JAYOTI VIDYAPEETH WOMEN'S UNIVERSITY, JAIPUR

FACULTY OF EDUCATION & METHODOLOGY

Faculty Name	:	JV'n Girish Gupta (Assistant Professor)
Program	:	DET III rd Semester / Year
Course Name	:	DET
Session No. & Name	:	1.1 (Name of the Session)

Academic Day starts with –

- Greeting with saying **'Namaste'** by joining Hands together following by 2-3 Minutes Happy session, Celebrating birthday of any student of respective class and **National Anthem**.

Lecture Starts with-

- Topic to be discussed today- Today We will discuss about ALGORITHM
- Lesson deliverance (ICT, Diagrams & Live Example)-
  - ➢ Diagrams

Introduction & Brief Discussion about the Topic

*The word **Algorithm** means " A set of finite rules or instructions to be followed in calculations or other problem-solving operations "*

Or

" A procedure for solving a mathematical problem in a finite number of steps that frequently involves recursive operations".
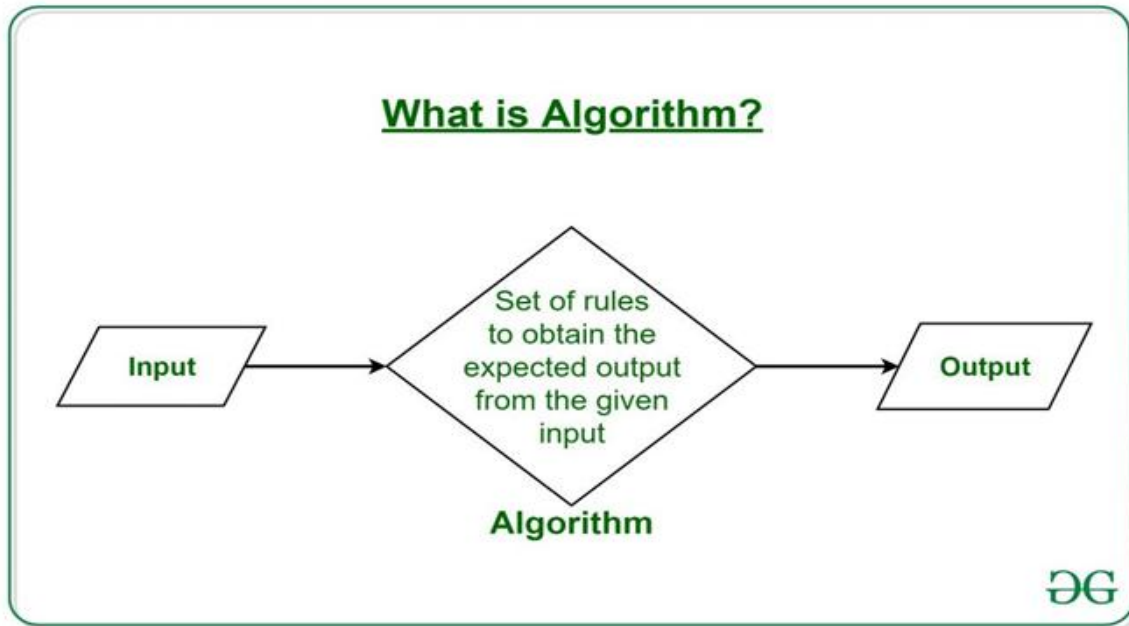
Use of the Algorithms:

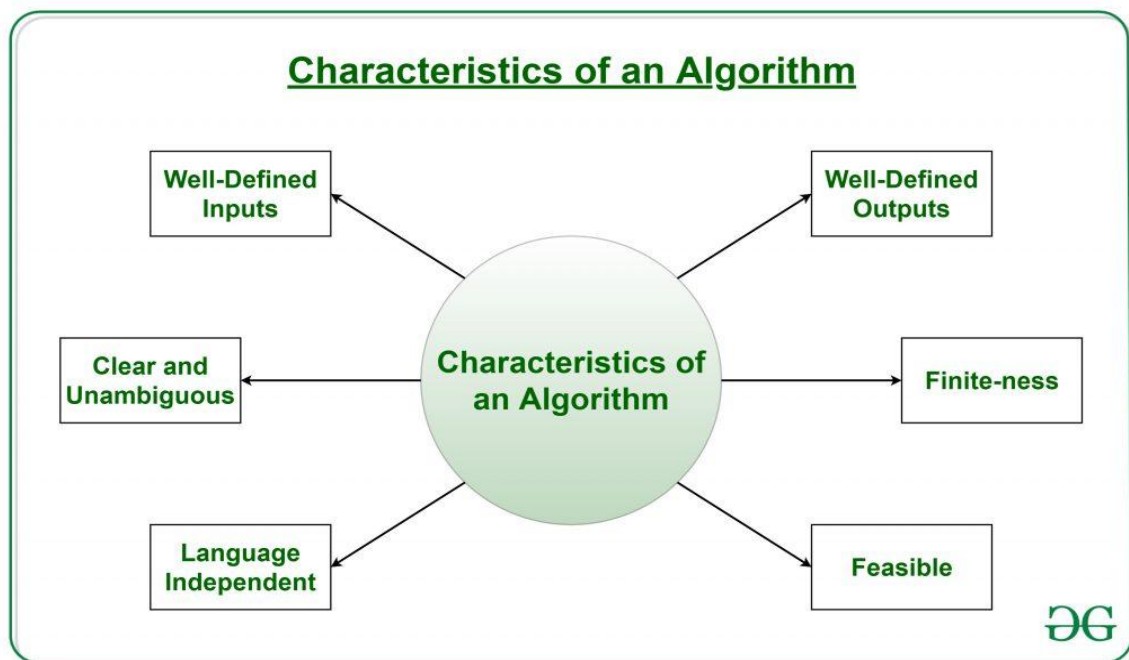Algorithms play a crucial role in various fields and have many applications. Some of the key areas where algorithms are used include:

1. **Computer Science:** Algorithms form the basis of computer programming and are used to solve problems ranging from simple sorting and searching to complex tasks such as artificial intelligence and machine learning.

2. **Mathematics:** Algorithms are used to solve mathematical problems, such as finding the optimal solution to a system of linear equations or finding the shortest path in a graph.

3. **Operations Research**: Algorithms are used to optimize and make decisions in fields such as transportation, logistics, and resource allocation.

4. **Artificial Intelligence:** Algorithms are the foundation of artificial intelligence and machine learning, and are used to develop intelligent systems that can perform tasks such as image recognition, natural language processing, and decision-making.

5. **Data Science:** Algorithms are used to analyze, process, and extract insights from large amounts of data in fields such as marketing, finance, and healthcare.

These are just a few examples of the many applications of algorithms. The use of algorithms is continually expanding as new technologies and fields emerge, making it a vital component of modern society.

Algorithms can be simple and complex depending on what you want to achieve.

Characteristics of an Algorithm

Well-Defined Inputs

Well-Defined Outputs

Clear and Unambiguous

Characteristics of an Algorithm

Finite-ness

Language Independent

Feasible

1. **Clear and Unambiguous**: The algorithm should be unambiguous. Each of its steps should be clear in all aspects and must lead to only one meaning.

2. **Well-Defined Inputs**: If an algorithm says to take inputs, it should be well-defined inputs. It may or may not take input.

3. **Well-Defined Outputs:** The algorithm must clearly define what output will be yielded and it should be well-defined as well. It should produce at least 1 output.

4. **Finite-ness:** The algorithm must be finite, i.e. it should terminate after a finite time.

5. **Feasible:** The algorithm must be simple, generic, and practical, such that it can be executed with the available resources. It must not contain some future technology or anything.

6. **Language Independent:** The Algorithm designed must be language-independent, i.e. it must be just plain instructions that can be implemented in any language, and yet the output will be the same, as expected.

7. **Input**: An algorithm has zero or more inputs. Each that contains a fundamental operator must accept zero or more inputs.

8. **Output**: An algorithm produces at least one output. Every instruction that contains a fundamental operator must accept zero or more inputs.

9. **Definiteness:** All instructions in an algorithm must be unambiguous, precise, and easy to interpret. By referring to any of the instructions in an algorithm one can clearly understand what is to be done. Every fundamental operator in instruction must be defined without any ambiguity.

10. **Finiteness:** An algorithm must terminate after a finite number of steps in all test cases. Every instruction which contains a fundamental operator must be terminated within a finite amount of time. Infinite loops or recursive functions without base conditions do not possess finiteness.

11. **Effectiveness:** An algorithm must be developed by using very basic, simple, and feasible operations so that one can trace it out by using just paper and pencil.

- University Library Reference- <u>Introduction to Algorithms</u> (Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein.)

➢ Online Reference if Any.

- Suggestions to secure good marks to answer in exam-
➢ Explain answer with key point answers
- Questions to check understanding level of students-
- Small Discussion About Next Topic-

Academic Day ends with-
National song' Vande Mataram'