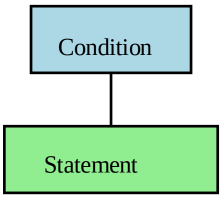
SESSION 3: CONTROL STATEMENTS

Control statements are used in programming to control the flow of execution. They allow decision-making, enabling different blocks of code to run depending on conditions. In C, the most common control statements are if, if-else, nested if-else, and switch-case. These statements make programs dynamic and flexible.

The if Statement

The if statement is the simplest decision-making statement. It checks a condition and executes a block of code only if the condition is true.



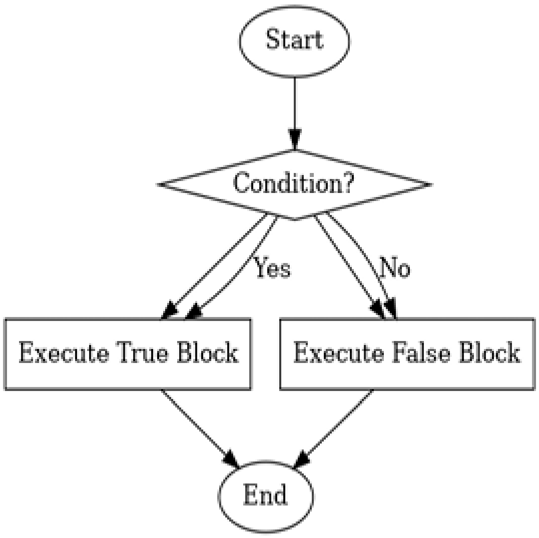
Example :

```
#include<stdio.h>
 int main() {
       int num = 10;
       if(num>0){
              printf("Number is positive");
       }
       return 0;
}
```

The if-else Statement

The if-else statement allows branching into two paths. If the condition is true, the if block executes; otherwise, the else block executes.

Flowchart for if-else



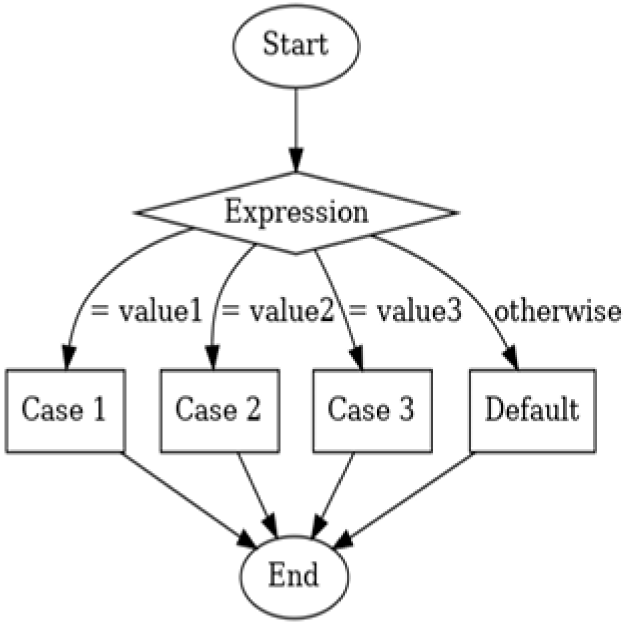
Example:

```
#include<stdio.h>
int main() {
    int num = -5;
    if(num>=0){
        printf("Non-negative");
    } else {
        printf("Negative");
    }
    return 0;
    }
```

The switch-case Statement

The switch statement allows multi-way branching. Based on the value of an expression, the program jumps to the matching case label. Each case should end with a break statement to prevent fall-through.

Flowchart for switch-case



Example:

```
#include<stdio.h>
int main() {
        int choice = 2;
        switch(choice){
                case 1:
                        printf("Option1");
                        break;
                case 2:
                        printf("Option2");
                        break;
                default:
                        printf("Invalid choice");
        }
        return 0;
}
```

Problems using If-else:

Power of Two

```
#include <stdio.h>
#include<stdbool.h>

bool isPowerOfTwo(int n) {
    if(n<=0)return false;
    return !(n&(n-1));
}
```