**"CODEKIDS: A GUIDE TO CODING FOR CHILDREN AND THEIR PARENTS"**

*Research project report submitted*

*at the institute*

## **INDIAN INSTITUTE OF INFORMATION TECHNOLOGY GUWAHATI**

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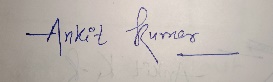
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**Declaration**

I hereby declare that this submission is my own work and that, to the best of our knowledge and belief, it contains no material previously published or written by another person nor material that, to a substantial extent, has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

**Date**: 18th July, 2024 **Student Name, Roll No, Signature**

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## **About This Report**

This report, **"CodeKids: A Guide to Coding Education for Children and Their Parents,"** is designed to provide a comprehensive pathway for children to develop an interest and proficiency in coding from an early age. The guide is structured to cater to different age groups (0 to 15 years) and class levels (Nursery to 10th grade), ensuring that the learning journey is both engaging and age-appropriate.

### **Contributors:**

* **Ankit Kumar**  
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* **My Friends and Colleagues**  
  Students and Alumni of IIT Patna
* **Professors and Experts**  
  Faculty members from the Department of Computer Science and Engineering, IIT Patna

### **Methodology:**

This report is based on my personal experience, insights from my friends and colleagues at IIT Patna, and the expertise of our distinguished alumni and professors. Additionally, I have researched extensively through articles and resources available on the internet to ensure that the content is comprehensive and up-to-date.

We hope this guide serves as a valuable resource for parents and children alike, fostering a love for coding and paving the way for future innovators.

# Chapt 01: The Intuitions behind CodeKids

In today's digital era, technology plays a crucial role in almost every aspect of our lives. From the devices we use daily to the innovative solutions transforming industries, the impact of technology is undeniable. As we navigate this ever-evolving landscape, it becomes essential to equip the next generation with the skills and knowledge needed to thrive.

Why CodeKids?

* **Addressing Screen & phone Addiction and misuse:** Many children today spend a significant amount of time on screens, often engaging with content that offers limited educational value. By introducing coding early, we can channel this screen time into productive learning experiences that are both fun and intellectually stimulating.
* **Building Future-Ready Skills**: Coding is not just about programming; it’s about problem-solving, logical thinking, and creativity. These skills are invaluable, transcending beyond the realm of technology and contributing to overall cognitive development.
* **Enhancing Academic Performance:** Studies have shown that learning to code can enhance a child's performance in subjects like mathematics and science. The *logical structure and problem-solving* nature of coding can help strengthen their analytical abilities and understanding of complex concepts.

The CodeKids initiative aims to create a structured and engaging pathway for children to develop an interest in coding. By addressing the challenges and leveraging the opportunities presented by our digital world, we can inspire and empower the next generation of innovators.

# Chapt 02: Nursery to Kindergarten

During the early years of childhood, from ages 1 to 5 and classes Nursery, LKG & UKG, children undergo rapid cognitive and linguistic development. This chapter focuses on laying a strong foundation through basic elementary education, encompassing essential skills such as language development, numerical awareness, and cognitive abilities.

* Nursery (Age 1-2):  
   Introduction to sounds and basic language skills.  
   Recognition and learning of alphabets and numbers through visual aids and interactive games.
* Lower Kindergarten (LKG) (Age 3):  
  Continued exploration of language development.  
  Introduction to simple mathematical concepts such as counting and basic arithmetic.
* Upper Kindergarten (UKG) (Age 4-5):  
  Building vocabulary and understanding word meanings.  
  Strengthening numerical skills through more structured learning activities.

The Nursery to Kindergarten phase is crucial in establishing a solid educational base for children. By focusing on language development, numerical awareness, and cognitive skills, we aim to nurture a love for learning and prepare children for further academic pursuits.

# Chapt 03: Elementary to Secondary Education

This chapter outlines a structured journey through coding and technology education, tailored for students from grades 1 to 10. Emphasizing practical learning alongside school curricula, each class level introduces foundational concepts and practical skills, preparing students to explore and excel in the digital world. From basic computer literacy to full-stack development projects, this curriculum aims to empower young learners with essential skills for future academic and professional success.

1. **Class I (6 yrs old):** Introduction to Coding and Technology:  
   Motivation towards understanding how computers work, Basic overview of MS Office applications (Word, Excel, PowerPoint).
2. **Class II (7 yrs old):** Understanding Programming Languages  
   Introduction to what programming languages is.  
   Exploration of how the internet works.
3. **Class III** (8 yrs old): Introduction to Web Development  
    What websites are and how they function.  
   Basics of creating websites using HTML and CSS.  
   Introduction to coding environments like VS Code.  
   Resources from platforms like Apna College and CodeWithHarry on YouTube.
4. **Class IV** (9 yrs old): Introduction to JavaScript:  
    Basic concepts and applications of JavaScript.
5. **Class V** (10 years old): *Creating Entertainment Games*  
    Using HTML, CSS, and JavaScript to develop simple games.  
   Completion of at least two mini fun projects.
6. **Class VI** (11 years old): Version Control with Git and GitHub: Learning to use Git for version control.  
   Uploading code to GitHub repositories.  
   Introduction to Pull Requests (PRs).
7. **Class VII** (12 years old): Exploring Interests in Various Subjects:  
    Encouragement to explore interests in Maths, Science, Social Sciences, or Technology.  
   Parents are encouraged to observe and support their child's interests.
8. **Class VIII** (13 years old): Exploring Backend Development  
   Introduction to backend development with Node.js and Express.js (MERN stack).
9. **Class IX** (14 years old): Introduction to Databases (DB)  
    Understanding databases (SQL or NoSQL, like MongoDB).  
   Establishing connections and basic operations.
10. **Class X** (15 years old): Full Stack Development Projects  
     Developing at least two full-stack projects using the MERN (MongoDB, Express.js, React.js, Node.js) stack.  
    Learning the Python programming language and their applications (OOPS - concepts).

Note:

* All learning activities are designed to complement and integrate with the parallel curricula of schools following CBSE, ICSE, or state boards.
* Emphasis is placed on practical application alongside academic studies to foster comprehensive skill development.
* Don’t give pressure on the student, if he or she is interested, then definitely they will do.

# Chapt 05: Personal Suggestion & Insights:

In this chapter, I provide personal suggestions based on my own experiences and insights to help students enhance their coding journey. These recommendations aim to foster good coding habits, ensure health and eye safety, and guide future learning paths.

* Use Blogger.com (free of cost: provide by google) for code – Online Store House and revised the previous code on regular basis, try to make Coding-Habits (daily)
* Advised to use original *blue lens* while on systems and keep care of health & do exercise as coding, our most of time on screen and siting position.
* After 10th standard, if students are interested in coding (after follow this web-dev and pints tills now) they only solve a lot of D.S.A. with Java or C++ questions (LeetCode, or CodeCheff; only one platform can select) to develop logic building.
* Nothing does more (AI, ML, DL & Neural Network), according to Indian placements scene.

# Conclusion

These personalized tips are designed to help students build strong foundations, maintain good habits, and focus their efforts on areas that will provide the most benefit in their coding and professional journeys.

…………………………………………………Keep Learning and Keep Coding………………………………………………………………