1st Year Roadmap

1. Programming Fundamentals

- **Languages to Learn**: Choose one: **Python**, **C++**, or **Java**

- **Focus on**:

    - **Basic Syntax**: Understanding variables, operators, control structures (loops, conditionals)

    - **Data Structures**: Arrays, Strings, Lists, and Recursion basics

    - **Important Concepts**: Functions, Arrays, Recursion, and Sorting techniques

    - **Practice**: Solve beginner problems and learn through online coding platforms.

2. Data Structures & Algorithms (DSA)

- **Key Topics**:

    - Arrays, Linked Lists, Stacks, Queues, and Strings.

    - Sorting algorithms: Bubble Sort, Selection Sort, Insertion Sort

    - Practice by solving problems on various online coding platforms.

3. Additional Recommendations:

- **Version Control**: Learn Git and host your projects on GitHub to showcase your work.

- **Begin Project Work**: Start small projects (e.g., a simple calculator, todo list) to apply programming skills.

2nd Year Roadmap

1. Advanced Data Structures & Algorithms (DSA)

- **Key Topics**:

  - Trees (Binary Tree, Binary Search Tree), Graphs (BFS, DFS)

  - Dynamic Programming (DP), Greedy Algorithms

  - Divide and Conquer Algorithms

  - Practice by solving problems regularly through online coding platforms.

2. Development Skills

- Pick **one domain** and deep dive:

  - **Web Development**: Learn HTML, CSS, JavaScript, ReactJS

  - **App Development**: Learn Flutter or React Native

  - **Other options**: ML/AI, Cybersecurity, Game Development

3. Projects

- **Build 2–3 Projects**: Create projects on GitHub related to your domain.

  - Example projects: Personal blog (Web Dev), Chat app (App Dev), ML model for data prediction (AI).

4. Internship Hunt

- Start applying for internships through online platforms

- Begin networking with professionals.

5. Soft Skills Development

- Join **clubs/activities** in college to develop leadership and communication skills.

- **Public Speaking**: Participate in group discussions, debates to improve communication.

3rd Year Roadmap

1. Advanced DSA

- **Cover Key Topics**:

  - **Trees (AVL Trees, Heaps)**, **Graphs** (Shortest Path Algorithms)

  - **Dynamic Programming**: Advanced problems

  - **Aim**: Solve a significant number of DSA problems online.

2. Internship Hunt

- Apply for internships on online platforms.

- Prepare for technical and aptitude tests (focus on **DBMS**, **OS**, **OOPs**).

3. Projects & Portfolio Update

- Work on **complex projects** (e.g., a full-stack web application, AI-based recommendation system).

- Add better **UI/UX** and deploy them online.

4. Resume & LinkedIn Update

- Add **projects**, **internships**, **skills** to your resume.

- Keep **LinkedIn** updated with recent achievements and projects.

5. Mock Interviews

- Practice mock technical interviews with peers or on mock interview platforms.

6. Coding Contests

- Participate regularly in online competitive programming contests to build competitive programming skills.

4th Year Roadmap

1. Full Project Development

- **Build Capstone Project**: A real-world project (e.g., an e-commerce app, AI-powered chatbot).

- **Collaborate with peers** for group projects.

- **Host your project** on **GitHub** and add a **portfolio website**.

2. Interview Preparation

- **Technical Interviews**: Revise important **CS subjects** (DBMS, OS, Networking, Algorithms).

- **Behavioral Interviews**: Prepare for HR rounds by practicing common questions like "Tell me about yourself," "Why do you want to join this company?".

- **Coding Practice**: Continue solving advanced problems on online platforms.

3. Job Hunt

- Apply to tech companies via **LinkedIn** and **Naukri**.

- Start preparing for **on-campus placements** through your college **TnP**.

Additional Tips:

- **Soft Skills Development**: Improve your English speaking and writing, which is crucial for interviews and presentations.

- **Network Actively**: Build a strong network of professionals on LinkedIn, attend webinars, and engage in tech communities.

- **Certifications**: Earn certifications in **Cloud Computing**, **AI/ML**, or **Web Development** from trusted learning platforms.

- **Health**: Stay physically and mentally healthy; balance study with hobbies and fitness activities to avoid burnout.