CHHOTUBHAI GOPALBHAI PATEL INSTITUTE OF TECHNOLOGY

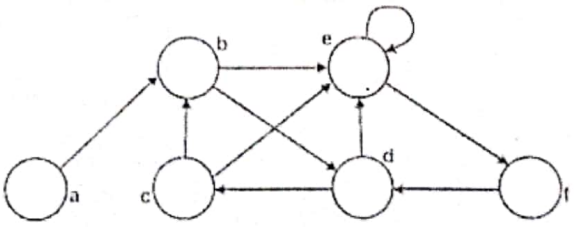
Computer Engineering and AIDS

Design & Analysis of Algorithms

List of Experiments

<table>
<tr><th>Sr. No.</th><th>Title</th><th>Hours</th></tr>
<tr><td>1</td><td>Find Factorial of a given number using Recursive and Iterative methods. Calculate execution time.</td><td>4</td></tr>
<tr><td>2</td><td>Following is the data of height of 10 students of Sports class in school. Lined up in a random order in front of the teacher, who's put to the task of lining all up in an ascending order of height. Now your task is to help your teacher in arranging them using following set of data and measure their execution time and time complexity.
Height:
<table>
<tr><td>Student</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr>
<tr><td>Height</td><td>89</td><td>42</td><td>100</td><td>93</td><td>11</td><td>234</td><td>30</td><td>82</td><td>22</td><td>75</td></tr>
</table></td><td>2</td></tr>
<tr><td>3</td><td>Suppose you are having a set of trump cards, each card is having one letter on it. To play a game it would be better if all the trump cards will be arranged. To arrange trump cards following technique should be adopted. Take very first card as a Key element and try to place it on its final position of arrangement. Repeat this procedure until all the cards will be arranged.
<table>
<tr><td>Card No</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr>
<tr><td>Value</td><td>D</td><td>W</td><td>A</td><td>S</td><td>E</td><td>U</td><td>G</td></tr>
</table></td><td>2</td></tr>
<tr><td>4</td><td>Creates two empty arrays to hold elements less than the pivot value and elements greater than the pivot value, and then recursively sort the sub arrays. There are two basic operations in the algorithm, swapping items in place and partitioning a section of the array. Take following results and note down your own observation.
<table>
<tr><td>I/P Size</td><td>Performance Measurement Model</td><td>Avg. Run Time</td><td>No. Instruction executed</td><td>Observation</td></tr>
<tr><td>100</td><td>Worst</td><td></td><td></td><td></td></tr>
</table></td><td>2</td></tr>
</table>

	100	Average				
	100	Best				

5	A thief robbing a store finds n items, i^{th} item is worth v_i dollers and weights w_i pounds, where v_i and w_i are integers. He wants to take as valuable a load as possible, but he can carry atmost W pounds in his knapsack where W is an integer. Which items should he take, where condition is that he is allowed to take or select fractional part of an item? W = 50, n = 3	4
6	You are given n activities with their start and finish times. Select the maximum number of activities that can be performed by a single person, assuming that a person can only work on a single activity at a time.	2
7	Suppose customer has purchased some items from Mall. He has the bill of Rs. 732 to be paid at the billing counter. Customer has the options in his wallet of Rs. {500, 100, 50, 20, 10, 1}. Your problem is to devise an algorithm for paying a given amount to billing counter using the smallest possible number of coins. You can use one option more than once.	4
8	In biological applications, we often want to compare the DNA of two (or more) different organisms. For example, the DNA of one organism may be S_1 = ACCGGTCGAGTG while the DNA of another organism may be S_2 = GTCGTTCGGAAT. One goal of comparing two strands of DNA is to determine how "similar" the two strands are, as some measure of how closely related the two organisms are.	4
9.	Mr. ABC wants to reach to destination node named "f". Write an algorithm for helping him to explore required destination in efficient manner where source node is "a". 	4

Object	1	2	3
Weight (w_i)	10	20	30
Value (v_i)($)	60	100	150

10	A research scholar submitted his/her work to deparment. Department wants to know that his/her report contents are original (not copy from someone). Write an algorithm to find whether the report is original or copied from some one.	2

Subject In-charge
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