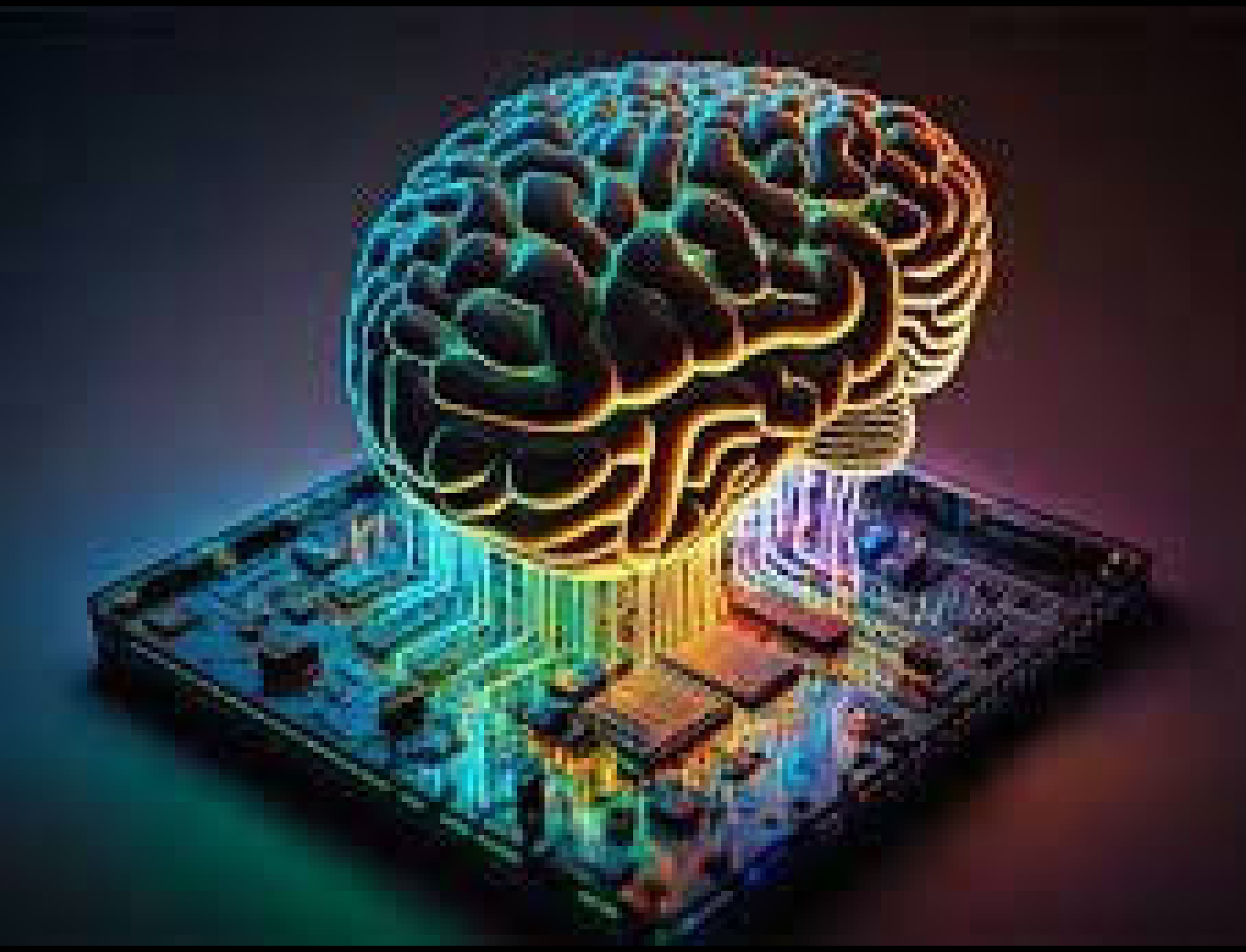
JSPM's
Bhivarabai Sawant Institute of Technology & Research, Wagholi, Pune
(Approved by AICTE, Delhi & Govt. of Maharashtra, affiliated to Savitribai Phule Pune University)
Department of Information Technology

# INFOTECH

VOLUME 9 ISSUE 1



**Vision:** *To be a nucleus nurturing learner to cater current & future digital needs.*
**Mission:** *M1-To groom learners for addressing technical challenges by utilizing knowledge and skill sets.*
*M2-To inculcate professional values to develop effective and efficient organization through best practices*
**PEO-1:** *Graduate shall have the ability to exhibit excellence in professional career by demonstrating a positive representation of their brand.*
**PEO-2:** *Graduate shall have the ability to learn latest trends coping present and future needs.*
**PEO-3:** *Graduate shall have sense of social responsibility by balancing the emotional quotient and strengthening the personal trails.*

# Vision and Mision


## Vision of the Institue

"To satisfy the aspirations of the youth force, who wants to lead the nation towards prosperity through techno-economic development."

## Mision of the Institue

"To provide, nurture and maintain an environment of high academic excellence, research and entrepreneurship for all aspiring students, which will prepare them to face global challenges maintaining high ethical and moral standards."

# Vision and Mision


## Vision of the Department

"To be a nucleus nurturing learner to cater current & future digital needs."

## Mision of the Department

1. Educating aspirants to fulfill technological and social needs through effective teaching learning process.

2. Imparting IT skills to develop innovative solution scatering needs of multidisciplinary domain.

# "PEO's and PSO's"

## PEO

## Program Educational Objectives

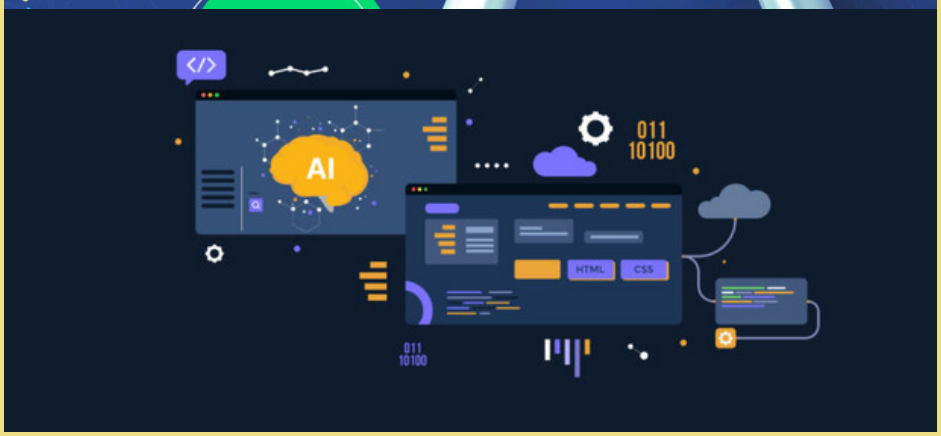
PEO1: Graduate shall have the ability to exhibit excellence in professional career by demonstrating a positive representation of their brand.
PEO2: Graduate shall have the ability to learn latest trends coping present and future needs.
PEO3: Graduate shall have sense of social responsibility by balancing the emotional quotient and strengthening the personal traits.

## Pso

## Program Specific Outcomes

PSO1:Apply appropriate technologies and employ suitable methodologies by managing the information technology resources of an individual or organisation for betterment.
PSO2: Anticipate the ever-changing trends in information technology and assess the likely utility of new technologies
PSO3: Develop IT systems that would resolve issues related to socio-economic development and build the nation through digitisation.






## AI-Generated Code & Autonomous Software Development

**AI-generated code and autonomous software development are transforming the way developers build and maintain applications. Tools like GitHub Copilot and other AI coding assistants use machine learning algorithms to analyze codebases and generate context-aware code snippets, reducing the time spent on routine tasks and allowing developers to focus on complex problem-solving. This innovation is not only accelerating the software development lifecycle but also democratizing coding by lowering entry barriers for new programmers.**

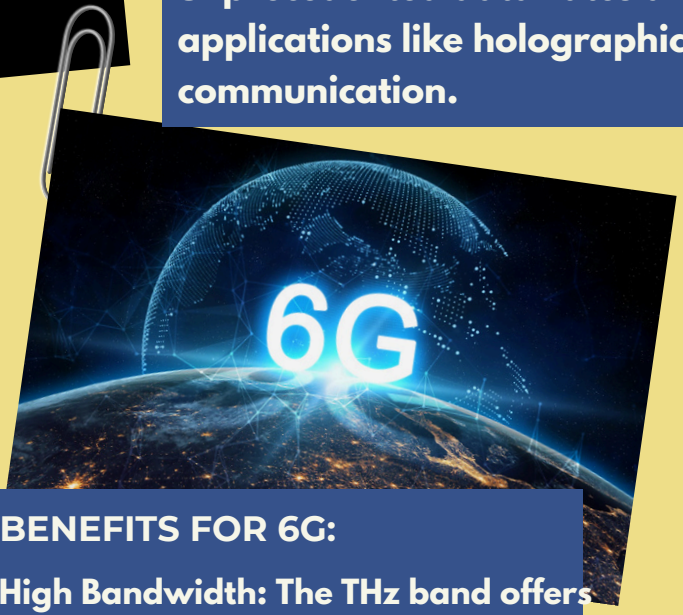
**Beyond mere code generation, these AI-driven platforms are evolving to handle larger portions of the development process autonomously. As they improve in understanding project contexts and programming paradigms, they can suggest entire functions, optimize existing code, and even identify potential bugs before runtime. This shift towards autonomous software development is paving the way for smarter integrated development environments (IDEs) that continuously learn and adapt to the evolving needs of developers and organizations.**

**Mayank Deore**
**(S.E-I.T)**

# 6G & TERAHERTZ COMMUNICATION


6G wireless technology, aiming for ultra-high speeds and low latency, is expected to leverage terahertz (THz) communication, which utilizes frequencies between 0.1 and 10 THz, for unprecedented data rates and applications like holographic communication.

6G and terahertz communication represent the next evolution in wireless networking, promising to push the boundaries of data transmission far beyond what 5G can achieve. With anticipated data speeds that could exceed hundreds of gigabits per second, 6G will empower a new era of ultra-connected devices and applications, from immersive virtual reality experiences to real-time holographic communication. Terahertz frequencies, a key component of 6G, offer tremendous bandwidth, enabling faster and more reliable networks.This breakthrough technology is expected to fuel innovations across multiple sectors, including smart cities, autonomous vehicles, andadvanced healthcare systems. By integrating advanced signal processing and machine learning techniques, 6G networks will not only enhance connectivity but also optimize network performance dynamically. As research and development accelerate, 6G and terahertz communication will lay the groundwork for a hyper-connected future with transformative impacts on both consumer and industrial technologies.




## BENEFITS FOR 6G:

High Bandwidth: The THz band offers significantly wider bandwidths compared to current wireless technologies, enabling extremely high data rates.
Low Latency: THz communication can achieve very low latency, crucial for real-time applications like remote surgery and autonomous driving.
New Applications: THz waves open up possibilities for new applications such as holographic communication, digital twins, and advanced machine-to-machine interactions.

**Ayush Gaikwad**
**(S.E I.T)**

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# BIOMETRIC SECURITY

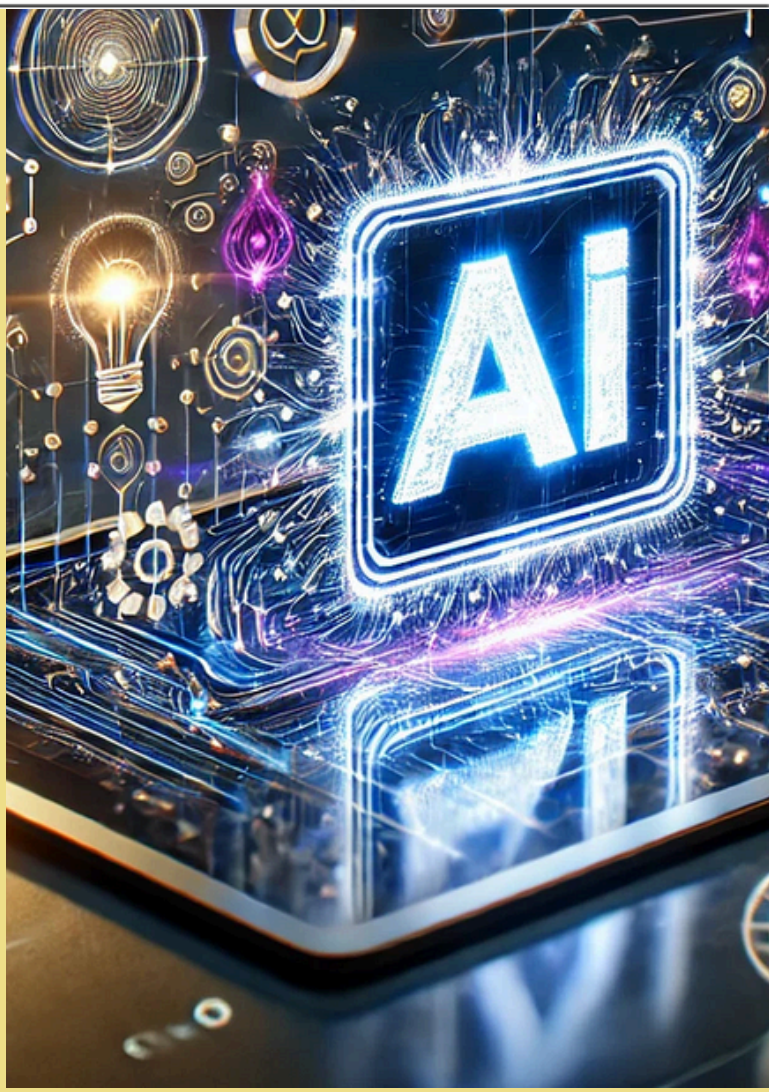
**Biometric security utilizes unique physical and behavioral traits—such as fingerprints, facial features, iris scans, and voice patterns—to verify personal identities. This method provides a stronger safeguard than traditional password-based systems because these traits are inherently exclusive to each individual.Continuous innovations in sensor technology and machine learning are boosting the precision and robustness of these systems against fraudulent attempts**


**By leveraging cutting-edge sensors and refined algorithms, biometric systems facilitate swift and precise identity confirmation in various applications, ranging from unlocking smartphones to managing access in secure environments.**

**Continuous innovations in sensor technology and machine learning are boosting the precision and robustness of these systems against fraudulent attempts**

**Avneet PKT**
**(S.E I.T)**

# AI-DRIVEN IDENTITY PROTECTION



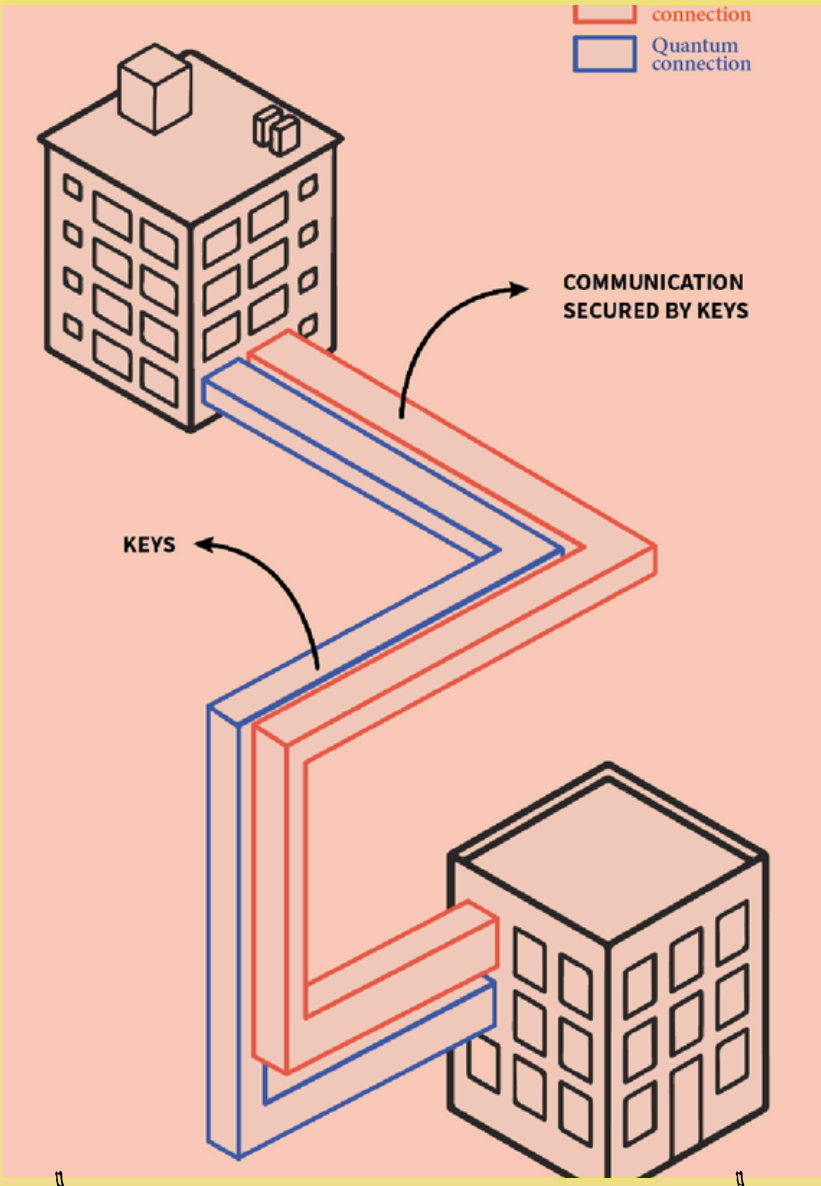

AI-driven identity protection leverages artificial intelligence to monitor, scrutinize, and safeguard digital identities in real time. By employing sophisticated machine learning techniques and behavioral analytics, these systems can swiftly detect irregular patterns and suspicious activities that may indicate identity fraud or cyber threats. Their ability to continuously learn from expansive datasets allows them to adapt to new forms of attack, providing a proactive defense against malicious efforts targeting both personal and corporate identities.

In addition, AI-enhanced identity protection reinforces cybersecurity infrastructures by automating both threat detection and response measures. These intelligent systems integrate seamlessly with existing security protocols to deliver multi-layered defenses that quickly isolate and neutralize potential breaches before they escalate. As digital interactions become ever more complex, AI-driven identity protection will play a critical role in preserving the integrity of confidential information and fostering trust in online communications, ultimately ensuring a more secure digital ecosystem.

Ajinkya Dalvi
(S.E I.T)

# Quantum Internet: Secure Communications

Quantum internet and secure communications are on the frontier of digital security, promising a paradigm shift in how data is transmitted and protected. Unlike classical internet protocols, quantum communication leverages the principles of quantum mechanics—such as superposition and entanglement—to create networks that are theoretically immune to eavesdropping. This quantum advantage ensures that any attempt to intercept data would be immediately noticeable, paving the way for unbreakable encryption methods. In addition to secure communications, the quantum internet is set to enable revolutionary applications like quantum teleportation of information and distributed quantum computing. By connecting quantum devices across long distances, researchers hope to develop a global network that not only enhances security but also accelerates computational capabilities. As the technology matures, quantum communication will play a pivotal role in safeguarding critical information and supporting next-generation digital infrastructures.





Sarthak Deo
(S.E I.T)

# ROBOTICS IN EVERYDAY LIFE

Robotics in everyday life enhances convenience, efficiency, and safety. Smart home assistants automate tasks, healthcare robots improve patient care, and delivery drones speed up logistics. In retail, robots enhance customer service, while educational bots personalize learning. Exoskeletons assist people with mobility challenges, and AI-driven robots improve human-robot interaction. Robotics is revolutionizing daily life by making tasks smarter and more accessible. By 2025, robotics is expected to be deeply integrated into everyday life, with robots assisting in various tasks like home automation, healthcare, delivery services, customer service, and education, thanks to advancements in AI and sensor technology, making them more interactive, adaptable, and capable of complex tasks while seamlessly interacting with humans; . essentially, robots will become commonplace in daily routines,

Robotics has seamlessly integrated into daily life, transforming industries and households alike. From AI-driven personal assistants and robotic vacuum cleaners to automated delivery drones and industrial robots, these innovations enhance convenience, efficiency, and productivity. Healthcare sees robotic surgeons performing precise procedures, while elderly care benefits from companion robots offering assistance and companionship. Smart factories rely on autonomous robots for seamless production, and AI-powered exoskeletons aid mobility-impaired individuals. As robotics continues to advance, society moves closer to a world where human- robot collaboration is the norm.

Sahil Bhandare
(S.E I.T)

# HYPERAUTOMATION

Hyperautomation refers to the strategic combination of advanced technologies such as artificial intelligence, machine learning, robotic process automation, and workflow orchestration to automate complex business processes. This approach goes beyond simple task automation by integrating multiple tools and systems, enabling organizations to streamline operations, reduce manual errors, and significantly improve productivity. By automating end-to-end processes, hyperautomation creates an agile, data-driven environment where routine and even intricate decision-making tasks can be executed with minimal human intervention.

In practice, hyperautomation facilitates continuous process optimization, allowing businesses to adapt quickly to changing market conditions and customer needs. It leverages real-time analytics and predictive insights to monitor performance, identify bottlenecks, and proactively address potential issues before they impact operations. As organizations increasingly rely on digital transformation to drive efficiency and innovation, hyperautomation stands out as a critical enabler for achieving operational excellence and maintaining a competitive edge in today's dynamic business landscape


Omkar Biradar
(S.E I.T)

# PERSONALIZED AI & AUTONOMOUS DIGITAL ASSISTANTS

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**Siddhart Gawde**
**(S.E I.T)**

# CYBER-PHYSICAL SYSTEMS (CPS)AUTOMATION

**Cyber-Physical Systems (CPS) seamlessly integrate computational processes with physical operations, bridging the gap between digital information and the real world. These systems incorporate sensors, actuators, and embedded computing to monitor and control physical processes in real time. This integration allows CPS to react dynamically to environmental changes, enabling more efficient and adaptive operations across various applications such as smart manufacturing, intelligent transportation, and healthcare monitoring.**

**As foundational components of Industry 4.0, CPS are transforming traditional industrial practices by creating more responsive and interconnected systems. They enhance operational efficiency, improve resource management, and bolster safety through real-time data analytics and automation. With ongoing advancements in sensor technology, network connectivity, and data processing, Cyber-Physical Systems are emerging as critical enablers of innovation, driving the next wave of digital transformation in both industrial and everyday applications.**

**Atharva Kalhatkar**
**(S.E I.T)**