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Assignment Set :1

Problem No: 6

Problem Statement :

Store the names of your classmates according to roll numbers in a text file one name per line. Write a program to find out from the file, the smallest and largest names and their lengths in number of characters. Write a function to sort the names alphabetically and store in a second file.

Solution Approach:

For this problem we would first read the file and store the roll and names of the candidates by creating corresponding arrays of required types,say array of strings .Then we create another file and open it in write mode.We apply sorting algorithm may be any of them (here,bubble sort has been used ) to sort the names alphabetically and then again store them in the file which we opened in writing mode. While reading the rolls and names we also keep track of the longest and shortest name and print them once the file reading is done or we reached the end of file.

Structured Pseudocode :

1.Initialise File pointer ptr and i

2.ptr=open file roll\_name.txt in reading mode

3.if(ptr==NULL)

4. print “File not found”

5. Exit

6.else

7. initialise Array\_Roll to store Roll , Array\_Name for names

8.Initialise shortest\_name with large string and longest\_name with empty string

8. While(!EOF)

9. Store Array1[i]=roll , Array2[i]=name

10. if(name>longest\_name)

11. longest\_name=name;

12. if(name<shortest\_name)

13. shortest\_name=name;

14. Initialise string str as another file name

15.SortAndWriteToFile(Array\_Roll,Array\_Name,str)

16.print longest\_name and shortest name

17.Close file ptr

SortAndWrite(Array\_Roll,Array\_Name,str)

1.Initialise file pointer ptr ,i ,j

2.Initialise n=total number of lines till EOF(end of file)

2.Open file str in writing mode

3.//No need to check because if file is not present it would be created

4.for i from 1 to n-1

5. for j from 1 to n-i-1

6. if (Array\_Name[j]>Array\_Name[j+1])

7. swap Array\_Name[j],Array\_Name[j+1]

8, swap Array\_Roll[j],Array\_Roll[j+1]

9. While(!EOF)

10. write Array\_Roll[i] and Array\_Name[i],for each i from 1 to n

11.Close the File pointed by ptr

//Indentation refers to the scope of a particular block

Results:

Here,we are getting the sorted list of names according to the alphabetical order in a separate file and printing the longest and shortest name from the list of roll and names.The files are closed once the operations to be performed on it are done.

Discussions:

Here we will be writing directly to a file after sorting the list.Even if the file doesn’t exist and we open it in the write mode a new file with “filename” will be created.We are using the C library functions like fopen(“filename”,”mode”) and fprintf(file pointer,”control specifier”,list of values) to open and write to the file,fclose(file pointer) to close the file and sorting algorithm(bubble sort) in this case in particular which has a complexity of O(n2).If the number of students is very large we have to use more efficient sorting algorithms like quick\_sort so that the program is efficient but since the number of students is 100 here, bubble sort is used.There are chances of error if the file is not present in the same directory(the fopen() returns Null pointer ) as the program file so it must be ensured otherwise we must specify the complete pathname to the program.

Separate files containing commented source code

The file has been attached.