Lab Manual for Structured programming Sessional(CSE-142)

Lab No.	Lecture Title	Lecture Details	References	Online Judge's problems
01	Introductory Class	Overview of C programming,Importance of C programming, Some basic programs 1. A C program to print your name. 2. A C program to print your address and personal information. 3. A C program to calculate the area of a circle. 4. A C program to calculate the perimeter of a triangle etc.	Reference Problems : Ref book 1 page-20	
02	Constants, Variables and Data types	Characters,C Tokens,keywords,Identifiers,constants,variables,data types and their uses in programs. 1. Write a C program to enter two numbers and find their sum. 2. Write a C program to enter two numbers and perform all arithmetic operations. 3. Write a C program to enter length and breadth of a rectangle and find its perimeter. 4. Write a C program to enter length and breadth of a rectangle and find its area. 5. Write a C program to enter radius of a circle and find its diameter, circumference and area. 6. Write a C program to enter length in centimeter and convert it into meter and kilometer. 7. Write a C program to enter temperature in °Celsius and convert it into °Fahrenheit.	Reference Problems : http://www.codeforwin.in/2015/05/basic-programming-practice-problems.html Ref book 1 page-50	

		8. Write a C program to enter temperature in Fahrenheit(°F) and convert it into Celsius(°C) 9. Write a C program to convert days into years, weeks and days. 10. Write a C program to find power of any number x ^ y. 11. Write a C program to enter any number and calculate its square root. 12. Write a C program to enter two angles of a triangle and find the third angle. 13. Write a C program to enter base and height of a triangle and find its area. 14. Write a C program to calculate area of an equilateral triangle. 15. Write a C program to enter marks of five subjects and calculate total, average and percentage. 16. Write a C program to enter P, T, R and calculate Simple Interest. 17. Write a C program to enter P, T, R and calculate Compound Interest.		
03	Operators, Expressions and Input output operations	Various types of operators and their uses,Details about Conditional Operators,Inut output related problems. 1. Write a C program to find maximum between two numbers using conditional/ternary operator. 2. Write a C program to find maximum between three numbers using conditional/ternary operator.	Reference Problems : http://www.codeforwin.in/2015/06/conditional-operator-programming-	

		3. Write a C program to check whether a number is even or odd using conditional/ternary operator. 4. Write a C program to check whether year is leap year or not using conditional/ternary operator. 5. Write a C program to check whether character is an alphabet or not using conditional/ternary operator. 6. Write a C program to check Least Significant Bit (LSB) of a number is set or not. 7. Write a C program to check Most Significant Bit (MSB) of a number is set or not. 8. Write a C program to get nth bit of a number. 9. Write a C program to set nth bit of a number. 10. Write a C program to clear nth bit of a number. 11. Write a C program to toggle nth bit of a number. 12. Write a C program to get highest set bit of a number. 13. Write a C program to get lowest set bit of a number. 14. Write a C program to count trailing zeros in a binary number. 15. Write a C program to count leading zeros in a binary number. 16. Write a C program to flip bits of a binary number using bitwise operator. 17. Write a C program to total number of zeros and ones in a binary number. 18. Write a C program to convert decimal to binary number system using bitwise operator.	exercise.html http://www.codeforwin.in/2016/01/bitwise-operator-programming-exercises-and-solutions-in-c.html http://www.worldbestlearningcenter.com/index_files/c_operators_increment_decrement_exercises.htm Ref book 1 page-80,110	

<table>
<tr>
<td></td>
<td></td>
<td>19. Write a C program to swap two numbers using bitwise operator.
20. Write a C program to check whether a number is even or odd using bitwise operator.</td>
<td></td>
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</tr>
<tr>
<td>04</td>
<td>Decision Making : If Else,Switch</td>
<td>Various types of If else,problems related if else and switch statement
1. Write a C program to find maximum between two numbers.
2. Write a C program to find maximum between three numbers.
3. Write a C program to check whether a number is negative, positive or zero.
4. Write a C program to check whether a number is divisible by 5 and 11 or not.
5. Write a C program to check whether a number is even or odd.
6. Write a C program to check whether a year is leap year or not.
7. Write a C program to check whether a character is alphabet or not.
8. Write a C program to input any alphabet and check whether it is vowel or consonant.
9. Write a C program to input any character and check whether it is alphabet, digit or special character.
10. Write a C program to check whether a character is uppercase or lowercase alphabet.
11. Write a C program to input week number and print week day.
12. Write a C program to input month number and print number of days in that month.
13. Write a C program to count total number of notes in given amount.</td>
<td>Reference Problems : http://www.codeforwin.in/2015/05/if-else-programming-practice.html http://www.codeforwin.in/2015/06/switch-case-programming-exercise.html Ref book 1 page-147</td>
<td>
<table>
<tr><td>LightOJ 1000</td><td>Greetings from LightOJ</td></tr>
<tr><td>LightOJ 1001</td><td>Opposite Task</td></tr>
<tr><td>UVA 272</td><td>TEX Quotes</td></tr>
<tr><td>UVA 10071</td><td>Back to High School Physics</td></tr>
<tr><td>UVA 10055</td><td>Hashmat the Brave Warrior</td></tr>
<tr><td>UVA 11172</td><td>Relational Operator</td></tr>
<tr><td>UVA 11479</td><td>Is this the easiest problem?</td></tr>
<tr><td>UVA 11455</td><td>Behold my quadrangle</td></tr>
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		14. Write a C program to input angles of a triangle and check whether triangle is valid or not. 15. Write a C program to input all sides of a triangle and check whether triangle is valid or not. 16. Write a C program to check whether the triangle is equilateral, isosceles or scalene triangle. 17. Write a C program to find all roots of a quadratic equation. 18. Write a C program to calculate profit or loss. 19. Write a C program to input marks of five subjects Physics, Chemistry, Biology, Mathematics and Computer. Calculate percentage and grade according to following: Percentage >= 90% : Grade A Percentage >= 80% : Grade B Percentage >= 70% : Grade C Percentage >= 60% : Grade D Percentage >= 40% : Grade E Percentage < 40% : Grade F 20. 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% 21. Write a C program to input electricity unit charges and calculate total electricity bill according to the given condition: For first 50 units Rs. 0.50/unit		

UVA 11185	Ternary
UVA 11854	Egypt
UVA 11727	Cost Cutting
UVA 11677	Alarm Clock
UVA 11547	Automatic Answer
UVA 11417	GCD
UVA 10783	Odd Sum
UVA 10082	WERTYU
UVA 113	Power of Cryptography
UVA 10368	Euclid's Game

<table>
<tr>
<td></td>
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<td>For next 100 units Rs. 0.75/unit
For next 100 units Rs. 1.20/unit
For unit above 250 Rs. 1.50/unit
An additional surcharge of 20% is added to the bill
22. Write a C program to print day of week name using switch case.
23. Write a C program print total number of days in a month using switch case.
24. Write a C program to check whether an alphabet is vowel or consonant using switch case.
25. Write a C program to find maximum between two numbers using switch case.
26. Write a C program to check whether a number is even or odd using switch case.
27. Write a C program to find roots of a quadratic equation using switch case.
28. Write a C program to create Simple Calculator using switch case</td>
<td></td>
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<table>
<tr><td>UVA 12372</td><td>Packing for Holiday</td></tr>
<tr><td>UVA 11984</td><td>A Change in Thermal Unit</td></tr>
<tr><td>UVA 11936</td><td>The Lazy Lumberjacks</td></tr>
<tr><td>UVA 11805</td><td>Bafana Bafana</td></tr>
<tr><td>UVA 11530</td><td>SMS Typing</td></tr>
<tr><td>UVA 11764</td><td>Jumping Mario</td></tr>
<tr><td>UVA 11219</td><td>How old are you?</td></tr>
<tr><td>UVA 10931</td><td>Parity</td></tr>
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<tr>
<td>05</td>
<td>Decision Making : Looping</td>
<td>Different types of Loops,Problems using various types of loops
1. Write a C program to print all natural numbers from 1 to n. - using while loop</td>
<td>Reference Problems : http://www.codefor</td>
<td>
<table>
<tr><td>CodeForces 451A</td><td>Game With Sticks</td></tr>
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		2. Write a C program to print all natural numbers in reverse (from n to 1). - using while loop 3. Write a C program to print all alphabets from a to z. - using while loop 4. Write a C program to print all even numbers between 1 to 100. - using while loop 5. Write a C program to print all odd number between 1 to 100. 6. Write a C program to find sum of all natural numbers between 1 to n. 7. Write a C program to find sum of all even numbers between 1 to n. 8. Write a C program to find sum of all odd numbers between 1 to n. 9. Write a C program to print multiplication table of any number. 10. Write a C program to count number of digits in any number. 11. Write a C program to find first and last digit of any number. 12. Write a C program to find sum of first and last digit of any number. 13. Write a C program to swap first and last digits of any number. 14. Write a C program to calculate sum of digits of any number.	win.in/2015/06/for-do-while-loop-programming-exercises.html Ref book 1 page-188	CodeForces 158A	Next Round
				CodeForces 96A	Football
				CodeForces 263A	Beautiful Matrix
				CodeForces 467A	George and Accommodation
				CodeForces 148A	Insomnia cure
				CodeForces 486A	Calculating Function
				CodeForces 4A	Watermelon
				CodeForces 50A	Domino piling
				LightOJ 1001	Opposite Task
				CodeForces 492A	Vanya and Cubes

		15. Write a C program to calculate product of digits of any number. 16. Write a C program to enter any number and print its reverse. 17. Write a C program to enter any number and check whether the number is palindrome or not. 18. Write a C program to find frequency of each digit in a given integer. 19. Write a C program to enter any number and print it in words. 20. Write a C program to print all ASCII character with their values. 21. Write a C program to find power of any number using for loop. 22. Write a C program to enter any number and print all factors of the number. 23. Write a C program to enter any number and calculate its factorial. 24. Write a C program to find HCF (GCD) of two numbers. 25. Write a C program to find LCM of two numbers. 26. Write a C program to check whether a number is Prime number or not. 27. Write a C program to print all Prime numbers between 1 to n.		<table><tr><td>LightOJ 1182</td><td>Parity</td></tr><tr><td>LightOJ 1015</td><td>Brush (I)</td></tr><tr><td>CodeForces 282A</td><td>Bit++</td></tr><tr><td>CodeForces 136A</td><td>Presents</td></tr><tr><td>CodeForces 379A</td><td>New Year Candles</td></tr><tr><td>CodeForces 405A</td><td>Gravity Flip</td></tr></table>

		28. Write a C program to find sum of all prime numbers between 1 to n. 29. Write a C program to enter any number and print its prime factors. 30. Write a C program to check whether a number is Armstrong number or not. 31. Write a C program to print all Armstrong numbers between 1 to n. 32. Write a C program to check whether a number is Perfect number or not. 33. Write a C program to print all Perfect numbers between 1 to n. 34. Write a C program to check whether a number is Strong number or not. 35. Write a C program to print all Strong numbers between 1 to n. 36. Write a C program to print Fibonacci series up to n terms. 37. Write a C program to find one's complement of a binary number. 38. Write a C program to find two's complement of a binary number. 39. Write a C program to convert Binary to Octal number system.		

		40. Write a C program to convert Binary to Decimal number system. 41. Write a C program to convert Binary to Hexadecimal number system. 42. Write a C program to convert Octal to Binary number system. 43. Write a C program to convert Octal to Decimal number system. 44. Write a C program to convert Octal to Hexadecimal number system. 45. Write a C program to convert Decimal to Binary number system. 46. Write a C program to convert Decimal to Octal number system. 47. Write a C program to convert Decimal to Hexadecimal number system. 48. Write a C program to convert Hexadecimal to Binary number system. 49. Write a C program to convert Hexadecimal to Octal number system. 50. Write a C program to convert Hexadecimal to Decimal number system. 51. Write a C program to print Pascal triangle upto n rows.		

06	Looping (Continued) : Special Cases	Star pattern Programming,Number Pattern Programming ***** ***** ***** ***** ***** 1. Square ***** * * * * * * ***** 2. Hollow Square ***** ***** ***** ***** ***** 3. Rhombus (01) *****	Reference Problems : http://www.codeforwin.in/2015/07/star-patterns-program-in-c.html http://www.codeforwin.in/2016/06/number-pattern-programs-in-c.html	

		* * * * * * ***** 4. Hollow Rhombus (30) ***** ***** ***** ***** ***** 5. Mirrored Rhombus (02) ***** * * * * * * ***** 6. Hollow mirrored Rhombus (29) * ** ***		

		**** ***** 7. Right triangle (03) * ** * * * * ***** 8. Hollow right triangle (28) * ** *** **** ***** 9. Mirrored right triangle (04) * ** * * * *		

		***** 10. Hollow mirrored right triangle (27) ***** **** *** ** * 11. Inverted right triangle (06) ***** * * * * ** * 12. Hollow inverted right triangle (26)		

		***** **** *** ** * 13. Inverted mirrored right triangle (07) ***** * * * * ** * 14. Hollow inverted mirrored right triangle (25) * *** ***** ******* ********* 15. Pyramid (Equilateral triangle) (08) *		

		* * * * * * ********* 16. Hollow Pyramid(24) ********* ******* ***** *** * 17. Inverted Pyramid (09) ********* * * * * * * * 18. Hollow inverted pyramid (23)		

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		***
		**
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		19. Half diamond (10)
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		  ****
		*****
		  ****
		  ***
		  **
		  *
		
		20. Mirrored
		half diamond (22)		

		* *** ***** ******* ********* ******* ***** *** * 21. Diamond (11) ********** **** **** *** *** ** ** * * * * ** ** *** *** **** **** **********		

		22. Hollow diamond (21) ***** **** *** ** * ** *** **** ***** 23. Right Arrow (13) ***** **** *** ** * ** *** **** *****		

		24. Left arrow (20) + + + + +++++++++ + + + + 25. Plus Star pattern (14) * * * * * * * * * * * * * * * * *		

26. X Star pattern (19)

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*  *
*  *
*  *
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*  *
*  *
*  *
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27. Eight (8) Star pattern (15)

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  *****    *****
 *******  *******
********* *********
*******************
 *****************
  ***************
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		********** ********** ********* ******* ***** *** * 28. Heart Star pattern 1 (18) ***** ***** ******* ******* ********* ********* *****ILove CUET**** ********** ********** ********** ********** ********* ******* ***** *** * 29. Heart Star pattern 2(16) 11111		

		11111 11111 11111 11111 Number pattern 1 11111 00000 11111 00000 11111 Number pattern 2 01010 01010 01010 01010 01010 Number pattern 3 11111 10001 10001 10001 11111		

		Number pattern 4 (1509011) 11111 11111 11011 11111 11111 Number pattern 5 10101 01010 10101 01010 10101 Number pattern 6 11011 11011 00000 11011 11011 Number pattern 7 10001 01010		

		00100 01010 10001 Number pattern 8 01110 10001 10001 10001 01110 Number pattern 9 11111 22222 33333 44444 55555 Number pattern 10 12345 12345 12345 12345 12345		

		Number pattern 11 12345 23456 34567 45678 56789 Number pattern 12 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 Number pattern 13 55555 54444 54333 54322 54321 Number pattern 14 12345 23455		

		34555 45555 55555 Number pattern 15 12345 23451 34521 45321 54321 Number pattern 16 12345 21234 32123 43212 54321 Number pattern 17 5 5 5 5 5 5 5 5 5 5 4 4 4 4 4 4 4 5 5 4 3 3 3 3 3 4 5 5 4 3 2 2 2 3 4 5		

5 4 3 2 1 2 3 4 5
5 4 3 2 2 2 3 4 5
5 4 3 3 3 3 3 4 5
5 4 4 4 4 4 4 4 5
5 5 5 5 5 5 5 5 5

Number pattern 18

1 2 3 4 5
16 17 18 19 6
15 24 25 20 7
14 23 22 21 8
13 12 11 10 9

Number pattern 19

Triangle easy number patterns

1
22
333
4444
55555

Number pattern 20

55555

		4444 333 22 1 Number pattern 21 11111 2222 333 44 5 Number pattern 22 5 44 333 2222 11111 Number pattern 23 1 12 123		

		1234 12345 Number pattern 24 12345 1234 123 12 1 Number pattern 25 1 21 321 4321 54321 Number pattern 26 54321 4321 321 21 1		

		Number pattern 27 5 54 543 5432 54321 Number pattern 28 54321 5432 543 54 5 Number pattern 29 5 45 345 2345 12345 Number pattern 30		

		12345 2345 345 45 5 Number pattern 31 1 23 345 4567 56789 Number pattern 32 56789 4567 345 23 1 Number pattern 33 13579 3579		

		579 79 9 Number pattern 34 --- **Triangle 0,1 easy patterns** 1 10 101 1010 10101 Number pattern 35 1 00 111 0000 11111 Number pattern 36 1		

		01 010 1010 10101 Number pattern 37 1 11 101 1001 11111 Number pattern 38 --- **Triangle hard number patterns** 1 123 12345 1234567 123456789 Number pattern 39 1 24		

		135 2468 13579 Number pattern 40 1 131 13531 1357531 135797531 Number pattern 41 2 242 24642 2468642 2468108642 Number pattern 42 1 121 12321 1234321		

		123454321 Number pattern 43 1 32 4543 567654 67898765 Number pattern 44 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 Number pattern 45 1 21 123 4321 12345 Number pattern 46		

		1 23 4567 89123456 7891234567891234 Number pattern 47 1 1 12 21 123 321 1234 4321 1234554321 Number pattern 48 1 2 6 3 7 10 4 8 11 13 5 9 12 14 15 Number pattern 49 1 2 4 7 11 16 22 29 37 46		

		56 67 79 92 106 Number pattern 50 1 3 2 4 5 6 10 9 8 7 11 12 13 14 15 Number pattern 51 1 22 333 2222 11111 Number pattern 52 N = 12345 12345 1234 123 12		

		1 Number pattern 53 N = 12345 12345 2345 345 45 5 Number pattern 54 --- **Diamond number patterns** 1 12 123 1234 12345 1234 123 12 1		

		Number pattern 55 1 123 12345 1234567 123456789 1234567 12345 123 1 Number pattern 56 1 121 12321 1234321 123454321 1234321 12321 121 1 Number pattern 57 ---		

Diamond number pattern with star border

```
    *
    *1*
    *121*
    *12321*
    *1234321*
    *123454321*
    *1234321*
    *12321*
    *121*
    *1*
    *
```

Number pattern 58

Tricky number pattern

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

<table>
<tr><td></td><td></td><td>5
4 4
3 3
2 2
1 1
Number pattern 59</td><td></td><td></td></tr>
<tr><td>07</td><td>Arrays and Matrices</td><td>Arrays,Different types of arrays,matrices in arrays,how to solve array related problems,some problems for exercise.
1. Write a C program to read and print elements of array. - using recursion.
2. Write a C program to print all negative elements in an array.
3. Write a C program to find sum of all array elements. - using recursion.
4. Write a C program to find maximum and minimum element in an array. - using recursion.
5. Write a C program to find second largest element in an array.
6. Write a C program to count total number of even and odd elements in an array.
7. Write a C program to count total number of negative elements in an array.
8. Write a C program to copy all elements from an array to another array.
9. Write a C program to insert an element in an array.
10. Write a C program to delete an element from an array at specified position.</td><td>Reference Problems : http://www.codeforwin.in/2015/07/array-programming-exercises-and.html
Ref book 1
page-233</td><td><table><tr><td>UVA 1585</td><td>Score</td></tr><tr><td>UVA 1586</td><td>Molar mass</td></tr><tr><td>UVA 575</td><td>Skew Binary</td></tr><tr><td>UVA 499</td><td>What's The Frequency, Kenneth?</td></tr><tr><td>UVA 1225</td><td>Digit Counting</td></tr><tr><td>UVA 455</td><td>Periodic Strings</td></tr><tr><td>UVA 10038</td><td>Jolly Jumpers</td></tr></table></td></tr>
</table>

		11. Write a C program to print all unique elements in the array. 12. Write a C program to count total number of duplicate elements in an array. 13. Write a C program to delete all duplicate elements from an array. 14. Write a C program to count frequency of each element in an array. 15. Write a C program to merge two array to third array. 16. Write a C program to find reverse of an array. 17. Write a C program to put even and odd elements of array in two separate array. 18. Write a C program to search an element in an array. 19. Write a C program to sort array elements in ascending order. 20. Write a C program to sort array elements in descending order. 21. Write a C program to sort even and odd elements of array separately. 22. Write a C program to left rotate an array. 23. Write a C program to right rotate an array. 24. Write a C program to add two matrices. 25. Write a C program to subtract two matrices. 26. Write a C program to perform Scalar matrix multiplication. 27. Write a C program to multiply two matrices. 28. Write a C program to check whether two matrices are equal or not.		UVA 11340	Newspaper
				UVA 498	Polly the Polynomial
				UVA 100	The 3n + 1 problem
				UVA 119	Greedy Gift Givers
				UVA 12897	Decoding Baby Boos
				UVA 136	Ugly Numbers
				UVA 401	Palindromes
				UVA 483	Word Scramble
				UVA 444	Encoder and Decoder
				UVA 446	Kibbles "n" Bits "n" Bits "n" Bits

		29. Write a C program to find sum of main diagonal elements of a matrix. 30. Write a C program to find sum of minor diagonal elements of a matrix. 31. Write a C program to find sum of each row and column of a matrix. 32. Write a C program to interchange diagonals of a matrix. 33. Write a C program to find upper triangular matrix. 34. Write a C program to find lower triangular matrix. 35. Write a C program to find sum of upper triangular matrix. 36. Write a C program to find transpose of a matrix. 37. Write a C program to find determinant of a matrix. 38. Write a C program to check Identity matrix. 39. Write a C program to check Sparse matrix. 40. Write a C program to check Symmetric matrix.		UVA 458 The Decoder UVA 10924 Prime Words UVA 476 Points in Figures: Rectangles UVA 490 Rotating Sentences UVA 489 Hangman Judge UVA 591 Box of Bricks UVA 492 Pig-Latin UVA 494 Kindergarten Counting Game UVA 579 Clock Hands

Lab Manual for Structured programming Sessional(CSE-142)

<table>
<tr>
<td>08</td>
<td>Strings and character arrays</td>
<td>What is string,how to use them in programs,comparison,some problems for exercise.
1. Write a C program to find length of a string.
2. Write a C program to copy one string to another string.
3. Write a C program to concatenate two strings.
4. Write a C program to compare two strings.
5. Write a C program to convert lowercase string to uppercase.
6. Write a C program to convert uppercase string to lowercase.
7. Write a C program to toggle case of each character of a string.
8. Write a C program to find total number of alphabets, digits or special character in a string.
9. Write a C program to count total number of vowels and consonants in a string.
10. Write a C program to count total number of words in a string.
11. Write a C program to find reverse of a string.
12. Write a C program to check whether a string is palindrome or not.
13. Write a C program to reverse order of words in a given string.
14. Write a C program to find first occurrence of a character in a given string.
15. Write a C program to find last occurrence of a character in a given string.</td>
<td>Reference Problems : http://www.codeforwin.in/2015/11/string-programming-exercises-and-solutions-in-c.html
Ref Book 1
page-268</td>
<td>
<table>
<tr><td>A</td><td>CodeForces 71A</td></tr>
<tr><td>B</td><td>CodeForces 118A</td></tr>
<tr><td>C</td><td>CodeForces 96A</td></tr>
<tr><td>D</td><td>CodeForces 112A</td></tr>
<tr><td>E</td><td>CodeForces 339A</td></tr>
<tr><td>F</td><td>CodeForces 131A</td></tr>
<tr><td>G</td><td>CodeForces 281A</td></tr>
<tr><td>H</td><td>CodeForces 58A</td></tr>
<tr><td>I</td><td>CodeForces 41A</td></tr>
<tr><td>J</td><td>CodeForces 208A</td></tr>
<tr><td>K</td><td>CodeForces 520A</td></tr>
<tr><td>L</td><td>CodeForces 141A</td></tr>
<tr><td>M</td><td>CodeForces 59A</td></tr>
<tr><td>N</td><td>CodeForces 734A</td></tr>
<tr><td>O</td><td>CodeForces 499B</td></tr>
<tr><td>P</td><td>CodeForces 550A</td></tr>
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		16. Write a C program to search all occurrences of a character in given string. 17. Write a C program to count occurrences of a character in given string. 18. Write a C program to find highest frequency character in a string. 19. Write a C program to find lowest frequency character in a string. 20. Write a C program to count frequency of each character in a string. 21. Write a C program to remove first occurrence of a character from string. 22. Write a C program to remove last occurrence of a character from string. 23. Write a C program to remove all occurrences of a character from string. 24. Write a C program to remove all repeated characters from a given string. 25. Write a C program to replace first occurrence of a character with another in a string. 26. Write a C program to replace last occurrence of a character with another in a string. 27. Write a C program to replace all occurrences of a character with another in a string. 28. Write a C program to find first occurrence of a word in a given string.		

Q	CodeForces 731A
R	CodeForces 766A
S	CodeForces 721B
T	CodeForces 735A
U	CodeForces 672B
V	CodeForces 43A
W	CodeForces 219A
X	CodeForces 745A
Y	CodeForces 746B
Z	CodeForces 554B

		29. Write a C program to find last occurrence of a word in a given string. 30. Write a C program to search all occurrences of a word in given string. 31. Write a C program to count occurrences of a word in a given string. 32. Write a C program to remove first occurrence of a word from string. 33. Write a C program to remove last occurrence of a word in given string. 34. Write a C program to remove all occurrence of a word in given string. 35. Write a C program to trim leading white space characters in a string. 36. Write a C program to trim trailing white space characters in a string. 37. Write a C program to trim both leading and trailing white space characters in a string. 38. Write a C program to remove all extra blank spaces from a given string.		
09	User Defined Functions	Introduction,Importance of user defined functions,Use of functions in programs,function calling,categories of functions,Recursion,arrays and strings in functions,Some problems for exercise. 1. Write a C program to find cube of any number using function.	Reference Problems : http://www.codeforwin.in/201	

		2. Write a C program to find diameter, circumference and area of circle using functions. 3. Write a C program to find maximum and minimum between two numbers using functions. 4. Write a C program to check whether a number is even or odd using functions. 5. Write a C program to check whether a number is prime, Armstrong or perfect number using functions. 6. Write a C program to find all prime numbers between given interval using functions. 7. Write a C program to print all strong numbers between given interval using functions. 8. Write a C program to print all armstrong numbers between given interval using functions. 9. Write a C program to print all perfect numbers between given interval using functions. 10. Write a C program to find power of any number using recursion. 11. Write a C program to print all natural numbers between 1 to n using recursion. 12. Write a C program to print all even or odd numbers in given range using recursion. 13. Write a C program to find sum of all natural numbers between 1 to n using recursion.	6/03/functions-programming-exercises-and-solutions-in-c.html Ref Book 1 page-321	

		14. Write a C program to find sum of all even or odd numbers in given range using recursion. 15. Write a C program to find reverse of any number using recursion. 16. Write a C program to check whether a number is palindrome or not using recursion. 17. Write a C program to find sum of digits of a given number using recursion. 18. Write a C program to find factorial of any number using recursion. 19. Write a C program to generate nth Fibonacci term using recursion. 20. Write a C program to find GCD (HCF) of two numbers using recursion. 21. Write a C program to find LCM of two numbers using recursion. 22. Write a C program to display all array elements using recursion. 23. Write a C program to find sum of elements of array using recursion. 24. Write a C program to find maximum and minimum elements in array using recursion.		
10	Pointers	What is pointer,Declaring pointer variables,chain of pointers,pointer expressions,arrays and strings in pointer,Pointers to functions,Some Problems for exercise. **1.** Write a program in C to show the basic declaration of pointer. Go to the editor *Expected Output* :	Reference Problems : http://www.w3resource.com/c-programming-exerci	

		z sotres the address of m = 0x7ffe97a39854 *z stores the value of m = 10 &m is the address of m = 0x7ffe97a39854 &n stores the address of n = 0x7ffe97a39858 &o stores the address of o = 0x7ffe97a3985c &z stores the address of z = 0x7ffe97a39860 **2.** Write a program in C to demonstrate how to handle the pointers in the program. Go to the editor *Expected Output* : Address of m : 0x7ffcc3ad291c Value of m : 29 Now ab is assigned with the address of m. Address of pointer ab : 0x7ffcc3ad291c Content of pointer ab : 29 The value of m assigned to 34 now. Address of pointer ab : 0x7ffcc3ad291c Content of pointer ab : 34	ses/pointer/ http://joequery.me/education/c-pointer-exercises/ http://www.csc.villanova.edu/~mdamian/Past/csc2400fa11/notes/plab.pdf Ref Book 1 page-394	

		The pointer variable ab is assigned with the value 7 now. Address of m : 0x7ffcc3ad291c Value of m : 7 **3.** Write a program in C to demonstrate the use of &(address of) and *(value at address) operator. Go to the editor *Expected Output* : Using & operator : ---------- address of m = 0x7ffea3610bb8 address of fx = 0x7ffea3610bbc address of cht = 0x7ffea3610bb7 Using & and * operator : ---------- value at address of m = 300 value at address of fx = 300.600006 value at address of cht = z Using only pointer variable :		

		---------- address of m = 0x7ffea3610bb8 address of fx = 0x7ffea3610bbc address of cht = 0x7ffea3610bb7 Using only pointer operator : ---------- value at address of m = 300 value at address of fx= 300.600006 value at address of cht= z Click me to see the solution **4.** Write a program in C to add two numbers using pointers. Go to the editor Test Data : Input the first number : 5 Input the second number : 6 *Expected Output* : The sum of the entered numbers is : 11 **5.** Write a program in C to add numbers using call by reference. Test Data : Input the first number : 5 Input the second number : 6 *Expected Output* :		

		The sum of 5 and 6 is 11 **6.** Write a program in C to find the maximum number between two numbers using a pointer. Go to the editor Test Data : Input the first number : 5 Input the second number : 6 *Expected Output* : 6 is the maximum number. **7.** Write a program in C to store n elements in an array and print the elements using pointer. Go to the editor Test Data : Input the number of elements to store in the array :5 Input 5 number of elements in the array : element - 0 : 5 element - 1 : 7 element - 2 : 2 element - 3 : 9 element - 4 : 8 *Expected Output* : The elements you entered are : element - 0 : 5 element - 1 : 7		

element - 2 : 2

element - 3 : 9

element - 4 : 8

8. Write a program in C to print all permutations of a given string using pointers. Go to the editor

Expected Output :

The permutations of the string are :

abcd abdc acbd acdb adcb adbc bacd badc bcad bcda bdca bdac cbad cbda cabd cadb cdab cdba db

ca dbac dcba dcab dacb dabc

9. Write a program in C to find the largest element using Dynamic Memory Allocation. Go to the editor

Test Data :

Input total number of elements(1 to 100): 5

Number 1: 5
Number 2: 7
Number 3: 2
Number 4: 9
Number 5: 8

Expected Output :

The Largest element is : 9.00

		10. Write a program in C to Calculate the length of the string using a pointer. Go to the editor Test Data : Input a string : w3resource *Expected Output* : The length of the given string w3resource is : 10 **11.** Write a program in C to swap elements using call by reference. Go to the editor Test Data : Input the value of 1st element : 5 Input the value of 2nd element : 6 Input the value of 3rd element : 7 *Expected Output* : The value before swapping are : element 1 = 5 element 2 = 6 element 3 = 7 The value after swapping are : element 1 = 7		

		element 2 = 5 element 3 = 6 **12.** Write a program in C to find the factorial of a given number using pointers. Go to the editor Test Data : Input a number : 5 *Expected Output* : The Factorial of 5 is : 120 **13.** Write a program in C to count the number of vowels and consonants in a string using a pointer. Go to the editor Test Data : Input a string: string *Expected Output* : Number of vowels : 1 Number of constant : 5 **14.** Write a program in C to sort an array using Pointer. Go to the editor Test Data : testdata *Expected Output* : Test Data : Input the number of elements to store in the array : 5 Input 5 number of elements in the array :		

element - 1 : 25
element - 2 : 45
element - 3 : 89
element - 4 : 15
element - 5 : 82
Expected Output :

```
The elements in the array after sorting :
element - 1 : 15
element - 2 : 25
element - 3 : 45
element - 4 : 82
element - 5 : 89
```

15. Write a program in C to show how a function returning pointer. Go to the editor
Test Data :
Input the first number : 5
Input the second number : 6
Expected Output :

```
The number 6 is larger.
```

		16. Write a program in C to compute the sum of all elements in an array using pointers. Go to the editor Test Data : Input the number of elements to store in the array (max 10) : 5 Input 5 number of elements in the array : element - 1 : 2 element - 2 : 3 element - 3 : 4 element - 4 : 5 element - 5 : 6 *Expected Output* : The sum of array is : 20 **17.** Write a program in C to print the elements of an array in reverse order. Go to the editor Test Data : Input the number of elements to store in the array (max 15) : 5 Input 5 number of elements in the array : element - 1 : 2 element - 2 : 3 element - 3 : 4 element - 4 : 5 element - 5 : 6 *Expected Output* : The elements of array in reverse order are : element - 5 : 6		

element - 4 : 5

element - 3 : 4

element - 2 : 3

element - 1 : 2

18. Write a program in C to show the usage of pointer to structure. Go to the editor

Expected Output :

John Alter from Court Street

Click me to see the solution

19. Write a program in C to show a pointer to union. Go to the editor

Expected Output :

Jhon Mc Jhon Mc

20. Write a program in C to show a pointer to an array which contents are pointer to structure. Go to the editor

Expected Output :

Exmployee Name : Alex

Employee ID : 1002

21. Write a program in C to print all the alphabets using a pointer. Go to the editor

Expected Output :

		The Alphabets are : A B C D E F G H I J K L M N O P Q R S T U V W X Y Z **22.** Write a program in C to print a string in reverse using a pointer. Go to the editor Test Data : Input a string : w3resource *Expected Output* : Reverse of the string is : ecruoser3w		
11	Structures and Unions	Introduction,what is structure,how to declare structure variables,Copying and comparing,arrays in structure,unions,some problems for exercise. 1. **C program to create, declare and initialize structure.** This program will define a structure, declare an object of the structure and initialize the structure members. 2. **C program to read and print an employee's detail using structure.** This program will read and print the employee's details like name, employee id, salary etc using structure. 3. **C program to demonstrate example of nested structure.** This program will demonstrate example of Nested Structure in C language, how to define, declare and access the nested structure?	Reference Problems : http://www.includehelp.com/c-programs/c-programs-structure-and-union-solved-examples.aspx	

		4. **C program to demonstrate example structure pointer (structure with pointer).** This program will demonstrate example of pointer to structure, structure pointer in C. 5. **C program to demonstrate example structure pointer (structure with pointer) using user define function.** This program will demonstrate example of pointer to structure, structure pointer using USER DEFINE FUNCTION in C. 6. **C program to declare, initialize an union, example of union.** Union example: this program will demonstrate example of union, how to define, declare a union and how to access of the members of union? 7. **C program to demonstrate example of structure of array.** Structure of Array: this program will demonstrate example of structure of array, how to declare an array within structure how to access its elements? 8. **C program to add two distances in feet and inches using structure.** This program will read two distances in feet and inches and add them; final result will be printed in the form of feet and inches using structure in C. 9. **C program to extract individual bytes from an unsigned int using union.** This program will read an integer number and extract its bytes using union in C language. 10. **C program for passing structures as function arguments and returning a structure from a function.** This program will demonstrate example for passing Structures as function arguments and returning a structure from a function in C language.	http://www.wellho.net/resources/C209.html https://www.programiz.com/c-programming/c-structure-examples Ref Book 1 page-355	

12	File management and Memory allocating	Introduction,defining,opening,closing a file,input output operations in files,Error handling,Memory allocation in details,Some problems for exercise. Reference Problems : **1.** Write a program in C to create and store information in a text file. Go to the editor Test Data : Input a sentence for the file : This is the content of the file test.txt. *Expected Output* : The file test.txt created successfully...!! **2.** Write a program in C to read an existing file. Go to the editor Test Data : Input the file name to be opened : test.txt *Expected Output* : The content of the file test.txt is : This is the content of the file test.txt. **3.** Write a program in C to write multiple lines in a text file. Go to the editor Test Data : Input the number of lines to be written : 4 :: The lines are :: test line 1 test line 2 test line 3 test line 4 *Expected Output* :	http://www.inf.udec.cl/~leo/fio.pdf http://www.w3resource.com/c-programming-exercises/file-handling/ Ref Book 1 page-418, 450	

		The content of the file test.txt is : test line 1 test line 2 test line 3 test line 4 **4.** Write a program in C to read the file and store the lines into an array. Go to the editor Test Data : Input the file name to be opened : test.txt *Expected Output* : The content of the file test.txt are : test line 1 test line 2 test line 3 test line 4 **5.** Write a program in C to Find the Number of Lines in a Text File. Go to the editor Test Data : Input the file name to be opened : test.txt *Expected Output* :		

		The lines in the file test.txt are : 4 **6.** Write a program in C to find the content of the file and number of lines in a Text File. Go to the editor Test Data : Input the filen ame to be opened : test.txt *Expected Output* : The content of the file test.txt are : test line 1 test line 2 test line 3 test line 4 The lines in the file are : 4 **7.** Write a program in C to count a number of words and characters in a file. Go to the editor Test Data : Input the file name to be opened : test.txt *Expected Output* : The content of the file test.txt are : test line 1 test line 2		

test line 3

test line 4

The number of words in the file test.txt are : 12

The number of characters in the file test.txt are : 36

8. Write a program in C to delete a specific line from a file. Go to the editor

Assume that the content of the file test.txt is :

test line 1

test line 2

test line 3

test line 4

Test Data :
Input the file name to be opened : test.txt
Input the line you want to remove : 2

Expected Output :

The content of the file test.txt is :

test line 1

test line 3

test line 4

		9. Write a program in C to replace a specific line with another text in a file. Go to the editor Assume that the content of the file test.txt is : test line 1 test line 2 test line 3 test line 4 Test Data : Input the file name to be opened : test.txt Input the content of the new line : Yes, I am the new text instead of test line 2 Input the line no you want to replace : 2 *Expected Output* : Replacement did successfully..!! If you read the file you will see the content of the file : test line 1 Yes, I am the new text instead of test line 2 test line 3 test line 4 **10.** Write a program in C to append multiple lines at the end of a text file. Go to the editor Assume that the content of the file test.txt is :		

		test line 1 test line 2 test line 3 test line 4 Test Data : Input the file name to be opened : test.txt Input the number of lines to be written : 3 The lines are : test line 5 test line 6 test line 7 *Expected Output* : The content of the file test.txt is : test line 1 test line 2 test line 3 test line 4 test line 5 test line 6 test line 7 **11.** Write a program in C to copy a file in another name. Go to the editor		

		Assume that the content of the file test.txt is : test line 1 test line 2 test line 3 test line 4 Test Data : Input the source file name : test.txt Input the new file name : test1.txt *Expected Output* : The file test.txt copied successfully in the file test1.txt. If you read the new file you will see the content of the file : test line 1 test line 2 test line 3 test line 4 **12.** Write a program in C to merge two files and write it in a new file. Go to the editor Assume that the content of the file test.txt and test1.txr is : The content of the file test.txt is : This is the file test.txt.		

		The content of the file test1.txt is : This is the file test1.txt. Test Data : Input the 1st file name : test.txt Input the 2nd file name : test1.txt Input the new file name where to merge the above two files : mergefiles.txt *Expected Output* : The two files merged into mergefiles.txt file successfully..!! Here is the content of the merge file mergefiles.txt : The content of the file mergefiles.txt is : This is the file test.txt. This is the file test1.txt. **13.** Write a program in C to encrypt a text file. Go to the editor Assume that, the content of the file test.txt is : Welcome to w3resource.com. Test Data : Input the name of file to encrypt : test.txt *Expected Output* : File test.txt successfully encrypted ..!! If you read the file test.txt you will see the following : [illegible]		

		14. Write a program in C to decrypt a previously encrypted file file. Go to the editor Assume that, the content of the file test.txt was : Welcome to w3resource.com. After encryption, the content of the file is : Ƙ Test Data : Input the name of file to decrypt : test.txt *Expected Output* : The file test.txt decrypted successfully..!! Now, if you read the file test.txt you will see the following : Welcome to w3resource.com. **15.** Write a program in C to remove a file from the disk. Go to the editor Test Data : Input the name of file to delete : test.txt *Expected Output* : The file test.txt is deleted successfully..!!		
13	Final Class	Quiz and Viva		

Lab Manual for Structured programming Sessional(CSE-142)