

17BCACPRP17: Programming Lab- C programming

Practical Hours: 4 Hrs/week

Marks: Main exam: 80

IA: 20

Students are encouraged to use Linux-Open Source OS for executing c –programs using gcc/similar compiler available with Linux.

Students shall gain familiarity with working in Linux environment with the help of course teacher in Lab. Following shall be practiced

- Using vi editor for writing c programs
- Familiarity with bash/similar shell for executing basic shell commands such as ls, cd, mv, man, mkdir, rm, locate, touch, cat, etc.

URL for reference: <http://www.ee.surrey.ac.uk/Teaching/Unix/> ,

<https://www.tutorialspoint.com/unix/unix-vi-editor.htm> ,

https://www.tutorialspoint.com/compile_c_online.php

Student shall gain hands-on experience of drawing flow chart, writing algorithm, and writing c programs and executing the c program. Following assignments shall be implemented in C.

1. Write a program to enter length and breadth of a rectangle and find its perimeter and area.
2. Write a program to enter P, T, R and calculate Simple Interest.
3. Write a program to find maximum between three numbers.
4. Write a program to check whether year is leap year or not using conditional/ternary operator.
5. Write a program to function as a basic calculator; it should ask the user to input what type of arithmetic operation he would like, and then ask for the numbers on which the operation should be performed. The calculator should then give the output of the operation. Use switch. Error message should be reported, if any attempt is made to divide by zero.
6. Write a program that takes in three arguments, a start temperature (in Celsius), an end temperature (in Celsius) and a step size. Print out a table that goes from the start temperature to the end temperature, in steps of the step size; Celsius to Fahrenheit.
7. Write a program to sort array elements in ascending order.
8. Write a program to subtract/add/multiply two matrices.
9. Write a program to find HCF (GCD) of two numbers.
10. Write a C Program to check the given number is Armstrong number or not? Armstrong number is a number that is the sum of its own digits each raised to the power of the number of digits.
Example: $153 = 1^3 + 5^3 + 3^3$
11. Write a program to check whether an alphabet is vowel or consonant using switch case.
12. Write a program to display all possible permutations of a given input string--if the string contains duplicate characters, you may have multiple repeated results. Input should be of the form permute *string* and output should be a word per line.

Here is a sample for the input *cat*

cat

cta

act

atc

tac

tca

13. Write a function that accepts a number, n, and prints all prime numbers between 1 to n.
14. Write an iterative function calculate factorial of a given integer.
15. Write a function that accepts array of integers to find maximum and minimum element in an array.
16. Write a program to input marks of five subjects Physics, Chemistry, Biology, Mathematics and Computer. Calculate percentage and grade according to following. Use structure to create array of students and compute percentage and grade by passing structure to function.
 Percentage \geq 90% : Grade A
 Percentage \geq 80% : Grade B
 Percentage \geq 70% : Grade C
 Percentage \geq 60% : Grade D
 Percentage \geq 40% : Grade E
 Percentage $<$ 40% : Grade F
17. Write a C program to add two complex numbers by passing structure to a function. Consider the following structure definition for complex number.

```
typedefstruct complex
{
float real;
floatimag;
} complex;
```
18. Write a C program to illustrate difference between structure and union by defining emp_Name, salary, job as members and displaying the size of the defined structure and union. (ie. In terms of memory allocation)
19. Write a program that accepts a base ten (non-fractional) number at the command line and outputs the binary representation of that number.
20. Write a C program to concatenate two strings without using library function
21. Write a C program to compare two strings without using library function
22. Write a C program to illustrate string library functions (copy, concat, uppercase to lower case and vice-versa, length of string, sort set of strings(use strcmp)).

Note:

Students shall write flow charts for ten programs, among the given set of assignments, identified by courser teacher, covering all the symbols of the flow charts.

Students shall write algorithms for ten programs, among the given set of assignments, identified by courser teacher.