Faculty of Computers and Information

Analysis and Design of Algorithms (3rd Year)

Dept. of Computers Science

Fall 2024/2025

Due: Dec. 21, 2025 (11:00 am) Programming Assignment

- (i) The following programing assignment measures the ability to analyze and implement Heap-Sort algorithm. You are required to work *individually* in this work.
 - a. Write all required algorithms needed to sort a sequence of numbers using Heapsort Algorithms.

b. Analyze in detail your written algorithms in Part (a).

	teset (
	number of nodes in heap h 2hot 1
* 11.28	number of nodes an many not
* Alia	number of nodes in keap = 2h
Prote	that n elements heap has height I togn
	2h < n < 2h+1
	1 × 100 × 11 11
	50 h=1 109 ml
	min hear by maintain min hear free
	MAX hard Find (Q.1)
	L = left(i) i*2 3 9
	R= right (1)(1+2)+1 2 3 2
	if (1 <= Heapsize 88 Arij > Arij
	1 Largest = 13
	elses
	Largest=13
	IF (R<- Heapsize 88 A[R] >A[la
	1 Largest = R
	if (largest!=i)
	Swap (ACI], As largest
	- (2013) Max heapity (A, Largest)
	The state of the s

c. Implement your written algorithms in Part (a).

https://github.com/Mariamadham8/Algorithm_Project/tree/main/Algorithms

- (ii) The following programing assignment measures the ability to analyze and implement Kruskal's algorithm to find MST of a network. You are required to work with your colleagues in a teamwork (Maximum *Two-Three members*).
 - a. Write all required algorithms needed to find MST using Kruskal's Algorithm.
 - b. Analyze in detail your written algorithms in Part (a).

* KRUS H	(al Algorithm:-
MS	t-kniskal (G,W)
1	1= {} empty graph
- F	oreach vertex v & G.V
Flog E +	Sort edges G. F into non increasing oborder by W For each Sorted edge (U,V)
	if find-set (u) = find-set(v) v-1
Vlogy	A = AU (UIV) de
	logy = union (U,V)
	Return A
	T(n) = O(ElogE) = 0 (ElogV)

c. Implement your written algorithms in Part (a).

https://github.com/Mariamadham8/Algorithm_Project.git

Any further information will be announcement later