PYTHON FOR COMPUTATIONAL PROBLEM SOLVING

Data Structures in Python

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Introduction

- **A way of organizing and storing data** so that they can be accessed and worked with efficiently.
- **Becomes more significant with increase in the volume of data** to be stored and retrieved.
- Real life examples:
  - Organization of books in library
  - Organization of clothes
  - File system on a computer

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Broad Classification of Data Structures

- **Generic Data Structures**
  - Can be used to develop any collections
  - No particular way to access elements
  - Example: List, tuple

- **Specific Data Structures – Collections**
  - There is a particular way in which an element can be accessed
  - Stack, Queue

Classification Based On Memory Usage

- **Sequence Type Data Structures**
  - Data stored in contiguous manner
  - Elements can be accessed through indexes/subscript notation
  - Enables random access of elements
  - Can store homogeneous or heterogeneous data

- **Non-Sequence Type Data Structures**
  - Data stored in non-contiguous manner
  - No direct indexing
  - No random access of elements
  - Typically stores homogeneous data

Common Operations on Sequence Type

- in, not in
- Index operator []
- Relational operators
- Slicing operator (:)
- len()
- max(), min()
- count()
- index()

Common Operations on Non-Sequence Type

- in, not in
- len()
- max(), min()
- Few of the relational operators

THANK YOU

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