PDS Lab, Section - 17, Date: 22nd Feb 2021

Assignment - 9 [FILES]

Instructions

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1. **Create a directory named as <rollno>_A9, where <rollno> is your roll number.**
2. **Give the name of the program as <p>.c where <p> implies the problems number, like 1.c 2.c 3.c etc. Store all the program under this Assignment in the directory <rollno>_A9**
3. **Zip the entire directory <rollno>_A9.**
4. **You should upload your zipped file <rollno>_A9.zip to the Moodle course web page latest by 5:30 PM (without penalty). The cutoff time will be till 6:00 PM with a penalty of 25% on your secured marks (i.e., if you secured 80 marks, after penalty you will get 60 marks). Beyond 6:00 PM, the moodle system will not allow you to submit, as a result you will get zero.**

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1. Write a C Program to open a new file named int_file, and read N (N specified by the user) positive integers from a keyboard and store them in int_file. Read the integers from int_file one by one and write them into three files even_file, odd_file and prime_file, based on the following constraint: (i) even_file and prime_file should contain only even and prime numbers, respectively. (ii) The rest of the numbers should present in odd_file. Finally display the contents of all four files created in the following order: int_file, even_file, prime_file and odd_file. **(15M)**

   Example:
   N = 10
   Contents of int_file = 23, 77, 46, 99, 113, 996, 105, 773, 103, 12
   Contents of even_file = 46, 996, 12
   Contents of prime_file = 23, 113, 773, 47
   Contents of odd_file = 77, 99, 105

2. Write a C program to perform the following: **(20M)**

   a. Consider an existing .c file, which contains some C program. Open the file and display its contents.

   b. Write a C function to encrypt the contents of the .c file with the following encryption rule: Each character (source) of the file is replaced with a character (target) whose ASCII code is m (0<m<=10, the integer value of m will be provided by the user) more than the ASCII code of the source. The function should return the encrypted file to the main(). Print the encrypted contents of the file.

   c. Write a C function to decrypt the encrypted file (encrypted by the key m) based on the user specified key n. If the user specified decrypted key match with encrypted key, then the original file contents can be recovered. The function should return the decrypted file to the main(). Print the decrypted contents of the file, and demonstrate the decryption process.

3. A student has taken N tests (N is provided by the user through keyboard) in a particular subject, and their marks (range of marks = 0 - 100) have to be stored in two text files namely, list1_file and list2_file, in arbitrary manner specified by the user (say for example, user says marks of m tests (m<N) in one file and the rest N-m tests in another file). Here, you need to open two new files and write the marks into these two files through keyboard by the user. Read the contents of two files having a list of m and N-m scores (marks), respectively, and display the same. Merge the two lists in to a separate file merge_list and display the contents of merge_list file. Sort the contents of merge_list file, and find the average of the top k (where k to be specified by the user, k<=N) scores of the merge_list file. Store the sorted marks and append the average of top k scores at the end of the file sorted_merge_file and display its contents. **(30M)**

   Example: N = 12
   Size of list1_file (m) = 5
   Size of list2_file (N-m) = 7
   Contents of list1_file = 54, 76, 88, 47, 97
   Contents of list2_file = 24, 62, 90, 70, 91, 66, 84
   Contents of merge_list = 54, 76, 88, 47, 97, 24, 62, 90, 70, 91, 66, 84
   Sorted list = 24, 47, 54, 62, 66, 70, 76, 84, 88, 90, 91, 97
   k = 5
   Average of k top marks = 90
   Contents of sort_merge_list file = 24, 47, 54, 62, 66, 70, 76, 84, 88, 90, 91, 97, 90

4. Write a C program to create a new file (with some file name) and enter the text through keyboard. Write appropriate C functions to determine and display the following contents of the file:
   a. Display the file contents.
   b. The longest and the shortest words.
   c. The words with the minimum and maximum number of vowels.
   d. All repeated words. **(35M)**

   Example: Suppose, a new file by the name "file.txt" is created and the following text is entered through the keyboard:

   Congress MP, Sashi Tharoor used the following words to highlight the dishonesty of a journalist: Exasperating farrago of distortions, misrepresentations and outright lies, being broadcast by an unprincipled showman masquerading as a journalist.

   The output of the program on this file for questions a, b, c and d are as follows:
   a. Congress MP, Sashi Tharoor used the following words to highlight the dishonesty of a journalist: Exasperating farrago of distortions, misrepresentations and outright lies, being broadcast by an unprincipled showman masquerading as a journalist.
   b. The longest word is "misrepresentrations". The shortest word is "a".
   c. The words with the minimum number of vowels are "MP", "by". The word with the maximum number of vowels is "misrepresentations".
   d. The repeated words are "the", "a"