



RAJADHANI INSTITUTE OF ENGINEERING AND TECHNOLOGY

Rajadhani Hills, Nagaroor, Attingal, Thiruvananthapuram, Kerala 695102



COGNITIO
STORIES IN SYNTAX
STORIES IN SYNTAX

2022-23

Department of
*Computer Science
&
Engineering*





VISION OF THE INSTITUTION



Groom the Youth as Innovative, Creative and Empathetic Technologists, Hospitality Professionals, Managers and Entrepreneurs for Social Transformation.

MISSION OF THE INSTITUTION



M1: To encourage holistic development of students with well-balanced curricular, co-curricular and extra-curricular activities.

M2: To promote ethical and value-oriented teaching, research and consultancy among faculty and students for social transformation.

M3: To interact with industrial organizations, governmental agencies, and engineering, hospitality and business enterprises for collaborative learning.



VISION OF THE DEPARTMENT



To be a premier department nurturing students to be strong in core and interdisciplinary knowledge, employable skills, industrially competent, innovative and creative professionals with ethical values.

MISSION OF THE DEPARTMENT



M1 : To develop competency in Computer Science & Engineering through outcome based education.

M2 : To imbibe the culture of creativity and critical thinking to enhance research and innovations in advanced computing technology.

M3 : To enhance leadership, problem solving and entrepreneurial skills to transform social responsibilities with ethical values.



PEO STATEMENTS

PEO1: Exhibit knowledge and proficiency in various domains of Computer Science & Engineering.

PEO2: Develop innovative computing products for reconcile contemporary issues in industry.

PEO3: Demonstrate team work, ethical leadership and promote entrepreneurship

PROGRAM SPECIFIC OUTCOMES (PSOS)

PSO 1 : Able to analyze and design solutions for complex problems in computing technologies using software project management concepts and programming languages.

PSO2: Develop proficiency in interdisciplinary areas of computer engineering to perform tasks related to industry & research.

PSO 3 : Competent to solve real world problems pertaining to products and services in Information Technology.





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ABOUT RIET

A Scientific Approach to Learning

Engineering & Technology is demystified through a scientific approach of teaching and learning. Traditional concepts are shattered; new ideas are explored, possibilities are unraveled, and learning is unbounded by the environment prevailing at the Institute. The curriculum is adequately supported by value-added short-term certifications by the industry to meet the global standards of technology education. The pristine and natural terrain of the campus is an ideal place for both learning and fun at RIET, blending nature with technology. RIET has a strong orientation towards R&D, aligning with the national and international objectives of excellence.

Departments and Infrastructure

You just have to walk in and capture the spirit of scientific temperament at the campus. There are eleven departments, each having emphasis on instruction and research. State-of-the-art laboratories furnished with the latest equipment and experienced faculty ensures an enriching learning culture.

Research, Development, and Innovation

The Centre for Research and Development undertakes projects in the areas of Civil, Mechanical, Electronics & Communications, and Computer Science in collaboration with national/international research and R&D laboratories. RIET in partnership with Technopark, Govt of Kerala has a technology incubation centre for fostering a culture of entrepreneurship & creativity amongst the students. The other centres proposed are Innovations Lab, Centre for Alternative Technologies for Rural Development, and Industry Sponsored Research Centre etc.

The Vision

The vision of RIET is to groom and empower a new generation of technologists and innovators with a lifelong passion for learning and achievement. Efforts are to productively mold them to be good citizens with sensitivity, empathy, and compassion for society, thus enabling education to be a better tomorrow.



ABOUT CSE

The Department of Computer Science & Engineering (CSE) at Rajadhani Institute of Engineering & Technology (RIET) was established in 2009 with the vision providing high-quality education of and training in the rapidly evolving fields of computer science and technology. The department initially began with an intake capacity of 60 students and has since expanded to meet the growing demand for skilled professionals in the tech industry.

Key milestones in the department's growth: 2009: Establishment of the Computer Science & Engineering department. 2020: Introduction of the Cyber Security program, with an intake capacity of 60 students. This program was designed to address the increasing need for experts in protecting digital systems and data from cyber threats. 2023: Launch of the Artificial Intelligence & Machine Learning (AI & ML) program, with an intake of 60 students. This program aims to equip students with the knowledge and skills required in the cutting-edge areas of AI, ML, and Data Science.

The department's growth in both academic offerings and intake reflects its dedication to preparing students for the challenges and opportunities in the ever-changing landscape of computer science and technology. The department has grown steadily over the years, maintaining a strong academic reputation, and producing skilled professionals who excel in both the industry and academia. The department has dedicated, qualified and experienced faculty members to guide the students in academics



CHAIRMAN'S REMARK

I appreciate the sincere efforts made by the faculty members and students of the Department of Computer Science in RIET for publishing a technological Magazine "COGNITIO" in connection with the "ITHIHA 2K23". The hard work and dedication of the whole computer science community and especially that by the organizing committee members is highly appreciable.



Dr. Biju Ramesh

I wish all success to 'COGNITIO'.

DIRECTOR'S REMARK

It is a great joy to know that our computer science department is publishing a souvenir 'COGNITIO'. It will be a forum for the students to showcase and enhance their technical skills and an opportunity for their self-development at a time the country is marching ahead in the growth. Besides, the hard work put in for putting together such a remarkable magazine is admirable. I also wish that, the department continue their efforts to bring out innovative skills of not just the students of RIET, but that of the end of the nation. I congratulate the organizers and wish the magazine a grand success.



Ms. Megha Biju Ramesh

HOD'S REMARK



Dr. SANGEETHA SHIBU

I am very happy to inform that our pride rests in the yearly magazine *Cognitio*, which highlights the academic and non-academic activities of the students of our department. Every semester showcases all the curricular and extra-curricular events of the department.

It is great to find a considerable number of articles, poems, and drawings that clearly show that our staff and students are well-equipped and possess the necessary skills to express their talent.

Reading this magazine will surely inspire and motivate all students to contribute even more in future editions. I hope everyone continues to give their full efforts to maintain the momentum and further enhance the standards of the magazine.

MESSAGE FROM THE STAFF EDITOR



Ms. SREETHU L KUMAR

Dear Students,

It is a pleasure to present our departmental magazine *Cognitio*. This edition highlights the creativity of our students and captures the memorable moments and activities of ASCI throughout the year.

On behalf of Ithiha 2023, I express my sincere gratitude to all mentors and to the dedicated editorial team whose efforts made *Cognitio* possible.

We hope you enjoy reading it and welcome your valuable feedback.

STUDENT EDITOR



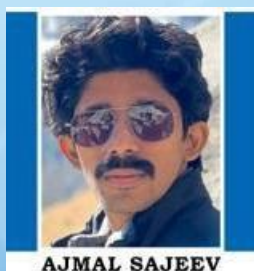
Mr. JUDE MAXIN
S6 CSE

It gives me immense pleasure to present *COGNITIO 2022-23*, a reflection of the creativity, talent, and intellectual spirit of our student community.

This magazine is not just a collection of articles—it is a vibrant platform where ideas come alive, voices are heard, and imagination finds its expression. Each page of *COGNITIO* captures the enthusiasm and dedication of students who have contributed their thoughts, stories, artwork, and insights.

I would like to extend my heartfelt gratitude to all contributors, teachers, and the editorial team whose continuous support and hard work made this publication possible. Your efforts have truly brought this magazine to life.

Behind Our Magazine



EVENTS



COGNITIO
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EXPERT TALK



Department of Computer Science and Engineering and IQAC of Rajadhani Institute of Science and Technology (RIET) have jointly organized an expert talk on “Cyber Security in the Corporate World” on 25th April, 2022. The talk was conducted by the expert Mr. Kiran Kolavennu ,Cyber Security Head CISCO USA(Leader ,Security and Privacy).

In this session, a total of 98 B.Tech first- and second-year students participated. Mr. Kiran shared his experiences and the challenges he faced during his journey.

Linux/Unix Script programming

Department of Computer Science and Engineering and IQAC of Rajadhani Institute of Science and Technology (RIET) have jointly organized two days workshop on Linux/Unix Script Programming on 26th and 27th June 2022. The workshop was conducted by Sunith V S and Rohith T P, they are prefinal year students in CUSAT and active members in thinker hub.





ANDROID APP DEVELOPMENT

Department of Computer Science and Engineering and IQAC of Rajadhani Institute of Science and Technology (RIET) have jointly organized workshop on Android App Development on 1st July 2022. The workshop was conducted by Abhishek S Lal, alumni CSE and founder of Campuzon App. He is a software engineer at AOT Technologies Pvt Ltd.

Workshop on Android App Development.



Resource Person : Abhishek S Lal (Alumni CSE),
 Founder Campuzon App | Software Engineer at AOT Technologies Pvt Ltd | Technical Trainer at Keltron

1st July , 2022
Time: 9.00 am to 12.00 pm
Venue:: SDPK LAB, RIET

Organised By:
 DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
 CYBER SECURITY

In association with RIET






NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL


NATIONAL BOARD OF ACCREDITATION



RAJADHANI
 INSTITUTE OF ENGINEERING
 AND TECHNOLOGY





ALUMNI INTERACTION-BACK TO CAMPUS

COLLEGE CODE RIE Computer Science and Engineering Department   United Nations 
NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL Academic Impact

Alumini Interaction - Back to Campus
A talk on Placement Opportunities and Higher Studies
By. Sharath Nair, Associate Software Developer, Cognizant



**RAJADHANI INSTITUTE OF
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Department of Computer Science and Engineering and IQAC of Rajadhani Institute of Science and Technology (RIET) have jointly organized an alumni talk on “Back to Campus” on 21st October, 2022. The talk was conducted by the Mr. Sharath Nair, Associate Software Developer in Cognizant Bangalore.

In this session was conducted for B.tech 3rd year students , Total of 43 students were participated. Mr. Sharath had shared his way of studying and what should be done for getting placed. Students asked their doubts about higher studies and about jobs.



MACHINE LEARNING & DEEP LEARNING



Department of Computer Science and Engineering and IQAC of Rajadhani Institute of Science and Technology (RIET) have jointly organized two days workshop on Machine Learning and Deep Learning on 25th and 26th October 2022. The workshop was conducted by Dr.Reena Mol V U Asst Prof CSE Dept. in St Philomina's College (Autonomous) Mysuru.



EXPERT TALK IN CYBER SECURITY

Department of Computer Science and Engineering and IQAC of Rajadhani Institute of Science and Technology (RIET) have jointly organized an afternoon session on the topic Cyber Security on 16th November 2022. The session was conducted by A.R.S. Iyer (Honorary Director & CTO M.Sc. in Physics (Electronics), Post. M.Sc. Diploma in Space Physics, Associate Membership of Institute of Electronics & Telecommunication Engineers & L.L.B., Former Joint Director (Technical) Intelligence Bureau Ministry of Home Affairs, (MHA). Govt of India.





BRIDGE COURSE

PROGRAM LOGIC BUILDING THROUGH C



Department of computer science RIET has organized a 2 days bridge course on *Program Logic Building Through C* From 06th October 2022 to 07th October 2022. The class was taken by Ms Amala V S, S3 Computer Science

DAY 2



Department of computer science RIET has organized a 2 days bridge course on *Program Logic Building Through C* From 06th October 2022 to 07th October 2022. The Class was taken by Ms Amala V S

HANDS ON TRAINING



Topic : Python Programming: Beginner to Advanced Level

The sessions were handled by Adityan Jayakumar, Lalhmangaihzuala and Mayank D of S8 CSE in SDPK Lab.

EXPERT TALK



Mr. ALEX THOMAS
Associate Director
Cloud Security Consulting AT EY



The class was handled by **Mr Alex Thomas, Associate Director, Cyber Security Analyst, EY, Ernakulam**. The event mainly covered the concepts like phases, architect, testing in security and what are the advantages of cloud in cyber security and so on. The program was conducted in the SDPK lab and was inaugurated by the Principal Dr Suresh Babu and Dr Sangeetha Shibu, Head of the Department, Computer Science & Engineering. After the class, there was a section for clearing the student's doubts. Later the program was ended with student's feedback and vote of thanks by Dr Sangeetha Shibu.

TECHNICAL TRAINING

Day 1

Resource Person : Mr. Sumith Sugathan

The first session commenced at 9 am. The area was an introduction to pseudo code. The trainer explained all scenarios of solving pseudocode problems. AN session started with Coding fundamentals. The first day of training was concluded by 4pm. Questions on Loops, Functions and Arrays including previous questions asked for TCS were discussed. The session ended at 4pm.

Day 2

Resource Persons : Mr. Aswin P

Chandran, Mr. Sreekanth Gopinathan Sarojini. The second day started with the area of Advanced C Programming. The topics included Pointers and Storage classes. Previous questions for UST were included. They practiced coding questions of Level 2.

Day 3

Resource Person : Mr. Sumith Sugathan

For the third day, the area was Data structure and Advanced coding. Pseudo code questions in Data Structures were discussed. They practiced coding questions asked in Product -Based Companies. The training ended at 4pm after feedback sessions from students.



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For the third day, the area was Data structure and Advanced coding. Pseudo code questions in Data Structures were discussed. They practiced coding questions asked in Product -Based Companies. The training ended at 4pm after feedback sessions from students.



WEB DEVELOPMENT



Department of Computer Science and Engineering IEEE Computer Society has jointly organized two days workshop on Web Development on 3rd and 4th October 2022. Resource person for the session was Ms Aparna , Senior software Engineer PITS solutions PVT LTD. The main intention of this workshop was to create a knowledge on Front End Development (HTML & JavaScript) and Back end development (PHP) the workshop saw active participation from both IEEE and non-IEEE members. A diverse group of participants, including students and professionals from various backgrounds, joined the session to expand their web development skills.



Day 1:

Front-End Development (HTML & JavaScript)

• Session Highlights:

- Introduction to HTML: Structure of web pages, essential tags, and attributes.
- Hands-on session on creating simple web pages using HTML.
- Basics of JavaScript: Introduction to scripting, DOM manipulation, and interactivity in web pages.
- Practical exercises to enhance JavaScript skills.





Workshop Sessions

Day 2: Back-End Development (PHP)

- **Session Highlights:**

- Introduction to PHP: Basics of PHP, server-side scripting, and database integration.
- Hands-on session on creating dynamic web pages and connecting them to databases.
- PHP syntax, functions, and debugging techniques.
- Real-world application examples of PHP in web development





DISCORD & NOTION







Department of Computer Science & Cyber Security

TINKERX#02

DISCORD & NOTION


 Session handled by
Akash M Kumar
 Tech lead, TinkerHub RIET




<https://bit.ly/DiscordNotion-Intro>
#tinkerxfridays

Department of Computer Science & Cyber Security Engineering and TinkerHub RIET have jointly organized a one day learning session on Discord & Notion on 31st March 2023. The event was handled by Akash M Kumar (S6 CSE) Tech Lead of TinkerHub RIET.





ARTICLES



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Robotics: Shaping the Future of Automation



Evolution from Repetitive Tasks to Intelligent Systems: Robotics has moved from early, fixed-task industrial arms to intelligent machines integrated with Artificial Intelligence (AI), Machine Learning (ML), and the Internet of Things (IoT). These modern robots can learn, adapt, and make autonomous decisions in dynamic environments.

•**Synergy with AI:** The fusion of AI and robotics is a paradigm shift. AI algorithms allow robots to interpret complex situations, recognize patterns, and interact more intuitively with humans, expanding their capabilities beyond predefined programming.

•**Diverse Applications Across Industries:** Robotics is redefining numerous sectors:

- **Manufacturing:** Robotic arms, automated assembly lines, and collaborative robots (cobots) enhance precision, efficiency, and safety in production processes.
- **Healthcare:** Surgical robots, exoskeletons for rehabilitation, and telepresence robots are improving patient care and enabling precise procedures.
- **Logistics & E-commerce:** Autonomous Mobile Robots (AMRs), drones, and self-driving vehicles are optimizing inventory management, order fulfillment, and delivery services.
- **Agriculture:** Precision farming uses drones and robotic harvesters to monitor crops, reduce waste, and increase yields sustainably.

•**Key Technological Innovations:** Emerging trends include collaborative robots (cobots) designed to work safely alongside humans, soft robotics that mimic biological organisms, and the use of digital twins (virtual simulations) for testing and optimizing factory layouts.

•**Societal and Ethical Considerations:** The rise of automation brings challenges, notably job displacement in certain sectors. Proactive measures such as upskilling and reskilling programs are crucial to prepare the workforce for new roles that require creativity, critical thinking, and technical skills.

•**Human-Robot Collaboration:** The future emphasizes a symbiotic relationship where humans and robots collaborate, with robots handling dangerous or repetitive tasks and humans focusing on problem-solving, decision-making, and creative endeavors.

•**Sustainability:** Robotics contributes to environmental sustainability by optimizing energy use, reducing material waste, and improving recycling and waste management processes.



Cloud Computing: The Backbone of Modern Technology

Cloud computing serves as the fundamental **backbone** of modern technology by providing on-demand, scalable, and cost-effective access to computing resources over the internet. This shift from on-premises physical infrastructure to cloud-based services (like Amazon Web Services, Microsoft Azure, and Google Cloud) enables unprecedented agility, innovation, and efficiency across all industries.

Key Aspects and Benefits

- **Scalability and Elasticity:** Businesses can instantly scale their computing resources (storage, processing power, bandwidth) up or down based on demand, without the need for significant capital investment in physical hardware. This rapid elasticity ensures uninterrupted service during traffic spikes and allows for seamless business growth.
- **Cost Efficiency:** Cloud computing operates on a "pay-as-you-go" or subscription model, which converts large capital expenditures (CapEx) into predictable operational expenditures (OpEx). Organizations only pay for the resources they consume, reducing overhead costs associated with hardware procurement, maintenance, and energy consumption.
- **Accessibility and Collaboration:** Data and applications hosted in the cloud are accessible from anywhere in the world with an internet connection, on various devices. This fosters enhanced collaboration among remote and global teams using tools like Google Workspace and [Microsoft 365](#), improving overall productivity and supporting flexible work models.
- **Innovation and Agility:** The cloud democratizes access to cutting-edge technologies, such as Artificial Intelligence (AI), Machine Learning (ML), Big Data analytics, and IoT, which were once only available to large corporations. Businesses can rapidly test new ideas, develop prototypes, and deploy applications faster (accelerating time-to-market), giving them a competitive edge.
- **Reliability and Disaster Recovery:** Cloud providers operate vast data centers with built-in redundancy and automated backup systems across multiple geographic locations. This ensures high availability and business continuity in the event of local hardware failures, cyberattacks, or natural disasters, minimizing downtime and data loss.
- **Enhanced Security:** Leading cloud providers invest heavily in robust security measures that often exceed what individual companies can implement on their own. These include data encryption, multi-factor authentication (MFA), role-based access controls, and continuous threat monitoring, ensuring data protection and compliance with industry regulations.

Internet of Things (IoT): Connecting the World



The Internet of Things (IoT) is transforming the way we live, work, and interact with technology. It refers to a network of everyday devices—such as smart watches, home assistants, sensors, and appliances—that are connected to the internet and communicate with each other. These devices collect and share data, allowing tasks to be automated and managed with minimal human effort.

IoT has made homes smarter and more efficient. From controlling lights and temperature through a mobile app to monitoring home security systems remotely, IoT brings convenience into our daily routines. In industries, IoT devices help track machinery, improve safety, and reduce operational costs, making businesses more productive.

The impact of IoT extends to healthcare, transportation, agriculture, and smart cities. Wearable health devices can monitor vital signs, smart traffic systems help reduce congestion, and agricultural sensors support farmers in improving crop production. As technology continues to evolve, IoT is expected to connect billions of devices, making the world more intelligent and interconnected.

The future of IoT is bright, and it offers students immense opportunities for innovation, research, and problem-solving. In a world where everything is becoming smart, IoT stands as a bridge between the digital and physical realms.



Green Computing: Technology with Responsibility



In today's digital world, technology plays an essential role in every aspect of life. However, the rapid growth of electronic devices and data-driven systems has also increased energy consumption and electronic waste. **Green computing**, also known as sustainable computing, focuses on designing and using technology in an environmentally responsible way.

Green computing encourages energy-efficient hardware, optimized software, and eco-friendly practices. Simple steps—like using power-saving modes, reducing unnecessary downloads, or shutting down idle systems—can significantly reduce energy consumption. On a larger scale, companies are moving toward cloud computing and virtualization to minimize the number of physical servers, cutting down both power usage and carbon emissions.

E-waste is another major concern. Discarded devices contain harmful chemicals that can damage the environment. Proper recycling, responsible disposal, and reusing components help reduce this growing problem. Manufacturers are now adopting greener designs, using recyclable materials and creating devices that consume less power.

Green computing is not just a trend; it is a responsibility. As future engineers and innovators, students can contribute by developing sustainable applications, promoting awareness, and adopting mindful digital habits. By embracing green computing, we move toward a future where technology grows without harming the planet.





The Power of Data Science

In the age of information, data has become one of the most valuable resources. Every click, transaction, and online activity generates data that holds the potential to reveal meaningful patterns. **Data Science** is the field that transforms this raw data into insights, helping organizations make smarter decisions and solve complex problems.

Data science brings together statistics, programming, and domain knowledge to analyze large datasets. With the help of tools like Python, SQL, and machine learning algorithms, data scientists can predict trends, identify risks, and uncover hidden opportunities. From recommending movies on OTT platforms to detecting fraud in banking, data science is everywhere.

Industries such as healthcare, business, transportation, and education rely heavily on data-driven solutions. For instance, hospitals use predictive models to detect diseases early, while companies use customer data to personalize their services. Even government agencies depend on data to plan smart cities and improve public services.

As technology continues to grow, the demand for skilled data professionals is rising rapidly. For students, data science offers exciting career paths and endless opportunities for innovation. In a world guided by information, data science stands as a powerful tool shaping decisions, improving lives, and transforming the future.

Using machine learning and statistical models, data science helps predict future events. Weather predictions, stock market trends, demand forecasting, and even predicting equipment breakdowns are examples. Companies can plan ahead and avoid losses by understanding future possibilities.



Operating System: The Heart of a Computer System

An Operating System (OS) is system software that acts as an interface between the computer hardware and the user. It manages the computer's hardware resources and provides services for application programs. Without an operating system, it is difficult for users to communicate with the computer hardware.

The operating system performs several important functions. One of the main functions is process management. A process is a program that is currently being executed. The operating system controls the creation, scheduling, and termination of processes to ensure that the CPU is used efficiently.

Another important function is memory management. The operating system manages the main memory (RAM) by allocating memory to different programs and processes when required and freeing it when the task is completed. This ensures that multiple programs can run smoothly at the same time.

The operating system also performs file management. It organizes and controls the storage of data on storage devices such as hard disks and SSDs. It allows users to create, delete, read, and modify files and directories.

Device management is another function of the operating system. It controls various hardware devices such as printers, keyboards, and monitors using device drivers. The operating system ensures that these devices work properly with the computer system.

Operating systems can be classified into different types such as Batch Operating System, Time-Sharing Operating System, Distributed Operating System, Real-Time Operating System, and Multiprocessing Operating System. Each type is designed to handle specific computing needs.

Some popular operating systems include Microsoft Windows, Linux, macOS, and Android. These operating systems are widely used in personal computers, servers, and mobile devices.

In conclusion, the operating system is an essential part of a computer system. It manages hardware resources, provides a user interface, and enables application programs to run efficiently. Without an operating system, the functioning of a computer would not be possible.



Internet Protocol Versions: IPv4 and IPv6

IPv4

IPv6

IPv4 stands for **Internet Protocol Version 4**. It is the fourth version of the Internet Protocol and has been widely used since the early days of the internet.

IPv6 stands for **Internet Protocol Version 6**. It is the latest version of the Internet Protocol developed to replace IPv4 and solve the problem of IP address shortage.

IPv4 uses a **32-bit address length**.

IPv6 uses a **128-bit address length**.

IPv4 supports about **4.3 billion unique IP addresses**.

IPv6 supports an **extremely large number of addresses (about 340 undecillion)**, which is enough for future internet growth.

IPv4 addresses are written in **decimal format** separated by dots.

IPv6 addresses are written in **hexadecimal format** separated by colons.

Example of IPv4 address:
192.168.1.1

Example of IPv6 address:
2001:0db8:85a3:0000:0000:8a2e:0370:7334

IPv4 has **limited built-in security features** and often relies on additional protocols for security.

IPv6 has **improved built-in security features**, including support for IPsec for secure communication.

IPv4 requires **manual configuration or DHCP (Dynamic Host Configuration Protocol)** for assigning IP addresses.

IPv6 supports **automatic address configuration (Auto-configuration)**, making network setup easier.

IPv4 uses **broadcast communication** to send data to multiple devices.

IPv6 uses **multicast and anycast communication**, which improves network efficiency.

IPv4 header structure is **simpler but less efficient for modern networks**.

IPv6 header structure is **more efficient and designed for faster routing and better performance**.

IPv4 is still **widely used in most networks today**.

IPv6 adoption is **increasing as the internet continues to expand**.



Autonomous Vehicles and Their Mechanism

A **driverless car**, also known as an **autonomous vehicle**, is a vehicle that can operate and navigate without human intervention. It uses advanced technologies such as **sensors, cameras, artificial intelligence (AI), machine learning, and GPS** to detect its surroundings and move safely on the road.

The working mechanism of a driverless car involves several important components that work together to control the vehicle automatically.

1. Sensors

Driverless cars use different types of sensors such as **LiDAR, radar, ultrasonic sensors, and cameras**.

These sensors continuously collect information about the vehicle's surroundings, including other vehicles, pedestrians, traffic signals, and road conditions.

2. Cameras

Cameras capture images of the road and nearby objects. They help the system recognize **traffic lights, road signs, lane markings, and obstacles**.

3. GPS and Mapping

Driverless cars use **Global Positioning System (GPS)** along with detailed digital maps to determine the vehicle's exact location and to find the best route to the destination.

4. Artificial Intelligence (AI)

Artificial Intelligence processes the data collected by sensors and cameras. The AI system analyzes the environment and makes decisions such as **when to stop, accelerate, change lanes, or avoid obstacles**.

5. Control System

The control system sends commands to different parts of the car such as the **steering, brakes, and accelerator**. Based on the AI decisions, the car moves safely on the road.

6. Communication Systems

Some driverless cars can communicate with **other vehicles and traffic infrastructure** to improve safety and traffic management.



Fundamentals of Image Processing

Image Processing is a method of performing operations on an image in order to improve its quality or to extract useful information from it. It is a part of the field of **digital signal processing** and is widely used in many applications such as medical imaging, satellite imaging, security systems, and computer vision.

In digital image processing, an image is treated as a **two-dimensional signal** made up of pixels. A **pixel** is the smallest element of an image and contains intensity or color information. Image processing techniques analyze and modify these pixels to achieve the desired result.

The basic steps involved in image processing include **image acquisition, image enhancement, image restoration, image segmentation, and image analysis.**

Image acquisition is the first step, where an image is captured using devices such as cameras, scanners, or satellites. After capturing the image, it is converted into digital form so that a computer can process it.

• **Image enhancement** improves the quality of the image by adjusting brightness, contrast, or removing noise. This makes the image clearer and easier to analyze.

Image restoration focuses on removing distortions or degradations from an image to restore it to its original quality.

Image segmentation divides the image into different regions or objects. This helps in identifying important parts of the image, such as edges, shapes, or boundaries.

Image analysis and interpretation involve extracting useful information from the processed image. This information can be used for applications such as face recognition, object detection, and medical diagnosis.

Image processing has many practical applications. It is used in **medical fields** for analyzing X-rays and MRI scans, in **satellite imaging** for weather forecasting and environmental monitoring, and in **security systems** for face recognition and surveillance.



STORIES



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The Surveyor of Glass and Steel



PRANAV P V
RIE19CS041

Anya lived in **Veridia**, the City of Glass, and was its **Structural Surveyor**. She measured the glass for stress, but also for **resonance**—the trapped, unspoken emotions of the silent city.

One day, her sensitive rod registered an impossible, rhythmic pulsation: **one cycle per 3600 seconds**. Following the precise beat, she tracked the source to the city's edge, where a delicate brass vine, the **Serpens Temporis**, emerged from the mud.

The vine led her out of the city, through the mist, and into a valley filled with metallic life—the Clockwork Garden. There, she found **Kael**, the Clockwork Gardener, tending to his whirring **Titanium Bloom**.

Kael, the man of mechanical precision, was startled by the woman of reflective silence. Anya, instead of speaking, touched her glass rod to a brass petal. She measured the resonance, finding it **perfectly aligned** with the garden's steady, mechanical heartbeat.

Kael saw that she *heard* the music in his machines. He offered her his copper watering can.

"Your time is so steady," Anya finally whispered.

"And your silence is so loud," Kael replied.

Their love was a perfect blend of Veridia's silent, resonant glass and the Garden's steady, mechanical time—a perfectly timed connection in systems built on precision.



The Butterfly Who Carried Sunshine



RIYA REJI
RIE19CS046

In the peaceful village of Chandangiri, mornings always began the same way—golden sunlight, singing birds, and the soft rustle of flowers waking up. But for a young boy named Aarav, mornings felt dull. He was quiet, shy, and often kept to himself. His classmates called him “silent shadow,” and he truly believed he had nothing special inside him.

One afternoon, as Aarav sat alone under a mango tree, he noticed a bright yellow butterfly lying on the ground. Its wings looked torn, and it seemed too weak to fly. Aarav gently picked it up and placed it in his notebook.

For the next three days, Aarav cared for the butterfly. He gave it drops of sugar water, kept it warm in a little paper shelter, and protected it from the wind. Every morning, he whispered, “Don’t worry... you will fly again.”

On the fourth day, when Aarav opened his notebook, he saw the butterfly sitting upright. Slowly, it flapped its wings—first gently, then stronger, until it lifted itself into the air. Aarav’s face lit up with joy.

But something magical happened next.

Instead of flying away, the butterfly circled around Aarav, brushing his cheek with its wings. Then it gently landed on his shoulder, as if thanking him. At that moment, sunlight streamed through the branches above, and the butterfly looked like a tiny piece of sunshine.

Aarav smiled. For the first time, he felt special.

The next day at school, the butterfly followed him, dancing above his head. His classmates gathered around in amazement.

“How is it staying with you?”

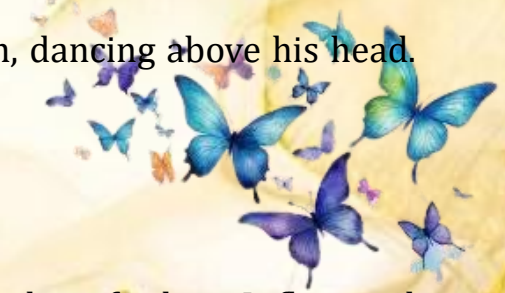
“Does it understand you?”

“You must be really kind!”

Aarav didn’t say much, but the butterfly said everything for him. It fluttered around him proudly, as if showing the world the gentle heart it had found.

From that day on, Aarav was no longer the “silent shadow.” He was the boy who carried sunshine—because the butterfly never forgot the kindness he had shown.

And Aarav learned something important, too:



🌸 My Mother, My First Home 🌸



DEEPIKA S R
RIE20CS023

You held my hand before I could speak,
Guiding my steps when my legs were weak.
Your smile became my morning sun,
Your love the place where I begun.

You taught me how to dream and grow,
To face the world, to let fears go.
In every laugh, in every tear,
Your gentle heart is always near.

When nights felt long, you stayed awake,
Whispering hope with every ache.
Your arms—my shelter, soft and wide,
A little world where I could hide.

And though I walk my path each day,
Your love still shows me the way.
For in my heart, forever true—
My very first home, mother, is you.





The Last Train

HAFEES J
RIE20CS030

It was past midnight when Arjun stood alone on the empty railway platform. The cold wind moved through the silent station, and the old clock on the wall ticked slowly. The **last train** would arrive in a few minutes.

Ten years ago, Arjun had left this small town with big dreams. He wanted success, money, and a life far away from the quiet streets where he grew up. Over the years, he achieved everything he wanted — a high-paying job, a luxury apartment, and recognition. But somewhere along the way, he had lost the people who mattered most.

That night he had returned after receiving a phone call that changed everything. His father, who had always waited for him to visit, was gone. Arjun sat on the cold bench and remembered the countless times his father had called him. "When will you come home, son?" he would ask gently.

"I'm busy, Dad. Maybe next month," Arjun would reply every time. But **next month never came.**

A train horn echoed in the distance, breaking the silence. The train slowly arrived at the platform. People stepped down, hugging their families and laughing together.

Arjun watched quietly.

For the first time in many years, he realized something painful — success had given him everything except the moments he could never get back.

He picked up his bag and walked toward the exit of the station, knowing that life had given him many opportunities, but the most important one had quietly slipped away.

That night he understood a truth many people learn too late:

Time spent with loved ones is the most valuable thing in life.

The Silent Battlefield



SIVADEV V
RIE21CS050

In 1944, during the dark days of **World War II**, a young soldier named Daniel stood alone on a quiet battlefield. The war had taken him far away from his home, family, and peaceful life.

The night was cold, and the moonlight shone faintly over the destroyed village nearby. Broken houses, burnt trees, and abandoned vehicles were scattered everywhere. The war had turned a once beautiful place into silence and ashes. Daniel walked slowly through the ruins. In his pocket was a small photograph of his younger sister. Before leaving for the war, she had told him, *“Come back safely. I will be waiting.”*

Suddenly, Daniel heard a faint sound. He followed it carefully and discovered a frightened little boy hiding behind a broken wall. The child looked weak and hungry.

“Don’t be afraid,” Daniel said softly.

The boy slowly came out. He had lost his parents during the bombing and had been hiding alone for days.

Daniel shared his last piece of bread with the boy and gave him his jacket to keep warm. For a moment, the war around them seemed to disappear.

But soon, distant gunfire echoed again.

Daniel knew he had to return to his unit. Before leaving, he pointed to the road leading to a nearby refugee camp.

“You will be safe there,” he told the boy.

The boy nodded quietly.

Years later, after the war finally ended, Daniel returned home. Life slowly returned to normal, but he never forgot that night.

One day, a young man visited Daniel’s house. In his hands was the same old photograph Daniel had once shown the little boy.

The young man smiled and said,

“You saved my life that night. I never forgot you.”

Daniel realized that even in the darkest times of war, a small act of kindness could change someone’s entire life.

And in a world once destroyed by war, hope had quietly survived.

A Confession from Jail



JINO AJAYAN
RIE20CS034

The rain fell softly outside the old prison walls. Inside a small, dimly lit cell, **Raghav** sat quietly with a pen and a piece of paper. After years of silence, he had finally decided to write the truth.

“Dear Mother,” he began.

“My hands tremble as I write this letter. For years I blamed fate for bringing me here. But today I realize the truth — it was my own choices.”

Raghav had once been a kind young man with big dreams. But anger, bad friends, and one terrible mistake changed his life forever. One night, during a heated argument, he committed a crime that he could never undo. A moment of rage had destroyed many lives — including his own.

In prison, time moved slowly. Days turned into years. The silence of the cell forced him to face the truth he had been avoiding.

“I am not writing this to ask for forgiveness,” he continued. “I only want you to know that I understand my mistake now. If I had listened to your words, I would not be here.”

Every night he remembered his mother’s gentle advice, the warmth of his home, and the life he had lost.

“But prison has taught me something important,” he wrote. “A man cannot change his past, but he can change his heart.”

Tears fell onto the paper as he finished the letter.

“Your son, who finally understands.”

Raghav folded the letter carefully. Outside, the rain had stopped. For the first time in many years, his heart felt a little lighter — because the truth had finally been spoken.

Behind the Screen



PARVATHI B
RIE19CS039

Late at night, the computer lab of a small college was almost empty. Only **Arun**, a final-year computer science student, sat quietly in front of a glowing monitor. Everyone else had gone home. Arun was working on his project called "**Behind the Screen**", a program designed to track suspicious online activity. It could monitor messages, hidden data, and unusual network traffic. At first, it was just a simple academic project. But that night, something strange appeared on his screen. A **hidden chat window** suddenly opened inside the program. No username. No profile picture. Just one message: "**STOP WATCHING.**" Arun frowned. He checked the system logs. His program had detected an encrypted communication channel running through the college network. Someone was using the lab's internet to send secret messages. Curious, Arun decided to trace the source. The code ran quickly. The IP address appeared on the screen. It was **inside the college itself**. Room number **203**. Arun felt uneasy. That room belonged to **Professor Nair**, the respected head of the computer science department. "This must be a mistake," Arun whispered. But the program continued scanning. More messages appeared in the hidden chat. "**Delivery tomorrow.**" "**Payment confirmed.**" "**No mistakes.**" This didn't look like normal communication. Suddenly, another message appeared. "**Someone is tracing us.**" Arun's heart started beating faster. A few seconds later, the computer screen went black. Then slowly, white letters appeared. "**ARUN... WE CAN SEE YOU.**" He turned around quickly. The computer lab door was still closed. The room was silent. But the message continued typing by itself. "**Behind the screen... you are not the only one watching.**" At that moment, Arun realized something terrifying. His program wasn't just tracking them. **They were tracking him too.** The computer webcam light turned on. Someone, somewhere, was watching. And Arun had just discovered something he was **never supposed to see.**

The Old Man and the Little Girl



GEETHU T M
RIE20CS028

An old man lived alone in a small house at the end of a quiet street. His children had grown up and moved far away. Days passed slowly for him, and most of the time he sat alone outside his house watching people pass by.

One afternoon, a little girl named Meera moved into the neighborhood with her parents. Every day while returning from school, she saw the old man sitting alone. One day she walked up to him and said with a smile, "Hello Grandpa!"

The old man was surprised. No one had called him that in years. From that day, Meera stopped by every afternoon. Sometimes she shared her chocolates, sometimes she talked about her school, and sometimes she simply sat beside him.

The old man's lonely days slowly filled with laughter and happiness. Her small visits meant the world to him.

One day Meera noticed tears in the old man's eyes and asked, "Grandpa, why are you crying?"

He smiled and said softly, "I am not crying because I am sad. I am crying because you reminded me that I am not alone."

Years later, when Meera grew older, she remembered the old man and realized something important:

Sometimes the **smallest act of kindness can bring the biggest happiness to someone's life.**



My Father: A Hidden Love

A father's love is often quiet, gentle, and unseen—yet it is one of the strongest forces shaping a child's life. Unlike the warmth of a mother that is shown through hugs, words, and soft comfort, a father's love sometimes hides behind silence, discipline, and responsibility. But hidden love is still love; in fact, it is a love that speaks through actions rather than words.

From the moment a child is born, a father begins building invisible walls of protection. He may not always express his feelings openly, but every early morning he wakes up for work, every sacrifice he makes, and every moment he spends thinking about his family is a silent poem of love. It is a love that stands strong like a tree—offering shade, support, and safety without expecting anything in return.

Growing up, many children misunderstand this quiet affection. They might feel their father is strict, busy, or distant. But behind every strict word lies a hope that the child will grow stronger. Behind every rule lies a desire to keep the child safe. And behind every moment of silence lies a heart full of emotions he cannot always express.

A father shows love in small ways—buying your favourite snack without saying why, teaching you how to ride a bicycle while pretending he's not afraid of you falling, staying up late to make sure you reached home safely, or pretending to be strong when he is actually worried. These actions may seem simple, but they reveal the depth of his care.

As we grow older, we begin to understand the beauty of this hidden love. We realize that strength and tenderness can coexist, and that silence can speak loudly. A father's love is like the roots of a tree—unseen, but holding everything together.

In the end, "My Father: A Hidden Love" is not just a title; it is a truth many of us discover with time. A father may not always say "I love you," but his life reflects it in a thousand quiet ways. And when we finally recognize this silent affection, we understand that his hidden love was never hidden—our eyes simply learned to see it.



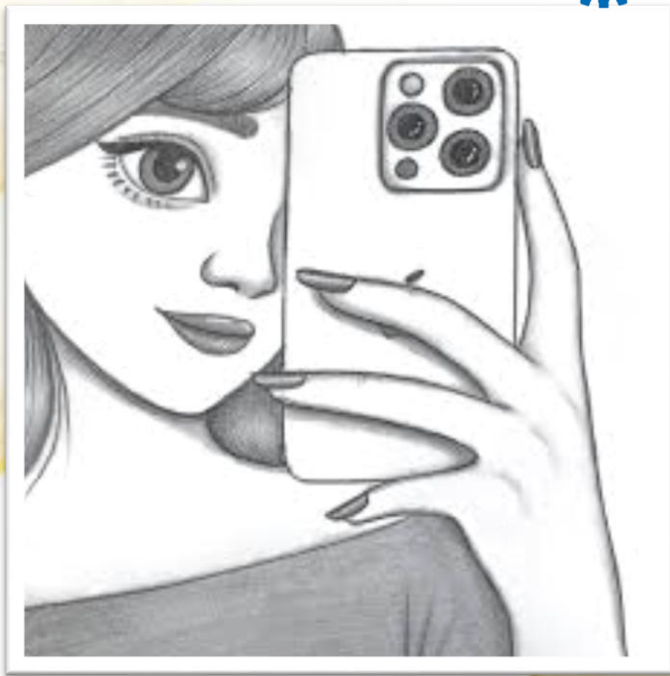
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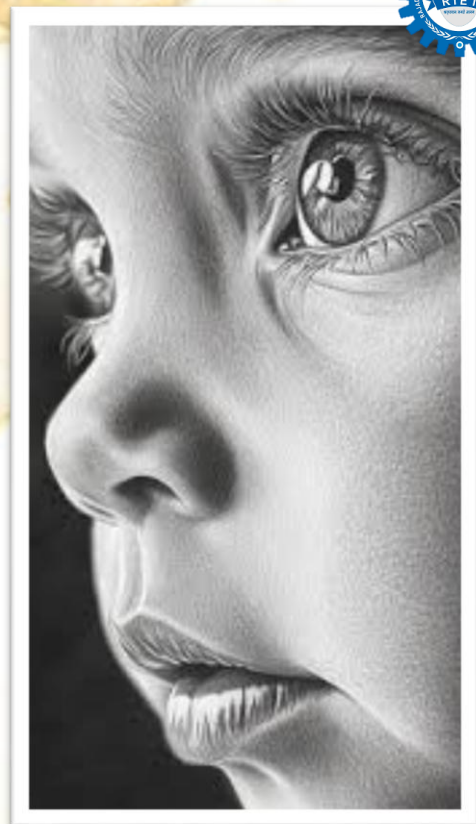


NISHA BABU
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GAUTHAM S B
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MUHAMMED MIDLAJ A
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MUHAMMED MIDLAJ A
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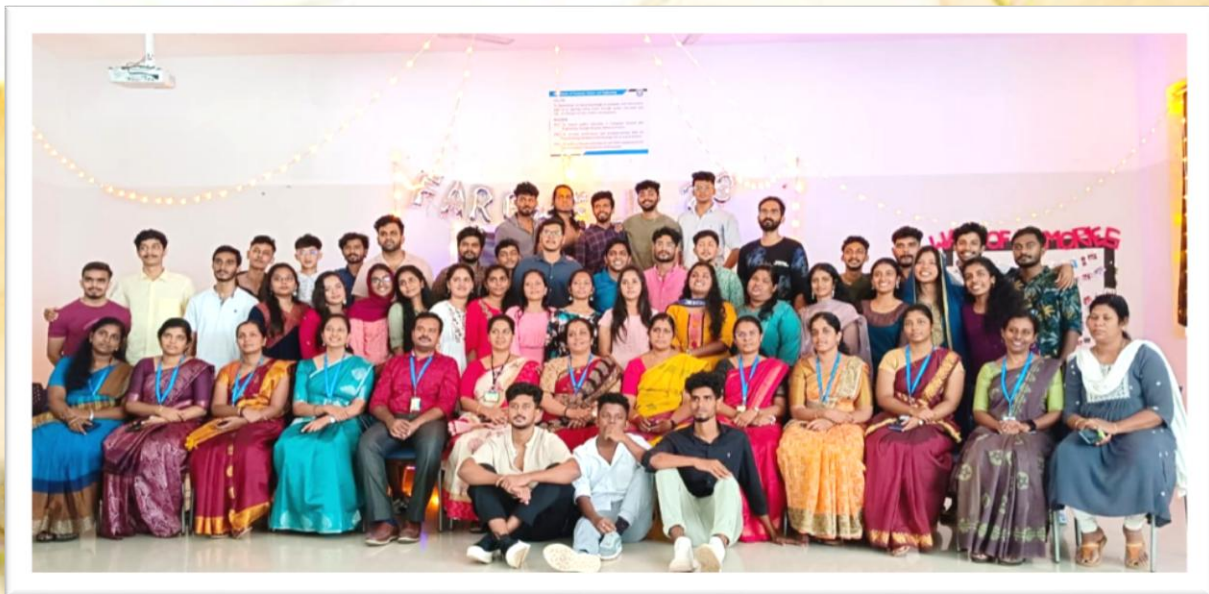
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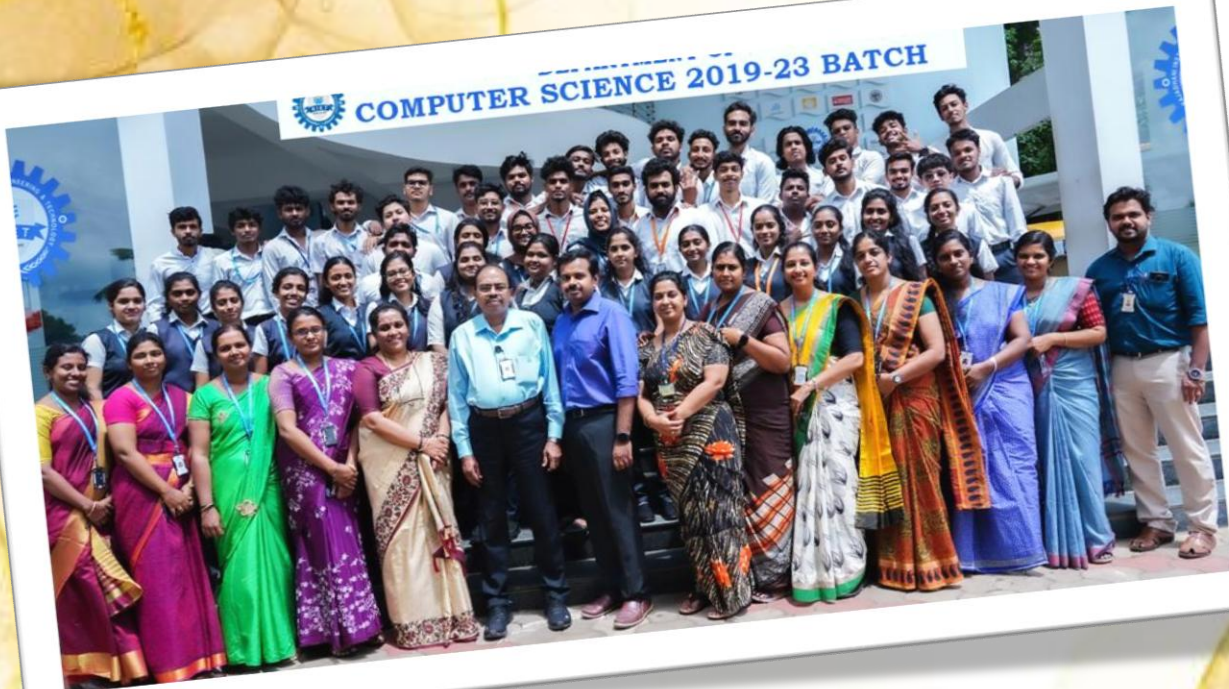


TIMELESS MEMORIES





YOUNG PROFESSIONALS



TOUR

“Every tour reminds us that learning happens far beyond the classroom.”



OUR TEAM



**“A teacher’s strength lies not in power,
but in patience, hope,
And
the courage to shape the future.”**



