“3D – Edtech”
Second-year Mini Project Report

Submitted in partial fulfillment of the requirements of the degree
BACHELOR OF ENGINEERING IN COMPUTER ENGINEERING

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CERTIFICATE

This is to certify that the Mini Project entitled **" 3D Edtech"** is a bonafide work of **Mahek Kataria D7C/38, Riya Lassi D7C/42, Gazal Keshwani D7C/39, Harshita Lohana D7A/38** submitted to the University of Mumbai in partial fulfillment of the requirement for the award of the degree of **"Bachelor of Engineering" in "Computer Engineering".**

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Supervisor

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Head of Department Principal

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Mini Project Approval

This Mini Project entitled "**3D Edtech**" by **Riya Lasi D7C/42, Mahek Kataria D7C/38, Gazal Keshwani D7C/39, Harshita Lohana D7C/38** is approved for the degree of **Bachelor of Engineering** in **Computer Engineering.**

Examiners

1. Prof. Mrs Priyanka Shah
(Internal Examiner Name & Sign)

2. (External Examiner name & Sign)

Date :
Place:

Contents

1. INTRODUCTION:

1.1 INTRODUCTION:

The world of education has developed a lot but still, some loopholes make education difficult for a lot of students. 2D learning cannot often show depth and perspective, which can limit the understanding of the concepts. Learners may not be able to connect and interact with the content directly and more efficiently so to cope with this problem we have constructed a website named '3D -EDTECH' which is an innovative web platform designed to enhance the understanding of complex data structures and algorithms through interactive 3D Animations. This project aims to provide an engaging and immersive learning experience to users, enabling them to grasp intricate programming concepts with ease. The platform features real-time 3D visualizations, comprehensive explanations, and practical demonstrations, making it a valuable resource for students and enthusiasts in the field of Science. The mission of this website is to demystify the captivating universe of 3D concepts and empower learners of all ages and backgrounds to master this transformative technology. we're here to guide you through the journey of turning your imagination into reality.

1.2 MOTIVATION:

The motivation behind 3D-EDTECH was rooted in a vision to redefine education and professional development, recognizing the need for a dynamic and inclusive platform for fun learn:

- Engaging Exploration: Dive headfirst into the world of 3D through dynamic lessons that transform abstract theories into tangible knowledge.

- Interactive Experience: Learn by doing with our interactive simulations and real-world applications that make each concept come to life.

- Limitless Creativity: Discover how 3D opens the door to endless possibilities, from animation to technical visualization and more.

1.3 Problem Statement and Objectives:

- Lack of Depth and Perspective: 2D learning cannot often show depth and perspective, which can limit the understanding of complex three-dimensional concepts. This is particularly problematic for subjects like geometry, architecture, and scientific visualization.

- Limited Interactivity: In 2D formats, learners may not be able to interact with the content directly. Interactivity enhances engagement and understanding, allowing learners to manipulate objects and variables to observe different outcomes.

- Difficulty in Visualizing 3D Concepts: Some concepts, such as Stacks, linked lists, atomic activities have complex machinery, are better understood in a three-dimensional space. 2D representations may not fully capture the intricacies of these concepts, leading to a limited understanding.

- Complex Processes and Systems: Learning complex processes, systems, or procedures in a 2D format might be challenging, as it may not accurately convey the sequence of events or the interaction between components.

- Real-World Context: Many concepts are better understood when presented within their real-world context. In 2D, it can be harder to simulate real-world scenarios, which can hinder understanding and application

- Sensory Engagement: Learning through only visual stimuli in 2D can lack sensory engagement that comes from other formats, like hands-on activities, virtual reality, or augmented reality. Engaging multiple senses can lead to better retention and comprehension.

- Static Representations: 2D formats are often static and fixed, making it difficult to demonstrate dynamic or changing processes. This can be problematic when trying to convey concepts that involve motion, change over time, or cause-and-effect relationship.

1.4. Organization of the Report

The introduction sets the stage for the report, beginning with a general overview (1.1 Introduction) of the topic. Motivation (1.2) elucidates the reasons driving the research or project, followed by the Problem Statement & Objectives (1.3) that delineate the issue at hand and the intended goals. The organization of the report (1.4) is outlined, providing readers with a roadmap of what to expect.

The Literature Survey delves into existing knowledge. It commences with a Survey of Existing System (2.1), presenting an overview of the current state of the subject. Limitations of the existing system or research gaps (2.2) are discussed, identifying areas where improvements or advancements are needed. The section also highlights the Mini Project Contribution (2.3), explaining how the present project aims to fill the identified gaps.

The Proposed System introduces a novel approach or system. Beginning with an Introduction (3.1), it provides a comprehensive overview. Architecture/Framework (3.2) offers insights into the structure and framework of the proposed system, while Algorithm and Process Design (3.3) explain the methodologies employed. Details of Hardware & Software (3.4) shed light on the technological aspects. Experiments and Results (3.5) present findings, and Conclusion and Future Work (3.6) summarize the outcomes and suggest future research directions.

Lastly, the References section is a compilation of all the sources referenced throughout the report, allowing readers to explore the cited works in depth.

2. Literature Survey

1.4 Survey of Existing System:

R	TITLE	SUMMARY	YEAR	SOURCE LINK
1.	Influence of 3D Models and animations on students in natural subjects.	This study assesses whether dynamic visualization used in the experimental group has a stronger positive influence on science students' intrinsic motivation and learning outcomes than static visualization used in the control group. The result shows that using 3d models and animations in the teaching process significantly increased the student's intrinsic motivation for learning natural sciences.	2022	https://stemeducationjournal.springeropen.com/articles/10.1186/s40594-022-00382-8
2.	Student Perceptions Using Augmented Reality and 3D Visualization Technologies in Chemistry Education.	This article discusses how Modern Computational technologies have revolutionized education, including visualizing molecular geometry in chemistry. The authors developed several 3D animations of Fundamental chemical transformation aimed at organic chemistry courses. These animations became the basis for the 3D augmented reality tool called ARchemy.	2020	https://link.springer.com/article/10.1007/s10956-020-09880-2
3.	3D Animation in Education	This article discusses how 3D educational animation can be used to enhance learning. These types of assignments can help mold the future of academia.	2017	https://pixelperfect-studios.com/3d-animation-future-education/

21.Users of the system:

➢ Students: Both school-age and college-level students could benefit from learning 3D concepts. These students might be pursuing degrees or careers in fields like computer science engineering.

➢ Professionals: Individuals working in industries such as animation, game development, virtual reality, augmented reality, architecture, product design, and visual effects might use the website to enhance their existing skills or stay up-to-date with the latest trends in 3D technology.

➢ Educators: Teachers and professors looking to integrate 3D concepts into their curriculum can use the website as a resource to enhance their teaching materials and methodologies. Enthusiasts: People who are simply fascinated by 3D technology and want to understand the underlying principles and techniques without necessarily pursuing it as a career.

➢ Parents and Guardians: Parents interested in exposing their children to technology and creativity might use the website to teach their kids about 3D concepts in an engaging and education

2.2 Limitation Existing system or research gap:

- Lack of Depth and Perspective.
- Difficulty in Visualizing 3D Concepts.
- Complex Processes and Systems.
- Real-World Context.
- Static Representations.

2.3 Mini Project Contribution:

- User-friendly interface
- Attractive 3D quizes of concepts.
- Self-learning and understanding of concepts.
- Important visual explanation available along with animated quiz.
- Shows the compilation process of a program in 3D

3. Proposed System

3.1 Introduction:

The core of the website's offerings is its interactive 3D Quizes. Visualizing data structures in three dimensions allows users to perceive abstract concepts more tangibly, making it easier to comprehend their behaviour and interactions..

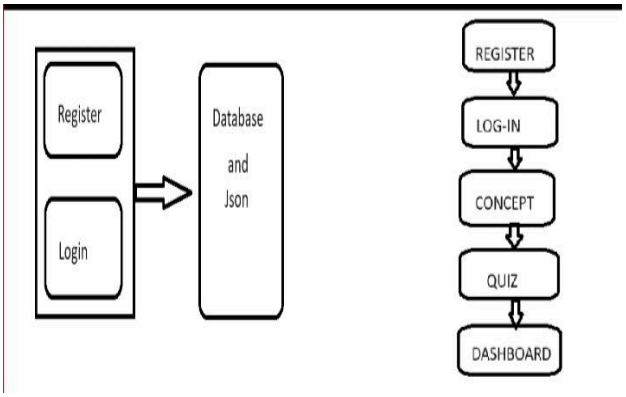
Self-Learning Environment: "3D EdTech" is designed to empower learners to study at their own pace. Users can interact with animations, replay scenarios, and progress through content as per their understanding, fostering a sense of autonomy and confidence.

Dashboard: To represent the progress of the user.

3.2 Architecture/ Framework:

1) 3D EdTech Visualisation Platform ➡the Central element, representing the main project. 2) User Interface(Web Application) ➡ The interface that users interact with, providing access to animation explanation and search functionality. 3) Content Management(Database) It stores the login and registration details of the user . 4)3D Animation Engine ➡The engine integrates 3D models and animations with the user interface, allowing users to interact with visual representations of concepts. 5) Visual Explanations ➡ Dynamic explanation of concepts to enhance user experience

3.3 Algorithm and Process Design



3.4.Details of Hardware & Software:

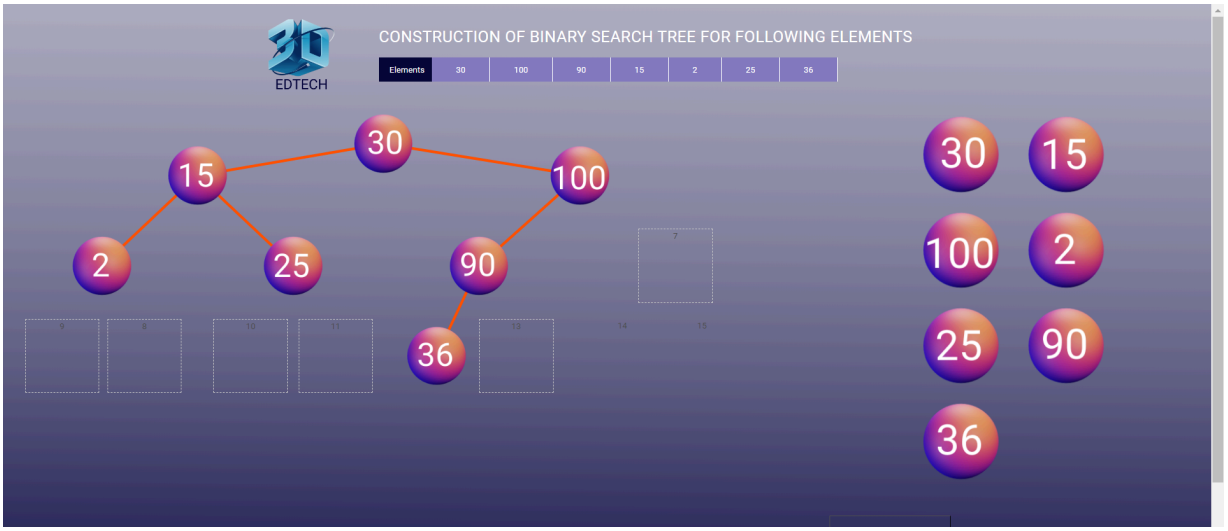
Hardware Requirements:

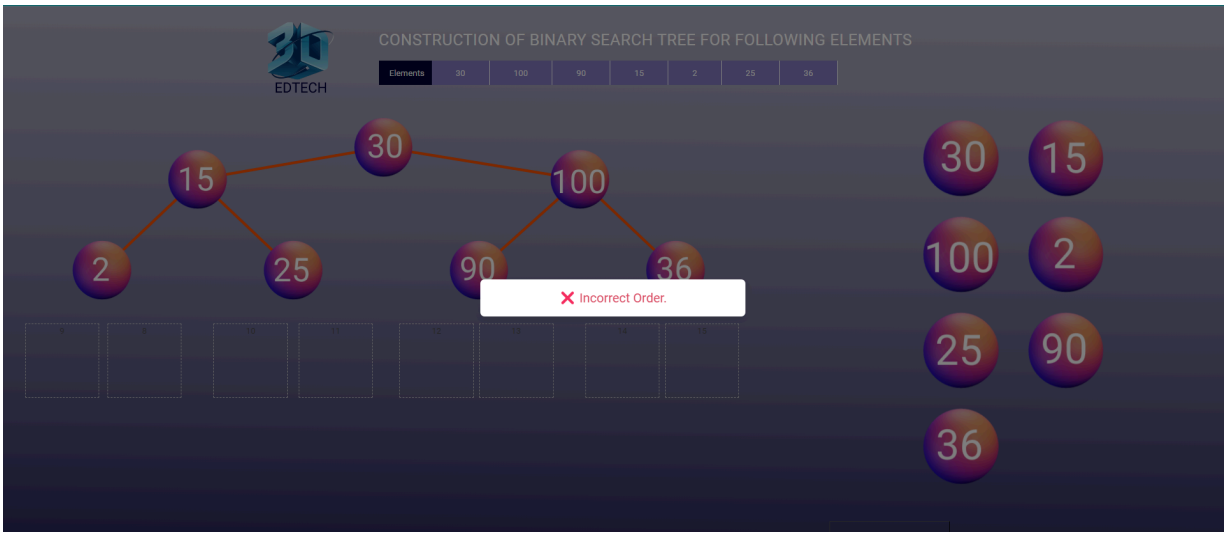
- A Mobile Device
- Computer
- Internet Connection

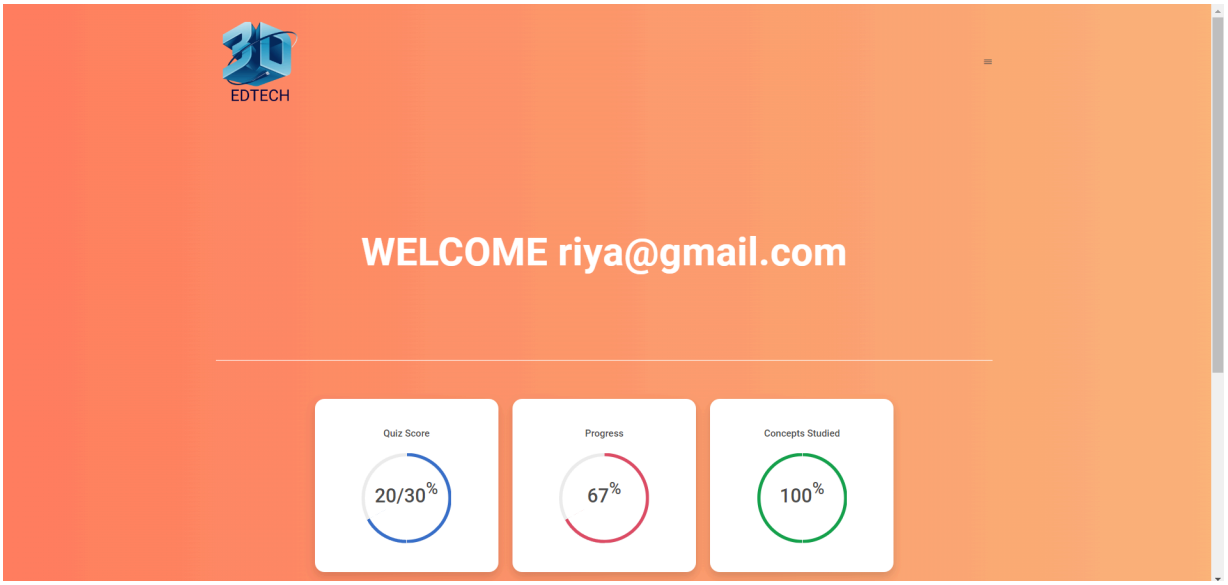
Software Requirements:

- Html , CSS , JavaScript
- Nodejs and json
- Bootstrap

3.5 Experiments and results:







3.6 Conclusion and Future Work:

- 3D EDTECH is a website that provides 3D Quizzes on data structures and other technical concepts specifically for engineering students.
- It is seen that many students struggle to understand the concepts which needs imagination in classroom learning.
- (3D EDTECH) which provides the 3D Animation and visualised explanation of such concepts.3D EDTECH can be effective for many students, providing an alternative option to traditional learning methods.
- 3D EDTECH is effective and cost-efficient as it is a free source of learning which increases the student's access to the subject.
- It can lead to improved outcomes and high student satisfaction ratings.

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