COMP 352: Principles of Programming Languages

Assignment 1 on Logical Programming

Summer 2020, sections AA

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Question 1:

**algorithm** **Method**

**input**: String S of n characters

**Output**: String with each character and its number of repetitions

result “”

S += ‘\0’

A S **as** character array

current A[0]

count 1

**for** i 1 **to** n – 1 **do**

**if** A[i] = current **then**

count++

**continue**

num count > 1 ? count : “”;

result += current + num

current A[i];

count 1

**return** result

Question 2:

**algorithm** **Method**

**input**: Array A of n Integers

**Output**: Void

smallestDiff 2147483647 // Stores the smallest difference encountered yet

largestDiff -1

firstSmallestIndex **null**

secondSmallestIndex **null**

firstLargestIndex **null**

secondLargestIndex **null**

**for** i 0 **to** n – 1 **do**

**if** **|**A[i] – A[i + 1]**|** < smallestDiff **then**

smallestDiff **|**A[i] – A[i + 1]**|**

firstSmallestIndex i

secondSmallestIndex i + 1

**if** **abs**(A[i] – A[i + 1]) > largestDiff **then**

largestDiff **|**A[i] – A[i + 1]**|**

firstLargestIndex i

secondLargestIndex i + 1

**print** “The two conductive indices with smallest difference between their values are: index $(firstSmallestIndex) and index $(secondSmallestIndex), storing values $(A[firstSmallestIndex]) and $(A[secondSmallestIndex]).”

**print** “The two conductive indices with largest difference between their values are: index $(firstLargestIndex) and index $(secondLargestIndex), storing values $(A[firstLargestIndex]) and $(A[secondLargestIndex]).”

ii) Iterate through the array and compare the consecutive numbers

iii) . Because we have 1 loop of n iterations

iv) . Because there’s no recursion meaning that the function is called only once

Question 3:

1. False,
2. True
3. False
4. True
5. False
6. False