

**NIRMA UNIVERSITY**  
**Institute Of Technology, Ahmedabad**  
**B.Tech, Semester - I / II (All Branch)**  
**CE101: Art of Programming**

**List of Practicals**

Sr. No.	Practical	Hours	CLOs
1	<b>LINUX Commands and RAPTOR tool</b> a) To practice elementary commands of Ubuntu/LINUX/UNIX. b) To understand the meaning of various symbols used in a flowchart and to construct flowcharts for solving computational problem at introductory level using Raptor Tool.	2	CLO1, CLO2
2	<b>Related to basic C constructs :</b> a) Find area and perimeter of a circle and rectangle. b) Find the roots of a quadratic equation. c) A pharmaceutical company provides solution to complete a chemical process. Time and resources taken by chemical process depends on set of chemical compounds as an input conditions. Company charges on the following basis: <ul style="list-style-type: none"> <li>If number of hours required to complete chemical process is less or equal to 48 then rates are rupees 2k per hour.</li> <li>If number of hours are more than 48 and less than 240, then the rates are up to 48 hours as serial number 1. For all the remaining rate is fixed at rupees 4k per hours.</li> <li>If number of hours are more than 240, then the rates are upto 240 hours as per serial number 2. For all remaining rate is fixed at rupees 10k per hour.</li> </ul> Write a program to automate the above process.	2	CLO1
3	<b>Related to Branching:</b> a) Find whether number is even or odd (using if...else) b) Check the category of a given character. (using if...else...if ladder) c) Perform arithmetic operations of a calculator. (using switch case) d) Find maximum out of three numbers (using nested if)	2	CLO3
4	<b>Related to looping and arrays :</b> a) Calculate sum of series. (using for loop) $\frac{1}{x} - \frac{2}{x^2} + \frac{3}{x^3} - \frac{4}{x^4} \dots \frac{n}{x^n}$ b) Display reverse of a number and check whether it is palindrome or not. (using while/do while loop) c) Pattern printing. (using nested loops) <pre> 1 1 2 1 2 3 1 2 3 4 1 2 3 4 5 1 2 3 4 5 6           </pre>	2	CLO3

5	<b>Related to 1-D and 2-D array manipulations:</b> <ol style="list-style-type: none"> <li>Write a program <ul style="list-style-type: none"> <li>To read data from keyboard and store into 1-D array</li> <li>To read data from array and copy its square back to another array</li> <li>To reverse all elements of original array</li> <li>To find out maximum element of an original array and print its location</li> </ul> </li> <li>Write a program to find transpose of a matrix and find whether it is symmetric or not.</li> </ol>	4	CLO3
6	<b>Related to Functions:</b> <ol style="list-style-type: none"> <li>Find union and intersection of two input integer arrays using user defined function. The function should return the resultant array to the main function.</li> <li>Perform matrix multiplication using user defined function.</li> <li>Generate Fibonacci Series using concept of recursion.</li> </ol>	4	CLO3 CLO4 CLO5
7	<b>Related to character and string manipulations:</b> <ol style="list-style-type: none"> <li>Write a menu driven program to convert an input statement to title case/upper case/lower case/sentence case as per the user's choice.</li> <li>Find out whether a string is palindrome or not. Example of palindrome is "madam".</li> <li>Read a name from keyboard and find out how many times same character (case insensitive) is repeating. Develop a UDF for the said task. Example: <b>Input :</b> Anand <b>Output :</b> a is repeating two times, n is repeating two times <b>Input :</b> Kunal <b>Output :</b> None of the character are repeating.</li> </ol>	4	CLO3 CLO4
8	<b>Related to structures:</b> <ol style="list-style-type: none"> <li>Calculate net salary of N employees using structure. Total = Basic + DA + HRA + TA, Net = Total – ITax ITax = 5 % of Total, DA = 50 % of Basic, HRA = 15 % of Basic, TA = 400 fix Note: All employee records are to be stored in an array of structures.</li> <li>Add two distances (feet (integer) – inch (float) system) and display the result without the return statement. Use structure and function.</li> </ol>	4	CLO3 CLO4
9	<b>Related to pointers:</b> <ol style="list-style-type: none"> <li>Sort an array of ten integer values in ascending order. The function will accept two arguments, a pointer that points to the array and the array size. The function returns a pointer that points to the sorted array.</li> <li>Calculate time difference between two time periods using structure and pointer.</li> </ol>	4	CLO4 CLO5
10	<b>Related to File Handling:</b> Write a program to copy the contents from one file to another file by using file handling library functions such as fopen, fread, fwrite, etc. Verify the copy operation by displaying the contents of second file.	2	CLO3
	<b>Total</b>	<b>30</b>	

