Amrita Vishwa Vidyapeetham

Amrita School of Computing, Coimbatore

Department of Computer Science and Engineering

23CSE006 – Computational Problem Solving

B. Tech – CSE E - Semester 1
Lab Evaluation 3
Date: 07.12.2023

Course Outcomes

CO1: Apply algorithmic thinking to understand, define and solve problems.
CO2: Design and implement algorithm(s) for a given problem.
CO3: Apply the basic programming constructs for developing solutions and programs.
CO4: Analyze an algorithm by tracing its computational states, identifying bugs and correcting them.

Set 1

1. Read the number of subjects (N) from the user and then read the subject titles (N strings) from the user into a list called 'Subjects'. After getting the names, perform the following operations as per the instructions given:
    - **a.** Write a Python function to return the lengths of each subject name as a list, when the entire subject name list is given as parameters. Use an additional function to calculate the length of each string. **You should not use len() to calculate the length of each string.** **[7 Marks] [CO2] [BTL3]**
    - **b.** Re-write the second module to calculate the string length using recursion. [**Hint:** If there is no character remaining in the string, return 0. Otherwise, calculate the length of the string excluding the first character using the same function, add one to the result, and return the value] **[3 Marks] [CO2] [BTL3]**
2. Create a file with the following content.

    "Martin Luther King Jr. aka MLK was born in 1929. MLK was one of the most prominent leaders in the civil rights movement from 1955. King advanced civil rights for people of color in the United States through nonviolence and civil disobedience. MLK was assassinated in 1968."

    After saving the file as "MLK.txt", perform the following using Python programming:
    - **a.** Read the MLK.txt file, extract words, and create a collection of words without duplication, compute the frequency of each of these words in the original file, and write (word, frequency) pair into a new file called "Words.txt".
    - **b.** Create another file called "WordSwap.txt", that writes the contents into another file by swapping the adjacent words in the original file **[10 Marks] [CO2] [BTL3]**

Amrita Vishwa Vidyapeetham

Amrita School of Computing, Coimbatore

Department of Computer Science and Engineering

23CSE006 – Computational Problem Solving

B. Tech – CSE E - Semester 1
Lab Evaluation 3
Date: 07.12.2023

Course Outcomes

CO1: Apply algorithmic thinking to understand, define and solve problems.
CO2: Design and implement algorithm(s) for a given problem.
CO3: Apply the basic programming constructs for developing solutions and programs.
CO4: Analyze an algorithm by tracing its computational states, identifying bugs and correcting them.

Set 2

1. Read the number of neighbouring countries (N) from the user and then read the country names (N strings) from the user into a list called 'Neighbours'. After getting the names, perform the following operations as per the instructions given:
   - **a.** Write a Python function to return the count of country names that has a given sub-string present in it, when the entire list and the substring to be checked are given as parameters. **[7 Marks] [CO2] [BTL3]**
   - **b.** Re-write the above module using recursion. [**Hint:** If there is only one string, and it contains the substring, then return 1. If there is only one string, and it does not contain the substring, then return 0. When there is more than one string, check whether the substring is present in the first string. If present, add 1 to the result of the recursive call to the sublist containing strings except the first string. If not present, return the result of the recursive call to the sublist containing strings except the first string] **[3 Marks] [CO2] [BTL3]**
2. Create a file with the following content.
   "William Shakespeare was an English playwright, poet, and actor who is widely regarded as one of the greatest writers in the English language and the world's pre-eminent dramatist. He was born in Stratford-upon-Avon in 1564 and married Anne Hathaway in 1582. They had three children. Shakespeare's plays include Macbeth, Romeo and Juliet, and The Tempest."
   After saving the file as "WS.txt", perform the following using Python programming:
   - **a.** Read the MLK.txt file, extract words, and create a collection of words without duplication, compute the frequency of each of these words in the original file, and write (word, frequency) pair into a new file called "Words.txt".
   - **b.** Create another file called "Reversed.txt", that writes the contents into another file by reversing each word. **[10 Marks] [CO2] [BTL3]**