Control Statements
&
Decision-Making In C
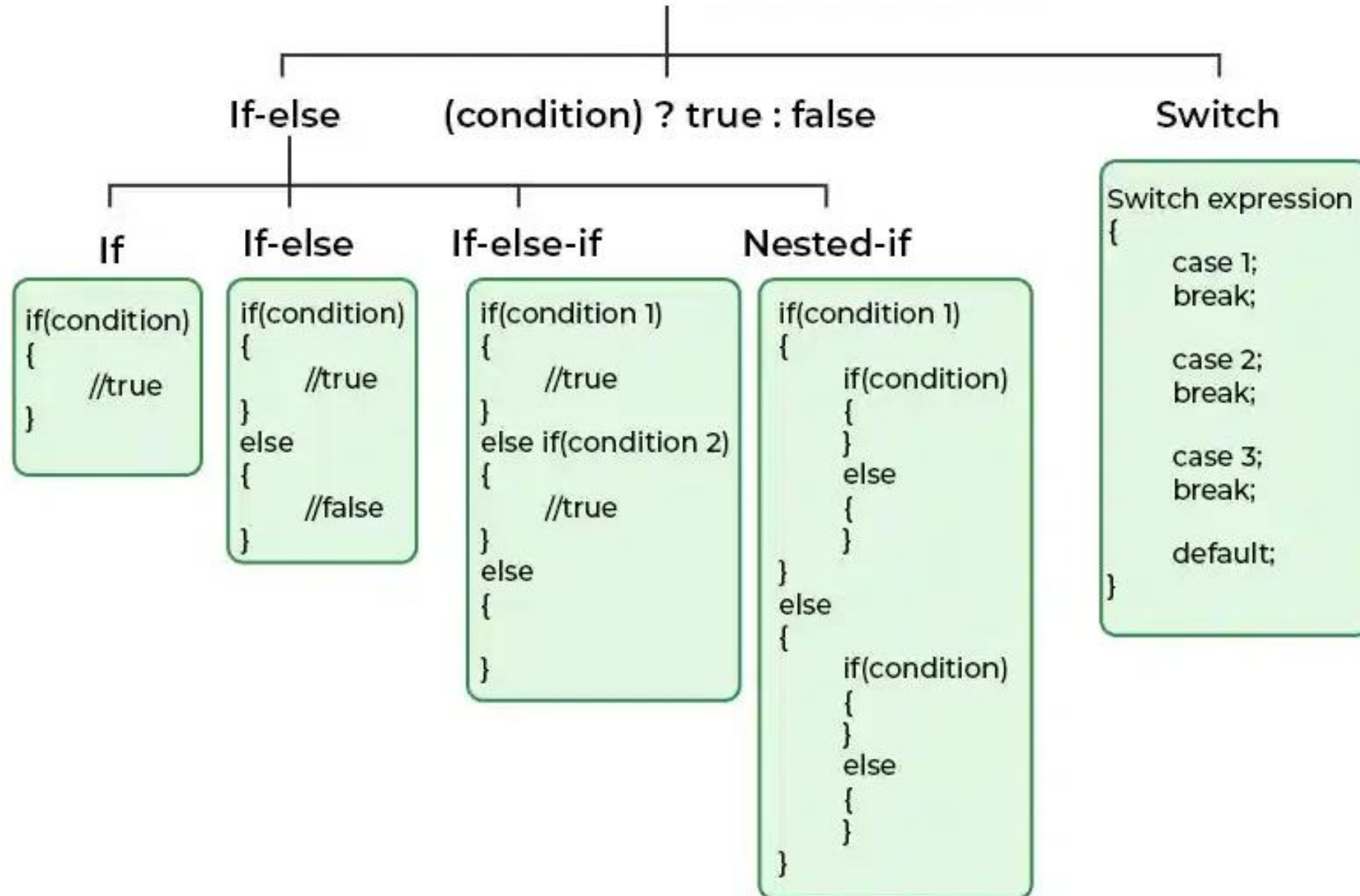
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Level Term: 1-II-A(G₁) & 1-II-B(G₃,G₄)

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Decision Making in C (if , if..else, Nested if, if-else-if)

Conditional Statements in C

If-else   (condition) ? true : false   **Switch**

If

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

If-else

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

If-else-if

```
if(condition 1)
{
    //true
}
else if(condition 2)
{
    //true
}
else
{

}
```

Nested-if

```
if(condition 1)
{
    if(condition)
    {
    }
    else
    {
    }
}
else
{
    if(condition)
    {
    }
    else
    {
    }
}
```

Switch

```
Switch expression
{
    case 1;
    break;

    case 2;
    break;

    case 3;
    break;

    default;
}
```

C – if Statement

Syntax of if Statement in C

```c
if(condition)
{
    // if body
    // Statements to execute if condition is true
}
```

```c
#include <stdio.h>
int main(){
        int gfg = 9;
        if (gfg < 10) {
                printf("%d is less than 10", gfg);
        }
        if (gfg > 20) {
                printf("%d is greater than 20", gfg);
        }
}
```
Output: 9 is less than 10

How if in C works?

Expression is True.

```
Int GFG = 9;

if (GFG < 10)

{
    //Statements;
}

// code after if
```

Expression is False.

```
Int GFG = 9;

if (GFG > 10)

{
    //Statements;
}

// code after if
```

Can we specify multiple conditions in if statement?
We can specify multiple conditions in the if statement but not separately. We have to join these multiple conditions using logical operators making them into a single expression. We can then use this expression in the if statement.

Valid Expressions
if (a < b && a < c);
if (a == 25 || a < 25);

Invalid Expressions
if (a < b, a < c);

C if-else Statement

Syntax of if-else

```
if (condition)
{
    // code executed when the condition is
true
}
else
{
    // code executed when the condition is
false
}
```

Conditions and If Statements

Less than: a < b

Less than or equal to: a <= b

Greater than: a > b

Greater than or equal to: a >= b

Equal to a == b

Not Equal to: a != b

Q-2: Can we skip second braces{} around the body of the if-else block in C?

Answer:

We can skip the braces of the body of the if or else block as long as there is only a single statement inside their body. We will get an error if there is more than one statement in the body without braces.

Expression is true.

```
int test = 5;

if (test < 10)
{
    // body of if
}
else
{
    // body of else
}
```

Expression is false.

```
int test = 5;

if (test > 10)
{
    // body of if
}
else
{
    // body of else
}
```

We can also test variables:

Example

```
int x = 20;
int y = 18;
if (x > y) {
  printf("x is greater than y");
}
```

Example

```
int time = 20;
if (time < 18) {
  printf("Good day.");
} else {
  printf("Good evening.");
}
// Outputs "Good evening."
```

```
// use of if-else statement
#include <stdio.h>
int main(){
        if (5 < 10) {
                printf("5 is less than 10.");
        }
        else {
                printf("5 is greater that 10.");
        }
}
```
Output: 5 is less than 10.

C Short Hand If Else / Conditional Operator

Example
```c
int time = 20;
if (time < 18) {
  printf("Good day.");
}
else {
  printf("Good evening.");
}
```

```c
#include <stdio.h>
int main() {
  int age;
  printf("Enter your age: ");
  scanf("%d", &age);
  (age >= 18) ? printf("You can vote") : printf("You cannot vote");
}
```

Example
```c
int time = 20;
(time < 18) ? printf("Good day.") : printf("Good evening.");
```

```c
#include <stdio.h>
int main() {
  int number = 3;
  (number % 2 == 0) ? printf("Even Number") :
printf("Odd Number");
}
```

```c
// C program to find largest among two numbers using ternary operator
#include <stdio.h>
int main() {
        int m = 5, n = 4;
        (m > n) ? printf("m is greater than n") : printf("n is greater than m");

}
```

The else if Statement

// C program to illustrate if-else-if statement
```c
#include <stdio.h>
int main() {
        int i = 20;
        if (i == 10)
                printf("i is 10");
        else if (i == 15)
                printf("i is 15");
        else if (i == 20)
                printf("i is 20");
        else
                printf("i is not present");
}
```
Output: i is 20

Nested if-else in C

// C program to illustrate nested-if statement
```c
#include <stdio.h>
int main() {
        int i = 10;
        if (i == 10)  {
                        if (i < 15)
                                printf("i is smaller than 15\n");
                        if (i < 12)
                                printf("i is smaller than 12 too\n");
                        else
                                printf("i is greater than 15");
        }
}
```

Output
i is smaller than 15
i is smaller than 12 too

switch Statement in C

```c
// An example of switch case
#include <stdio.h>
int main(){
        int var = 1;
    switch (var) {
    case 1:
        printf("Case 1 is Matched.");
        break;
    case 2:
        printf("Case 2 is Matched.");
        break;
    case 3:
        printf("Case 3 is Matched.");
        break;
    default:
        printf("Default case is Matched.");
        break;
    }
}
```
Output: Case 1 is Matched.

```c
// switch case without break keyword
#include <stdio.h>
int main(){
    int var = 2;

    switch (var) {
    case 1:
        printf("Case 1 is executed.\n");
    case 2:
        printf("Case 2 is executed.\n");
    case 3:
        printf("Case 3 is executed.");
    case 4:
        printf("Case 4 is executed.");
    }
}
```
Output
Case 2 is executed.
Case 3 is executed.Case 4 is executed.

Q-1: Use of Break in switch case

This keyword is used to stop the execution inside a switch block. It helps to terminate the switch block and break out of it. When a break statement is reached, the switch terminates, and the flow of control jumps to the next line following the switch statement.

The **break statement is optional**. If omitted, execution will continue on into the next case. The flow of control will fall through to subsequent cases until a break is reached.

Q-2: Use of Default in switch case

The default keyword is used to specify the set of **statements to execute if there is no case match**.

It is **optional** to use the default keyword in a switch case. Even if the switch case statement does not have a default statement, it would run without any problem.

What are the differences between switch and if else if ladder in C?

switch	if - else if
It executes the different cases on the basis of the value of the switch variable.	It executes the different blocks based on the condition specified.
It can only evaluate the int or char type expressions.	It can evaluate any type of expression.
Faster and easier to read for the large number of conditions.	It can get messy when there are lots of conditions.

Important programs in control statements [if - else]

----
1. basic [if] and [if-else] and [if-else-if]
2. only use if ladder for multiple statements
3. C Program to check whether the number is even or odd.
4. C program for voting system
5. print weeks day
6. calculator using
7. Program to compare two integers using =, > , <
8. C Program to find out if a number is positive or negative or 0
9. check alphabet or not
10. find vowel or consonant
11.Grade According to marks
12. largest among three numbers
13. smallest among three numbers
14. check leap year

switch:
----
1. switch case basic example
2. switch case without break keyword
3. C Program to check whether the number is even or odd.
4. C program for voting system
5. print weeks day
6. calculator using

Example–1-a. basic [if] and [if-else] and [if-else-if]

```c
int main()
{  int x;
   printf("Enter a number : ");
   scanf("%d", &x);
   if(x >= 6){
     printf("Number >= 6\n");
   }
   else if(x == 5){
     printf("Number = 5\n");
   }
   else if(x == 4){
     printf("Number = 4\n");
   }
  else if(x == 3){
     printf("Number = 3\n");
   }
   else if(x == 2){
     printf("Number = 2\n");
   }
   else {
     printf("Number <= 1\n");
   }
```

```c
int main(){
  int x; ///basic switch case
  printf("Enter a number : ");
  scanf("%d", &x);
  switch(x){
    case 6:
       printf("number = 6\n");
       break;
    case 5:
       printf("number = 5\n");
       break;
          case 4:
       printf("number = 4\n");
       break;
          case 3:
           printf("number = 3\n");
       break;
    case 2:
       printf("number = 2\n");
       break;
    default:
       printf("number <= 1\n");
       break;
  }
}
```

Example-2-a. only use if ladder for multiple statements

```c
#include<stdio.h>
int main(){
    int x;
    printf("Enter a number : ");
    scanf("%d", &x);
    if(x >= 6){
        printf("Number >= 6\n");
    }
    if(x >= 5){
        printf("Number = 5\n");
    }
    if(x >= 4){
        printf("Number = 4\n");
    }
}
 if(x >= 3){
        printf("Number = 3\n");
    }
    if(x >= 2){
        printf("Number = 2\n");
    }
    else {
        printf("Number <= 1\n");
    }
```

2. switch case without break keyword

```c
#include<stdio.h>
int main(){
    int x;
    printf("Enter a number : ");
    scanf("%d", &x);
    switch(x){
        case 6:
            printf("number = 6\n");
        case 5:
            printf("number = 5\n");
            case 4:
            printf("number = 4\n");
        case 3:
            printf("number = 3\n");
        case 2:
            printf("number = 2\n");
        default:
            printf("value not matched\n");
    }
}
```

3. C Program to check whether the number is even or odd.

```c
#include<stdio.h>
int main()
{
  int number;
  scanf("%d", &number);
  number = abs(number);
  int result = number % 2 ;

  if(result == 0)
  {
    printf("Even\n");
  }
  else{
    printf("Odd\n");
  }
}
```

```c
#include<stdio.h>
int main(){
int number;
  scanf("%d", &number);
  number = abs(number);
  int result = number % 2 ;
  switch(result){
    case 0:
      printf("Even");
      break;
    case 1:
      printf("Odd");
      break;
    default:
      printf("Invalid statements");
  }
}
```

4. C program to check voting eligibility

```c
#include<stdio.h>
int main(){
    int age;
    scanf("%d", &age);
    if(age >= 18){
        printf("You can vote\n");
    }
    else{
        printf("You can't vote\n");
    }
}
```

```
How old are you?
= 12
Sorry! You are below 18.
```

```c
#include<stdio.h>
int main(){
int age;
    scanf("%d", &age);
    switch(age >= 18)
    {
        case 0:
            printf("You can't vote\n");
            break;
        case 1:
            printf("You can vote\n");
            break;
    }
}
```

5-a. print day names of weeks

```c
#include<stdio.h>
int main(){
  int day;
   scanf("%d", &day);
   if(day == 1){
     printf("Sunday\n");
   }
   else if(day == 2){
     printf("Monday\n");
   }
   else if(day == 3){
     printf("Tuesday\n");
   }
   else if(day == 4){
     printf("Wednesday\n");
   }
 else if(day == 5){
     printf("Thursday\n");
   }
   else if(day == 6){
     printf("Friday\n");
   }
   else if(day == 7){
     printf("Saturday\n");
   }
   else{
     printf("Invalid input\n");
   }
}
```

5-b. print day names of weeks

```c
#include<stdio.h>
int main(){
  int day;
   scanf("%d", &day);
   switch(day) {
   case 1:
     printf("Sunday\n");
     break;
   case 2:
     printf("Monday\n");
     break;
   case 3:
     printf("Tuesday\n");
     break;
  case 4:
     printf("Wednesday\n");
     break;
   case 5:
     printf("Thursday\n");
     break;
   case 6:
     printf("Friday\n");
     break;
   case 7:
     printf("Saturday\n");
   default:
     printf("Invalid");
   }
}
```

6-a.Simple calculator using if else

```c
#include<stdio.h>
int main(){
  int a,b;
  char sign;
  scanf("%d %c %d", &a, &sign, &b);
  if(sign == '+'){
    printf("%d %c %d = %d\n", a, sign, b, a+b);
  }
  else if(sign == '-'){
    printf("%d %c %d = %d\n", a, sign, b, a-b);
  }
 else if(sign == '*'){
    printf("%d %c %d = %d\n", a, sign, b, a*b);
  }
  else if(sign == '/'){
    printf("%d %c %d = %0.2f\n", a, sign, b, (float)a/b);
  }
 else if(sign == '%'){
    printf("%d %c %d = %d\n", a, sign, b, a%b);
  }
  else{
    printf("Invalid Sign");
  }
```

```c
#include<stdio.h>
int main(){
  int a,b;
  char sign;
  scanf("%d %c %d", &a, &sign, &b);
  switch(sign) {
  case '+':
    printf("%d %c %d = %d\n", a, sign, b, a+b);
    break;
  case '-':
    printf("%d %c %d = %d\n", a, sign, b, a-b);
    break;
  case '*':
    printf("%d %c %d = %d\n", a, sign, b, a*b);
    break;
 case '/':
    printf("%d %c %d = %0.2f\n", a, sign, b, (float)a/b);
    break;
  case '%':
    printf("%d %c %d = %d\n", a, sign, b, a%b);
    break;
  default:
    printf("Invalid Sign");
  }
}
```

7. Program to compare two integers using =, > , <

```c
#include<stdio.h>
int main(){
    int num1, num2;
    scanf("%d %d", &num1, &num2);
    if(num1 > num2){
        printf("%d > %d\n", num1, num2);
    }
    else if(num1 < num2){
        printf("%d < %d\n", num1, num2);
    }
    else{
        printf("%d == %d\n", num1, num2);
    }
}
```

```
Enter two integers: 2 2
Result: 2 = 2

Enter two integers: 12 11
Result: 12 > 11

Enter two integers: 12 44
Result: 12 < 44
```

8. C Program to find out if a number is positive or negative or 0

```c
#include<stdio.h>
int main(){
    int n;
    scanf("%d", &n);
    if(n > 0) {
        printf("Positive\n");
    }
    else if(n < 0){
        printf("Negative\n");
    }
    else{
        printf("Zero");
    }
}
```

```
Enter an integer: -155
You entered -155.
The if statement is easy.

Enter an integer: 200
The if statement is easy.
```

9. check alphabet(a-z , A-Z) or not

```c
#include<stdio.h>
int main(){
char input;
    scanf("%c", &input);
    ///method -1
    if( input>='a' && input<='z'){
        printf("alphabet[smaller]\n");
    }
    else if(input>='A' && input<='Z'){
        printf("alphabet[upper]\n");
    }
    else{
        printf("Not an alphabet\n");
    }

    ///method-2
    if (isalpha(input) == 0)
        printf("not an alphabet.");
    else
        printf("alphabet");
}
```

10. find vowel[a, e, I, o, u] or consonant

```c
#include <stdio.h>
int main() {
    char vowel;
    printf("Enter an alphabet: ");
    scanf("%c", &vowel);

    if(vowel == 'a' || vowel == 'A'){
        printf("Vowel\n");
    }
    else if(vowel == 'e' || vowel == 'E'){
        printf("Vowel\n");
    }
    else if(vowel == 'i' || vowel == 'I'){
        printf("Vowel\n");
    }
    else if(vowel == 'o' || vowel == 'O'){
        printf("Vowel\n");
    }
    else if(vowel == 'u' || vowel == 'U'){
        printf("Vowel\n");
    }
    else{
        printf("Consonant\n");
    }

}
```

11.Grade According to marks

```c
#include<stdio.h>
int main(){
    int marks;
    scanf("%d", &marks);
    if(marks>=80 && marks<=100){
        printf("You got \"A+\" \n");
    }
    else if(marks>=75 && marks<=79){
        printf("You got \"A\" \n");
    }
    else if(marks>=70 && marks<=74){
        printf("You got \"A-\" \n");
    }
    else if(marks>=65 && marks<=69){
        printf("You got \"B+\" \n");
    }
    else if(marks>=60 && marks<=64){
        printf("You got \"B\" \n");
    }
    else{
        printf("You failed\n");
    }
}
```

12. largest among three numbers

```c
#include <stdio.h>
int main() {
  int n1, n2, n3;

  ///type-1
  printf("Enter three different numbers: ");
  scanf("%d %d %d", &n1, &n2, &n3);
  if (n1 >= n2 && n1 >= n3)
    printf("%d is the Largest Number\n", n1);
  if (n2 >= n1 && n2 >= n3)
    printf("%d is the Largest Number\n", n2);
  if (n3 >= n1 && n3 >= n2)
    printf("%d is the Largest Number\n", n3);
  ///type-2
  if (n1 >= n2 && n1 >= n3)
    printf("%d is the largest number\n", n1);
  else if (n2 >= n1 && n2 >= n3)
    printf("%d is the largest number\n", n2);
  else
    printf("%d is the largest number\n", n3);
}
```

13. smallest among three numbers

```c
#include <stdio.h>
int main() {
  int n1, n2, n3;
  ///type-1
  printf("Enter three different numbers: ");
  scanf("%d %d %d", &n1, &n2, &n3);
  if (n1 <= n2 && n1 <= n3)
    printf("%d is the Smallest Number\n", n1);
  if (n2 <= n1 && n2 <= n3)
    printf("%d is the Smallest Number\n", n2);
  if (n3 <= n1 && n3 <= n2)
    printf("%d is the Smallest Number\n", n3);
  ///type-2
  if (n1 <= n2 && n1 <= n3)
    printf("%d is the Smallest number\n", n1);
  else if (n2 <= n1 && n2 <= n3)
    printf("%d is the Smallest number\n", n2);
  else
    printf("%d is the Smallest number\n", n3);
```

14. check leap year

```c
#include<stdio.h>
int main(){
    int year;
    printf("Enter a year: ");
    scanf("%d", &year);
    if(year % 400 == 0){
        printf("%d is a leap year\n", year);
    }
    else if (((year % 4 == 0) && (year % 100!= 0))){
        printf("%d is a leap year\n", year);
    }
    else{
        printf("%d is not a leap year\n", year);
    }
}
```

Online judge problems

BeeCrowd

https://judge.beecrowd.com/en/problems/view/1035
https://judge.beecrowd.com/en/problems/view/1036
https://judge.beecrowd.com/en/problems/view/1037
https://judge.beecrowd.com/en/problems/view/1041
https://judge.beecrowd.com/en/problems/view/1042
https://judge.beecrowd.com/en/problems/view/1044
https://judge.beecrowd.com/en/problems/view/1045
https://judge.beecrowd.com/en/problems/view/1060
https://judge.beecrowd.com/en/problems/view/1064
https://judge.beecrowd.com/en/problems/view/1065
https://judge.beecrowd.com/en/problems/view/1066

Codeforces

https://codeforces.com/group/MWSDmqGsZm/contest/219158/problem/I
https://codeforces.com/group/MWSDmqGsZm/contest/219158/problem/j
https://codeforces.com/group/MWSDmqGsZm/contest/219158/problem/k
https://codeforces.com/group/MWSDmqGsZm/contest/219158/problem/L
https://codeforces.com/group/MWSDmqGsZm/contest/219158/problem/m
https://codeforces.com/group/MWSDmqGsZm/contest/219158/problem/n
https://codeforces.com/group/MWSDmqGsZm/contest/219158/problem/u
https://codeforces.com/group/MWSDmqGsZm/contest/219158/problem/t
https://codeforces.com/group/MWSDmqGsZm/contest/219158/problem/z

Exercise: Solve this Questions

```c
#include <stdio.h>
int main() {
    int x=0;
    x++;
    if(--x){
        x=x++;
        if(x){
            printf("hello");
        }else{
            printf("%d",x);
        }
    }else{
        x=x+5;
        if(x){
            printf("i win x times");
        }
        else{
            printf("you win 5 times");
        }
    }
}
```

1. if (X > Y) ? (if (X < 0) ? X= abs(X) : X = 2 * X)

```c
if(a > b)  if(b > c)    s1;  else s2;
```

```c
void main( )
{
    int a=3,b=1;
     if( b>a, a>b) printf("%d",--b);
    else printf("%d", a++);
}
```

```c
main(){
int i=0,j=0;
if(i&&j++)
printf ("i = %d, j = %d", i, j);
printf ("i = %d, j = %d", i, j);
}
```

```c
int a = 2;
int b = 0;
int y = (b==0)? a:(a>b) ? (b==1):a;
printf("%d", y );
```

```c
#include <stdio.h>
int main() {
int i = -1;
int x = (unsigned char)i;
printf("%d", x);
}
```

```c
main( ){
int i=-4, j, num=10;
j = i % -3;
j = j?0: num*num;
printf("j = %d", j);
}
```

What is printed by the following program?
```c
main () {
int x = 0;
if (x = 0) printf("Case (a): %d", x);
else if (x -= 7) printf("Case (b): %d", x);
else printf("Case (c): %d", x);
}
```

```c
x = 4 > 8 ? 5!= 1<5 == 0 ? 1:2:3;
```

```c
int y;
y = 7 <= 9 && 3 != 2 ? 4 + 5 : 6 - 1;
printf("%d", y);
```

```c
int z;
z = !(2 < 5) || (8 > 3) ? 10 / 2 : 15 % 3;
printf("%d", z);
```

```c
int x = 5, y = 10, z = 2;
int result = (x > y) ? (x > z ? x : z) : (y > z ? y : z);
printf("%d", result);
```

```c
int a = 3, b = 7, c = 5;
int middle = (a < b) ? ((b < c) ? b : ((a < c) ? c : a)) : ((a < c) ? a : ((b < c) ? c : b));
printf("Middle number: %d", middle);
```

```c
int x = 5, y = 3, z = 8;
int middle = (x > y) ? ((y > z) ? y : (x > z ? z : x)) : ((x > z) ? x : (y > z ? z : y));
printf("Middle value: %d", middle);
```

```c
int x = 3;
x = x < 2 ? 1 : x == 3 ? 4 : 5;
printf("%d", x);
```

```c
int x = 2, y = 1, z;
z = x > 3 ? (y < 1 ? 5 : 6) : (y == 1 ? 7 : 8);
printf("%d", z);
```

```c
int a = 2, b = 5, result;
result = a > b ? 10 : a == 2 ? b < 10 ? 15 : 20 : 30;
printf("%d", result);
```

```c
#include<stdio.h>
int main(){
    int i = -5;
    while (i <= 5){
        if (i >= 0)
            break;
        else {
            i++;
            continue;
        }
        printf("GeeksQuiz");
    }
}
```

```c
#include <stdio.h>

int main() {
    int i = 2;
    switch (i) {
        case 0:
            printf("Geeks");
            break;
        case 1:
            printf("Quiz");
            break;
        default:
            printf("GeeksQuiz");
    }
}
```

```c
#include <stdio.h>
#define EVEN 0
#define ODD 1
int main() {
    int i = 3;
    switch (i % 2) {
        case EVEN:
            printf("Even");
            break;
        case ODD:
            printf("Odd");
            break;
        default:
            printf("Default");
    }
}
```

```c
#include <stdio.h>
int main()
{
    int i = 3;
    switch(i)
    {
        printf("Outside ");
        case 1: printf("Geeks");
            break;
        case 2: printf("Quiz");
            break;
        defau1t: printf("GeeksQuiz");
    }
}
```

```c
#include<stdio.h>
int main(){
    int a = 5;
    switch(a){
        default:
            a = 4;
        case 6:
            a--;
        case 5:
            a = a+1;
        case 1:
            a = a-1;
    }
    printf("%d \\n", a);
}
```

```c
#include <stdio.h>
int main(){
    int x = 3;
    if (x == 2); x = 0;
    if (x == 3) x++;
    else x += 2;
    printf("x = %d", x);
}
```

```c
main(){
    int i =10;
    static int x=1;
    if(x==i) printf("equal");
    else if(x<i)printf("less than");
    else printf("greater than");
}
```

What will be printed by the following code segment? Explain your answer.
```c
int i=1;
if (i=0)  printf("False \n");
else  printf("True \n");
```

What will be the execution of the following code on the input I do not know ?
```c
char a, b;
scanf("%c do not %c", &a, &b);
```

What is the value of x after the execution of the following program segment?
```c
x=-5; y=10;
if(x>y)x=1;
else if(y<0) x=(x) * (-1);
else x=2*x;
```

```c
int main() {
char x = 'w';
switch(x)
{
case 'a': printf("Append");
break;
case 'w': printf("Write");
case 'r': printf("Read");
break;
default : printf("Open");
break;
}
```

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

```c
#include <stdio.h>
int i;
int main() {
    if (i) {
        // Do nothing
    } else {
        printf("Else");
    }
    return 0;
}
```

What will be printed?
```c
int i=0, j=45, x;
x= i++ + ++j;
printf("x=%d, i=%d j=%d \n",x,i,j);
```

What values does the following code print?
```c
int k; int num = 30;
k = num > 5 ? (num <= 10 ? 100:200):500;
printf ( "k = %d\n", k );
```

```c
char c='r';
switch(c)
{
case 'b': printf("Blue \n");
case 'r': printf("Red \n");
case 'g': printf("Green \n");
break;
case 'y': printf("Yellow \n");
default:
printf("Other \n");
}
```

Consider the following C function:
```c
int f(int n) {
    static int i = 1;
    if (n >= 5)
        return n;
    n = n+i;
    i++;
    return f(n);
}
```

```c
#include<stdio.h>
int main() {
    unsigned int x = -1;
    int y = ~0;
    if (x == y)
        printf("same");
    else
        printf("not same");
}
```