SESSION: 2017-18

CSE1181: COMPUTER PROGRAMMING LAB- I (CSE 1181)

Credits: 01 **Semester: I** **L–T–P : 0–0–2**

Module-I

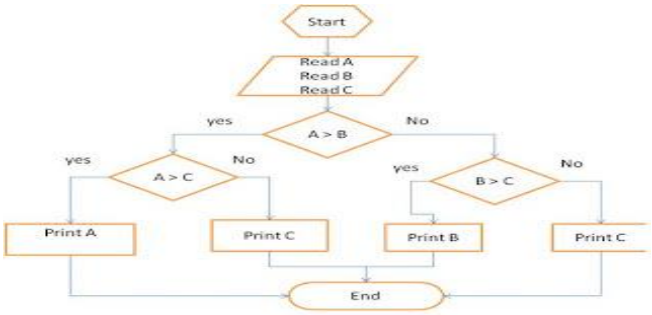
Experiment 1: Basic Linux Commands

- man: An interface to the on-line reference manuals of Linux
- cal: The Calendar of any specific month or a complete year.
- date: Displaying the system date
- echo: Displaying a Message
- who: Maintains an account of all the users who are logged on to the system.
- uname: Print detailed information about the machine name, Operating System and Kernel.
- pwd: Checking your current directory
- cd: Change directory
- mkdir: To make a directory
- rmdir :To remove a directory
- ls: Listing directory contents
- cat : Displaying and creating files
- cp: Copy a file
- rm : Deleting files
- mv : Moving and Renaming files
- wc : Counting lines, words, characters in a file
- cmp : Comparing two files identical or not.
- shutdown: Shutdown the system

Experiment 2: Algorithm & Flowchart

- Mr. X goes to market for buying some fruits and vegetables. He is having a currency of Rs 500 with him for marketing. From a shop, he purchases 2.0 kg Apple priced Rs. 50.0 per kg, 1.5 kg Mango priced Rs.35.0 per kg, 2.5 kg Potato priced Rs.10.0 per kg, and 1.0 kg Tomato priced Rs.15 per kg. He gives the currency of Rs. 500 to the shopkeeper. Find out the amount shopkeeper will return to X and also tell the total item purchased.
- John bought a toy for Rs. 325 and sold the same for Rs. 458. Explain how we can find if John has made a profit or a loss and write the algorithm for the same.
- Write algorithm and flowchart to compute volume of sphere. Use the formula-

  $v = (4/3) * pi * r^3$
- Suppose you start writing a C program at time T1. At time T2 coding is finished. After compiling code, you get an error, and it took you T3 time to fix the error. Write an algorithm to find the total time you spent in executing this program.
- Write the algorithm of following flow chart.



- Draw a flowchart to find all the roots of a quadratic equation $ax^2+bx+c=0$.
- Convert the following algorithm into flowchart-
  1. Sum=0
  2. Count=1
  3. REPEAT
  4. IF count is even THEN sum=sum+count
  5. Count=count+1
  6. UNTIL count>20
  7. DISPLAY sum
- Write an algorithm which generates the table of any number N.
- Write an algorithm and flowchart to find whether a number is palindrome or not.

Experiment 3: Simple C programs

- Write a C program to print your name, date of birth and mobile number
- Write a program to print the following line (Assume the total value is contained in a variable named cost)
  The sales total is : $ 172.53
- Raju got 6 and half apples from each of Raghu, Sheenu and Akash. He wants to know how many apples he has in total without adding them. Write a program which could help Raju in doing this.
- Write a program that prints the floating point value in exponential format correct to two decimal places.
- Write a program to input and print a mobile number (i.e. of 10 digits).
- The population of a city is 30000. It increases by 20 % during first year and 30% during the second year. Write a program to find the population after two years? (Ans: 31200)
- Write a program to find the ASCII value of a character.

Experiment 4: Simple C programs (contd...)

- Write a program to calculate salary of an employee, given his basic pay (entered by user), HRA=15% of the basic pay and TA=20% of the basic pay.
- Write a program to find the slope of a line and angle of inclination that passes through two points P and Q with coordinates (x_p, y_p) and (x_q, y_q) respectively.
- The SPI (Semester Performance Index) is a weighted average of the grade points earned by a student in all the courses he registered for in a semester. If the grade points associated with the letter grades awarded to a student are $g_1, g_2, g_3, \ldots\ldots g_k$ etc. and the corresponding credits are $c_1, c_2, c_3, \ldots\ldots c_k$, the SPI is given by:

$$\boldsymbol{SPI} = \frac{\sum_{i=1}^{k} \boldsymbol{c_i g_i}}{\sum_{i=1}^{k} \boldsymbol{c_i}}$$

  Where, k is the number of courses for which the candidate remains registered for during the semester/ trimester. Write a program in C to calculate SPI.
- Write a program to calculate the frequency (f) of a given wave with wavelength (λ) and speed (c), where $c=\lambda*f$.
- A car travelling at 30 m/s accelerates steadily at 5 m/s^2 for a distance of 70 m. What is the final velocity of the car? [Hint: $v^2 = u^2 + 2as$]
- A horse accelerates steadily from rest at 4 m/s^2 for 3s. (a) What is its final velocity? (b) How far has it travelled? [Hint: (a) $v = u + at$ (b) $s = ut + \frac{1}{2}at^2$]

Module II

Experiment 5: Operators

- Write a program to interchange two values by using the following operators:
  (a)Assignment Operator (b)Arithmetic Operator (c)Bitwise Operator
- Write a program to find the sum of your four last digit of your roll number.
- Write a program to find the highest marks of three students using conditional operator.
- Write a program to find the size of all data types (int, float, char, double, long double, short int etc.).
- Write a program to multiply a number by 16 without using multiplication or addition operator.
- Write a program to divide a number by 64 without using division operator.
- Write a program to find out whether inputted number is even or odd without using arithmetic operators.

Experiment 6: Decision Control Statement

- Write a C program to accept a coordinate point in a XY coordinate system and determine in which quadrant the coordinate point lies.
- Write a C program to find the eligibility of admission for a professional course based on the following criteria:
  Marks in Maths >=65
  Marks in Phy >=55
  Marks in Chem>=50
  Total in all three subject >=180
- 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
  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
- Write a C program to calculate profit or loss.
- Write a C program to input any character and check whether it is alphabet, digit or special character.
- Suppose you start writing a C program at time T1 (hh:mm:ss). At time T2 (hh:mm:ss) coding is finished. After compiling code, you get an error, and it took you T3 (hh:mm:ss) time to fix the error. Write a program to find the total time (hh:mm:ss) that you spent in executing this program.

Experiment 7: Looping Statement

- The program will read two integer numbers and find the multiplication of them using arithmetic plus (+) operator. Do not use multiplication operator to multiply the numbers.
- Write a C program to convert given decimal number to binary number.
- Write a program to read an age of 15 person & find out how many of them fall under :
  I. Still a baby- age 0 to 5
  II. Attending school - age 6 to 17
  III. Adult life- age 18 & over
- Write a C program to generate Armstrong number in the given range.
- Write a c program to print n terms of Fibonacci series.
- Write a C program to find average of all odd number in the given range.

Experiment 8: Looping Statement with nested loop and special control statement (break and continue)

- Write a program to print the following patterns-

```
1 2 3 4 5          * * * * *          1
1 2 3 4 5          * * * * *          1 2
1 2 3 4 5          * * * * *          1 2 3
1 2 3 4 5          * * * * *          1 2 3 4
```

```
1                  *                  A
2 2                * *                A B
3 3 3              * * *              A B C
4 4 4 4            * * * *            A B C D
```

```
 1                                        1
 2 3                                    1 2
 4  5 6                              1 2  3
 7  8 9 10                        1 2 3 4
```

- Write a program to check whether a given number is prime or not.
- Write a program using do while loop to read the numbers (positive and negative both) until -1 is encountered. Also find the sum of only positive numbers.
- Write a program to print table of sine and cos functions for the interval 0-360 degrees in increments of 30.

Module III

Experiment 9: One-Dimensional Array

- Write a program in C to copy the elements one array into another array.
- Write a program which takes 10 inputs in an integer array and display their values in the reverse order.
- Write a program to count the number of positive and negative numbers in an array as input by the user.
- In USA President election, there are 50 states, you have to create two arrays HILLARY and TRUMP store the number of vote polled in each state. Write a program to show result in each state and also find who is the winner?
- Write a program in C to separate odd and even integers in separate arrays.
- There is a class of 10 students having roll numbers from 1 to 10. One of the students in class is missing. How will you find the roll no. of that missing student?
- Find the binary equivalent of an integer number using array.

Experiment 10: Two- Dimensional Arrays

- Take input from the user in a 2D array and print the row-wise and column-wise sum of numbers stored in this 2D array.
- Write a program to keep records and perform statistical analysis for a class of students. The class may have upto 10 students. There are three quizzes during the term. Each student is identified by a four digit roll no. The program will print the student scores and calculate and print the statistics (High score, Low score and average) for each quiz.
- Write a program to multiply two Matrices.
- Write a program in C to calculate determinant of a 3 x 3 matrix.
- Write a program in C to check whether a given matrix is an identity matrix.
- Write a program in C to accept a matrix and determine whether it is a sparse matrix.

Experiment 11: Operations on Array

- An array stores the roll number of all present students. Write a program to search a student in a class by using their roll no. If roll number is found in this array, then find the position of the student.

- Write a C program to delete an element from the array. It should cover the following cases:
    - The index of deleted element is provided
    - The deleted element is provided by user.
    - If index or deleted element is not found in the array, then print the message "Deleted Element not found".
- Write a C program to insert an element at the n^{th} position by checking that array index condition.
- Write a program to sort the elements of an array in ascending order using Bubble Sort.
- An array contains n numbers ranging from 0 to n-2. There is exactly one number is repeated in the array. You need to write a program to find that duplicate number. For example, if an array with length 6 contains numbers {0, 3, 1, 2, 3}, then duplicated number is 3.

Experiment 12: String and operations

- Write a program to check whether given string is palindrome or not.
- Write a program to calculate total number of consonants, vowels and other characters in a given string.
- Write a program to input a word from the user and print it in the following way. For example, if the word is PROGRAM, the program will print it as-

  P
  P R
  P R O
  P R O G
  P R O G R
  P R O G R A
  P R O G R A M
- Write a program to search a middle name in the name consisting of first name, middle name and last name.
- Write a menu driven program to perform the following task-
    - Find length of a string
    - Copy of one string into another
    - Capitalize all letters of a string
    - Reverse of string
    - Comparison of two strings