WIA2005 Algorithm Design & Analysis

Semester 2, 2021/2022

Lab Viva - Sorting Algorithms and String Matching Algorithms (15%)

PART 1 – Implement the sorting algorithm

Given the following array A = [16, 30, 95, 51, 84, 23, 62, 44], implement a program to sort the array using the following algorithm:

a) Counting Sort

b) Radix Sort

c) Shell Sort

Provide the pseudocode, implement the algorithm using Python, explain the codes/algorithm, and explain running time complexity of each algorithm.

PART 2 – Implement the String Matching Algorithm

Given a String "algorisfunalgoisgreat", search for the word "fun" and "algo" in the String by applying the following algorithms:

a) Rabin-karp Algorithm

b) KMP Algorithm

c) TRIES

Provide the pseudocode, implement the algorithm using Python, explain the codes/algorithm, and explain running time complexity of each algorithm.

Rubric for Lab Viva (15%)

Coding/Implementation (Group marks)

No	Criteria	Marks		
		0	3	5
1	Code execution (5%)	Not able to execute any codes and does not contain the appropriate algorithm.	Able to execute some codes and contain the implementation of the appropriate algorithm.	Able to execute all codes correctly using the appropriate algorithm.

Report (Group marks)

No	Criteria	Marks		
		0	3	5
1	Pseudocode (2%)	Does not provide the pseudocode / pseudocode is a copy-paste of the source code.	Able to provide pseudocode but some does not match with the algorithm.	Able to provide the pseudocode and all according to the algorithm..
2	Running time complexity (3%)	Does not able to explain any of the running time complexity correctly.	Able to explain some running time complexity correctly.	Able to explain all running time complexity clearly and correctly.

Viva (Individual marks)

No	Criteria	Marks		
		0	3	5
1	Comprehension (5%)	Does not able to explain the codes/algorithm correctly.	Able to explain some codes/algorithm correctly.	Able to explain all codes/algorithm correctly.