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Semester: I
Course Name: Lab on C Programming - I
No. of Credits: 2

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Objective: The objective of this course is to develop logical abilities of students using C language as a vehicle. Students will be exposed to C programming language with an emphasis on semantics and problem solving.

Learning Outcomes:
1. provide foundation for programming
2. enable the students to analyze and efficiently solve the problems using C language

Prerequisites: XII Level Mathematics

Text Book: E. Balagurusamy, "Programming with C"

List of Laboratory Experiments:

Following is the list of problems expected to be solved using C Programming. As this list represents example problems; the problems discussed and given to solve are not restricts only to this.

1. Write a program to display "Welcome to Bharati Vidyapeeth University" on console.
2. Write a program to calculate the income-tax of an employee, where taxable income details are entered through the keyboard.
3. Write a program to calculate electricity-bill for a customer, where unit details are entered through the keyboard.
4. Write a program to display factorial of a given number.
5. Write a program to calculate a^b, where a and b are entered through the keyboard.
6. Write a program to check whether a given number is prime or not.
7. Write a program to find out series of prime numbers from a given range, where the range is entered by user.
8. Write a program to check whether a given number is Armstrong number or not.
9. Write a program to check whether a given number is Perfect or not.
10. Write a program to display all numbers between 1 and 100, which are divisible by 7.
11. Write a program to display the absent digits from a given number.
12. Write a program to print Fibonacci sequence up to a given number.
13. Write a program to convert decimal number to its binary, octal and hexadecimal equivalents.
14. Write a program to convert binary number to its decimal equivalent.
15. Write a program to reverse the digits of an integer.
16. Write a program to find LCM and GCD of given two integers.
17. Write a program to calculate prime factors of a given number.
18. Write a program to display sum of digits of given integer number.
19. Write a program to input a five digit number and display its last and first digits.
20. Write a program to convert rupees into thousands, hundreds and rupees.

21. Write a program to display the following pattern:

```
111111
 22222
  3333
   444
    55
     6
```

22. Write a program to display the following pattern:

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

23. Write a program to display Floyd's Triangle.
24. Write a function MaximumOfThree() which returns the maximum of its three parameters.
25. Write a function MinimumOfThree() which returns the minimum of its three parameters.
26. Write a function Factorial() to find factorial of given number.
27. Write a function IsPrime() to check whether a given parameter is prime or not (return 0 if prime and 1 if not).
28. Write a function SimpleInterest() to find simple interest on principal amount for N years with R rate of interest.
29. Write a function NoOfDigits() to return number of digits in given number.
30. Write a function Swap() to interchange the values of two variables.
31. Write a menu driven program using functions to calculate Square, Cube and Square-root of a given number.
32. Write a menu driven program using functions to convert a decimal number to its binary, octal and hexadecimal equivalents: DecimalToBinary(), DecimalToOctal(), DecimalToHex()
33. Write a function Pallindrome() to check whether a given number is palindrome or not (return 0 if palindrome and 1 if not).
34. Write a function to evaluate the following series up to n terms;
$1/1!+2/2!+\ldots\ldots+n/n!$
35. Write a function Sin() to evaluate the following series up to first ten terms;
$Sin(x) = x - (x^3/3!) + (x^5/5!) - (x^7/7!) + \ldots\ldots$
36. Write a function to check whether a given number is sum of all of its divisors, i.e. n is sum of all t such that $1<=t<n$, and t divides n.
37. Write a function to calculate ^nC_m.
38. Write a recursive function to find GCD of given two integers.
39. Write a recursive function to calculate factorial of a given number.
40. Write a recursive function to display first N terms of Fibonacci sequence.
41. Write a recursive function to compute sum of digits of a given integer number.
42. If A is an array of N elements then write recursive function to display the Power-set of A.
43. Write a program to copy the contents of one array into another in reverse order.
44. Write a menu driven program to insert and delete elements to an array of size N
45. Write a program to sort elements stored in an array.

46. Write a program to display all array elements in ascending order using selection sort.
47. Write a program to display all array elements in descending order using bubble sort.
48. Write a program to calculate largest and second largest from a set of N numbers.
49. Write a program to perform following operations on a matrix; addition, subtraction, multiplication, norm of matrix, saddle point, magic square, inverse and transpose
50. A square matrix, one having the same number of rows and columns, is called a diagonal matrix if it's only non-zero elements are on the diagonal from upper left to lower right. It is called upper triangular matrix if all elements bellow the diagonal are zeroes, and lower triangular matrix, if all the elements above the diagonal are zeroes. Write a program that reads a matrix and determines if it is one of the above mentioned three special matrices.
51. Write a program to read a line of characters from the user and count number of lines, words, spaces, tabs and characters in it.
52. Write a program that replaces two or more consecutive blanks in a string by a single blank. e.g. if the input is "Welcome   to   BVU" the output should be "Welcome to BVU".