



DSA **with** Python

python

About Us

Learnify is the MSME and Startup India verified destination for professionals in product, growth, design, management, business, tech, and data. It provides curated, hands-on learning from industry experts to instantly enhance skills, foster innovation, and empower you within a global community.



Our Vision & Mission

Learnify, MSME and Startup India verified, teaches millions technical skills with expert-led, hands-on courses for career growth.



VISION



The vision of Learnify is to revolutionize education through the seamless integration of technology, creating a direct path from skill acquisition to job readiness.



Our mission is to provide personalized and engaging learning experiences for students of all ages by leveraging digital tools, virtual platforms, and data-driven insights to ensure effective skill mastery and career readiness.



MISSION

DSA with Python

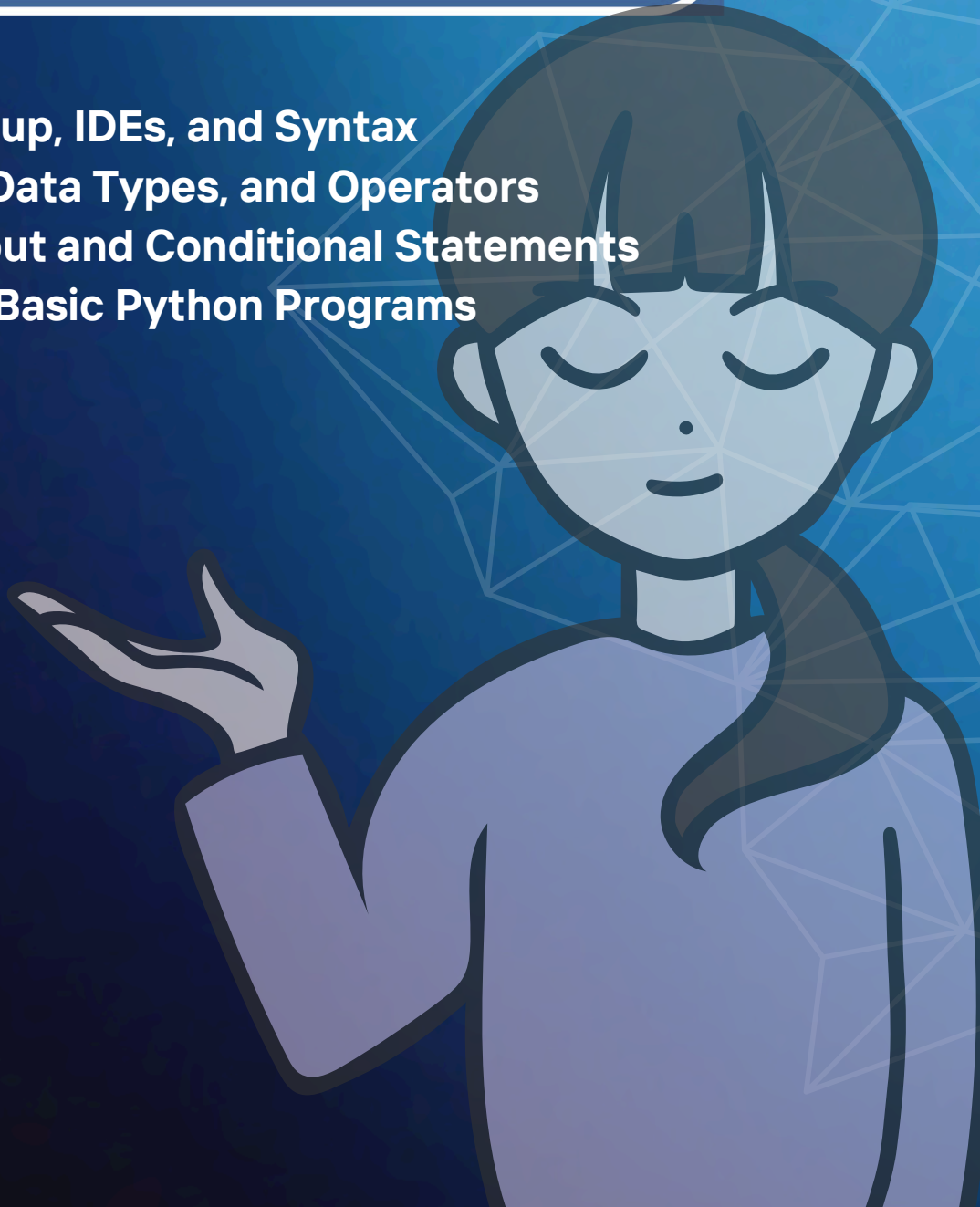


COURSE CURRICULUM

1.

INTRODUCTION TO PYTHON PROGRAMMING

- Python Setup, IDEs, and Syntax
- Variables, Data Types, and Operators
- Input/Output and Conditional Statements
- Hands-on: Basic Python Programs



DSA with Python

2.

USER RESEARCH & ANALYSIS

- Functions and Parameters
- While, For Loops, and Nested Loops
- Recursion Basics & Real-World Examples
- Hands-on: Factorial & Fibonacci using Recursion



DSA with Python

3.

DATA TYPES & BUILT-IN COLLECTIONS

- Lists, Tuples, Sets, and Dictionaries
- Comprehensions and Built-in Functions
- String Manipulation & Slicing
- Hands-on: Student Data Organizer Program

DSA with Python

4.

ARRAYS & LINKED LISTS

- Array Operations, Searching, and Sorting
- Singly, Doubly, and Circular Linked Lists
- Hands-on: Custom Linked List Implementation



5.

STACKS & QUEUES

- **Stack Operations using Lists**
- **Queue, Deque, and Priority Queue Concepts**
- **Hands-on: Browser History & Task Scheduler Simulation**



DSA with Python

6. TREES & BINARY SEARCH TREES (BST)

- Tree Terminology & Representation
- Binary Trees, BST Insertion & Deletion
- Traversal Algorithms (Inorder, Preorder, Postorder)
- Hands-on: Family Tree Visualization in Python



7.

GRAPHS & THEIR APPLICATIONS

- Graph Representation (Adjacency List/Matrix)
- BFS, DFS, Dijkstra's & Bellman-Ford Algorithms
- Hands-on: Social Network Graph or Map Route Finder



8.

SEARCHING & SORTING ALGORITHMS

- Linear, Binary, and Jump Search
- Bubble, Merge, Quick, and Heap Sort
- Time & Space Complexity Analysis
- Hands-on: Sorting Performance Comparison



9.

DYNAMIC PROGRAMMING (DP)

- **Principles of DP: Overlapping Subproblems & Memoization**
- **Classic Problems: Knapsack, Longest Common Subsequence, Matrix Chain Multiplication**
- **Hands-on: Optimizing Recursive Solutions**

dp

10.

GREEDY, DIVIDE & CONQUER ALGORITHMS

- Greedy Algorithms: Huffman Coding, Job Scheduling
- Divide & Conquer: Merge Sort, Quick Sort
- Hands-on: Activity Selection & Minimum Spanning Tree

11.

BACKTRACKING & ADVANCED PROBLEM SOLVING

- N-Queens, Sudoku Solver, and Maze Path
- Bit Manipulation Techniques
- Competitive Programming Practice (LeetCode, HackerRank)



12. CAPSTONE & RESEARCH PAPER PROJECTS

- Pathfinding Visualizer (Graph Algorithms)
- Library Management System
- Real-Time Job Scheduler Simulation
- Data Compression using Huffman Coding
- Performance Analysis of Sorting Algorithms in Python
- Optimizing Recursive Algorithms through Dynamic Programming
- Comparative Study of Graph Traversal Techniques for Real-World Data
- AI-Assisted Algorithm Optimization using Reinforcement Learning

13.

EACH RESEARCH PROJECT INCLUDES

- **Problem Statement**
- **Literature Review**
- **Implementation (Python Code)**
- **Findings & Publication Support**



14.

RESUME BUILDING & PROFILE OPTIMIZATION

- **Crafting an ATS-friendly resume tailored to tech roles**
- **Optimizing LinkedIn & GitHub profiles**
- **Writing impactful career objectives and summaries**



15. APTITUDE & LOGICAL REASONING

- Quantitative Aptitude: Speed, Accuracy & Problem Solving
- Logical Reasoning: Puzzles, Patterns & Data Interpretation
- Mock Tests and Time Management Strategies



16.

COMMUNICATION & SOFT SKILLS

- **Verbal Communication: Public Speaking & Presentation Skills**
- **Email Etiquette and Business Communication**
- **Teamwork, Leadership, and Professional Behavior**



17.

TECHNICAL INTERVIEW TRAINING

- Core DS Interview Concepts & Q&A Practice
- Hands-on Coding Interview Sessions (Python & Data Structures)
- Whiteboard Problem Solving & Project Discussion Tips



18.

HR & BEHAVIORAL INTERVIEW PREPARATION

- Understanding HR Questions & Framing STAR-Method
- Answers Mock HR Interviews with Personalized Feedback
- Building Confidence and Positive Body Language



DSA with Python

19.

INTERNSHIP & JOB ASSISTANCE

- Access to Learnify's Hiring Partner Network
- Internship Opportunities with EdTech & AI Startups
- Job Alerts, Career Counseling & Placement Support



20.

CERTIFICATION & CAREER SUPPORT

- Learnify Certificate of Completion
- MSME & Startup India Certification
- Resume Building & LinkedIn Optimization



DSA with
Python

Our Alumni Work At



**DSA with
Python**

Contact Us



+91 74396 78587



learnifytechnology.com



@learnify_technology



**[https://www.linkedin.com
/company/the-learnify/](https://www.linkedin.com/company/the-learnify/)**



Kolkata Sector V 700098