

What are Data Structures?

1

- **Data Structures** are different ways of organizing data on your computer, that can be used effectively.



Importance of data structure and algorithm???

What is an Algorithm?

- Set of steps to accomplish a task



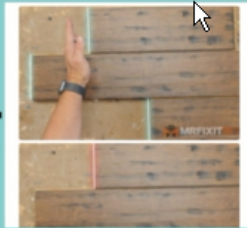
Step 1: Choosing flooring



Step 2: Purchase and bring



Step 5: Trim door casing



Step 4: Determine the layout



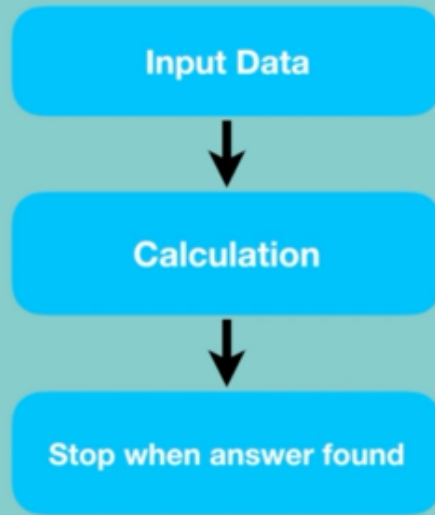
Step 3: Prepare sub flooring



AppMillers
www.appmillers.com

Algorithms in Computer Science

- Set of rules for a computer program to accomplish a task



What makes a good algorithm?

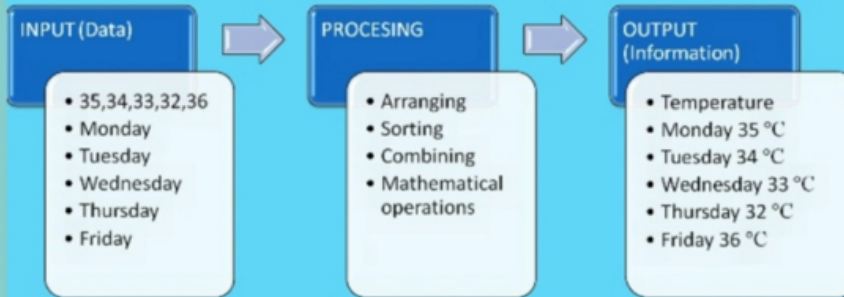
1. Correctness
2. Efficiency

Why are Data Structures and Algorithms important?

4



DATA PROCESSING

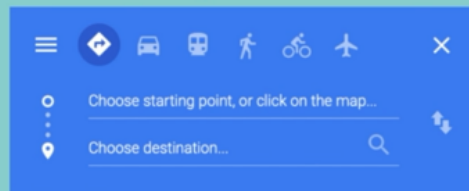


Why are Data Structures and Algorithms important?

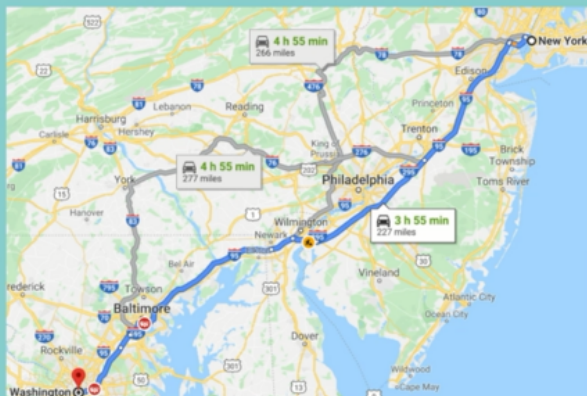


Google Maps

Input data



Output



Processing

AppMillers
www.appmillers.com

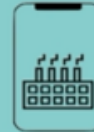


Why are Data Structures and Algorithms important?

5



books = data
arranging book = data structure
finding book = algorithm



Why are Data Structures and Algorithms in INTERVIEWS?

6



- Problem solving skills

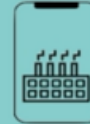


- Fundamental concepts of programming in limited time



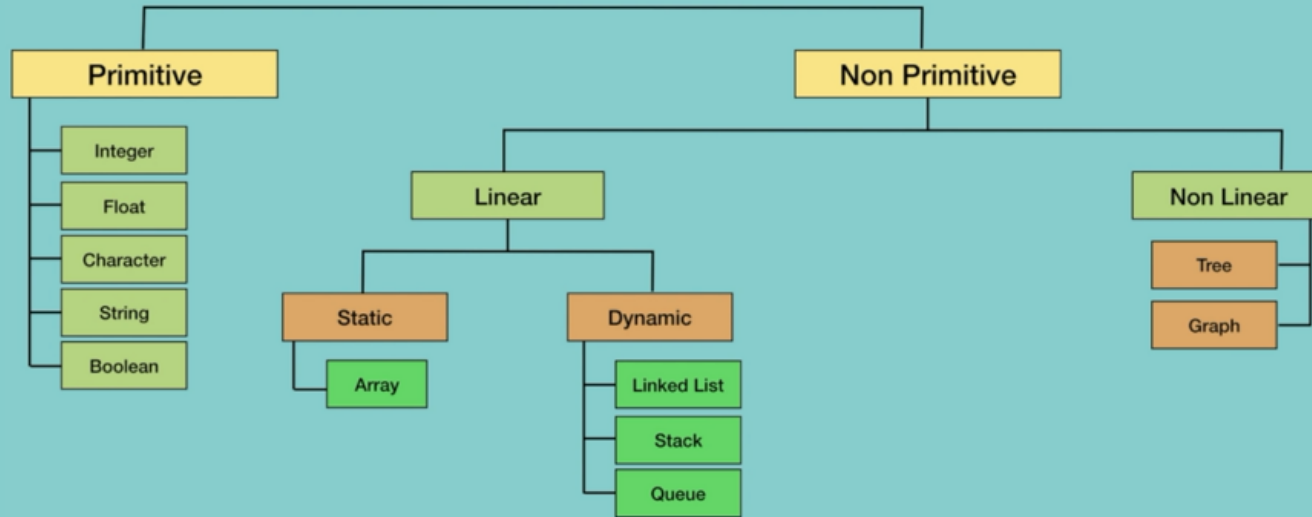
Programming
Fundamentals

AppMillers
www.appmillers.com



Types of Data Structures

Data Structures



AppMillers



Types of Algorithms

- Simple recursive algorithms
- Divide and conquer algorithms
- Dynamic programming algorithms
- Greedy algorithms
- Brute force algorithms
- Randomized algorithms

Divide and conquer algorithms

- Divide the problem into smaller subproblems of the same type, and solve these subproblems recursively
- Combine the solutions to the subproblems into a solution to the original problem

Examples: Quick sort and merge sort


Dynamic programming algorithms

- They work based on memoization
- To find the best solution

Greedy algorithms

- We take the best we can without worrying about future consequences.
- We hope that by choosing a local optimum solution at each step, we will end up at a global optimum solution

Primitive Data Structures

DATA STRUCTURE	Description	Example
INTEGER	Numbers with our decimal point	1, 2, 3, 4, 5, 1000
FLOAT	 Numbers with decimal point	3.5, 6.7, 6.987, 20.2
CHARACTER	Single Character	A, B, C, F
STRING	Text	Hello, Data Structure
BOOLEAN	Logical values true or false	TRUE, FALSE

