Department of Computer Science & Engineering
Faculty of Technology & Engineering
The M. S. University of Baroda

Practical List
Programming in C and C++ (CSE1201)
SSBE-I

Theory	:	3 Lectures	Marks (Theory)	:	100
Tutorial	:	1	Marks (Pr/Tw/Viva)	:	50
Practical	:	2 Hrs.	Total	:	150

Objective: To understand the various design issues involved in the development of a Programming Language and appreciate the features of any Programming language and thereby enable the students in applying the studied fundamentals to write efficient programs.
Outcome: Students will have an understanding and programming exposure of the C and C++ Programming.

Sr. No.	Topic	Assignment
		C Programming
1	Basic Concepts	1. WAP that reads two integer numbers statically and perform arithmetic operations on it and prints the result. 2. WAP that reads two floating point nos. from key board and gives their addition, subtraction, multiplication, division and modulo. Compare the results with results of above program. 3. WAP that takes amount of money as input with fractional values separates integral and fractional part of the amount and print Rupee and Paise parts separately. 4. WAP to find n^{th} root of a number without using any built-in function. 5. WAP to convert days into months and days. 6. WAP to covert the given temperature in Fahrenheit to Celsius and vice versa using the given conversion formula. C=F-32/1.8 7. WAP to do the following : Declare x and y as integer variables and z as a short integer variable. Assign two 6 digit numbers to x and y. Assign the sum of x and y to z. Output the values of x, y and z. Comment on the output. 8. WAP to define and initialize a variable of type short to 1, and then successively multiply it by 2 and display its value 16 times. Explain the reason for the last result. 9. WAP to swap values of two variables a. using third variable. b. Without using third variable. 10. WAP that displays size of every data type. 11. Give the illustration of enum data type. 12. Give the illustration of typedef data type. 13. WAP to perform following expressions: a. a – b / 3 + c * 2 – 1

		b. a – b /(3 + c) * (2 – 1) c. a – (b / (3 + c) * 2) – 1 d. $3a^2 + 2a + 1$ e. $2x^2 /a+ 9x/8 +1$ f. $a^2 +263b/296+8b^2 +963a/296$ 14. Write a C program to calculate volume of sphere with radius R. 15. WAP to simulate divide by two and multiply by two without using * and / operator.
2	Operators & Expressions	1. WAP to find the sum of the digits of a 3-digit integer constant. 2. WAP to convert given no. of days into months and days. 3. WAP for finding the maximum of two numbers using conditional operator. 4. WAP for finding the maximum of three numbers using conditional operator 5. WAP to find the size of int, float, char, long and double. 6. Find out the output of all the variables given in the expression at the end of execution of 7. the corresponding expressions in following : a. Z = X++ + ++Y - X-- + --Y where X = 7 and Y = 9 b. Z = X++ * Y++ / ++X - --y % X++ where X = 5 and Y = 2
3	Decision Making & Branching (Control Structures)	1. WAPs to do the followings: a. Determine whether the number is even or odd. b. Determine whether the given year is leap year or not c. Determine whether the person is eligible for vote or not. 2. WAP to test whether a number entered is positive, negative or equal to zero. 3. WAP that reads one character from the user and do the following: a. Print the ASCII value of the character b. If character is in uppercase convert is into lowercase and vice versa. c. Determine whether the character is vowel or not. 4. WAP to take a character as an input and display whether it is a number, alphabet upper/lower/vowel) or a special character (Use nested if statement). 5. WAPs to read the three nos. from the user and do the following: a. Find the average of those numbers. b. Find the largest number using nested if else. c. Find the smallest number using conditional operator 6. WAP to read four values a,b,c and d from the user and evaluate the ratio of (a+b) to (c-d) and print the result, if (c-d) is not equal to zero. 7. WAP to implement calculator using if-else statement as well as switch statement. 8. WAP to enter the marks of student in four subjects. Then calculate the total, aggregate and display the grades obtained by the student using else-if ladder as well as switch case. 9. WAP to calculate roots of quadratic equation.

		10. An electricity board charges the following rates for the use of electricity: For the first 200 units: 80 P per unit For the next 100 units: 90 P per unit Beyond 300 units: Rs 1.00 per unit All the users are charged a minimum of Rs. 100 as meter charge. If the total amount is more than Rs. 400, then additional surcharge of 15% of total amount is charged. 11. WAP to read number of units consumed and print out the charges. A company decides to give bonus to all its employees on Diwali. A 5% bonus on salary is given to the male workers and 10% bonus on salary to the female workers. WAP to enter the salary and gender of the employee. If the salary of the employee is less than Rs.10000 then the employee gets extra 2% bonus on salary. Calculate the bonus that has to be given to the employee and display the salary that the employee will get. 12. Given the values of the variables x, y and z WAP to rotate their values such that x has the value of y, y has value of z and z has the value of x. 13. Read the price of item in the decimal form e.g. 13.40 and separate Rupees and paisa e.g. 13 rupees and 40 paisa(Use Math.h header file) 14. WAP that takes input of 5 subject's marks .if student get 40 or more than 40 then he/she is PASS in that subject otherwise FAIL .print the result for following conditions a. if student is PASS in all subjects then declare PASS b. if student is FAIL in 1 or 2 subject then declare ATKT c. if student is FAIL in more than 2 subject then declare FAIL 15. Use of Switch Case: a. WAP to find area for circle, triangle and rectangle. b. WAP to find given number is odd or even with help of switch case.
4	Looping Structures	1. WAP to find the sum of n natural numbers using while loop, for loop and goto statement. 2. WAP to read the numbers until -1 is encountered. Also calculate the sum and average of all positive numbers and mean and sum of all negative numbers separately using goto statement as well as do while loop. 3. WAP to evaluate the equation $y=x^n$ (x raise to n). 4. WAP in C to generate Fibonacci series like following: 1, 1, 2, 3, 5, 8, 13 …Generate 20 such numbers. 5. WAP to calculate the sum of odd and even number between given no. of series. 6. WAP to convert given number into word. Example if number is 653 then output will be SIX FIVE THREE. 7. WAP to Find largest of the given 10 numbers using goto as well as while loop. 8. WAP to find the reverse of the given number and sum of its digits. 9. WAP to find the factorial of the given number. 10. WAP to determine and print the sum of the following series for given value of n. a. 1/1+1/2+1/3+…+1/n

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b. 1/2+2/3+3/4+…+n/(n+1)
c. $1+1/2^2+1/3^2+\ldots+1/n^2$
d. 1! +2! +3! +…+n!
e. 1+2-3+4+5-6+…+n
11. WAP to find the prime numbers in the given range.
12. WAP to find perfect numbers in the given range.
13. WAP to find the Armstrong numbers in the given range.
14. WAP to ask a question until user gives the correct answer. Print the result in how many trials the user has given the correct answer.
15. Write a c program to read a positive integer number n and generate output as follows: If n=5 output: 5 4 3 2 1 0 1 2 3 4 5 If n=6 output: 6 5 4 3 2 1 0 1 2 3 4 5 6
16. WAP that converts a number into words.
17. WAP that finds all the permutations of a number.
18. WAP that determines the number of trailing zeros at the end of X! (X factorial), where X is an arbitrary number. For instance, 5! is 120, so it has one trailing zero. (How can you handle extremely values, such as 100!?)
19. WAP that takes date as input in dd-mm-yyyy format and prints the corresponding weekday of the given date.
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<tr><td>5</td><td>Patterns</td><td>
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C D E F
5 6 7 8 9</td></tr>
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<tr><td>6</td><td>Array and Strings</td><td>1. WAP to read and display n numbers using an array.
2. WAP to read 10 numbers and display the sum and mean of those numbers.</td></tr>
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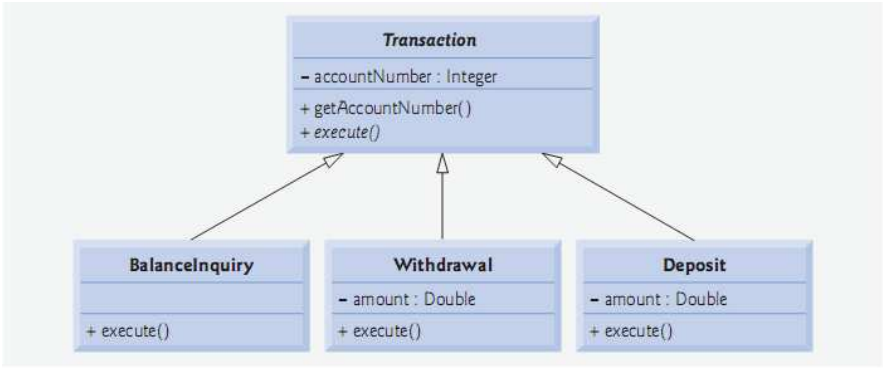
		3. WAP to given no in ascending order and descending order. 4. WAP to read array of integers and print it in reverse order 5. WAP to find out maximum and minimum from 1-D array. 6. WAP to search an element in an array, if it is not there then insert it at the end of the array. 7. WAP to display TRANSPOSE of a matrix 8. WAP to addition and multiplication of two matrixes. 9. WAP convert character into TOggLe character. 10. Find given string is palindrome or not using string library function. 11. WAP to scan a string using getchar(), gets( ), scanf(), scanf with command(^\n). 12. Write a separate program that will demonstrate the use of strcat(),strcmp(), strcpy( ), strlen( ) functions. 13. WAP to count frequency of the last character of a given string in that string. String will be taken from the user. 14. WAP that would sort a list of strings in the alphabetical order. 15. WAP to replace white spaces by "*" from a given string. 16. WAP function to find inverse of a matrix. 17. WAP to rearrange the elements of matrix even first and odd later without using any other array. 18. WAP to print a matrix in zigzag way.
7	User-Defined Functions	1. Write a function program to add first N numbers. 2. Write a function find out maximum out of three numbers. 3. Write a function power that computes x raised to the power y for integer x and y and returns double type value. 4. WAP to find factorial of a number using recursion. 5. WAP that used user defined function Swap ( ) and interchange the value of two variable. 6. Write a function prime that return 1 if it's argument is prime and return 0 otherwise. 7. Write a calculator program (add,subtract,multiply,divide). Prepare user defined function for each functionality. 8. WAP for addition of two integer number that will satisfied the following criteria: Function with no arguments and no return values. Function with arguments and no return values. Function with arguments and one return value. Function with no arguments but return a value. 9. Write a function to scan the string and pass as argument and convert into opposite case. 10. WAP by using recursion. a. Fibonacci series b. Factorial
8	Structure, Pointer and	1. Define a structure type, personal, that would contain person name, date of joining and salary. Using this structure, WAP to read this information for one

	File Management	person from the key board and print the same on the screen. 2. Define a structure called cricket that will describe the following information: a. Player name b. Team name c. Batting average 3. Write a function to enter rollno, marks of the three subject for 3 student and find total obtained by each student. 4. Define a structure data type called time_struct containing three members' integer hour, integer minute, and integer second. Develop a program that would assign values to the individual members and display the time in this form:16:40:51 5. WAP to demonstrate the use of union. 6. WAP using pointer and function to determine the length of string. 7. WAP using pointer to compare and concate two strings and also to copy one String to another string. 8. WAP using pointer to read an array if integer and print element in reverse order. 9. WAP to show the use of indirection operator '*' to access the value pointed by a pointer. 10. WAP to show the use of pointers in arithmetic operations. 11. WAP to that demonstrate call by value and call by reference concept in function arguments 12. WAP to read the content of file and display the same on screen 13. WAP to read the content of file and store the same content in another file. WAP to read the content of file and append the same content in another file 14. WAP to read n integers from the keyboard and store them into a file total.txt file, separate odd and even numbers and store them in odd.txt and even.txt file. Display the content of all three files. 15. A program to illustrate the use of fgets(), fputc() and fputs().
		C++ Programming
9	Object Oriented Concepts	1. WAP of your choice to demonstrate the function overloading concepts. 2. Write a function template to find maximum of given three values of any type. 3. Create a class called Employee that includes three pieces of information as instance variables—a first name (type String), a last name (type String) and a monthly salary (double). Your class should have a constructor that initializes the three instance variables. Provide a set and a get method for each instance variable. If the monthly salary is not positive, set it to 0.0. Write a test application named EmployeeTest that demonstrates class Employee's capabilities. Create two Employee objects and display each object's yearly salary. Then give each Employee a 10% raise and display each Employee's yearly salary again. 4. Create class SavingsAccount. Use a static variable annualInterestRate to store the annual interest rate for all account holders. Each object of the class contains a private instance variable savingsBalance indicating the

amount the saver currently has on deposit. Provide method calculateMonthlyInterest to calculate the monthly interest by multiplying the savingsBalance by annualInterestRate divided by 12 - this interest should be added to savings- Balance. Provide a static method modifyInterestRate that sets the annualInterestRate to a new value. WAP to test class SavingsAccount. Instantiate two savingsAccount objects, saver1 and saver2, with balances of $2000.00 and $3000.00, respectively. Set annualInterestRate to 4%, then calculate the monthly interest and print the new balances for both savers. Then set the annualInterestRate to 5%, calculate the next month's interest and print the new balances for both savers.

5. Create a class hierarchy using the following figure. Make Transaction an abstract class.



6.
7. Develop class Polynomial. The internal representation of a Polynomial is an array of terms. Each term contains a coefficient and an exponent. The term 2x4has the coefficient 2 and the exponent 4. Develop a complete class containing proper constructor and destructor functions as well as set and get functions. The class should also provide the following overloaded operator capabilities:
8. Overload+ to add, - to subtract, * to multiply, = to assign one Polynomial to another. Also overload +=, -= and *=.
9. Develop an Array class that overloads stream insertion, extraction operators to take input and print the array. Also overload ==, !=, subscript operator, assignment operator to copy an array.
10. Develop a string class to implement string functions by overloading +, !=, >, <, >=, <=
11. Create a date class to validate date with overloaded ++ and -- (unary pre and post) to increment or decrement the date value.
12. Create a template class Stack to implement all functions of a stack for char, int and float types of stack.
13. WAP to demonstrate the exception handling mechanism.
14. WAP of your choice to show the use of vectors.