SNS COLLEGE OF ENGINEE

Kurumbapalayam(Po), Coimbatore – 641 107
Accredited by NAAC-UGC with 'A' Grade
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Department of Artificial Intelligence an

Course Name: 23ITB201 Data structures a

II Year / III semester

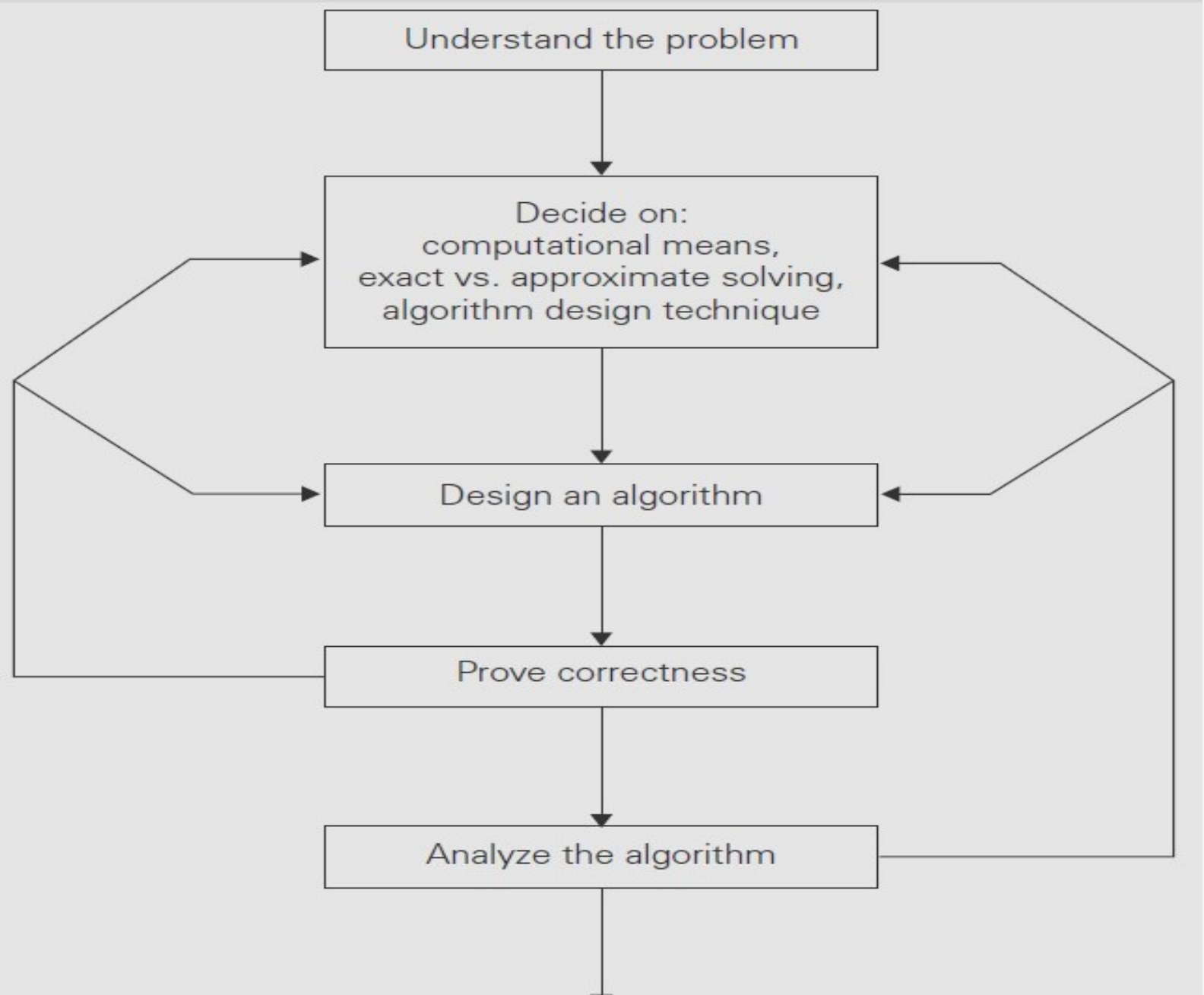
Unit I – Introduction to algorithm an

Topic: Algorithm analysis

Introduction to algorithm analysis

PROBLEM SOLVING

Algorithm design and analysis process



anding the Problem:

he first step in designing of algorithm.

problem's description carefully to understand the problem sta

stions for clarifying the doubts about the problem.

the problem types and use existing algorithm to find solution.

stance) to the problem and range of the input get fixed.

on making

on making is done on the following:

ning the Capabilities of the Computational Device

g between Exact and Approximate Problem Solving

*gorithm used to solve the **problem exactly** and produce correct*
algorithm.

***problem is so complex and not able to get exact solution**, then*
orithm called an approximation algorithm.

m Design Techniques

ithm design technique is a general approach to solving proble

ds of Specifying an Algorithm

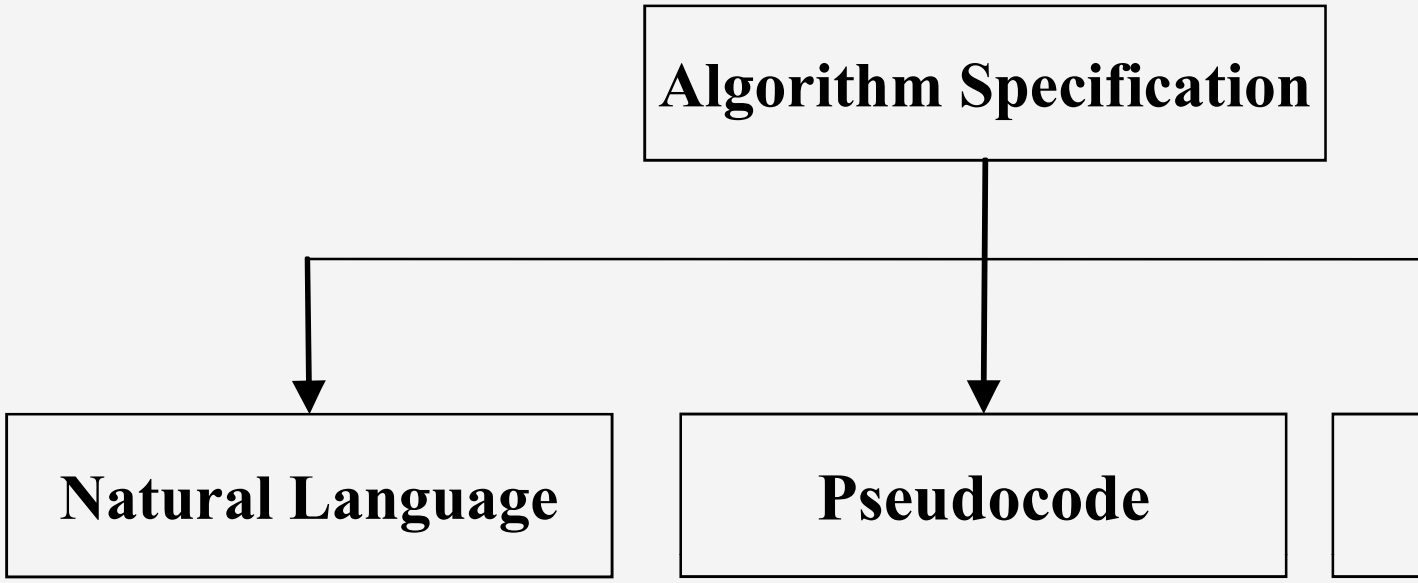
are three ways to specify an algorithm.

are:

Natural language

Pseudocode

Flowchart



g an Algorithm's Correctness

lgorithm has been specified then its **correctness** must be prov

thm must yields a required **result** for every legitimate input in

ple, the correctness of Euclid's algorithm for computing the gr
ems from the correctness of the equality gcd(m, n) = gcd(n, m

n technique for proving correctness is to use **mathematical in**

r produced by the algorithm should not exceed a predefined lir

zing an Algorithm

orithm the most important is efficiency. There are two kinds of alg

ciency, indicating how fast the algorithm runs, and

ciency, indicating how much extra memory it uses.

analyze an algorithm are:

fficiency of an algorithm

efficiency of an algorithm

city of an algorithm

lity of an algorithm

g an Algorithm

essential to write an optimized code (efficient code) to reduce the b

g an Algorithm

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What are the steps involved in algorithm analysis process ?

portant problem types are:

cessing

blems

orial problems

problems

problems

efficiency

y of an algorithm can be in terms of time and space.

n efficiency can be analyzed by the following ways.

Framework.

ic Notations and its properties.

ical analysis for Recursive algorithms.

ical analysis for Non-recursive algorithms.

efficiency

amework

o kinds of efficiencies to analyze the efficiency of any algorith

ciency, indicating how fast the algorithm runs, and

iciency, indicating how much extra memory it uses.

m analysis framework consists of the following:

g an Input's Size

Measuring Running Time

Growth

se, Best-Case, and Average-Case Efficiencies

efficiency

ng an Input's Size

thm's efficiency is defined as a function of some **parameter n**
ithm's input size.

ases, selecting such a parameter is quite straightforward.

ple, it will be the **size of the list for problems of sorting, sear**

ible approach is to count the number of times each of the algor


thank
you