

BVRITHYDERABAD

College of Engineering for Women

The Temple for Women Empowerment & Human Values

Approved by AICTE & Affiliated to JNTUH, Hyderabad
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PPS Lab Record	
Department	Basic Science and Humanities
Year/Semester	I B.Tech I Semester
Subject	Programming for Problem Solving Lab
Academic Year(Regulation)	2023-24(BH23)
Subject Code	BH108ES



Vision
To emerge as the best among the institutes of technology and research in the country dedicated to the cause of promoting quality technical education.

Mission
<p>At BVRITH , we Strive to</p> <ul style="list-style-type: none"> ➤ Achieve academic excellence through innovative learning practices. ➤ Enhance intellectual ability and technical competency for a successful career. ➤ Encourage research and innovation. ➤ Nurture student towards holistic development with emphasis on leadership skills Life skills and human values.

SYLLABUS

S.No	PROGRAMS	Date
	Practice sessions: a. Write a simple program that prints the results of all the operators available in C (including pre/post increment, bitwise and/or/not, etc.). Read required operand values from standard input.	
	b. Write a simple program that converts one given data type to another using auto conversion and casting. Take the values from standard input.	
	Simple numeric problems: a. Write a program to find the max and min from the three numbers.	
	b. Write the program for the simple, compound interest.	
	c. Write program that declares Class awarded for a given percentage of marks, where mark <40% = Failed, 40% to <60% = Second class, 60% to <70% = First class, >= 70% = Distinction. Read percentage from standard input.	
	d. Write a program that prints a multiplication table for a given number and the number of rows in the table. For example, for a number 5 and rows = 3, the output should be: 5 x 1 = 5 5 x 2 = 10 5 x 3 = 15	
	e. Write a program that shows the binary equivalent of a given positive number between 0 to 255.	
	Expression Evaluation: a. A building has 10 floors with a floor height of 3 meters each. A ball is dropped from the top of the building. Find the time taken by the ball to reach each floor. (Use the formula $s = ut + \frac{1}{2}at^2$ where u and a are the initial velocity in m/sec (= 0) and acceleration in m/sec^2 (= 9.8 m/s^2)).	

	b. Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +, -, *, /, % and use Switch Statement)	
	c. Write a program that finds if a given number is a prime number	
	d. Write a C program to find the sum of individual digits of a positive integer and test given number is palindrome	
	e. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.	
	f. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.	
	g. Write a C program to find the roots of a Quadratic equation.	
	h. Write a C program to calculate the following, where x is a fractional value. $1 - x / 2 + x^2 / 4 - x^3 / 6$	
	i. Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression: $1 + x + x^2 + x^3 + \dots + x^n$. For example: if n is 3 and x is 5, then the program computes $1 + 5 + 25 + 125$	
	Arrays and Pointers and Functions: a. Write a C program to find the minimum, maximum and average in an array of integers.	
	b. Write a functions to compute mean, variance, Standard Deviation, sorting of n elements in single dimension array.	

	<p>c. Write a C program that uses functions to perform the following: Addition of Two Matrices Multiplication of Two Matrices Transpose of a matrix with memory dynamically allocated for the new matrix as row and column counts may not be same.</p>	
	<p>d. Write C programs that use both recursive and non-recursive functions To find the factorial of a given integer. To find the GCD (greatest common divisor) of two given integers. To find x^n</p>	
	<p>e. Write a program for reading elements using pointer in to array and display the values using array.</p>	
	<p>f. Write a program for display values reverse order from array using pointer.</p>	
	<p>g. Write a program through pointer variable to sum of n elements from array.</p>	
	<p>Files:</p>	
	<p>a. Write a C program to display the contents of a file to standard output device.</p>	
	<p>b. Write a C program which copies one file to another, replacing all lowercase characters with their uppercase equivalents.</p>	
	<p>c. Write a C program to count the number of times a character occurs in a text file. The file name and the character are supplied as command line arguments.</p>	
	<p>d. Write a C program that does the following: It should first create a binary file and store 10 integers, where the file name and 10 values are given in the command line. (hint: convert the strings using atoi function) Now the program asks for an index and a value from the user and the value at that index should be changed to the new value in the file. (hint: use fseek function) The program should then read all 10 values and print them back.</p>	
	<p>e. Write a C program to merge two files in to a third file (i.e., the contents of the first file followed by those of the second are put in the third file).</p>	

	<p>Strings:</p> <p>a. Write a C program to convert a Roman numeral ranging from I to L to its decimal equivalent.</p>	
	<p>b. Write a C program that converts a number ranging from 1 to 50 to Roman equivalent</p>	
	<p>c. Write a C program that uses functions to perform the following operations: To insert a sub-string in to a given main string from a given position. To delete n Characters from a given position in a given string.</p>	
	<p>d. Write a C program to determine if the given string is a palindrome or not (Spelled same in both directions with or without a meaning like madam, civic, noon, abeba, etc.)</p>	
	<p>e. Write a C program that displays the position of a character ch in the strings or -1 if S doesn't contain ch.</p>	
	<p>f. Write a C program to count the lines, words and characters in a given text.</p>	
	<p>Miscellaneous:</p> <p>a. Write a menu driven C program that allows a user to enter n numbers and then choose between finding the smallest, largest, sum, or average. The menu and all the choices are to be functions. Use a switch statement to determine what action to take. Display an error message if an invalid choice is entered.</p>	
	<p>b. Write a C program to construct a pyramid of numbers as follows:</p> <pre> 1 * 1 1 * 12 ** 23 22 ** 123 *** 456 333 *** 4 4 44 ** *</pre>	
	<p>Sorting and Searching:</p> <p>a. Write a C program that uses non recursive function to search for a Key value in a given list of integers using linear search method.</p>	

	b. Write a C program that uses non recursive function to search for a Key value in a given sorted list of integers using binary search method.	
	c. Write a C program that implements the Bubble sort method to sort a given list of integers in ascending order.	
	d. Write a C program that sorts the given array of integers using selection sort in descending order	
	e. Write a C program that sorts the given array of integers using insertion sort in ascending order	
	f. Write a C program that sorts a given array of names	

Programs beyond Syllabus.

- Given an integer n , for every integer $i \leq n$, the task is to print "FizzBuzz" if i is divisible by 3 and 5, "Fizz" if i is divisible by 3, "Buzz" if i is divisible by 5 or i (as a string) if none of the conditions are true.
- Starting with any positive integer N , Collatz sequence is defined corresponding to n as the numbers formed by the following operations :

 If n is even, then $n = n / 2$.
 If n is odd, then $n = 3*n + 1$.
 Repeat above steps, until it becomes 1.
- Program to check whether the number is strong or not.
 A number can be said as a strong number when the sum of the factorial of the individual digits is equal to the number.
 For example, 145 is a strong number.
- Program to check whether the given number is the Perfect number .
 A perfect number is a positive integer that is equal to the sum of its positive divisors, excluding the number itself.
- Write a program to print lower triangular matrix and upper triangular matrix of an Array.
 Lower Triangular Matrix :A square matrix is called lower triangular if all the entries above the main diagonal are zero.
 Upper Triangular Matrix:A square matrix is called upper triangular if all the entries below the main diagonal are zero.
- This C program uses a recursive function to solve the Tower of Hanoi puzzle. The Tower of Hanoi is a mathematical puzzle that consists of three rods and a number of disks of different sizes, which can slide onto any rod. The puzzle begins with all disks stacked on one rod in decreasing order of size, and the task is to move the entire stack to another rod, obeying the following rules:
 - Rules of Tower of Hanoi Puzzle:
 - Only one disk can be moved at a time.
 - Each move consists of taking the topmost disk from one of the stacks and placing it on top of another stack or on an empty rod.
 - No disk may be placed on top of a disk that is smaller than it.

7. Write program to store details of 60 students with following members Name, roll number , 6 subjects marks of each student, display Student name ,roll number with their average marks.
8. Write a program to find out string is palindrome or not using pointers.
9. Write a program to implement linear search in array of numbers ,searching for first occurrence of prime number ,if not return false.
10. Write a program to take list of N Numbers ,separate even and odd numbers and put them in two appropriate file (even.txt and odd.txt).