## Chandubhai S. Patel Institute of Technology-Changa U & P U. Patel Department of Computer Engineering

Subject Name: Design and Analysis of Algorithms

Semester: 5<sup>th</sup>

Subject Code: CE342 Academic year: June -November 2019

## **Practical List**

## Analysis of Program should contain following sub heading(s).

- 1. Impact of Input Size on the Performance of Program. Make Table and Draw graph of Input Size Vs Running Time/Total No of Instructions. Take at least Five Input of Different Size.
- 2. Impact of Input Quality on the Performance of Program. Make Table and Draw graph of Best Case, Worst Case and Average Case Input Quality Vs Running Time/ Total No. of Instructions.
- 3. Rate of Growth of Program. Make Table and Draw Graph of Input Size Vs Instruction(s) Running Maximum No of Time in the Program.
- 4. Conclusion from the above graph or Data Table

5. For all Test cases, add column for output, calculate the answer and write the answer in the output column and verify with the output of the program.

and v		th the output of the program.						
Exp.	Nam	e of Experiment	Hours					
No.								
1.	Imple	ement and analyze algorithms given below.	04					
	1.1	Factorial (Iterative and Recursive)						
	1.2	Euclidean algorithm						
	1.3	Matrix Addition and Matrix Multiplication(Iterative)						
	1.4	Recursive Linear Search and Binary Search						
	1.5	Find a subset of a given set $S = \{s1, s2,, sn\}$ of n positive integers whose sum is equal to a given positive integer d. For example, if $S = \{1, 2, 5, 6, 8\}$ and $d = 9$ there are two solutions $\{1,2,6\}$ and $\{1,8\}$ . A suitable message is to be displayed if the given problem instance doesn't have a solution.						
2.	Imple them)	ement and analyze algorithms given below (Compare						
	2.1	Bubble Sort						
	2.2	Selection Sort						
	2.3	Insertion Sort						
3.	Divid	e and Conquer Strategy	04					
	3.1	Implement and perform analysis of worst case of Merge Sort and Quick sort. Compare both algorithms.						
	3.2	Implement the program to find X^Y using divide and conquer strategy and print the total number of multiplications required to find X^Y. Test the program for following test cases:						
		Test Case         X         Y           1         2         6           2         7         25           3         5         34						
			_					

4.	Gree	dy Approa					04				
	4.1	A cashier to custom number of which is a cashier find a chartent the total r	r at any mall need ners many times of coins available described by a second to find the minimange of a particular program for followers.	s in a day. Cate le with different et C. Implement number of alar amount Arrequired of given	ashier has murent denominated the program of coins required. Output show wen denomina	altiple ations m for red to ald be					
		Test	Coin denon		Amount A	A					
		Case 1	₹1 ₹	₹1, ₹2, ₹3							
		2	₹18, ₹17		₹ 5 ₹ 22						
		3	₹100, ₹25,		₹ 289						
		Is the or	utput of Test on.	ease 2 is op	timal? Write	your					
	4.2	Implement assuming	a collection of on the fraction we have a sack C. Check the prog	al knapsack that can hold	problem for the problem for th	or S total					
		Test Case	S	profit-we	eight values	W					
		1	{A,B,C}	Profit:(1,2, Weight: (2	*	5					
			A,B,C,D,E,F,G		5,15,7,6,18,3) ,3,5,7,1,4,1)	15					
		3 {	A,B,C,D,E,F,G	C:(8,5),D:(	*	18					
	4.3	Cumpaga	von wont to sol	adula N activ	viting in a Co.	minon					
	4.3	Suppose you want to schedule N activities in a Seminar Hall. Start time and Finish time of activities are given by pair of (si,fi) for ith activity.  Implement the program to maximize the utilization of Seminar Hall. (Maximum activities should be selected.)									
		Test Case	Number of activities (N)	(	(si,fi)						
		1	9	(1,2), 1,3),(1, (4,9), (5,6), (6	4),(2,5),(3,7), 6,8), (7,9)						
		2	11	(1,4),(3,5),(0, (5,9), (6,10), (12,14), (2,13)							
			<u> </u>	(12,17), (2,12							
							06				
5.	Dynamic Programming  5.1 Implement a program which has PNMCOFF() function										
	5.1	Implement a program which has BNMCOEF() function that takes two parameters n and k and returns the value of Binomial Coefficient C(n, k). Compare the dynamic									
		programn		nentation	-	irsive					

			entation of BNMCOEF(). (In output, entire table be displayed.)								
			Test Case	n	k						
			1	5	2						
			2	11	6						
			3	12	5						
	5.2	Compare C	Greedy and I	1 4.2 using D Dynamic app	roach.						
	5.3	i=1,2,,n program to a way that Also calcu	matrix Ai fully paren minimizes the	A2,,An> of with dimer thesize the phe number of scalar of matrices.	sions. Imp roduct A1,A scalar mult	lement the 2,,An in iplications.					
		Test Case	n		vith dimens						
		1	3		2: 5*6, A3:						
		2	6 A1:	30*35, A2: 3							
				5*10, A5: 1	0*20, A6: 2	0*25					
	5.4	Implement a program to print the longest common subsequence for the following strings:									
		Te Ca	se	String1	String						
		1	A]	BCDAB	BDCAI	BA					
			TITE								
		2		ONENTIAL	POLYNO	MIAL					
		3		ONENTIAL GARITHM		MIAL					
					POLYNO	MIAL					
6.	Grap	3			POLYNO	MIAL	06				
6.	_	h	LOC		POLYNO! ALGORI	MIAL FHM	06				
6.	Grap 6.1 6.2	h Write a pr	ogram to det	SARITHM	POLYNOI ALGORI  an directed	graph.	06				
6.	6.1	h Write a pr From a gi program t	ogram to det ven vertex o find shor algorithm.	tect cycles in	an directed ed graph, in other ver	graph.	06				
6.	6.1	h Write a pr From a gi program t Dijkstra's	ogram to det ven vertex o find shor algorithm.	tect cycles in in a weighte test paths to	an directed ed graph, in other ver	graph.  plement a tices using	06				
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		2	0 1 2 3 4	6									3		
			2	6		2									
			3												
			3	3	8			5							
					9										
			4 1		-										
				_	$\rightarrow$					1					
			5		$\rightarrow$		7								
			6			9		4			3				
			7						1	6					
	6.3	Find Minimum Cost spanning tree of a given undirected graph using Prim's algorithm.													
		0 1													
7.	Rack	tracking													02
/•								, 1					<u> </u>	•	U <u>Z</u>
	7.1	Implement string.	ent a p	orog	ram	to	prın	it al	ı pe	rmu	itatio	ons (	of a g	given	
		sumg.			Tes	.4		Ç,	trin	σ.					
					r es Cas			3	trin	g					
					1			A	ACT	7					
					2			N	OT.	Е					
8.	Strin	g Matchi													02
8.	8.1	Suppose length n are give consisting be found symbol, other symbol are possubstring P = ab*, straightf	e you, consen a pag of sed in which who which is sorted it it is g S [j., then forwar	are istin atter symbol string a ma s m d list j in the d, na	give give give give give give give give	f systring a, large a, large ma ma ma su 1].	mbog P[ continued by property of the single character of the single character of the single continued by property of the single continued	ols a  0  nd *  syn  gle :  exa  cxa  that  houl	and m - , rep , rep hbol  ctly  ma  pa  mp ld b	l b 1] - 1] - stress - 1 - ttch - ttch - tter -	Sup of entire is a either posson Pf S = the	pose leng ng a "w ner a prob ition ma = aba Imp	that th m patte vild of or b. lem ss", w tches abbab bleme blem.	t you < n, ern to eard" The is to which the and ent a	02
8.		Suppose length n are give consisting be foun symbol, other symbol are possubstring P = ab*. straightf	e you , cons en a pe ng of s d in which ymbols a sorte itions g S [j., then corwar	are istin atter symbols strin mas mid list juit the dd, naabin	give give give give give give give give	f sy tring a, l S. T es a ma M of su 1].	mbo gg P[ o, ar The sing tch f va ch For M sl corit	ols a 0 10 md * 11 syn 12 syn 13 syn 14 syn 15 exa 16 syn 16 that 16 exa 16 syn 16 syn 16 syn 17 syn 18	and m - , rep , rep hbol  ctly  ma  pa  mp ld b	l b 1] - 1] - stress - 1 - ttch - ttch - tter -	Sup of entire is a either posson Pf S = the	pose leng ng a "w ner a prob ition ma = aba Imp	that th m patte vild c or b. lem s", w tches abbab bleme blem.	t you < n, ern to eard" The is to which the and ent a	02
8.	8.1	Suppose length n are give consisting be found symbol, other symbol, other symbol are possubstring P = ab*, straightf  Implement following Test	e you , cons en a pe ng of s d in which ymbols a sorte itions g S [j., then corwar	are istin atter symbols strin mas mid list juit the dd, naabin	give give give give give give give give	f sy tring a, l S. T es a ma M of su 1].	mbog P[ continued by property of the single character of the single character of the single continued by property of the single continued	ols a 0 10 md * 11 syn 12 syn 13 syn 14 syn 15 exa 16 syn 16 that 16 exa 16 syn 16 syn 16 syn 17 syn 18	and m - , rep , rep hbol  ctly  ma  pa  mp ld b	l b 1] - 1] - stress - 1 - ttch - ttch - tter -	Sup of entire is a either posson Pf S = the	pose leng ng a "w ner a prob ition ma = aba Imp	that th m patte vild of or b. lem ss", w tches abbab bleme blem.	t you < n, ern to eard" The is to which the and ent a	02
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8.		Suppose length n are give	you , cons	are istin atter	giv g of	en f sy tring	mbo g P[	ols a 0	and m –	d b. - 1]	Sup of	pose leng	that th m	t you < n,	02