

1. Accept dimensions of a cylinder and print the surface area and volume (Hint: surface area = $2\pi r^2 + 2\pi rh$, volume = $\pi r^2 h$)
2. Accept temperatures in Fahrenheit (F) and print it in Celsius(C) and Kelvin (K) (Hint: $C = 5/9(F - 32)$, $K = C + 273.15$)
3. Accept initial velocity (u), acceleration (a) and time (t). Print the final velocity (v) and the distance (s) travelled. (Hint: $v = u + at$, $s = ut + at^2$)
4. Accept inner and outer radius of a ring and print the perimeter and area of the ring (Hint: perimeter = $2\pi(a+b)$, area = $\pi(a^2 - b^2)$)
5. Accept two numbers and print arithmetic and harmonic mean of the two numbers (Hint: $AM = (a+b)/2$, $HM = ab/(a+b)$)
6. Accept three dimensions length (l), breadth(b) and height(h) of a cuboid and print surface area and volume (Hint : surface area = $2(lb + lh + bh)$, volume = lbh)
7. Accept a character from the keyboard and display its previous and next character in order. Ex. If the character entered is 'd', display "The previous character is c", "The next character is e".
8. Accept a character from the user and display its ASCII value.
9. Write a program to accept an integer and check if it is even or odd.
10. Write a program to accept three numbers and check whether the first is between the other two numbers. Ex: Input 20 10 30. Output: 20 is between 10 and 30
11. Accept a character as input and check whether the character is a digit. (Check if it is in the range '0' to '9' both inclusive)
12. Write a program to accept a number and check if it is divisible by 5 and 7.
13. Write a program, which accepts annual basic salary of an employee and calculates and displays the Income tax as per the following rules. Basic: < 1,50,000 Tax = 0 1,50,000 to 3,00,000 Tax = 20% > 3,00,000 Tax = 30%

14. Accept a lowercase character from the user and check whether the character is a vowel or consonant. (Hint: a,e,i,o,u are vowels)
15. Write a program to check whether given character is a digit or a character in lowercase or uppercase alphabet. (Hint ASCII value of digit is between 48 to 58 and Lowercase characters have ASCII values in the range of 97 to 122, uppercase is between 65 and 90)
16. Accept the time as hour, minute and seconds and check whether the time is valid. (Hint: $0 \leq \text{hour} < 24$ $0 \leq \text{minute} < 60$ $0 \leq \text{second} < 60$)
17. Accept any year as input through the keyboard. Write a program to check whether the year is a leap year or not. (Hint leap year is divisible by 4 and not by 100 or divisible by 400)
18. Write a program to accept an integer n and display all even numbers upto n.
19. Accept two integers x and y and calculate the sum of all integers between x and y (both inclusive)
20. Write a program to accept two integers x and n and compute x^n .
21. Write a program to accept an integer and check if it is prime or not.
22. Write a program to accept an integer and count the number of digits in the number.
23. Write a program to accept an integer and reverse the number.
Example: Input: 546, Output 645.
24. Write a program to accept a character, an integer n and display the next n characters.
25. Write a program to display the first n Fibonacci numbers. (1 1 2 3 5)
26. Write a program, which accepts a character from the user and checks if it is an alphabet, digit or punctuation symbol. If it is an alphabet, check if it is uppercase or lowercase and then change the case.

27. Write a menu driven program to perform the following operations till the user selects Exit. Accept appropriate data for each option. Use standard library functions from math.h

i. Sine ii. Cosine iii. log iv. ex v. Square Root vi. Exit

28. Accept two complex numbers from the user (real part, imaginary part). Write a menu driven program to perform the following operations till the user selects Exit.

i. ADD ii. SUBTRACT iii. MULTIPLY iv. EXIT

29. Write a function isEven, which accepts an integer as parameter and returns 1 if the number is even, and 0 otherwise. Use this function in main to accept n numbers and check if they are even or odd.

30. Write a function, which accepts a character and integer n as parameter and displays the next n characters.

31. Write a function, which accepts a character and integer n as parameter and displays the next n characters.

32. Write a recursive C function to calculate the sum of digits of a number. Use this function in main to accept a number and print sum of its digits.

33. Write a recursive C function to calculate the GCD of two numbers. Use this function in main. The GCD is calculated as :gcd(a,b) = a if b = 0 = gcd (b, a mod b) otherwise

34. Write a recursive C function to calculate x^y . (Do not use standard library function).

35. Write a recursive function to calculate the nth Fibonacci number. Use this function in main to display the first n Fibonacci numbers. The recursive definition of nth Fibonacci number is as follows: fib(n) = 1 if n = 1 or 2 = fib(n-2) + fib(n-1) if n>2

36. Write a recursive function to calculate the sum of digits of a number till you get a single digit number. Example: 961 -> 16 -> 5. (Note: Do not use a loop)

37. Write a recursive C function to print the digits of a number in reverse order. Use this function in main to accept a number and print the digits in reverse order separated by tab. Example 3456 6 5 4 3
(Hint: Recursiveprint(n) = print n if n is single digit number = print n % 10 + tab + Recursiveprint(n/10)
38. Write a program to accept n numbers in the range of 1 to 25 and count the frequency of occurrence of each number.
39. Write a function for Linear Search, which accepts an array of n elements and a key as parameters and returns the position of key in the array and -1 if the key is not found. Accept n numbers from the user, store them in an array. Accept the key to be searched and search it using this function. Display appropriate messages.
40. Write a function, which accepts an integer array and an integer as parameters and counts the occurrences of the number in the array.
41. Write a program to accept n numbers and store all prime numbers in an array called prime. Display this array.
42. Write a program to accept a decimal number and convert it to binary, octal and hexadecimal. Write separate functions.
43. Write a program to find the union and intersection of the two sets of integers (store it in two arrays).
44. Write a program to accept a matrix A of size m x n and store its transpose in matrix B. Display matrix B. Write separate functions.
45. Write a program to add and multiply two matrices. Write separate functions to accept, display, add and multiply the matrices. Perform necessary checks before adding and multiplying the matrices
46. Write a function which takes hours, minutes and seconds as parameters and an integer s and increments the time by s seconds. Accept time and seconds in main and Display the new time in main using the above function.
47. Write a program to display the elements of an array containing n integers in the reverse order using a pointer to the array.

48. Write a program to allocate memory dynamically for n integers such that the memory is initialized to 0. Accept the data from the user and find the range of the data elements.

49. Write a program that will accept a string and character to search. The program will call a function, which will search for the occurrence position of the character in the string and return its position. Function should return -1 if the character is not found in the string.

50. A palindrome is a string that reads the same-forward and reverse. Example: "madam" is a Palindrome. Write a function which accepts a string and returns 1 if the string is a palindrome and 0 otherwise. Use this function in main.

51. For the following standard functions, write corresponding user defined functions and write a menu driven program to use them.

strcat, strcmp, strrev,strupr

52. Write a program which accepts a sentence from the user and alters it as follows: Every space is replaced by *, case of all alphabets is reversed, digits are replaced by ?

53. Write a program to find the frequency of the character in the given string.

54. Create a structure student (roll number, name, marks of 3 subjects, percentage). Accept details of n students and write a menu driven program to perform the following operations. Write separate functions for the different options.

i) Search

ii) Display all student details

iii) Display all student having percentage > _____

v) Display student having maximum percentage

55. Create a structure employee (id, name, salary). Accept details of n employees and write a menu driven program to perform the following operations. Write separate functions for the different options.

i) Search by name

ii) Search by id

iii) Display all

iv) Display all employees having salary > _____

v) Display employee having maximum salary

56. Accept book details of 'n' books viz, book title, author, publisher and cost. Assign an accession numbers to each book in increasing order. (Use dynamic memory allocation).

Write a menu driven program for the following options.

- i. Books of a specific author
- ii. Books by a specific publisher
- iii. All books having cost \geq _____ .
- iv. Information about a particular book (accept the title)
- v. All books.

And that books program which I have given.