



Pandit Deendayal Energy University

School of Technology

Department of Computer Science & Engineering

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LIST OF PRACTICAL FOR DAA

BY

DR. ADITYA SHASTRI

Practical No. 1 and 2

Implement the following sorting in any programming language.

- a) Insertion sort
- b) Selection sort
- c) Merge sort
- d) Quick sort

Now, measure the execution time and the number of steps required to execute each algorithm in best case, worst case, and average case.

Practical No. 3

Use singly linked lists to implement integers of unlimited size. Each node of the list should store one digit of the integer. You should implement addition, subtraction, multiplication, and exponentiation operations. Limit exponents to be positive integers.

What is the asymptotic running time for each of your operations, expressed in terms of the number of digits for the two operands of each function?

Practical No. 4

Implement a city database using unordered lists. Each database record contains the name of the city (a string of arbitrary length) and the coordinates of the city expressed as integer x and y coordinates. Your program should allow following functionalities:

- a) Insert a record,
- b) Delete a record by name or coordinate,
- c) Search a record by name or coordinate.
- d) Print all records within a given distance of a specified point.

Implement the database using an array-based list implementation, and then a linked list implementation. Perform following analysis:

- a) Collect running time statistics for each operation in both implementations.
- b) What are your conclusions about the relative advantages and disadvantages of the two implementations?
- c) Would storing records on the list in alphabetical order by city name speed any of the operations?
- d) Would keeping the list in alphabetical order slow any of the operations?