

Revision

2018 May 09

- Write C programs to calculate the value of following expressions.
 - $25 + 32/4 * 7 + 4 - 11 + 5$
 - $25 * 25 + 50 * 50 + 75 * 75$
- Find the value of $b^2 - 4ac$ for $x^2 - 3x - 2$ (written in the format $ax^2 + bx + c = 0$)
- Calculates the area of a Circle given its radius using the formula.
- Calculates the volume and surface area of sphere.
$$\text{Surface_area} = 4 * \text{Pi} * r^2$$
$$\text{Volume} = 4/3 * \text{Pi} * r^3$$
 where r is the radius of the sphere
- Calculate the age of a person when given the birth year as user input.
- Write a C program to display the prime numbers in a given range.
- Write a simple C program that stores three integer numbers. The program calculates the total and the average of these three numbers.
- Print first N natural numbers and calculates the sum of these numbers.
- Write a simple C program to find the minimum and maximum among three numbers.
- Write a function in C to check whether a given year is a leap year. (A common year has 365 days and a leap year 366 days, with the extra, or intercultural, day designated as February 29. A leap year occurs every four years).
- Write a C program to check if a number is an Armstrong number or not.
For an example $153 = 1*1*1 + 5*5*5 + 3*3*3$ is a Armstrong number of order n .
- When an integer number is given, display the multiplicative table for that particular number.
Ex:
Assume the given number is 5. Then,
$$\begin{array}{l} 5*1=5 \\ 5*2=10 \\ 5*3=15 \\ \dots\dots\dots \\ \dots\dots\dots \\ 5*12=60 \end{array}$$
- Write a simple C program to calculate the Sum of Series $1 + 1/2 + 1/3 + 1/4 + \dots + 1/N$.
- Write a C program to find the first three numbers which could be divided by both 8 and 12.

15. Calculates the simple interest given the principal amount, rate of interest and time. The formula to calculate the simple interest is: $\text{simple_interest} = (p * t * r) / 100$ where p is principal amount, t is time and r is rate of interest.
16. Prints the Fibonacci series of a given number using recursion . In Fibonacci series the first two numbers in the Fibonacci sequence are 0 and 1 and each subsequent number is the sum of the previous two.
For example : Fibonacci series is 0, 1, 1, 2, 3, 5, 8,13, 21.....
17. Write a simple C program to finds the GCD of the two numbers entered by the user.
18. Write a simple C program to finds the largest and smallest possible word in a given sentence.
19. The student registration number has the following format.
S/08/101
It consists of three parts.
Part 1: The character determines the Faculty (Ex: S)
Part 2: .The number represents the year (Ex:8)
Part 3: Registration Number (Ex: 101)
Write a C program to display the registration number when you are given the above three parts separately.
(Hint: Three parts of the registration number should be stored in three variables)
20. Write a C program to count the vowels and letters in a word given from keyboard. Then display the number of occurrence of each of the vowel a, e, l, o and u in the word, the total number of letters.
21. Write a C program to check whether the word “cord” is available in the following phrase.
“Cut your coat according to the cloth”
22. Write a C program to check whether a given String is a number.
Ex: String num= “1265”;
23. Mathematics teacher needs to find values for $\{1+2+3+...+n\}$, $\{1+1/2+1/3+...+1/n\}$, $n!$ ($n!=1*2*3*...*n$, $0!=1$ and $1!=1$) and nCr ($nCr=n!/(n-r)!r!$).
Develop a C program to calculate the above values. Your program must facilitate,
a) The selection of an expression for calculation. For example, 1 for expression 1, 2 for expression 2 and so on.
b) Once an option is selected, read input values from the keyboard appropriately. In other words, allow user to enter n for the first three expression, and n and r for the fourth expression.
c) Finally output the computed value for correct input and an error message for incorrect input.
Test your program with n=5 and r=3.
24. Students need to calculate their final grade point averages (GPA) and need to check the final class. Develop a C program to achieve the above task.
 - a. Your program should provide a prompt to read input values from keyboard for Grade and Number of credits.
 - b. From the 2nd iteration, your program needs to provide a prompt with the message “do you need to enter another subject?” If “Y” (yes), is entered the program needs to be continued.

- c. If "N" (no), is entered the program must output the following.
- Number of subjects that you have entered
 - Total number of credits
 - Final value of the GPA
 - Final Class

GP values for grades are as follows.

A=4.0, B=3.0, C=2.0, D=1.0, F=0.0

GPA is computed as follows.

$$\text{GPA} = \frac{\sum C_i A_i}{\sum C_i}$$

Where C_i is the number of credits,

A_i is the GP value.

Eg: 'A' for a 3 credit course 'B' for a 2 credit course and 'D' for a 1 credit course

$$\text{GPA} = (3 \times 4.0 + 2 \times 3.0 + 1 \times 1.0) / 3 + 2 + 1$$

Class value is computed according to the following criteria.

GPA range	Class
≥ 3.75	1st class
≥ 3.30 and < 3.75	2nd class upper
≥ 2.70 and < 3.30	2nd class lower
≥ 2.00 and < 2.70	Pass

25. Write a program to get a marks from the user and display the grades on screen as follows

100-75	A
74-60	B
59-45	C
44-35	D
35-0	F

26. A perfect number is a positive integer that is equal to the sum of its positive divisors, including 1 but excluding itself. A divisor of a number is one which divides the number exactly without remainder. Ex:

When you consider 6,

Divisors of 6 are 1, 2 and 3.
Then the total of divisors=1+2+3=6
Hence 6 is a perfect number.

Write a C program to find the first four perfect numbers.

27. Running speed of an athlete is measured, using the starting time and the ending time of the race. Each athlete is given a unique identification number and the corresponding times are stored in terms of hours, minutes and seconds in 24 hour time. Assume that the race is started when the start command is given and the athletes have to reach the victory target located 100m far from the beginning place. Suppose that there are three athletes participate for the race.

Ex:

The identification number =10
Starting hour=8
Starting minute=45
Starting second=10
Then starting time=8:45:10

Ending hour=9
Ending minute=15
Ending second=8
Then ending time=9:15:8

The time spent for the race is calculated by subtracting the starting time from the ending time.

For previous example the time spent is,

Number of seconds = 58
Number of minutes = 29
Number of hours = 0

Write a C program to represent the Athlete. The program should contain,

- The details of three Athletes.
- A method to calculate the time spent for the race, in terms of seconds
- A method to calculate the speed of the athlete
 $\text{speed(m/s)} = \text{Distance of the race (meters)} / \text{Time spent to complete the race (seconds)}$
- A method to find the winner of the race.

The winner is the one who finished the race with the minimum amount of time.

29. Write a C program to declare a tuple called student which consist with following member variables

student first_name
student last_name
mathematics marks
chemistry marks
physics marks

- Store the above details for 4 students.
- Write functions to Calculate the total marks, average ,grade for each student

- Average marks= (mathematics marks + chemistry marks + physics marks)/3
 - grade –average >=50 – p average <50 - f
- c. Write a function to calculate the class average marks for each subject , class average marks as follows

ex: calculating class total marks for each subject

class average marks (math) = (student1_math's marks + student2_math's marks + student3_math's marks + student4_math's marks)/number of students

class average= (class math's total marks + class chemistry total marks + class physics total marks)/3

- d. Display the results as follows

student 1:

student name :

Math's marks :

Physics marks :

Chemistry marks :

Average marks:

Grade :

Display details for all the students

Class details

Class average math's marks:

Class average chemistry marks :

Class average physics marks :

Class average

31) Convert following flow chart into a C program. Explain the output.



