Programming for Problem Solving Lab

2019 EVEN SEMESTER

SEC-K/B
2019

1st Year 2nd Semester *Code:ES- CS 291*

Day 1:

1. Convert a given number of days into months and days.
2. Convert a temperature from Fahrenheit scale to Celsius scale.
3. Swap two numbers without using third variable.

Day 2:

4. Check whether a year is leap or not.
5. Compute the roots of a quadratic equation:
   $ax^2 + bx + c = 0$

   Use the following rules:

   a) No solution, if both a and b are zero
   b) There is only one root if a= 0 (x= -c/b)
   c) There are no real root, if $b^2 – 4ac$ is negative
   d) Otherwise, there are two real roots
6. Print Grade of a student whose marks is inputted through keyboard according to following rules:

Marks	Grade
90 to 100	O
80 to 89	E
70 to 79	A
60 to 69	B
50 to 59	C
40 to 49	D
0 to 39	F

i. Using if-else statement
ii. Using switch-case statement

Day 3:

7. Find the sum the following series:
   1 + ½ + 1/3 + ¼ + ... upto n terms
8. Generate the following Fibonacci series:
   1 1 2 3 5 8 13..... upto n terms
9. Calculate X^Y without using pow() function.
10. Calculate the Factorial value of a number.
11. Find the sum of the following series:
    -1 + 1/3! - 1/5! + 1/7! ..... upto n terms

Day 4:

12. Determine whether a number is prime or not.
13. Print all prime numbers between 1 and n.
14. Find HCF of two numbers (by atleast two methods).
15. Calculate the sum of digits of a 5-digit number.
16. Reverse a 5-digit number.
17. Generate the following Pyramid Pattern:

```
1
232
34543
```

```
*
* *
* * *
* * * *
```

```
    *
   * * *
  * * * * *
* * * * * * * *
```

```
a
ab
abc
abcd
```

```
a
bb
cccc
dddd
```

Day 5:

18. Sort a series of numbers in either ascending or descending order(using Bubble Sort, Insertion, Selection Sort Algorithm).
19. Print the largest number from any 5 × 5 matrix.
20. Find the transpose of a 4 × 4 matrix.
21. Generate following pattern by using a single 5 × 5 Array.

```
1 0 0 0 0
0 1 0 0 0
0 0 1 0 0
0 0 0 1 0
0 0 0 0 1
```

Day 6:

22. Find the length of an inputted string without using strlen() function.
23. Copy one inputted string to another string without using strcpy() function.
24. Check whether two inputted strings are equal or not without using strcmp() function.
25. Concatenate two inputted string without using strcat() function.
26. Determine whether an inputted is Palindrome or not.
27. Read a string from keyboard and Reverse it.

28. Count the number of **spaces** words and characters within an inputted text.

Day 7:

29. Swap the values of two variables using function. (Assume that the two variables are defined as global variables)
30. Calculate Factorial of a given number using function
    a. Without recursion
    b. With recursion
31. Generate Fibonacci series using function
    a. Without recursion
    b. With recursion
32. Use a recursive function to calculate HCF of two numbers.
33. Use recursion in C Program to implement Ackermann function using recursion
34. Implement Quick Sort and Merge Sort Using Recursion.

Day 8:

35. Find the bigger of two entered number using a macro.
36. Define a structure cricket which contains player name, team name and batting average. Input name, team name and batting average for 10 players and print the details of the player having highest batting average.

Day 9:

37. Copy the content of a file to another file.
38. Suppose one file has some even and odd numbers. Now separate the numbers into two different files: even numbers in even.txt and odd numbers in odd.txt file.
39. Count total number of characters, vowels spaces of a text file.

Project:

40. Develop a game of Tic-Tac-Toe.
41. Develop a snake game without graphics library.
42. Develop a project on student database management system using file.