C-Programming / READme.md

Rajiv-0920   23 minutes ago

1133 lines (662 loc) · 25.3 KB

Preview   Code   Blame

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Basic Simple C Programs

1. C Program to Display The Size of Different Data Types

Data Type	Size (bytes)	Range	Format Specifier
int	4	-2,147,483,648 to 2,147,483,647	%d
long int	4	-2,147,483,648 to 2,147,483,647	%ld
float	4	1.2E-38 to 3.4E+38	%f
double	8	1.7E-308 to 1.7E+308	%lf
long double	16	3.4E-4932 to 1.1E+4932	%Lf
char	1	-128 to 127	%c

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2. Write a program to accept values of two numbers and print their addition, subtraction, multiplication, division.

Addition: x + y;

Subtraction: x - y;

multiplication: x * y;

division: x / y;

3. Write a program to accept a number from user and print it's square & cube in C language

Square: x * x

Cube: x * x * x

4. Write a program to accept two values a & b and interchange their values in C language

Before Interchange value: a = 12; b = 15

After Interchange value: a = 15; b = 12

5. Write a program to accept roll no & marks of 3 subjects of a student, Calculate total 3 subjects and average in c language

$Average : Sanskrit + Hindi + Math/3$

6. Print following outputs: http:\www.kodegod.com\new in C language

7. Area and Circumference of a Circle

Area of the Circle is: πr^2

Circumstances of the Circle are: $2\pi r$

8. Print Ascii Value of the Character

9. Write a program to print area of a triangle

Triangle = $0.5 * Base * Height$
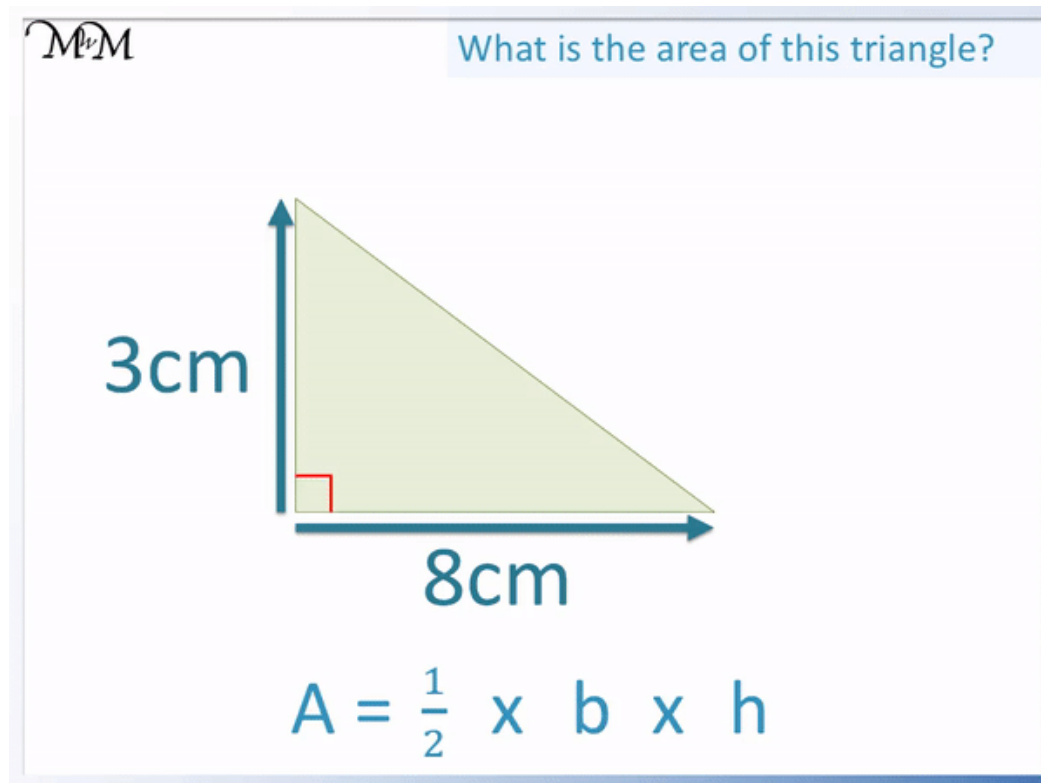
10. Convert a Person's Name in Abbreviated

Name: Ghanendra Pratap Singh

Abbreviated Name: G. P. Singh

11. C Program For Calculate Simple Interest

Simple Interest = (Principal Amount * Rate of Interest * Time) / 100;

12. Write a program to accept a name and basic salary of an employee calculate and display the gross salary Program in C.

Gross Salary = Basic_Salary + HRA + Other_Allowance.

13. Calculate Percentage of 5 Subjects

percentage = $((sanskrit + hindi + math + english + accountancy)/500) * 100$

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14. C Program For Converting Temperature Celsius Into Fahrenheit

Fahrenheit = $((9/5) * Celsius) + 32$ or you can use `1.8` in place of `9/5`

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15. First Three Powers (N, N * N, N * N * N) Without Using Power Function

Three Powers: (N, N * N, N * N * N)

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16. Write a C program input a number to compute the perimeter and area of a rectangle.

Perimeter of the rectangle = $2(height + width)$;
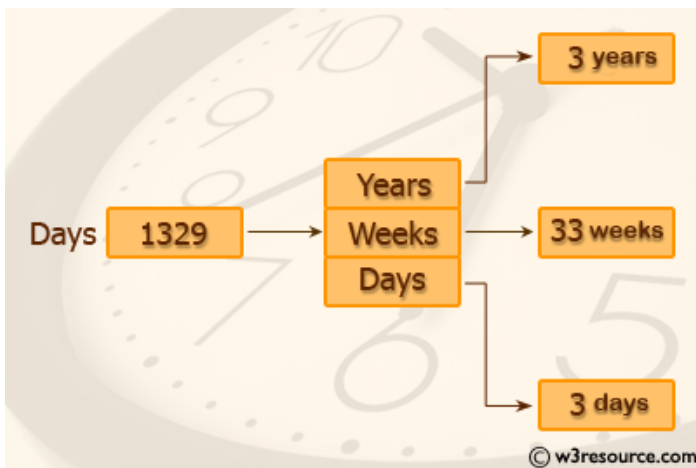
Area of Rectangle = $height * width$;

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17. Write a C program to accept 3 characters and print the sum of their ascii.

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18. Write a C program to convert specified days into years, weeks and days.

Note: Ignore leap year.

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19. Write a C program to calculate the distance between the two points

Formula:- $\sqrt{(x_1 - x_2)^2 + (y_1 + y_2)^2}$

Test Data :

```
Input x1: 25
Input y1: 15
Input x2: 35
Input y2: 10
```

Expected Output:

```
Distance between the said points: 11.1803
```

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20. Write a C program to read an amount (integer value) and break the amount into smallest possible number of bank notes.

Test Data :

```
Input the amount: 375
```

Expected Output:

```
There are:
3 Note(s) of 100.00
1 Note(s) of 50.00
1 Note(s) of 20.00
0 Note(s) of 10.00
1 Note(s) of 5.00
0 Note(s) of 2.00
0 Note(s) of 1.00
```

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21. Write a C program to convert a given integer (in seconds) to hours, minutes and seconds.

Test Data :

```
Input seconds: 25300
Expected Output:
There are:
H:M:S - 7:1:40
```

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22. Write a C program to convert a given integer (in millimeters) to kilometers, meters and centimeters.

```
1 centimeter = 10 millimeters.
1 meter = 100 centimeters.
1 meter = 1,000 millimeters.
1 kilometer = 1,000 meters.
```

Test Data :

```
Input no. of days: 2535220
```

Expected Output:

```
2.53 kilometers
2535.22 Meters
253522.0 Centimeters
```

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23. Write a C program that accepts two item's weight (floating points' values) and number of purchase (floating points' values) and calculate the average value of the items.

Test Data :

```
Weight - Item1: 15
No. of item1: 5
Weight - Item2: 25
No. of item2: 4
```

Expected Output:

```
Average Value = 19.444444
```

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24. Program to show swap of two number

```
i) using three variable

ii) without using third variable.

iii) swap withing a single line.
```

Test Data :

```
Input two number a and b: 5 10
```

Expected Output:

```
a = 10 and b = 5
```

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25. Write a program to display last digit of a number. Number is entered through keyboard.

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26. Write a program to calculate sum of the digits of three digit number.

27. Write a program to print profit and profit percentage. Selling price and cost price is given by user.

formula :-

$$profit = selling - cost$$

$$profitPercentage = \frac{profit}{cost} * 100$$

28. Input a number and change the sign.

Test Data:

```
input number : 10
input number : -15
```

Expected Output:

```
Sign Changed number = -10
Sign Changed number = 15
```

29. Input two number and display quotient and remainder.

Test Data:

```
input number : 98 4
```

Expected Output:

```
quotient = 24
remainder = 2
```
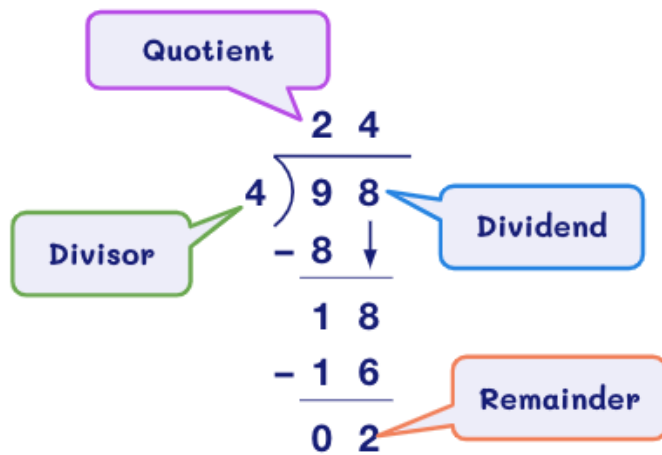
30. Input a 5 digit number and calculate the sum of last and first digit number.

Test Data:

```
number : 12345
```

Expected Output:

```
sum = 6
```

31. Input a 3 digit number and reverse it.

Test Data:

```
number = 123
```

Expected Output:

```
reverse number = 321
```

If/Else Statement

1. Write a program to accept a number and print if the number is Positive/Negative in C language
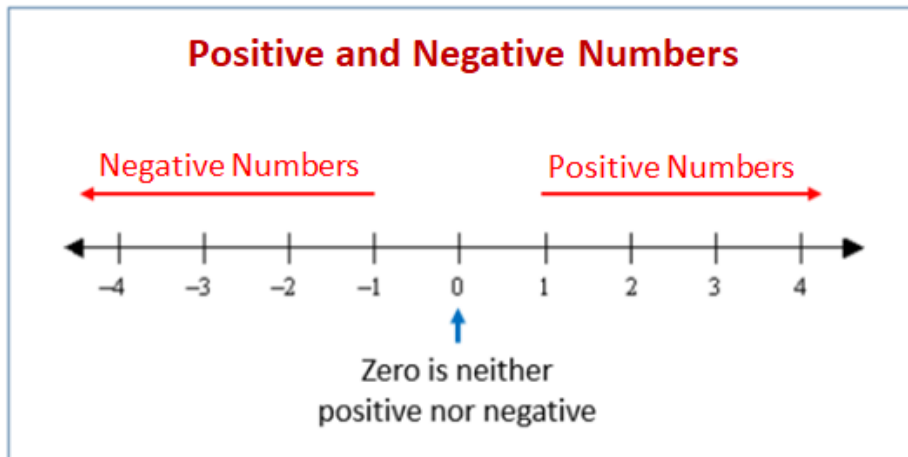
Positive and Negative Numbers

Negative Numbers   Positive Numbers

-4   -3   -2   -1   0   1   2   3   4

Zero is neither
positive nor negative
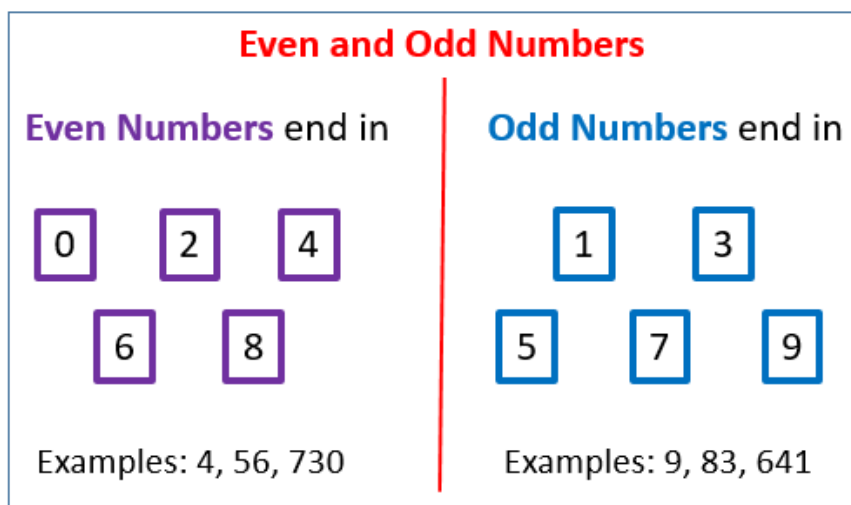
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2. Write a program to accept a number from user and print if it is even or odd in C language

HINT: Even number is divisible by 2 and generates a remainder of 0

Even and Odd Numbers

Even Numbers end in

0   2   4
6   8

Examples: 4, 56, 730

Odd Numbers end in

1   3
5   7   9

Examples: 9, 83, 641

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3. Write a program to find greater between two numbers.

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4. Write a program to accept three numbers from user and print them in ascending and descending order in C language

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5. Write a program to calculate roots of a quadratic equations in C language

Example 2: Finding Roots

- Consider the quadratic equation;
$$ax^2 + bx + c = 0$$

Mathematical Solution

First we need to find the value of the discriminant(Δ);

- $\Delta = b^2 - 4ac$, $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
- if $(\Delta < 0)$ then roots are complex.
- if $(\Delta = 0)$ then there is only one root.
- if $(\Delta > 0)$ then roots are real.

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6. Write a program to accept roll number ,and marks for three subjects, print total marks and average, also print grade by considering following conditions

Avg>=60 Grade A

Avg<60, Avg>=50 Grade B
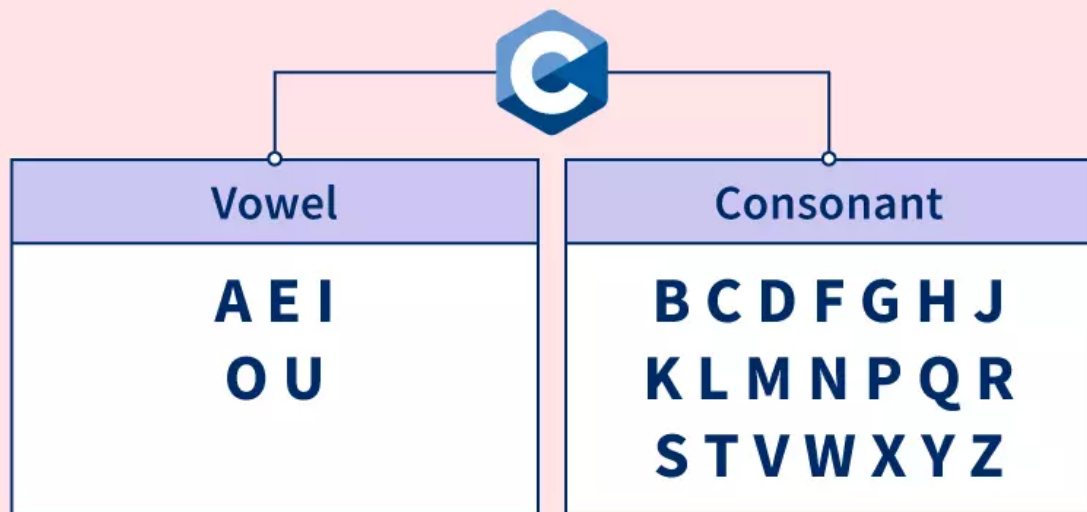
Avg<50, Avg>=40 Grade C Grade F.

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7. Write a Program to accept user's marital status, gender and age to check if he/she is eligible for marriage or not.

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8. Check Character Is Vowel or Consonant

9. A Character Is an Alphabet or Not

10. C Program to Check Uppercase or Lowercase or Digit or Special Character

Hint: ASCII value of the digit is between 48 to 58 and lowercase characters have ASCII values in the range of 97 to122, and uppercase is between 65 and 90.

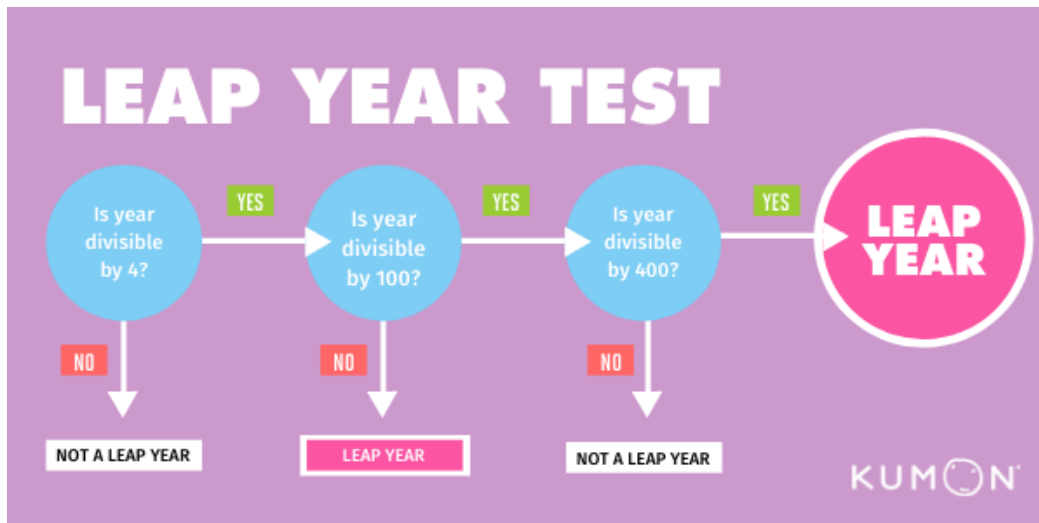## 11. Leap Year Program in C Using IF-ELSE

Leap Year Examples:

- 1992: Leap Year
- 2002: Not a Leap Year
- 2016: Leap Year
- 2100: Not a Leap Year

12. Given Date Month and the Year Is Correct or Not Using If-Else

Valid Date Examples:

- 09-03-2002
- 01-01-2023
- 31-12-2025

Invalid Date Examples:

- 29-02-2023
- 32-12-2023
- 31-03-2023

Loops C Programs

1. C Program to Reverse a Number Using FOR Loop

C Program to Reverse a Number Using FOR Loop

123456789 → 987654321

Given Number   Reverse Number

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2. Write a c program to check whether a given number is an Armstrong number or not.

Example: 153 is an Armstrong number

153 = (1 * 1 *1) + (5 * 5 * 5) + (3 * 3 * 3)

where: (1 * 1 * 1)=1 (5 * 5 * 5)=125 (3 *3 * 3)=27

So: 1 + 125 + 27 = 153

153 is an Armstrong number

Armstrong Numbers
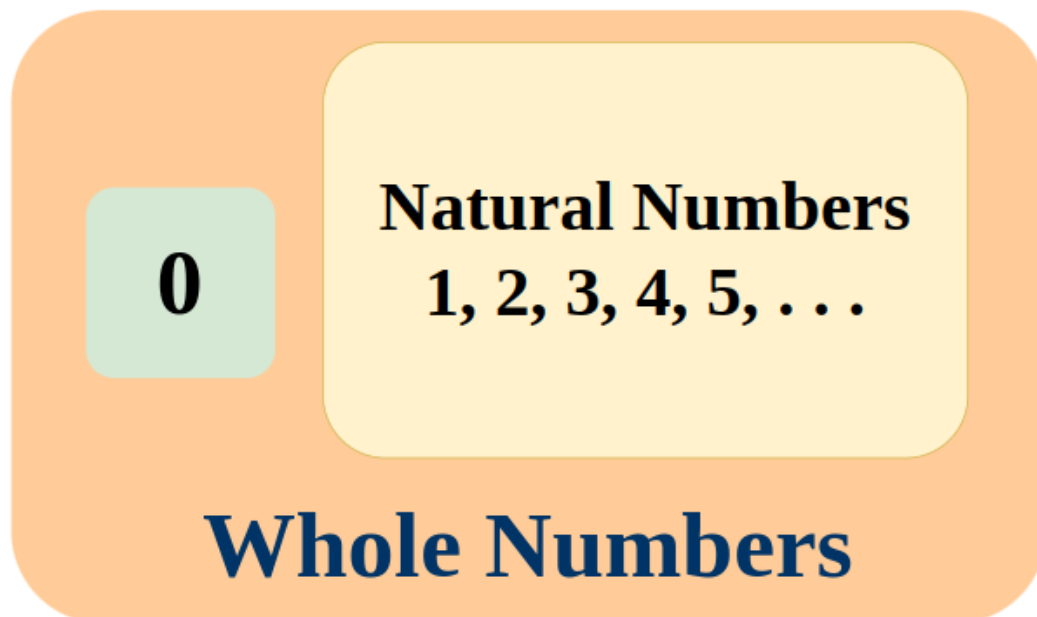
$$1^4 + 6^4 + 3^4 + 4^4 = 1634$$

Number of digits , d= 4
Sum of the digits raised to power number of digits is equal to the original digit , so this number is an Armstrong Number

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3. Calculate the Sum of n Natural Numbers Using the While Loop

0

Natural Numbers
1, 2, 3, 4, 5, . . .
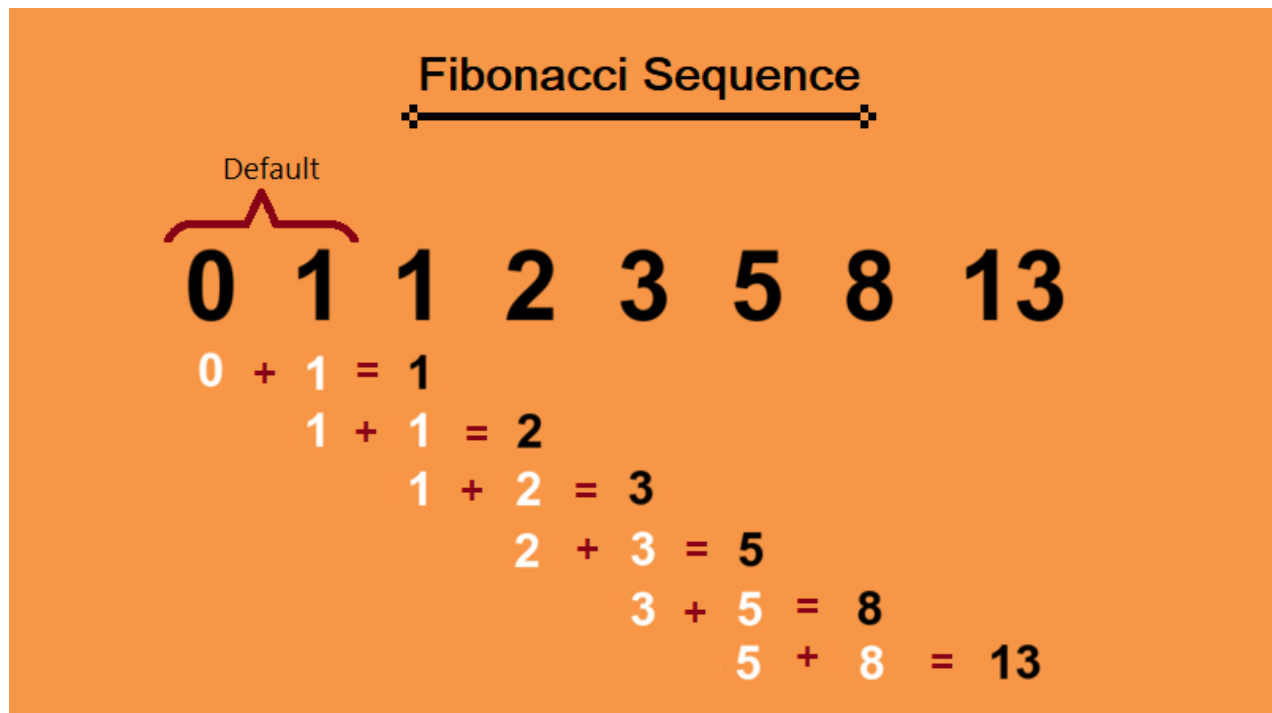
Whole Numbers

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4. Write a C Program to Print the Multiplication Table of N

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5. Fibonacci Series Program in C Using DO While Loop

Fibonacci Series: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34. Fibonacci Series is up to 10 Elements.

6. GCD of Two Numbers in C | Greatest Common Divisor Program
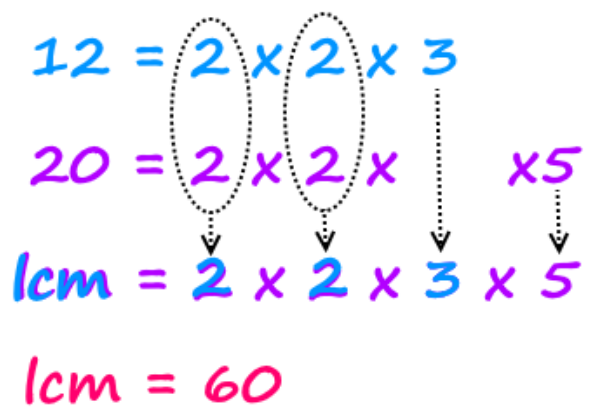
7. Program to Find LCM of Two Numbers in C Using While Loop

Formula

Least Common Multiple
(lcm)

12 = 2 x 2 x 3
20 = 2 x 2 x   x5
lcm = 2 x 2 x 3 x 5

lcm = 60

Factor Alignment is the KEY!

8. Palindrome Program in C Using While Loop

Number is Palindrome or Not

A palindrome number diagram showing the digits 1 2 3 3 2 1 read forward and backward.
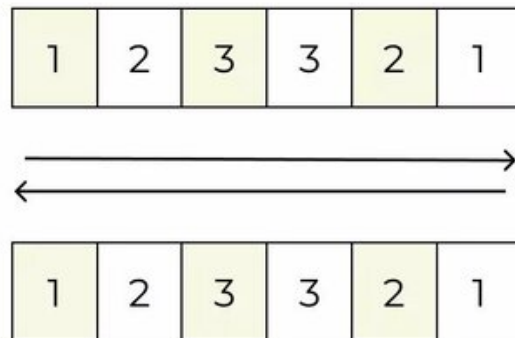
- A palindrome number is a number that is given the same number after reverse

- 123321 and the reverse of the number is same so this is a Palindrome Number

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9. Count the Number of Digits of an Integer Using the While Loop

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10. Find a Generic Root of a Number Using While Loop

For Example: If user input number is 12345, then we add all the individual digits of the number i.e., 1 + 2 + 3 + 4 + 5 = 15. We got 15. Now we add individual digits of number 15 i.e., 1 + 5 = 6. So Generic Root of number 12345 is 6.

num = 12345;

1 + 2 + 3 + 4 + 5 = 15

1 + 5 = 6

Generic Root of number 12345 is 6.

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11. C Program to Print The Calendar of a Month of 31 Days

Output

```
Enter Total Numbers of Days in a Month:31

Enter 0 for Monday:
Enter 1 for Tuesday:
Enter 2 for Wednesday:
Enter 3 for Thursday:
Enter 4 for Friday:
Enter 5 for Saturday:
Enter 6 for Sunday:

Enter First Day of the month 0 to 6:5

Mon     Tue     Wed     Thu     Fri     Sat     Sun

_____
-       -       -       -       -       1       2
3       4       5       6       7       8       9
10      11      12      13      14      15      16
17      18      19      20      21      22      23
24      25      26      27      28      29      30
31
```
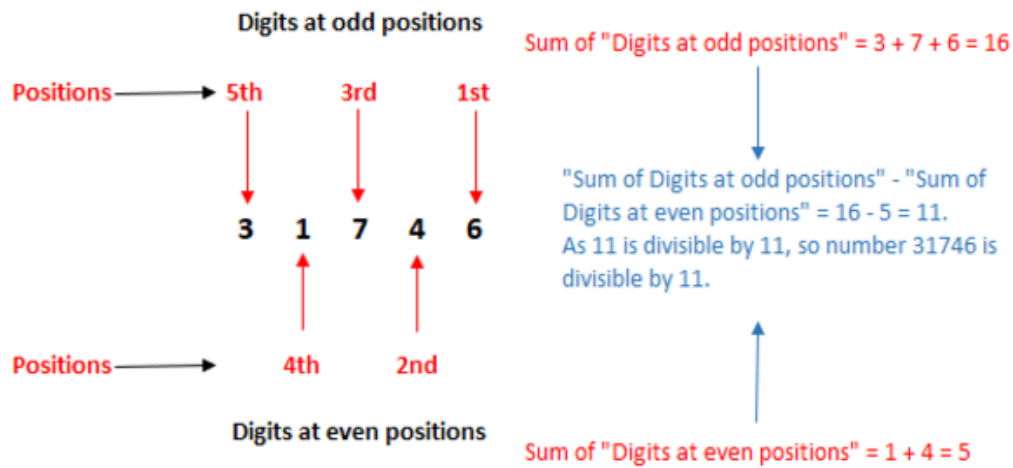
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12. Check Whether a Number Is Divisible by 11 Using (Vedic Maths)

Digits at odd positions

Positions ——→ 5th   3rd   1st

3   1   7   4   6

Positions ——→   4th   2nd

Digits at even positions

Sum of "Digits at odd positions" = 3 + 7 + 6 = 16

"Sum of Digits at odd positions" - "Sum of Digits at even positions" = 16 - 5 = 11.
As 11 is divisible by 11, so number 31746 is divisible by 11.

Sum of "Digits at even positions" = 1 + 4 = 5

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13. Denomination of an Amount Using While Loop

```
Logic :- The Logic Behind we have to divide a money by Above Money lets take a example
Suppose money is 16108 then follow the Step We are taking a example of Indian Currency
In present

Step 1:- Then First we divide 16108  by 2000 then we get 8    ,2000 rs notes then go to
step 2

Step 2:-  After divide 2000 we get a remainder 108 The we know that 108 is not
divisible by 500 so go to next step

Step 3:- Now divide 108 by 100 then we get 1 ,100 rs note now remainder is 8 go to next
step

Step 4:- 8 is divisible by 50 and 20 nor 10 so we escape now go to next step

Step 5:- Now divide 8 by 5 we get a 1 ,5 rs notes and remainder is 3 so go to next step

Step 6:- Now divide 3 by 2 we get 1 ,2 rs notes and remainder is 1
so follow the next step

Step 7:- This is a Last step divide 1 by 1 we get zero remainder now print the total no
of denomination needed and along with total no of count require to fulfill a
requirement

So for 16108 You Need to

No.

8 * 2000 = 16000
1 * 100 = 100
1 * 5 = 5
1 * 2 = 2
1 * 1 = 1

Total =12 Notes For minimum Transaction
```

14. Write a Program to print numbers 1 to n using while loop in C language

15. Write a Program to print first n even numbers in C language

HINT: Even number is divisible by 2 and generates a remainder of 0
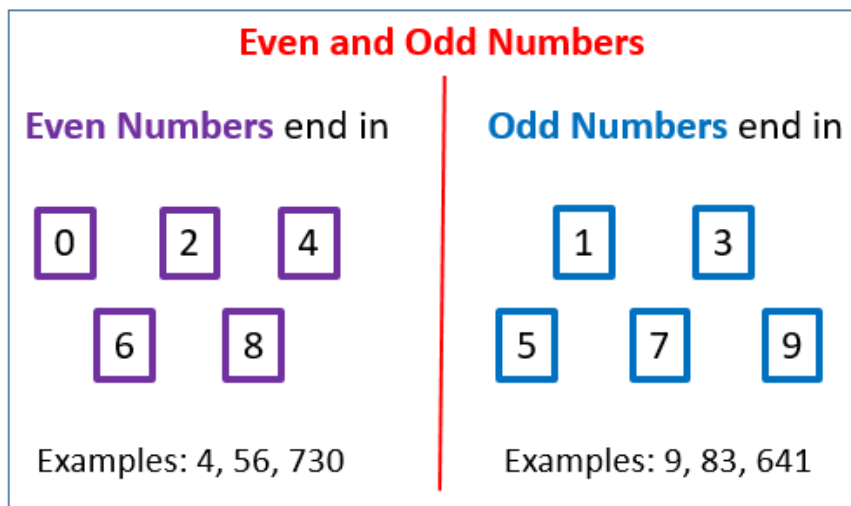
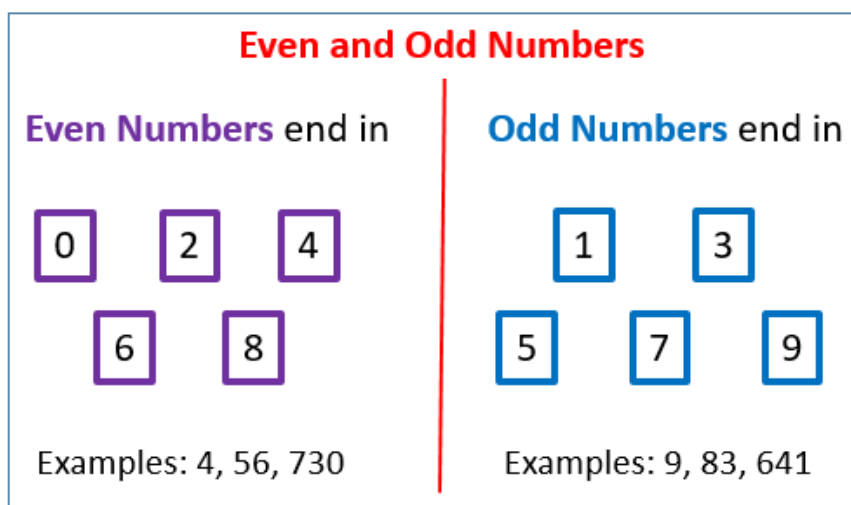## 16. Write a Program to print first n odd numbers in C language

HINT: Odd number which is not divisible by "2". An odd number always ends in 1, 3, 5, 7, or 9.

17. Write A Program To Accept A Number From User And Print If It Is Prime Or Not In C Language
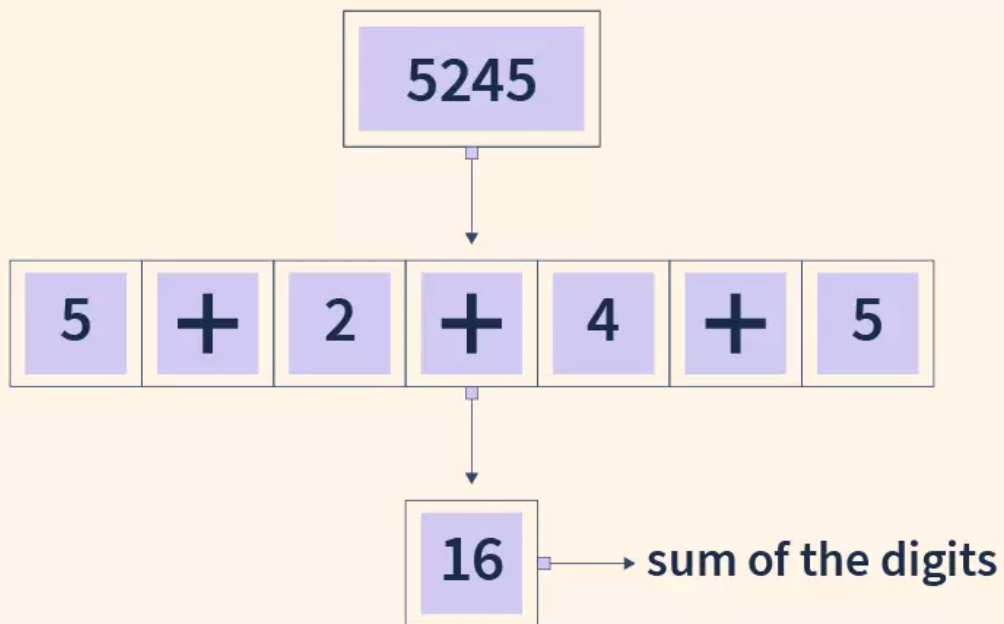

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18. Write a Program to accept a number and print sum of it's digits in C language

Ex: 153 Sum of its digit is 9

19. Write A Program To Accept A Number From User And Print It's Factorial In C Language

factorial of 5 is: 5! = 5 x 4 x 3 x 2 x 1 = 120

Factorial of a Number using Recursion

n = **5**

Base Condition : if(n==1 || n==0) return 1;

fact(5) ⟶ **(120)**

↓

return 5 * fact(4) ⟶ **(120)**

↓

return 4 * fact(3) ⟶ **(24)**

↓

return 3 * fact(2) ⟶ **(6)**

↓

return 2 * fact(1) ⟶ **(2)**

↓

return 1

Hence, Factorial of 5 is **120**

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20. Write a program to accept a number and print prime numbers between 2 and n in C language

Prime Numbers to 100
A prime number can only be divided (without a remainder) by itself and 1.

2	3	5	7	11
13	17	19	23	29
31	37	41	43	47
53	59	61	67	71
73	79	83	89	97

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21. Write a program to print digits, alphabets in capital and lower case in C language

ASCII

```
Digits

0  1  2  3  4  5  6  7  8  9

Uppercase Alphabets

A  B  C  D  E  F  G  H  I  J  K  L  M  N  O  P  Q  R  S  T  U  V  W  X  Y  Z

Lowercase Alphabets

a  b  c  d  e  f  g  h  i  j  k  l  m  n  o  p  q  r  s  t  u  v  w  x  y  z
```

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22. Write a program to print out ASCII chart on a single screen (all 256 characters from 0 to 255) in a tabular form. The ASCII code should be followed by the corresponding character in C language

ASCII

23. Program To Print Triangular Number Series Till n

Triangular Number Example: 15 is Triangular Number because it can be obtained by 1+2+3+4+5+6 i.e. 1+2+3+4+5+6=15

List of Triangular Numbers: 1, 3, 6, 10, 15, 21, 28, 36, 45, 55, 66, 78, 91, 105, 120, 136, 153, 171, 190, 210, 231, 253, 276, 300, 325, 351, 378, 406, 435, 465, 496, 528, 561, 595, 630, 666,

24. C Program to Check Whether a Number is Triangular or Not

Triangular Number Example: 15 is Triangular Number because it can be obtained by 1+2+3+4+5+6 i.e. 1+2+3+4+5+6=15

List of Triangular Numbers: 1, 3, 6, 10, 15, 21, 28, 36, 45, 55, 66, 78, 91, 105, 120, 136, 153, 171, 190, 210, 231, 253, 276, 300, 325, 351, 378, 406, 435, 465, 496, 528, 561, 595, 630, 666,
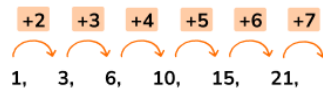
Triangular numbers

Triangular numbers are numbers that can be represented as a triangle.

The first triangular number $T_1 = 1$.

The second triangular number is found by adding 2 to the previous triangular number and so $T_2 = 1 + 2 = 3$.
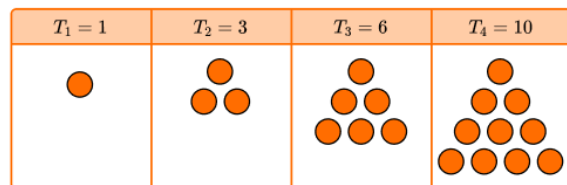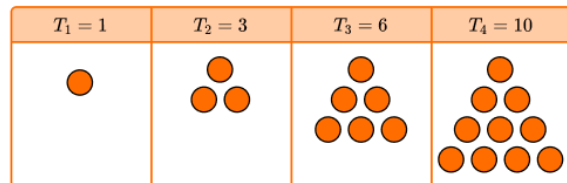
Continuing this pattern, we get:

+2 +3 +4 +5 +6 +7

1,   3,   6,   10,   15,   21,

The sequence of triangular numbers is:

1, 3, 6, 10, 15, 21, 28, 36, 45, 55, 66, 78, 91, 105, 120, ...

To determine the next triangular number in a numerical sequence, given the sequence, we need to find the difference between the previous two terms, and add one more than this value.

| $T_1 = 1$ | $T_2 = 3$ | $T_3 = 6$ | $T_4 = 10$ |

THIRD SPACE LEARNING

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25. Write a C program that read 5 numbers and sum of all odd values between them.

Test Data :

```
Input the first number: 11
Input the second number: 17
Input the third number: 13
Input the fourth number: 12
Input the fifth number: 5
```

Expected Output:

```
Sum of all odd values: 46
```

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Pattern

1. Write A Program To Print Following Outputs In C Language

```
* * * * * *
* * * * * *
* * * * * *
```

```
* * * * * *
* * * * * *
```

2. Write A Program To Print Following Outputs In C Language

```
*
* *
* * *
* * * *
* * * * *
```

3. Write A Program To Print Following Outputs In C Language

```
* * * * *
* * * *
* * *
* *
*
```

4. Write A Program To Print Following Outputs In C Language

```
* * * * *
 * * * *
  * * *
   * *
    *
```

5. Write A Program To Print Following Outputs In C Language

```
    *
   * *
  * * *
```

```
    *  *  *  *
 *  *  *  *  *
```

6. Write A Program To Print Following Outputs In C Language

```
          *
       *  *  *
    *  *  *  *  *
 *  *  *  *  *  *  *
*  *  *  *  *  *  *  *  *
```

7. Write A Program To Print Following Outputs In C Language

```
*  *  *  *  *  *  *  *  *
   *  *  *  *  *  *  *
      *  *  *  *  *
         *  *  *
            *
```

8. Write A Program To Print Following Outputs In C Language

```
            *
         *  *  *
      *  *  *  *  *
   *  *  *  *  *  *  *
*  *  *  *  *  *  *  *  *
   *  *  *  *  *  *  *
      *  *  *  *  *
         *  *  *
            *
```

9. Write A Program To Print Following Outputs In C Language

```
1
1 2
1 2 3
1 2 3 4
```

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10. Write A Program To Print Following Outputs In C Language

```
1
2 2
3 3 3
4 4 4 4
```

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11. Write A Program To Print Following Outputs In C Language

```
      A
    B B B
  C C C C C
D D D D D D D
```

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12. Write A Program To Print Following Outputs In C Language

```
A B C D E E D C B A
A B C D     D C B A
A B C         C B A
A B             B A
A                 A
```

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13. Write A Program To Print Following Outputs In C Language

```
1
1 1
1 2 1
1 2 3 1
1 2 3 4 1
1 2 3 4 5 1
```

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14. Write A Program To Print Following Outputs In C Language

```
x
x x
x x x x
x x x x x x
x x x x x x x x
```

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15. Write A Program To Print Following Outputs In C Language

```
* * * * * *
*         *
*         *
* * * * * *
```

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16. Write A Program To Print Following Outputs In C Language

```
1
2 3
4 5 6
7 8 9 10
11 12 13 15
```

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17. Write A Program To Print Following Outputs In C Language

```
1
0 1
1 0 1
0 1 0 1
1 0 1 0 1
```

Click Here For Solution

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18. Write A Program To Print Following Outputs In C Language

```
*               *
* *           * *
* * *       * * *
* * * * * * * *
* * * * * * * *
* * *       * * *
* *           * *
*               *
```

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19. Write A Program To Print Following Outputs In C Language

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20. Write A Program To Print Following Outputs In C Language

```
      * * * * *
        *       *
       *       *
      *       *
  * * * * *
```

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21. Write A Program To Print Following Outputs In C Language

```
    1
   2 2
  3 3 3
```

```
    4 4 4 4
  5 5 5 5 5
```

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22. Write A Program To Print Following Outputs In C Language

```
        1
      2 1 2
    3 2 1 2 3
  4 3 2 1 2 3 4
5 4 3 2 1 2 3 4 5
```

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23. Write A Program To Print Following Outputs In C Language

```
*
* *
* * *
* * * *
* * * * *
* * * *
* * *
* *
*
```

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24. Write A Program To Print Following Outputs In C Language

```
        *
      * *
    * * *
  * * * *
* * * * *
  * * * *
    * * *
      * *
        *
```

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25. Write A Program To Print Following Outputs In C Language

```
* * * * * * * *
* * * * * * *
* * * * *
* * *
*
* * *
* * * * *
* * * * * * *
* * * * * * * *
```

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26. Write A Program To Print Following Outputs In C Language

```
* * * * * * * *
  * * * * * * *
    * * * * *
      * * *
        *
      * * *
    * * * * *
  * * * * * * *
* * * * * * * *
```

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. Write A Program To Print Following Outputs In C Language

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