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Problem No. 5

Problem Statement :

Define an ADT for String. Write C data representation and functions for the operations on the String in a Header file, with array as the base data structure, without using any inbuilt function in C. Write a menu-driven main program in a separate file for testing the different operations and include the above header file.

Solution Approach:

For the string ADT we need to create a structure which consists of a character array so that we can perform the required operation on string using the string adt created.

We can find the length of the string by traversing the char array until we find the null char and return the length.We can concatenate two strings by creating a function strcat and pass two string types as the parameters.

We can copy one string to another string by creating a function string\_cpy similar to the library function strcpy in C and do the necessary operations.The other operations too can be done in the same way .

Structured Pseudocode :

1.Create a string structure which consists of an array of char and the size

2.Create the required functions to do the corresponding string operations

3.//for the length calculation of the string create a func say str\_length()

4.initialise len=0

5.while (s.array[i]!=’\0’)

6. len++,i++

7.return length

8.//for string concatenation take a source string say src and destination string say dest

9.//for copying a substring create a function say sub\_str(src,start\_index,length\_of\_substr)

Results:

We obtain the string adt as a result and now can perform the general string operation on that data type .An array of characters is taken to be the base data type to create the abstract data type of string.

Discussion:

The length of the array of characters to be taken inside the string structure is to be decided in such a manner that it can sufficiently accommodate the strings of larger length.

Separate files containing commented source code

The file has been attached.