**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:

1. Counting Sort
2. Radix Sort
3. 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)***

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| --- | --- | --- | --- | --- |
| **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)***

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| --- | --- | --- | --- | --- |
| **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)***

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| **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. |