



**Subject: C Programming**

**Sem: I**

◆ **2.1 Branching**

**If Statement**

**Syntax:**

```
if (condition) {  
    // code  
}
```

**Example:**

```
int x = 10;  
if (x > 5) {  
    printf("x is greater than 5\n");  
}
```

**If-Else Statement**

**Syntax:**

```
if (condition) {  
    // true block  
} else {  
    // false block  
}
```

**Example:**

```
int x = 4;  
if (x % 2 == 0) {  
    printf("Even Number\n");  
} else {  
    printf("Odd Number\n");  
}
```

**Else If Ladder (Multiway Decision)**

**Syntax:**

```
if (condition1) {}  
else if (condition2) {}  
else {}
```

**Example:**

```
int marks = 75;  
if (marks >= 90) {  
    printf("Grade A\n");  
} else if (marks >= 60) {  
    printf("Grade B\n");  
} else {  
    printf("Grade C\n");  
}
```

## ◆ 2.2 Looping

### ✓ While Loop

Syntax:

```
while (condition) {  
    // code  
}
```

Example:

```
int i = 1;  
while (i <= 5) {  
    printf("%d\n", i);  
    i++;  
}
```

### ✓ Do-While Loop

Syntax:

```
do {  
    // code  
} while (condition);
```

Example:

```
int i = 1;  
do {  
    printf("%d\n", i);  
    i++;  
} while (i <= 5);
```

### ✓ For Loop

Syntax:

```
for (init; condition; update) {  
    // code  
}
```

Example:

```
for (int i = 1; i <= 5; i++) {  
    printf("%d\n", i);  
}
```

## ◆ 2.3 Nested Control Structures

### ✓ Switch Statement

Syntax:

```
switch(expression) {  
    case value1: // code; break;  
    case value2: // code; break;  
    default: // code;  
}
```

Example:

```
int choice = 2;  
switch (choice) {  
    case 1: printf("Option 1\n"); break;  
    case 2: printf("Option 2\n"); break;
```

```
        default: printf("Invalid Choice\n");
    }
```

## ✓ Continue Statement

Syntax:

```
continue;
```

Example:

```
for (int i = 1; i <= 5; i++) {
    if (i == 3) continue;
    printf("%d\n", i);
}
```

➡ Skips 3.

## ✓ Break Statement

Syntax:

```
break;
```

Example:

```
for (int i = 1; i <= 5; i++) {
    if (i == 3) break;
    printf("%d\n", i);
}
```

➡ Stops loop at 3

## ✓ Goto Statement

Syntax:

```
goto label;
```

...

```
label: // code
```

Example:

```
int x = 1;
if (x == 1) goto jump;
printf("This won't print\n");

jump:
printf("Goto executed!\n");
```

## ◆ Quote for Students:

"First learn the rules, then learn how to break them wisely — that's true mastery in coding."

## ✓ Practice Questions:

- Check if a number is positive, negative, or zero.

👉 Concept: if-else statement

```
if(num > 0)
    printf("Positive\n");
else if(num < 0)
    printf("Negative\n");
else
    printf("Zero\n");
```

- Print all numbers from 1 to 10 using a while loop.

👉 Concept: while loop

```
int i = 1;
```

```

while(i <= 10) {
    printf("%d ", i);
    i++;
}

```

- Print multiplication table of a number using a for loop.

👉 *Concept: for loop*

```

👉 for(int i=1; i<=10; i++) {
    printf("%d x %d = %d\n", num, i, num*i);
}

```

- Menu-driven program using switch.

👉 *Concept: switch statement*

```

👉 switch(choice) {
    case 1: printf("You chose Addition\n"); break;
    case 2: printf("You chose Subtraction\n"); break;
    case 3: printf("You chose Multiplication\n"); break;
    default: printf("Invalid Choice\n");
}

```

- Print only odd numbers from 1 to 10 using continue.

👉 *Concept: continue*

```

👉 for(int i=1; i<=10; i++) {
    if(i % 2 == 0)
        continue; // Skip even numbers
    printf("%d ", i);
}

```

- Stop printing numbers when 5 is encountered using break.

👉 *Concept: break*

```

👉 for(int i=1; i<=10; i++) {
    if(i == 5)
        break;
    printf("%d ", i);
}

```

- Jump to a label using goto.

👉 *Concept: goto*

```

👉 int num = 1;

```

```

start:
if(num <= 5) {
    printf("%d ", num);
    num++;
    goto start; // Jump back to label
}

```

**"Don't watch the clock; do what it does. Keep going." – Sam Levenson** ☕💡

- Find the Output:

```
#include <stdio.h>
int main() {
    int a = 5, b = 10;
    if(a > b)
        printf("A is greater\n");
    else
        printf("B is greater\n");
    return 0;
}
```

```
#include <stdio.h>
int main() {
    int i = 1;
    while(i <= 5) {
        printf("%d ", i);
        i++;
    }
    return 0;
}
```

```
#include <stdio.h>
int main() {
    for(int i=1; i<=5; i++) {
        if(i == 3)
            continue;
        printf("%d ", i);
    }
    return 0;
}
```

```
#include <stdio.h>
int main() {
    for(int i=1; i<=5; i++) {
        if(i == 4)
            break;
        printf("%d ", i);
    }
    return 0;
}
```

```
#include <stdio.h>
int main() {
    int x = 2;
    switch(x) {
        case 1: printf("One"); break;
        case 2: printf("Two"); break;
        case 3: printf("Three"); break;
        default: printf("Other");
    }
    return 0;
}
```

```
#include <stdio.h>
int main() {
    int num = 1;
    start:
    if(num <= 3) {
        printf("%d ", num);
        num++;
        goto start;
    }
    return 0;
}
```

```
#include <stdio.h>
int main() {
    int a = 10, b = 20, c;
    c = (a > b) ? a : b;
    printf("%d", c);
    return 0;
}
```