Programming in C

Section 1 – Building block , I/O, Operators & Expressions

- Variable
- Data Type
- Input and Output
- Initialization Constant
- Escape Sequence
- Arithmetic Operator
- Relational & Logical Operator Increment & Decrement Operator
- Bitwise Operator
- Assignment Operator
- Conditional Expression
- Precedence & Order of Evaluation
- Type Conversion

*1. Write a program to print given format using printf function.
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*****
******
****
*2. Write a program to find out simple interest (SI).
*3. Write a program to find gross salary (Hint :-GS=BS+DA+TA).
*4. Write a program for swapping of two integer variables
using third variable.
*5. Write a program for swapping of two integer variables
Without using third variable.
*6. Write a program accepts a character and find out
corresponding ASCII value.
*7. Write a program to print last digit of a given number.
*8. Write a program to calculate Compound Interest
*9. Write a program to swap two numbers.

#1. Write a program to find out square of given number
#2. Write a program to find out area of circle
#3. Write a program accept 5 subject marks (Hint
P=67, C=87, M=90, H=98, E=88) and calculate total marks and
percentage.
#4 Write a program accepts three numbers from user and
calculate average of given three numbers.
#5. Write a program to accepts an amount in rupees (Hint Rs4567) and find out how many currency of Rs 2000 required. Also find remaining amount.
#6 C program to find power of a number using pow function
#7 Write a program to convert temperature from degree Fahrenheit to Celsius

#8 Write a program to convert days into years, weeks and months.
#9 Write a program to flip bits of a binary number using bitwise operator.
#10. Find sum of first , third and fifth digit of 6 digit number.

Section 2 – Flow Control (Conditional Statements)

- If
- If-Else
- Else-If
- Nested If-Else
- Ternary operator
- Switch

*1. Write a program to accepts a number from user and check given number is even or odd.

*2. Write a program to accepts two numbers from user and calculates first no is divisible by second or not.

*3. Write a program to accepts three numbers from user and calculate biggest number out of three numbers.

*4. Write a program to calculate whether character is in lowercase or uppercase.

*5. 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%
Gross Salary = Basic Salary + HRA + DA

*6. Write a program to show day of week according to user input by using switch case.
*7. Write a program to perform all arithmetic operations according to user choice (for ex-for addition press ⇞+⇟...) by using switch case.
*8. Write a program to find maximum between two numbers.
*9. Write a program to find maximum between three numbers using if-else and ternary operator.
*10.Write a program to calculate sum of digits of a number of three digit number using if-else
*11. Write a "Bonus Distribution Program" using logical operators. Bonus will be given to all those employees who have salary less than 20000 and tenure is more than 3 years.
*12 Write a code (using nested switch case) to suggest a diet plan (calories) to a consumer on behalf of inputs(gender and food time).

#1. Write a program that accepts the age of person, find out the person is eligible for voting or not.

#2. Write a program that accepts a number from user and find whether it is positive or negative or zero.

#3. Write a program to calculate whether year is leap year or not.

#4. Write a program that accepts five subjects' marks from user and calculate the total marks then calculate Percentage. Display message according to following condition:

Percentage >=60 then print message Grade A
Percentage >=50 then print message Grade B
Percentage >= 40 then print message Grade C
Percentage < 40 then print message Grade D

#5. Write a program for generating electricity Bill. Accept last month unit and current month unit from user, then calculate and print bill amount according to following condition:
0-150 charges 4 rs/unit
151-300 charges 6 rs/unit
301-500 charges 8rs/unit
>500 charges 10rs/unit

#6. Write a program to show name of month . Ask user to enter between 1 and 12. Use switch case.

#7. Write a program that accepts a character and check given character is vowel or not by using switch case.

#8. Write a program to check whether a number is even or odd using switch case.

#9. Write a program to find the greatest of four numbers entered by the user.

#10. Write a program to calculate the income tax of an employee.
The tax slabs according to annual salary are :
upto rs.300000 tax is 0%
from rs.300000 to rs. 500000 tax is 10%
from rs.500000 to rs. 1000000 tax is 15%
more than 100000 tax is 20%
Note: 250000 is exempted from tax criteria

#11. Write a code for call center (using nested switch case). E,g, 1 for prepaid, 2 for post paid. If 1 selected then show all the options for prepaid.

Section 3 – Flow Control(Loops)

- While Loop
- Do-While Loop
- Break & Continue
- For Loop
- Goto & Label

*1. Write a program to print "Code Better" five times by using loop.

*2. Write a program to print n natural number.

*3. Take any ten numbers from user and print sum and average of these numbers.

*4. Take any ten numbers from user and print sum and average of positive numbers.
*5. Take the numbers from user (until ten +ve numbers entered by the user), and print sum and average of these numbers.
*6. Write a program to calculate factorial of a given number.
*7.Write a program to calculate sum of digits of a number.
*8. Write a program to find out reverse of a given number.
*9. Write a program that accepts a number from user and check given number is Armstrong number or not.
*10. Write a program to find LCM of two numbers.
.e.g. LCM of 4 and 6 is 12
*11. Write a program to find HCF of two numbers.
.e.g. HCF of 16 and 24 is 8
*12. Write a program that accepts a number from user and check given number is prime number or not.
*13. Print Fibonacci series unto n terms 0,1,1,2,3,5,8,……

*14. Write a program to print given below patterns:

* * * * * * * * * * * * * * *	* * * * * * * * * *	A AB ABC ABCD ABCDE
* * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * *	1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5

#1. Write a program to calculate square of numbers between 1-10
#2. Write a program to calculate cube of numbers between m and n. Ask user to enter value of m and n.
#3. Write a program to print table of any given numbers. . e.g table of 5 is 5, 10, 15,…,50
#4. Write a program that accepts a number from user and check given number is palindrome number or not. e.g palindrome number is 16761.
#5. Write a program that accepts a number from user calculate factor of a given number.
.e.g. factors of 12 are 1,2,3,4,6,12
#6. Write a program that accepts a number from user check given number is perfect number or not. A perfect number is whose sum of factors is wise of that numbers. e.g. factor of 6 are 1,2,3,6 then sum os 1+2+3+6=12

#7. Write a program to accept N number from user and show how many number are even or odd.
#8. Write a program to accept N number from user and check and print only Prime numbers.
#9. Write a program to accept N number from user and check and print only Armstrong numbers.
#10. Write a program to accept N number from user and check and print only palindrome numbers.
#11. Write a program to calculate sum of given series: 1-2+3-4+5-6+7-8……n.
#12. Write a program to calculate sum of given series: x + x^2 + x^3 + …….+x^n

#13. Write a program to print given below patterns:

1 12 123 1234	5 54 543 5432 54321	5 4 3 2 1 5 4 3 2 1 5 4 3 2 1 5 4 3 2 1 5 4 3 2 1	1 1 2 1 2 3 1 2 3 4 1 2 3 4 5
1 1 1 1 2 1 1 3 3 1 1 4 6 4 1	***** * * * * * * *****	** **** ****** ******** ********** ********** ******** ****** **** **	* * ** ** *** *** **** **** ********** ********** **** **** *** *** ** ** * *

#14. print first letter of your name using start pattern

Section 4 - Functions

- Function Types
- Function Parameters
- Function Declaration
- Call by value & Call by address/reference
- Scope, Visibility & Lifetime of Variable
- Static & Register Variable
- Recursion
- Storage Class

*1. Write a program to find cube of any number using function.
*2. Write a program to check whether a number is even or odd using functions.

*3. Write a program to find sum of digits of a given number using recursion.

*4. Write a program to check whether a number is palindrome or not using recursion.

#1. Write a program to check the prime number using function with argument and no return type.

#2. Write a program to calculate factorial using function with argument and with return type.

#3. Write a program to print all even or odd numbers in given range using recursion.

#4. Write a program to find LCM of two numbers using recursion.

#5. Write a C program to print all natural numbers between 1 to n using recursion.

Section 5 - Array

- 1-D Array
- 2-D array
- Pass Array to Function, Return Array from function

*1. Write a program to read and print elements of array.

*2. Write a program to find sum of all array elements

*3. Write a program to find maximum and minimum element in an array

*4. Write a program to insert an element in an array.

*5. Write a program to add two matrices.

*6. Write a program to search an element in an array.

*7. Write a program to sort an array .

*8 Write a program to reverse elements of an array

#1. Write a program to count total number of even and odd elements in an array.

#2. Write a program to copy all elements from an array to another array.

#3. Write a C program to count total number of duplicate elements in an array.

#4. Write a C program to merge two array to third array.

#5. Write a C program to sort array elements in ascending or descending order.

#6. Write a C program to multiply two matrices.

#7. Write a C program to check whether two matrices are equal or not.

#8. Create an array of size 3x10 containing multiplication tables of the numbers 2,7 and 9, respectively.

#9 Remove all duplicate occurring elements from array.

#10 Write a program to print words representation of entered number. e.g. if entered number is 245983 then result should be Two Lac Forty Five Thousand Nine Hundred Eighty Three

#11. Ask user to enter any four numbers between 1 to 9 and print all numbers made using combination of these four number. Do not repeat any digit in the same number.

#12. Find 2nd highest number from and 2nd minimum from array of n elements.

Section 6 - Pointers

- Pointer Declaration
- Pointer & Address
- Pointer to Pointer
- Pointer Arithmetic
- Pointer & Function Argument
- Pointer & Array
- Pointer Array
- Pointer to Function
- Command Line Argument

*1. Write a program to create, initialize and use pointers.

*2. Write a program to add two numbers using pointers.

*3. Write a program to swap two numbers using pointers.

*4. Write a program to input and print array elements using pointer.

#1. Write a program to copy one array to another using pointer.

#2. Write a program to swap two arrays using pointers.

#3. Write a program to reverse an array using pointers.

#4. Write a program to search an element in array using pointers.

#5. Write a C program to return multiple values from function using pointers.

Section 7 - Structures

- Declaring Structure
- Nested Structures
- Structure & Function
- Array of Structure
- Pointer to Structure
- Self-Referential Structure
- Typedef
- Union
- Enum

*1. Write a program to create, declare and initialize structure.

*2. Write a program to store and print the roll no., name, age and marks of a student using structures.

*3. Enter the marks of 5 students in Chemistry, Mathematics and Physics (each out of 100) using a structure named Marks having elements roll no., name, chem_marks, maths_marks and phy_marks and then display the percentage of each student.

*4. Write a C Program to add two distances in inch-feet system using Structure

*5. Write a program for passing structures as function arguments and returning a structure from a function.

*6. Write a program to declare, initialize an union, example of union.

#1. Write a C program to create Book Details using structure

#2. Write a C Program to Calculate Difference between Two Time Periods

#3. Write a program to store and print the roll no., name, age, address and marks of 15 students using structure.

#4. Write a structure to store the roll no., name, age (between 11 to 14) and address of students (more than 10). Store the information of the students.

1 - Write a function to print the names of all the students having age 14.
2 - Write another function to print the names of all the students having even roll no.
3 - Write another function to display the details of the student whose roll no is given (i.e. roll no. entered by the user).

#5. Create a list of dictionary to store six product details (pid, name, quantity, price). Print in Alphabetical order by product name

#6. Write program to extract individual bytes from an unsigned int using union.

Section 8 - Strings

- Declaring Strings in C
- Strings Input and Output functions
- String Comparison
- String Functions

*1. Write a C program to find length of a string.

*2. Write a program to take a string as an input from the user using %c and %s. Confirm that the strings are equal.

*3. Write a C program to find total number of alphabets, digits or special character in a string.

*4. Write a C program to convert lowercase string to uppercase.

*5. Write a C program to find reverse of a string.

#1. Write a program to convert string into lowercase without any library function.

#2. Write a program to accept a string and check if it is palindrome or not?

#3. Write a program to count total number of vowels and consonants in a string.

#4. Write a program to find first occurrence of a character in a given string.

#5. Write a program to toggle case of each character of a string.

Section 9 – Dynamic Memory Allocation

- Compile time Vs Run time
- Dynamic Memory Allocation
- Memory Allocation functions - calloc, malloc, realloc, free

*1. Write a program to create memory for int, char and float variable at run time.

*2. Write a program to dynamically create an array of size 6 capable of storing 6 integers.

*3. C program to read and print the student details using structure and Dynamic Memory Allocation.

#1. Write a program to input and print text using Dynamic Memory Allocation.

#2. Create an array dynamically capable of storing 5 integers. Now use realloc so that it can now store 10 integers.

#3. C program to read and print the N student details using structure and Dynamic Memory Allocation.

Section 10 – File Management

- File Creation & modes
- File pointer
- File functions
- File Input / Output
- Read/ Write structure to a file
- File merging / copying

*1. Write a program to read a text file character by character and write its content on console.

*2. Write a program to read numbers from a file and write even, odd and prime numbers to separate file.

*3. Write a C program to copy contents from one file to another file.

*4. Write a program to write multiple lines in a text file

#1. Take name and salary of two employees as input from the user and write them to a text file

#2. Write a program to read three integers from a file.

#3. Write a program to print source code of same program.

#4. Write a program to merge two file to third file.

#5. Write a program to count a number of words and characters in a file

Mini Project Ideas

1. Create a Student Management System to store , delete, update list records of student. Store rollno, name, course, semester , percentage
2. Create BankAccount Management App to store , delete, update, list, deposit, withdraw, search records of Bank Account. Store accNo, customer name, balance, account type
3. Create CodeBetter enquiry system to store, delete, update, list, search enquiry details. Store enquiry details like candidate name, contact, address, course selected, course fee.