**PRACTICAL EXERCISES FOR C**

1. WAP that converts degree into radians.
2. WAP to check whether a given number is Armstrong or not.
3. Euler’s number e is used as a base of natural logarithms. It may be approximated using

Where n is sufficiently large. WAP that approximates e using a loop that terminates when difference between two successive values of e is less than 0.0000001.

1. WAP in C that would find the length of a straight line formed by two end-points, whose co-ordinates are given as inputs.
2. WAP to compute square root of a given number without using sqrt() function of math library.
3. Given lengths of three sides of a triangle. Check whether triangle can be formed or not. If possible then classify the triangle as isosceles, equilateral or scalene. Otherwise, if triangle cannot be formed.
4. Write a program that determines a user’s grade. It reads three test scores(between 0 and 100) and calls a function that calculates and returns a student’s grade based on the following rules:
   1. If the average score is 90% or more, the grade is A.
   2. If the average score is 70% or more and less than 90% , it checks the third score. If the third score is more than 90%, the grade is A, otherwise grade is B.
   3. If the average score is 50% or more and less than 70% , it checks the average of the second and third scores. If the average of the two is greater than 70%, the grade is C, otherwise grade is D.
   4. If average score is less than 50 %, then grade is F.

The program’s main is to contain only call statements. At least three sub functions are required: one to read scores, one to determine the grade and one to print the result.

1. Take three inputs from the user & then show:
   1. the largest if the average of the inputs is greater than 100
   2. the smallest if the average of the inputs is less than 100
   3. the middle value if the average of inputs is equal to 100.
2. The formula for converting centigrade temperatures to farenheit is

WAP that asks user to enter a temperature reading in centigrade and then prints the equivalent farenheit value. It then asks the user to enter a Fahrenheit value and prints out the equivalent centigrade value. Run the program several times. Include a negative value also.

1. WAP in c to count total numbers of Sundays in a year. You can assume the inputs as the year & the starting day of the year.
2. WAP that prompts user to enter date as three integer values for month, the day in the month and year. The program should then output the date in the form of 31st December 2003, when user enters 12 31 2003.
3. WAP in c to print Fibonacci in binary.
4. WAP in C to take 2 values(0-255) from the user and print all the ASCII characters them between them
5. WAP in C to accept 2 character symbols from the user and then print all the ASCII characters between them
6. Accept 10 numbers into an array & then separate them in two arrays in odd and even number sets (selective cut & copy operation).

1. WAP in C to create a frequency array for 100 numbers between 0-19. Create a corresponding histogram for the above.
2. WAP in C to take 20 numbers from the user in increasing order. The user should be prompted for any violation in the entry order. Then search the array using binary search algorithm for any number as input by the user
3. WAP that creates an array of 100 random integers in the range 1 to 200 and then using sequential search, searches the array 100 times using randomly generated targets in the same range. At the end of the program display the following statistics:
   1. The number of searches completed.
   2. The number of successful searches.
   3. The percentage of successful searches.
   4. The average number of tests per search.
4. WAP in C to transpose a matrix (stored in same 2D array without using different array).

The Pascal Triangle can be used to compute the coefficients of the terms in the expansion of . Write a function that creates a two-dimensional matrix representing the pascal triangle. In a Pascal triangle, each element is the sum of element directly above it and element to the left of the element directly above it. A pascal triangle of size 7 is shown below.

1

1 1

1 2 1

1 3 3 1

1 4 6 4 1

1 5 10 10 5 1

1 6 15 20 15 6 1

In the above example, the first element of row[0] and first two elements of row[1] are set to 1. Then each of the following rows, upto the maximum size, are set up with a loop. Your program must be able to create a triangle of any size.

1. Count number of clusters in a matrix. A cluster is a 3x3 square within any large matrix, in which at least 5 elements are same.
2. WAP to performing sorting of numbers using insertion sort, selection sort and bubble sort.
3. WAP in C with a function having static variable to display the alphabet.
4. WAP in C to print the elements of the array in the forward and backward order using pointers.
5. WAP in C to find the smallest number in an array using pointer.
6. WAP in C to perform the binary search using pointers.
7. Write a program and the following functions to compute the average value for the following data values stored in a two-dimensional array. Pass the array by name and pick it up using a pointer variable
   1. A function to input the data in a 2-D array.
   2. A function to compute the row averages and store them in a1-D array.
   3. A function to compute the column averages and store them in a1-D array.
   4. A function to compute the averages of all the values in the array.
   5. A function to output the array,row averages, column averages and overall average.
8. Copy a string in array in reverse using static variable.
9. WAP in c to change all “is” to “was” in a given string.
10. WAP in C to take to strings n then compare(using functions) then, according to dictionary sorting function (user defined):
11. return -1 if string1>string2
12. return 0 if string1=string2
13. return 1 if string1<string2
14. WAP in C writes odd numbers between 300 and 500 to a file.
15. WAP that appends one file at the end of the other.
16. WAP that copies one text file to another and inserts blank lines between paragraphs in the new file. Paragraphs are identified by a new line character.
17. Using Command Line arguments to add all the numbers given by the user.
18. Using bit manipulation & bit masking display the binary equivalent of any integer input by the user.

**Challenging Questions**

1. WAP to keep records and perform statistical analysis for a class of students. The class may have upto 40 students. There are five quizzes during the term. Each student is identified by a four-digit number.

The program will print the student scores and calculate and print the statistics for each quiz. The output is in the same order as the input; no sorting is needed. The input will be read from a text file. The output from the program should be similar to the following:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Student | Quiz 1 | Quiz 2 | Quiz 3 | Quiz 4 | Quiz 5 |
| 1234 | 78 | 83 | 87 | 91 | 86 |
| 2134 | 67 | 77 | 84 | 82 | 79 |
| 3124 | 77 | 76 | 87 | 76 | 86 |
| High Score | 78 | 83 | 87 | 91 | 86 |
| Low Score | 67 | 76 | 84 | 76 | 79 |
| Average | 73.4 |  |  |  |  |

Use 1-D and 2-D arrays.

1. Write a program that will read ten integers from keyboard and place them in an array. The program will then sort the array into ascending and descending order and print the sorted lists. The program does not change the original array or create any other integer arrays.

Hint: Use two pointer arrays. The first pointer array is rearranged so that it points to data in ascending order. The second pointer array is rearranged so that it points to data in descending order.

Before Sorting

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| --- |
| 26 |
| 14 |
| 57 |
| 33 |
| 41 |
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After Sorting

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| Ascending |
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| --- |
| 26 |
| 14 |
| 57 |
| 33 |
| 44 |
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| --- |
| Descending |
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