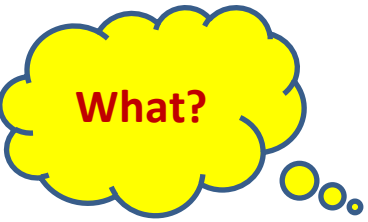
Data Structure : INTRODUCTION



Data + Structure

Organization of data items in such a way that it is easy to -

Access, Manipulate & Update

Data become more manageable if we use right data structure for a problem

It will be easy to find solution of a problem if correct data structure has been used

Data Structure : INTRODUCTION

One example of data structure is table – (Matrix/ 2D Array)

101

102

103

Table 1

Roll Number	Name
101	Anu
102	Radha
103	Ram

Anu

Radha

Ram

Where a Data Structure is going to be stored in my computer's memory?
When Data Structure is going to be stored ?
How Data Structure is going to be stored ?

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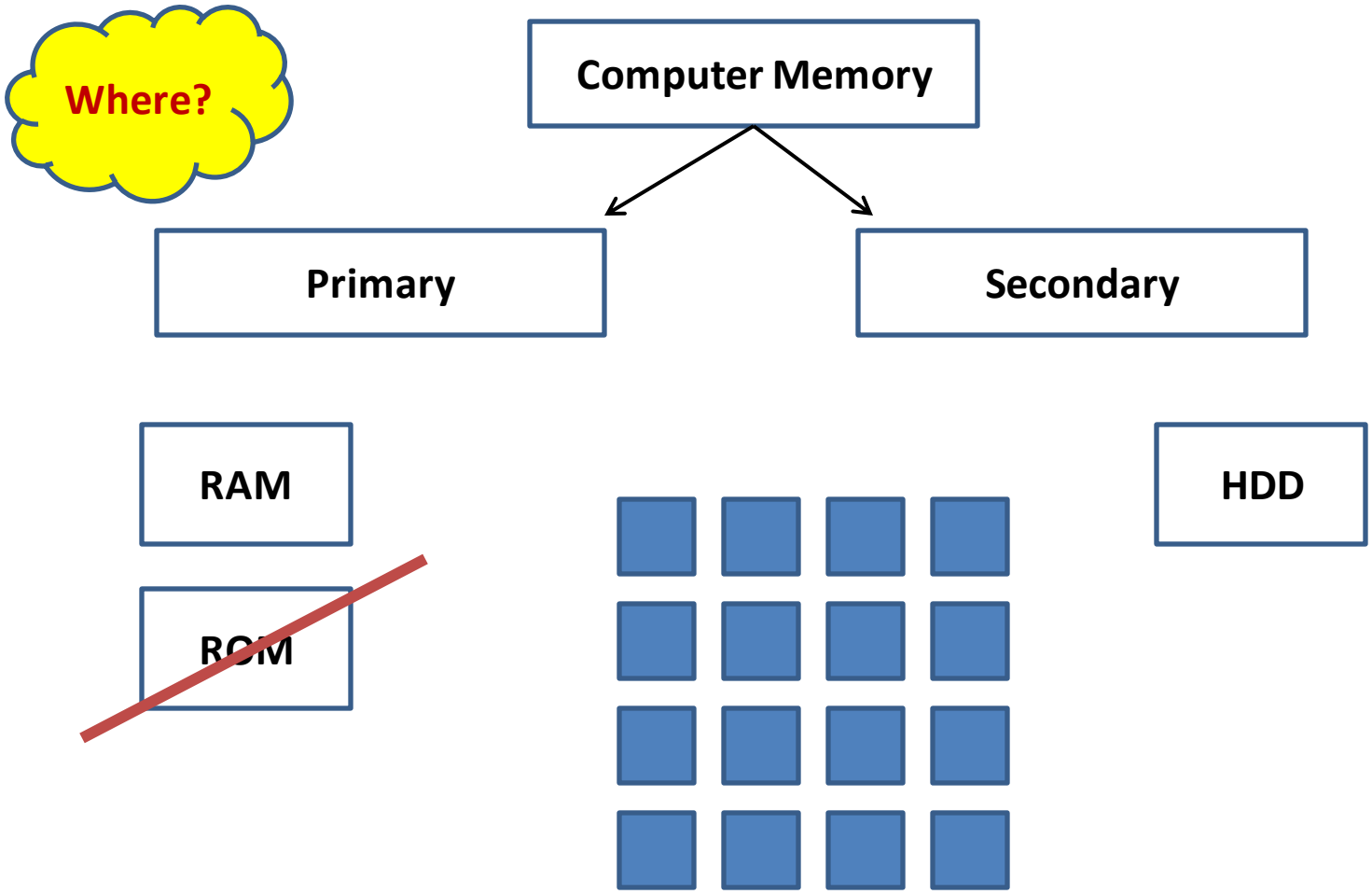
Data Structure : INTRODUCTION

Where a Data Structure is going to be stored in my computer's memory?



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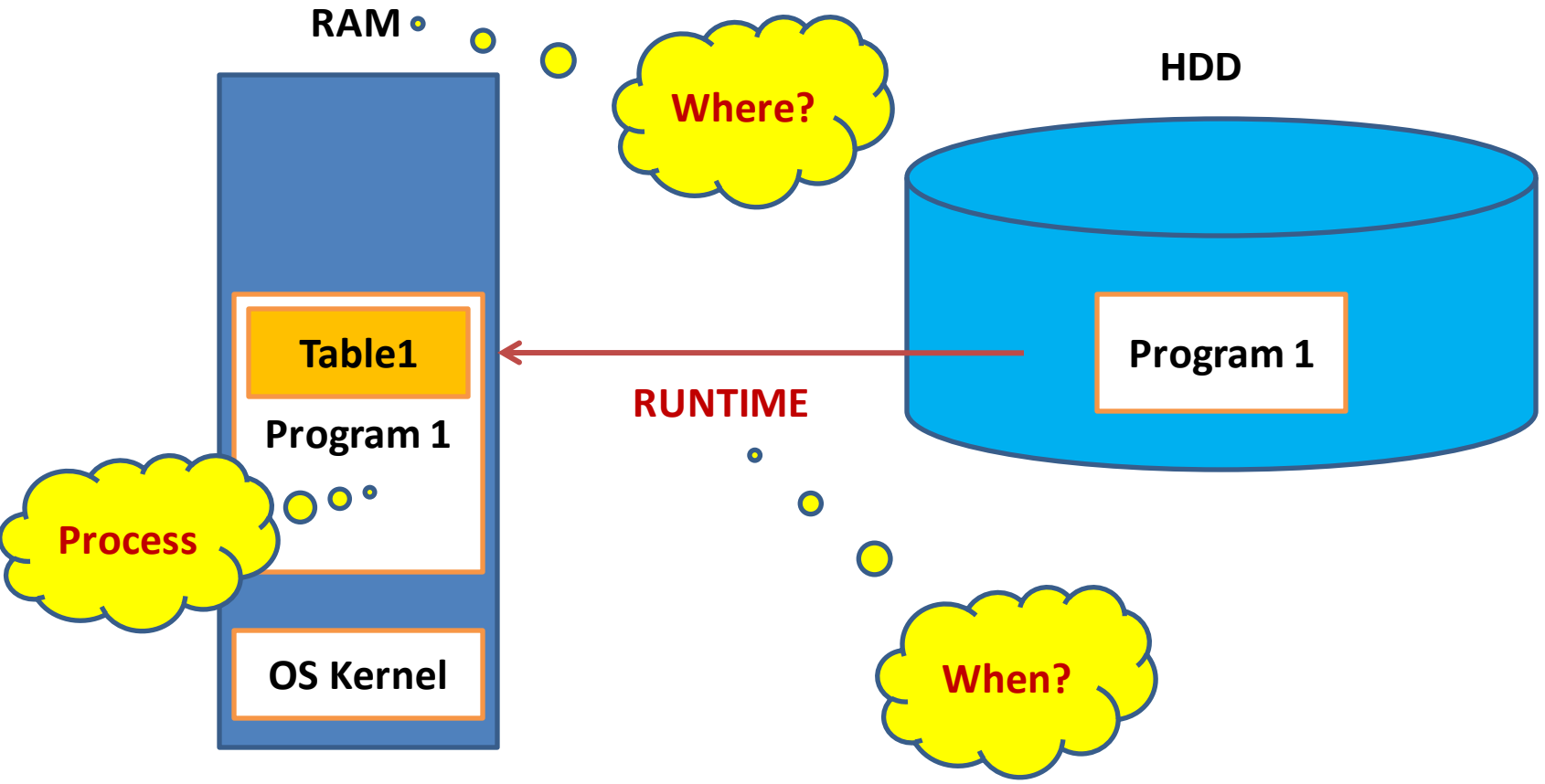
Data Structure : INTRODUCTION



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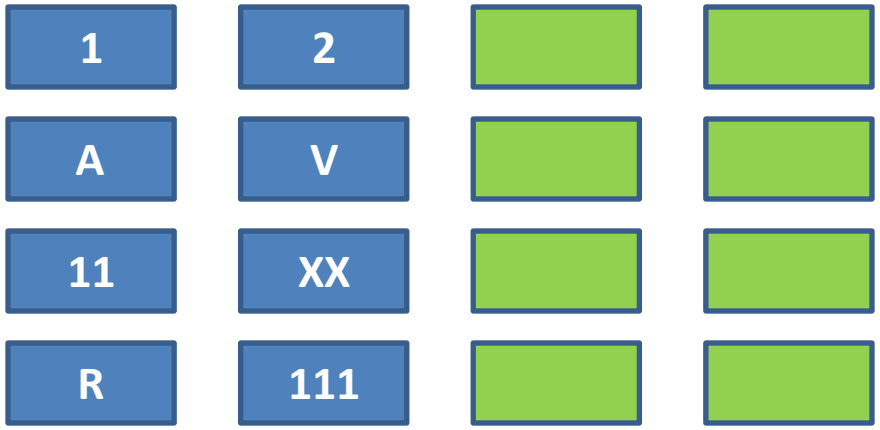
Data Structure : INTRODUCTION



Roll Number	Name
101	Anu
102	Radha
103	Ram

Linear Arrangement of Data

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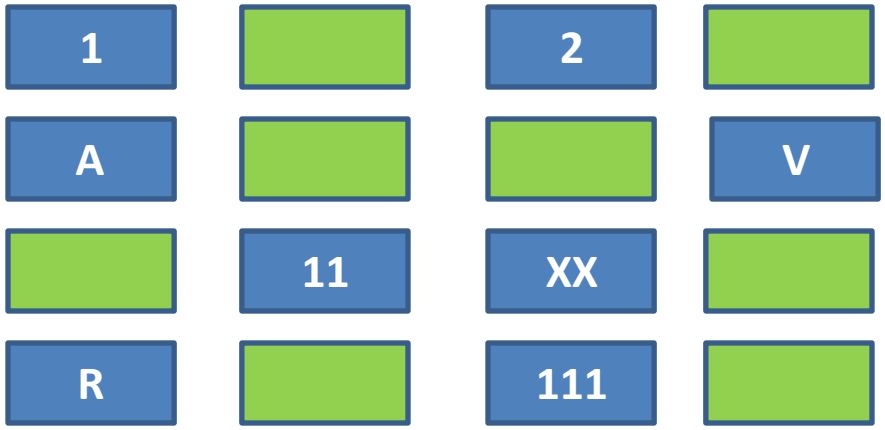
Data Structure : INTRODUCTION



Roll Number	Name
101	Anu
102	Radha
103	Ram

Discrete Arrangement of Data

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Data Structure : INTRODUCTION

Data Structure is a conceptual programming construct

These are run time entities

You can not save a data structure in HDD for future use

Data Structure : INTRODUCTION

Data Structure is a conceptual programming construct

These are run time entities

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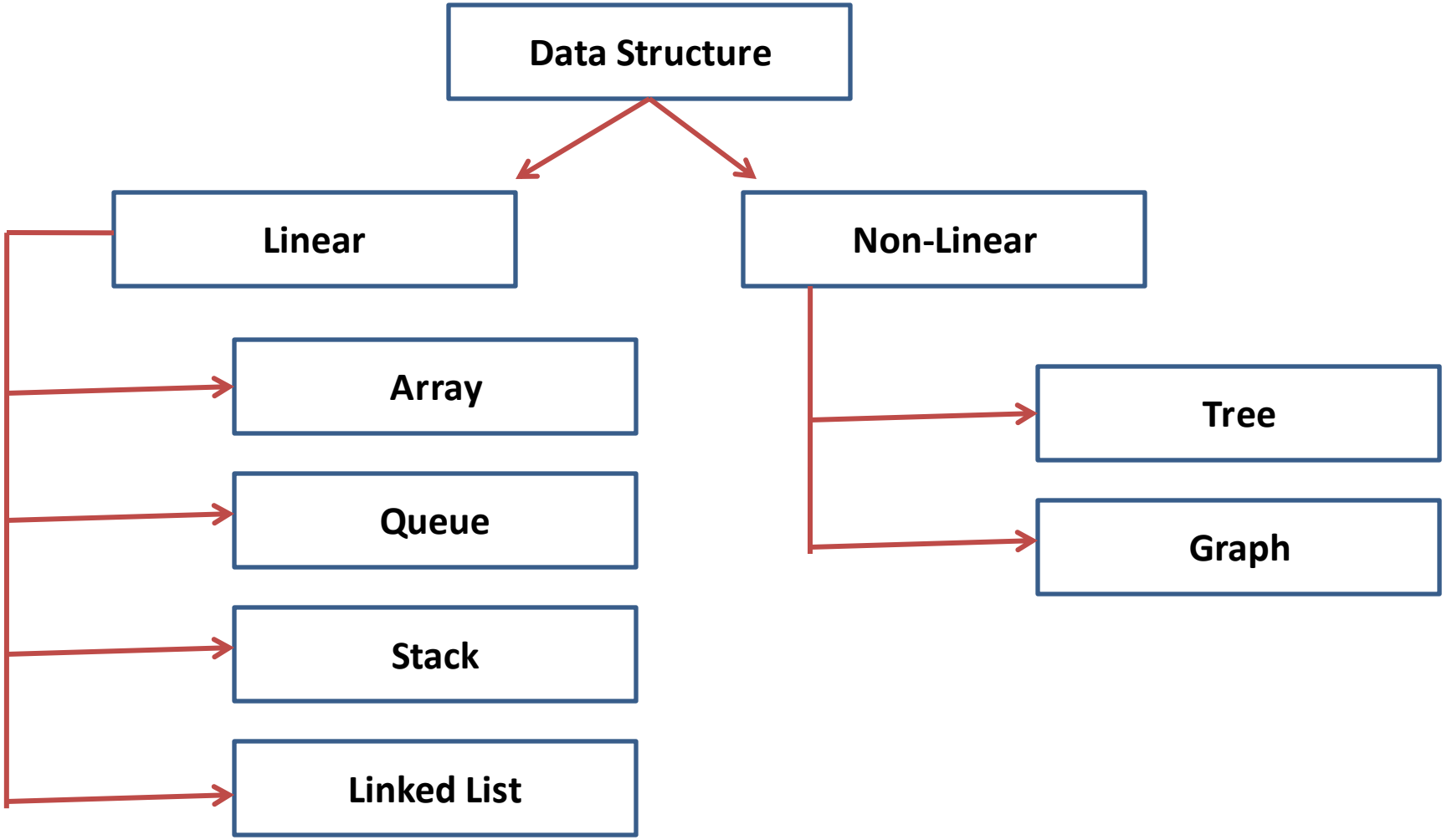
Data Structure : TYPES



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Data Structure : ALGORITHMS

The process of implementation of a solution of a complex problem

using Data Structure is Complex and very lengthy

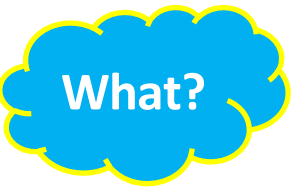
It is important to plan the steps of such problems before implementing solutions
And
To solve such problem in modular way

modular way means to break a complex problem in smaller problem (modules)
Advantage:

This can be done using ALGORITHMS

Easy to Plan
Easy to implement
Easy to understand
Easy to debug (find errors)
Easy to Test

Data Structure : ALGORITHMS



Algorithm

A set of Step by Step Instructions that provide a solution to a problem

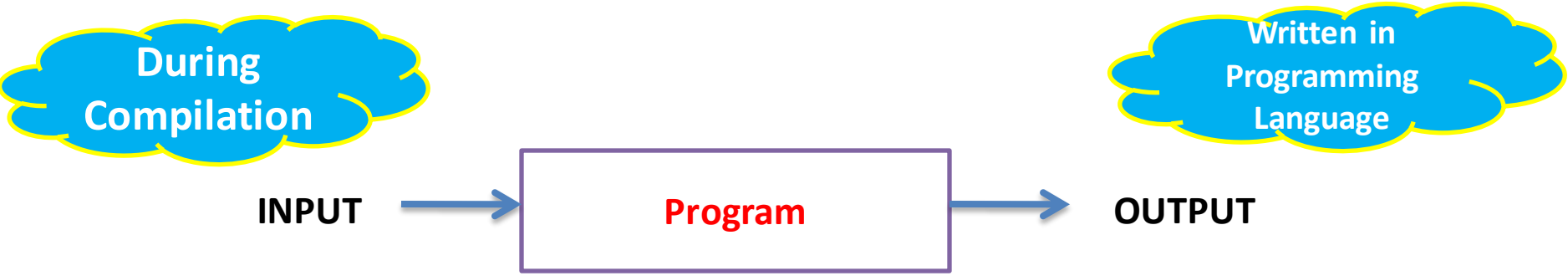
”a finite sequence of well-defined, computer-implementable instructions”
- Wiki

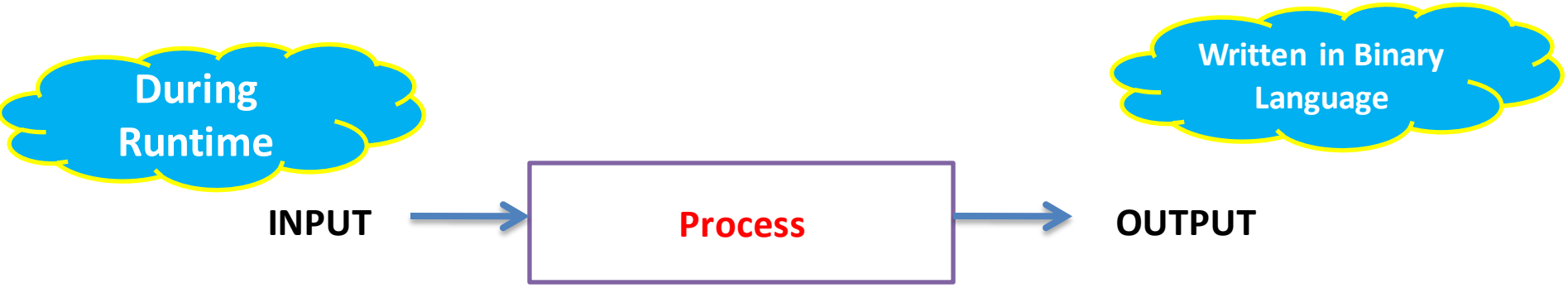
“An algorithm is any well-defined computational procedure that takes some value, or set of values, as input and produces some value, or set of values, as output”

-Coreman

Data Structure : ALGORITHMS

Question : This is a program/process also do. Then What is the Difference?





Data Structure : ALGORITHMS

Algorithm

can be written in

in a general language that is easily understandable

Natural Language like English

It is a convention to use Pseudo code or Flow Charts etc.

Symbolic Instruction

Diagrammatic Representation

Thanks