DATA STRUCTURES AND ALGORITHMS

DATA STRUCTURES ARE A WAY TO ORGANIZE INFORMATION IN SUCH A WAY THAT WE CAN DO USEFUL THINGS WITH IT

COMPUTING IS ALL ABOUT PERFORMING OPERATIONS ON INFORMATION

THE USE OF DATA STRUCTURES IS TO HELP PERFORM OPERATIONS EFFICIENTLY

DATA STRUCTURES TRY TO:

MAKE COMMON OPERATIONS FAST

MAKE DIFFICULT OPERATIONS POSSIBLE

OCCUPY LESS SPACE AND STILL REPRESENT THE COMPLEXITY OF INFORMATION AND IT'S INTERRELATIONSHIPS IN AN INTUITIVE WAY

DATA STRUCTURES LEND ITSELF TO EFFICIENT ALGORITHMS

DATA STRUCTURES FORM THE CORE IN MANY STANDARD ALGORITHMS

DATA STRUCTURES AND ALGORITHMS GO HAND IN HAND

DATA STRUCTURES CAN BE SPECIALIZED FOR CERTAIN TASKS

A SET MIGHT BE USEFUL FOR EXTREMELY FAST MEMBERSHIP AND CONTAINMENT QUERIES

COMPILERS USE HASH TABLES AS LOOK UP TABLES FOR OPERATIONS SUCH AS RUNTIME METHOD BINDING

GRAPHS ARE USED TO REPRESENT RELATIONSHIPS SUCH AS ON SOCIAL NETWORKING SITES

STACKS CAN BE USED FOR UNDO FUNCTIONALITY IN APPLICATIONS AS WELL AS THE BACK FUNCTIONALITY IN BROWSERS

INDEX DATA STRUCTURES SUCH AS A SUFFIX TREE OR AND INVERTED INDEX ARE USED IN SEARCH ENGINE INDEXING

DATA STRUCTURES INFLUENCE ALGORITHMS AS MUCH AS ALGORITHMS INFLUENCE THE DESIGN OF DATA STRUCTURES

DATA STRUCTURES VS ABSTRACT DATA TYPES

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ABSTRACT DATA TYPES ARE MATHEMATICAL MODELS OF DATA TYPES, WHERE THE DATA TYPE IS DEFINED BY HOW IT IS USED I.E. FROM THE POINT OF VIEW OF THE USER

THESE DEFINE THE OPERATIONS TO BE PERFORMED ON DATA, AND WHAT THE EXPECTED BEHAVIOR OF THOSE OPERATIONS ARE

DATA STRUCTURES ARE CONCRETE REPRESENTATIONS OF DATA FROM THE POINT OF VIEW OF AN IMPLEMENTOR

THIS SPECIFIES THE ACTUAL IMPLEMENTATION OF THE STRUCTURE IN CODE TO MEET THE EXPECTED BEHAVIOR

AN ABSTRACT DATA TYPE
CAN BE DEFINED AS A
"CLASS OF OBJECTS WHOSE
LOGICAL BEHAVIOR IS
DEFINED BY A SET OF VALUES
AND A SET OF OPERATIONS"

IT DOES NOT SPECIFY **HOW** THE TYPE
WILL ACTUALLY EXHIBIT THAT BEHAVIOR

THAT IS WHERE DATA STRUCTURES
COME IN