Arrays

Problem 1: For a given two arrays (size 6) of name and student marks (out

of 100) of four subjects, write a MIPS assembly program that lets the user enter

the name of a student as an input. The program checks whether the input name

is matched with the given string array of the names. If matched, the program

prints the marks list of the corresponding student. The two possible output

formats of the program are as follows:

Output 1: Enter Student Name: Abhilash

The marks of student is as follows:

Physics: 85

Chemistry: 70

Mathematics: 95

Biology: 90

Output 2: Enter Student Name: Tanmay

Student name is not matched

Problem 2: Write a MIPS assembly program that implements the bubble

sort for an integer array of size 10. The user provides the input value of the

integers for the array. The program prompts the following output on the screen:

Before Bubble Sort: 2, 3, 1, 0, 5, 4, 7, 6, 9, 8

Iteration 1: 2, 1, 0, 3, 4, 5, 6, 7, 8, 9

Iteration 2: 1, 0, 2, 3, 4, 5, 6, 7, 8, 9

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..

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After Bubble Sort: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Functions

Write a MIPS assembly program that lets the user to enter the

two strings of a maximum length of 8 characters and a character. The MIPS

program implements three functions: (a) compute length: compute the length

of the input string and print it (b) search character: search the character and determines whether the character is present or not in the string (c) concat string:

concatenate the two input string into the third-string and return the concatenated string into caller function and print it. Note that the first two functions

are called for both the strings, and the third function is called for two times: the

first time, the first input string is passed as the first input argument, and the

second input string is passed as the second argument. Whereas for the second

time, the first input string is passed as the second input argument, and the

second input string is passed as the first argument. The output format for the

input strings "Hi", "World" and the input character ‘H’ is as follows:

Length of first string: 2

Length of second string: 5

Input character is present in the first string

Input character is not present in the second string

First concatenated string: HiWorld

Second concatenated string: WorldHi

Write MIPS assembly program that implements the bubble sort,

quick sort (consider the pivot element to be the middle element of the array

always), and selection sort functions that sort an integer array of size 10. The

sorting algorithm print the sorted array along with the number of comparison

and swap operations. Further, based on the comparison operation, print the

best sorting algorithm. Similarly, based on the swap operation, print the best

sorting algorithm. The user provides the input value of the integers for the

array. The program prompts the following output on the screen:

Before Bubble Sort: 2, 3, 1, 0, 5, 4, 7, 6, 9, 8

After Bubble Sort: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Total Number of Comparisons: 12 (incorrect number)

Total Number of Swaps: 13 (incorrect number)

Before Quick Sort: 2, 3, 1, 0, 5, 4, 7, 6, 9, 8

After Quick Sort: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Total Number of Comparisons: 20 (incorrect number)

Total Number of Swaps: 19 (incorrect number)

3Before Selection Sort: 2, 3, 1, 0, 5, 4, 7, 6, 9, 8

After Selection Sort: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Total Number of Comparisons: 9 (incorrect number)

Total Number of Swaps: 15 (incorrect number)

Selection sort is best in terms of comparison

Bubble sort is best in terms of swap

Itreative Construct

The Fibonacci Sequence is the series of numbers:

0,1,1,2,3,5,8,13,21.........

that is produced by the adding up two number appear before the sequence.

Write a MIPS assembly program that takes one number as an input, let say n

and print the first n number of Fibonacci series by first storing into the memory.

The output format (for n = 6) should be like this:

1 number of fibonacci series is stored at memory location 3000

2 number of fibonacci series is stored at memory location 3004

3 number of fibonacci series is stored at memory location 3008

.....

fibonacci series: 0,1,1,2,3,5