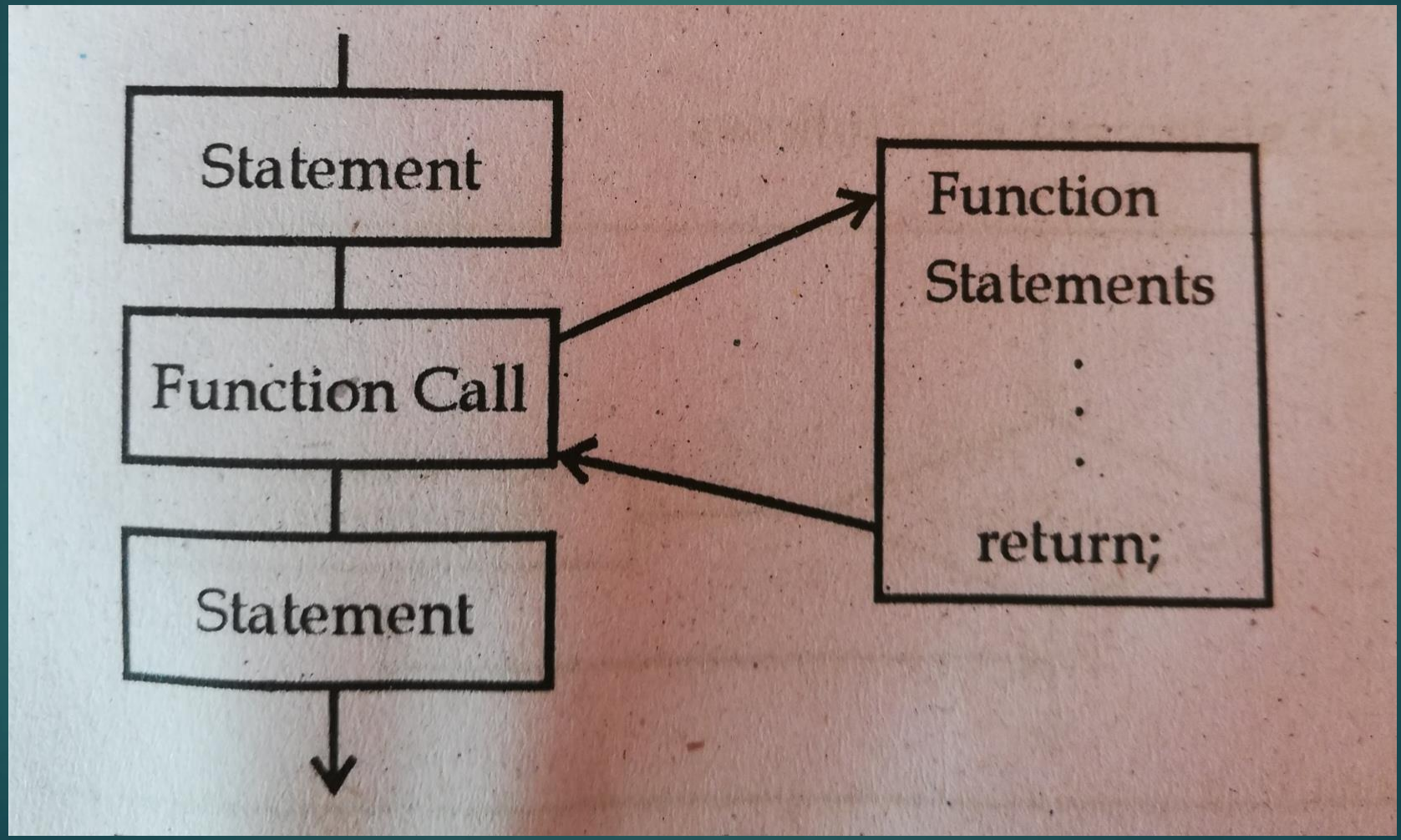
Flowchart (Repetition structure)



4. *Function call:*

- Function call is a type of statement that moves the control to another block of code.
- The control returns back after executing all statements in the block.
- The remaining statements are executed immediately after the function call, when the control is returned.

Flowchart (Function call)



Selection Structure:

- A selection structure selects a statement or set of statements to execute on the basis of a condition.
- Statement or set of statements is executed when a particular condition is true and ignored when the condition is false.

  Suppose a program displays **Pass** if a student gets 40 or more than 40 marks. it displays **Fail** when the marks are below 40.

  There are different types of selection structures.

  - if
  - if-else
  - if else-if
  - switch

“if” statement

- if is a keyword in C language.
- if statement is a decision making statement.
- It is the simplest form of selection structure.
- It is used to execute or skip a statement or set of statements by checking a condition.
- The condition is given as a relational expression. If the condition is true, the statements or set of statements after if statement is executed. If the condition is false, the statements or set of statements after if statement is not executed.

“if” statement

Syntax:

If(condition)

Statement;

Syntax for compound condition:

If(condition)

{

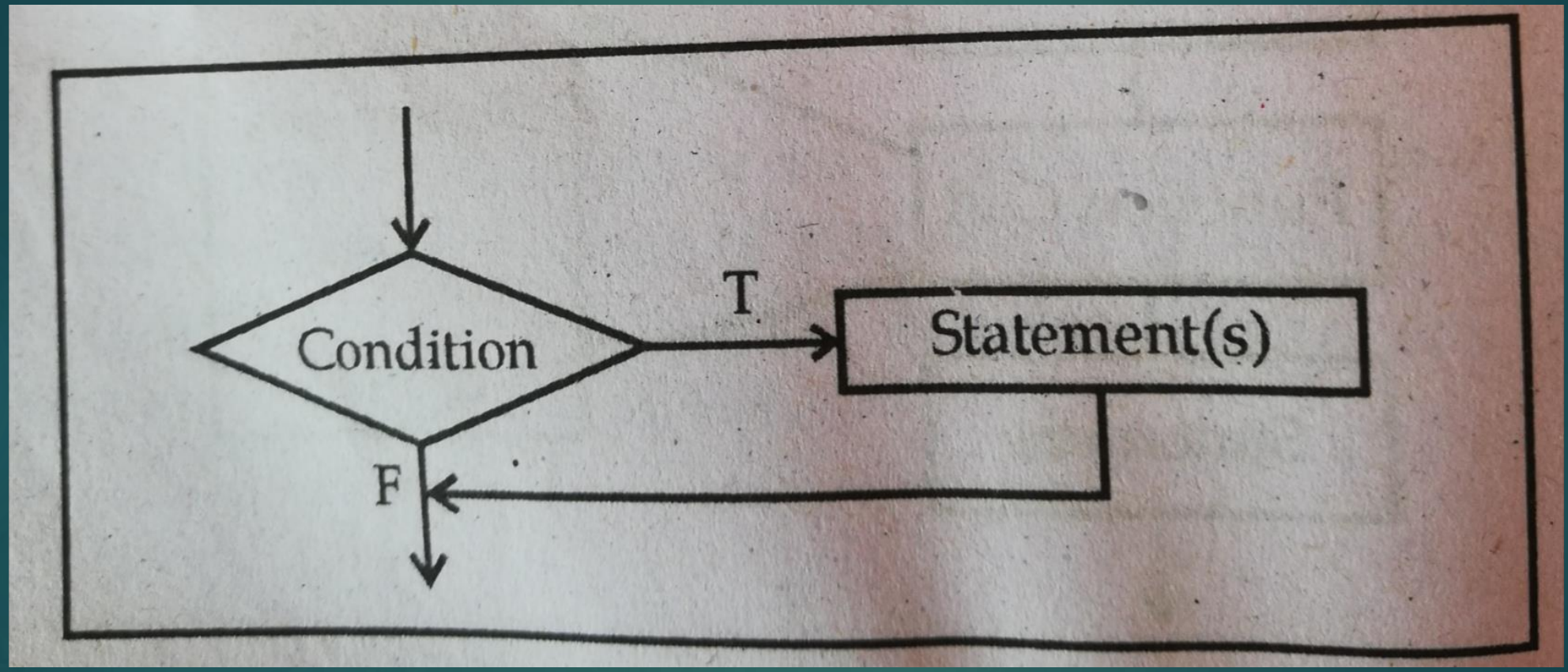
Statement 1;

Statement 2;

Statement 3;

}

Flowchart *("if" statement)*



Example 11.1

Write a program that inputs marks and display "You have passed". If the marks are 40 or more.

```
#include <stdio.h>
#include<conio.h>
main()
{
    int marks;
    printf("Enter your marks");
    scanf("%d", marks);
    if(marks >=40)
    printf("You have passed");
}
```

Limitation of simple "if" statement

- if statement is the simplest selection structure but it is very limited in its use. The statement or set of statement is executed if the condition is true. But if the condition is false then nothing happens.

  A user may want to:

  - Execute one statement or set of statements if the condition is true.
  - Execute other statement or set of statements if the condition is false.

  In this situation, simple if cannot be used effectively.

  Example:

  A program should display Pass, if the student get 40 or more marks.

  It should display Fail, if the student gets less then 40 marks,

  Simple if statement cannot be used to handle this situation.

The End

Read this topic from your books and ask question if any confusion.

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