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Conditional statement assignment:
1. Write a C program to find maximum between two numbers.

```
#include <stdio.h>

int max(int a, int b) {
    return a > b ? a : b;
}

int main() {
    int a, b;
    printf("Enter two numbers: ");
    scanf("%d%d", &a, &b);

    printf("Maximum between two numbers is %d\n", max(a, b));
    return 0;
}
```

Output:

```
 $  gcc -Wall q1.c
 $  ./a.out
Enter two numbers: 7 8
Maximum between two numbers is 8
 $  ./a.out
Enter two numbers: 9 10
Maximum between two numbers is 10
```

2. Write a C program to check whether a number is negative, positive or zero.

```
#include <stdio.h>

int check_sign(int n) {
    if(n < 0)
        return -1;
    else if(n > 0)
        return 1;
    else
     return 0;
}
```

```
int main() {
    int n;
    printf("Enter number: ");
    scanf("%d", &n);

    if(check_sign(n) == 1) {
        printf("Positive number.\n");
    }else if(check_sign(n) == -1) {
        printf("Negative number.\n");
    }else {
        printf("Zero.\n");
    }

    return 0;
}
```

Output:

```
 $  gcc -Wall q2.c
 $  ./a.out
Enter number: 10
Positive number.
 $  ./a.out
Enter number: -11
Negative number.
 $  ./a.out
Enter number: 0
Zero.
```

3. Write a C program to check whether a number is divisible by 5 and 11 or not

```
#include <stdio.h>

int main() {
    int n;
    printf("Enter number: ");
    scanf("%d", &n);

    if(n % 5 == 0 && n % 11 == 0) {
        printf("Number is divisible by 5 and 11.\n");
    }else {
        printf("Number is not divisible by 5 and 11.\n");
    }
    return 0;
}
```

```
 $  gcc -Wall q3.c
 $  ./a.out
Enter number: 57
Number is not divisible by 5 and 11.
 $  ./a.out
Enter number: 55
Number is divisible by 5 and 11.
 $  ./a.out
Enter number: 15
Number is not divisible by 5 and 11.
```

4. Write a C program to check whether a number is even or odd.

```
#include <stdio.h>

int main() {
    int n;
    printf("Enter number: ");
    scanf("%d", &n);

    if(n % 2 == 0) {
        printf("Number is even.\n");
    }else {
        printf("Number is odd.\n");
    }
    return 0;
}
```

```
 $  gcc -Wall q4.c
 $  ./a.out
Enter number: 11
Number is odd.
 $  ./a.out
Enter number: 6
Number is even.
 $  ./a.out
Enter number: 0
Number is even.
```

5. Write a C program to check whether a year is leap year or not

```c
#include <stdio.h>

int main() {
    int year;
    printf("Enter year: ");
    scanf("%d", &year);

    if(year % 4 == 0) {
        if(year % 100 == 0) {
            if(year % 400 == 0) {
                printf("Leap year\n");
            }else {
                printf("Not a leap year\n");
            }
        }else {
            printf("Leap year\n");
        }
    }else {
        printf("Not a leap year\n");
    }
    return 0;
}
```

```
 $  gcc -Wall q5.c
 $  ./a.out
Enter year: 2000
Leap year
 $  ./a.out
Enter year: 1700
Not a leap year
 $  ./a.out
Enter year: 2005
Not a leap year
```

6. Write a C program to check whether a character is alphabet or not.

```c
#include <stdio.h>

int main() {
    char a;
    a = getchar();
    if((a ⩾ 'a' && a ⩽ 'z') || (a ⩾ 'A' && a ⩽ 'Z')) {
        printf("You entered an alphabet.\n");
    }else {
        printf("You entered a non-alphabet character.\n");
    }
    return 0;
}
```

```
 $  gcc -Wall q6.c
 $  ./a.out
a
You entered an alphabet.
 $  ./a.out
A
You entered an alphabet.
 $  ./a.out
5
You entered a non-alphabet character.
```

7. Write a C program to input any alphabet and check whether it is vowel or consonant.

```
#include <stdio.h>

int main() {
    char a;
    printf("Enter an alphabet: ");
    a = getchar();
    if(a == 'a' || a == 'e' || a == 'i' || a == 'o' || a == 'u' ||
a == 'A' || a == 'E' || a == 'I' || a == 'O' || a == 'U') {
        printf("Entered character is a vowel\n");
    }else {
        printf("Entered character is a consonant\n");
    }
    return 0;
}
```

```
 $  gcc -Wall q7.c
 $  ./a.out
Enter an alphabet: A
Entered character is a vowel
 $  ./a.out
Enter an alphabet: a
Entered character is a vowel
 $  ./a.out
Enter an alphabet: r
Entered character is a consonant
```

8. Write a C program to input any character and check whether it is alphabet, digit or special
character

```c
#include <stdio.h>

int main() {
    char ch;
    printf("Enter any character: ");
    scanf("%c", &ch);
    if ((ch ⩾ 'A' && ch ⩽ 'Z') || (ch ⩾ 'a' && ch ⩽ 'z')) {
        printf("'%c' is an alphabet.\n", ch);
    }
    else if (ch ⩾ '0' && ch ⩽ '9') {
        printf("'%c' is a digit.\n", ch);
    }
    else {
        printf("'%c' is a special character.\n", ch);
    }
    return 0;
}
```

```
 $  gcc -Wall q8.c
 $  ./a.out
Enter any character: a
'a' is an alphabet.
 $  ./a.out
Enter any character: 8
'8' is a digit.
 $  ./a.out
Enter any character: $
'$' is a special character.
```

9. Write a C program to check whether a character is uppercase or lowercase alphabet

```c
#include <stdio.h>
int main() {
    char a;
    a = getchar();
    if(a ⩾ 'a' && a ⩽ 'z') {
        printf("You entered lower case character.\n");
    }else if(a ⩾ 'A' && a ⩽ 'Z') {
        printf("You enetered upper case character.\n");
    }else{
        printf("you entered invalid alphabet.\n");
    }
    return 0;
}
```

```
 $  gcc -Wall q9.c
 $  ./a.out
a
You entered lower case character.
 $  ./a.out
A
You enetered upper case character.
 $  ./a.out
Z
You enetered upper case character.
```

10. Write a C program to input month number and print number of days in that month.

```
#include <stdio.h>
int main() {
    int month;
    printf("Enter month number (1-12): ");
    scanf("%d", &month);
    if (month == 1) {
        printf("January has 31 days.\n");
    } else if (month == 2) {
        printf("February has 28 or 29 days.\n");
    } else if (month == 3) {
        printf("March has 31 days.\n");
    } else if (month == 4) {
        printf("April has 30 days.\n");
    } else if (month == 5) {
        printf("May has 31 days.\n");
    } else if (month == 6) {
        printf("June has 30 days.\n");
    } else if (month == 7) {
        printf("July has 31 days.\n");
    } else if (month == 8) {
        printf("August has 31 days.\n");
    } else if (month == 9) {
        printf("September has 30 days.\n");
    } else if (month == 10) {
        printf("October has 31 days.\n");
    } else if (month == 11) {
        printf("November has 30 days.\n");
    } else if (month == 12) {
        printf("December has 31 days.\n");
    } else {
        printf("Invalid month number!\n");
    }
    return 0;
}
```

```
 $  gcc -Wall q10.c
 $  ./a.out
Enter month number (1-12): 7
July has 31 days.
 $  ./a.out
Enter month number (1-12): 5
May has 31 days.
 $  ./a.out
Enter month number (1-12): 2
February has 28 or 29 days.
```

11. Write a C program to input angles of a triangle and check whether triangle is valid or not.

```
#include <stdio.h>
int main() {
    int a, b, c;
    printf("Enter sides of the triangle: ");
    scanf("%d%d%d", &a, &b, &c);

    if((a+b) ⩽ c || (b+c) ⩽ a || (a+c) ⩽ b) {
        printf("Given triangle is not valid.\n");
    }else {
        printf("Valid triangle\n");
    }
    return 0;
}
```

```
 $  gcc -Wall q11.c
 $  ./a.out
Enter sides of the triangle: 3 4 5
Valid triangle
 $  ./a.out
Enter sides of the triangle: 3 4 7
Given triangle is not valid.
 $  ./a.out
Enter sides of the triangle: 8 3 9
Valid triangle
```

Write a c program to check whether the triangle is equilateral, isoscales or scalene triangle.

```
#include <stdio.h>
int main() {
    int side1, side2, side3;
    scanf("%d%d%d", &side1, &side2, &side3);

    if(side1 == side2 && side2 == side3) printf("Equilateral
triangle\n");
    else if(side1 ≠ side2 && side2 ≠ side3 && side1 ≠ side3)
printf("Scalene Triangle\n");
    else printf("Isoscales triangle\n");
    return 0;
}
```

```
 $  gcc -Wall q12.c
 $  ./a.out
10 10 18
Isoscales triangle
 $  ./a.out
3 4 5
Scalene Triangle
 $  ./a.out
5 5 5
Equilateral triangle
```

13. write a c program to find all roots of quadratic equation.

```
#include <stdio.h>
#include <math.h>
int main() {
    int a, b, c, D, x1, x2;
    printf("Enter coefficients: \n");
    scanf("%d%d%d", &a, &b, &c);

    D = b*b - 4*a*c;
    if(D ≥ 0){
        x1 = (-b + sqrt(D)) / (2*a);
        x2 = (-b - sqrt(D)) / (2*a);
        printf("x1: %d, x2: %d\n", x1, x2);
    }else {
        printf("Roots are not real.\n");
    }
    return 0;
}
```

```
 $  gcc -Wall q13.c -lm
 $  ./a.out
Enter coefficients:
1 0 -4
x1: 2, x2: -2
 $  ./a.out
Enter coefficients:
1 2 1
x1: -1, x2: -1
 $  ./a.out
Enter coefficients:
3 7 8
Roots are not real.
```

14 Write a C program to input marks of five subjects Physics, Chemistry, Biology,
Mathematics and Computer. Calculate percentage and grade according to following:
Percentage ⩾ 90% : Grade A
Percentage ⩾ 80% : Grade B
Percentage ⩾ 70% : Grade C
Percentage ⩾ 60% : Grade D
Percentage ⩾ 40% : Grade E
Percentage < 40% : Grade F

```
#include <stdio.h>
int main() {
    float physics, chemistry, biology, mathematics, computer;
    float total, percentage;
    printf("Enter marks for Physics: ");
    scanf("%f", &physics);
    printf("Enter marks for Chemistry: ");
    scanf("%f", &chemistry);
    printf("Enter marks for Biology: ");
    scanf("%f", &biology);
    printf("Enter marks for Mathematics: ");
    scanf("%f", &mathematics);
    printf("Enter marks for Computer: ");
    scanf("%f", &computer);

    total = physics + chemistry + biology + mathematics + computer;
    percentage = (total / 500) * 100;
    printf("Total Marks: %.2f / 500.00\n", total);
    printf("Percentage: %.2f%%\n", percentage);

    if (percentage ⩾ 90) {
        printf("Grade A\n");
    } else if (percentage ⩾ 80) {
        printf("Grade B\n");
    } else if (percentage ⩾ 70) {
        printf("Grade C\n");
    } else if (percentage ⩾ 60) {
        printf("Grade D\n");
    } else if (percentage ⩾ 40) {
        printf("Grade E\n");
    } else {
        printf("Grade F\n");
    }
    return 0;
}
```

```
 $  gcc -Wall q14.c
 $  ./a.out
Enter marks for Physics: 65
Enter marks for Chemistry: 84
Enter marks for Biology: 77
Enter marks for Mathematics: 95
Enter marks for Computer: 98
Total Marks: 419.00 / 500.00
Percentage: 83.80%
Grade B
```

15. Write a C program to input basic salary of an employee and calculate its Gross salary
according to following:
Basic Salary ⩽ 10000 : HRA = 20%, DA = 80%
Basic Salary ⩽ 20000 : HRA = 25%, DA = 90%
Basic Salary > 20000 : HRA = 30%, DA = 95%

```
#include <stdio.h>

int main() {
    float basic_salary, hra, da, gross_salary;

    printf("Enter the basic salary of the employee: ");
    scanf("%f", &basic_salary);

    if (basic_salary ⩽ 10000) {
        hra = basic_salary * 0.20;
        da = basic_salary * 0.80;
    } else if (basic_salary ⩽ 20000) {
        hra = basic_salary * 0.25;
        da = basic_salary * 0.90;
    } else {
        hra = basic_salary * 0.30;
        da = basic_salary * 0.95;
    }

    gross_salary = basic_salary + hra + da;

    printf("Gross Salary = %.2f\n", gross_salary);

    return 0;
}
```

```
 $  gcc -Wall q15.c
 $  ./a.out
Enter the basic salary of the employee: 15000
Gross Salary = 32250.00
 $  ./a.out
Enter the basic salary of the employee: 100000
Gross Salary = 225000.00
```

16.Write a C program to input electricity unit charges and calculate total electricity bill
according to the given condition:
For first 50 units Rs. 0.50/unit
For next 100 units Rs. 0.75/unit
For next 100 units Rs. 1.20/unit
For unit above 250 Rs. 1.50/unit
An additional surcharge of 20% is added to the bill

```
#include <stdio.h>

int main() {
    float units, bill, surcharge;

    printf("Enter electricity units consumed: ");
    scanf("%f", &units);

    if (units ⩽ 50) {
        bill = units * 0.50;
    } else if (units ⩽ 150) {
        bill = (50 * 0.50) + ((units - 50) * 0.75);
    } else if (units ⩽ 250) {
        bill = (50 * 0.50) + (100 * 0.75) + ((units - 150) * 1.20);
    } else {
        bill = (50 * 0.50) + (100 * 0.75) + (100 * 1.20) + ((units
- 250) * 1.50);
    }

    surcharge = bill * 0.20;
    bill = bill + surcharge;

    printf("Total electricity bill = Rs. %.2f\n", bill);

    return 0;
}
```

```
 $  gcc -Wall q16.c
 $  ./a.out
Enter electricity units consumed: 123
Total electricity bill = Rs. 95.70
 $  ./a.out
Enter electricity units consumed: 287
Total electricity bill = Rs. 330.60
 $  ./a.out
Enter electricity units consumed: 75
Total electricity bill = Rs. 52.50
```