

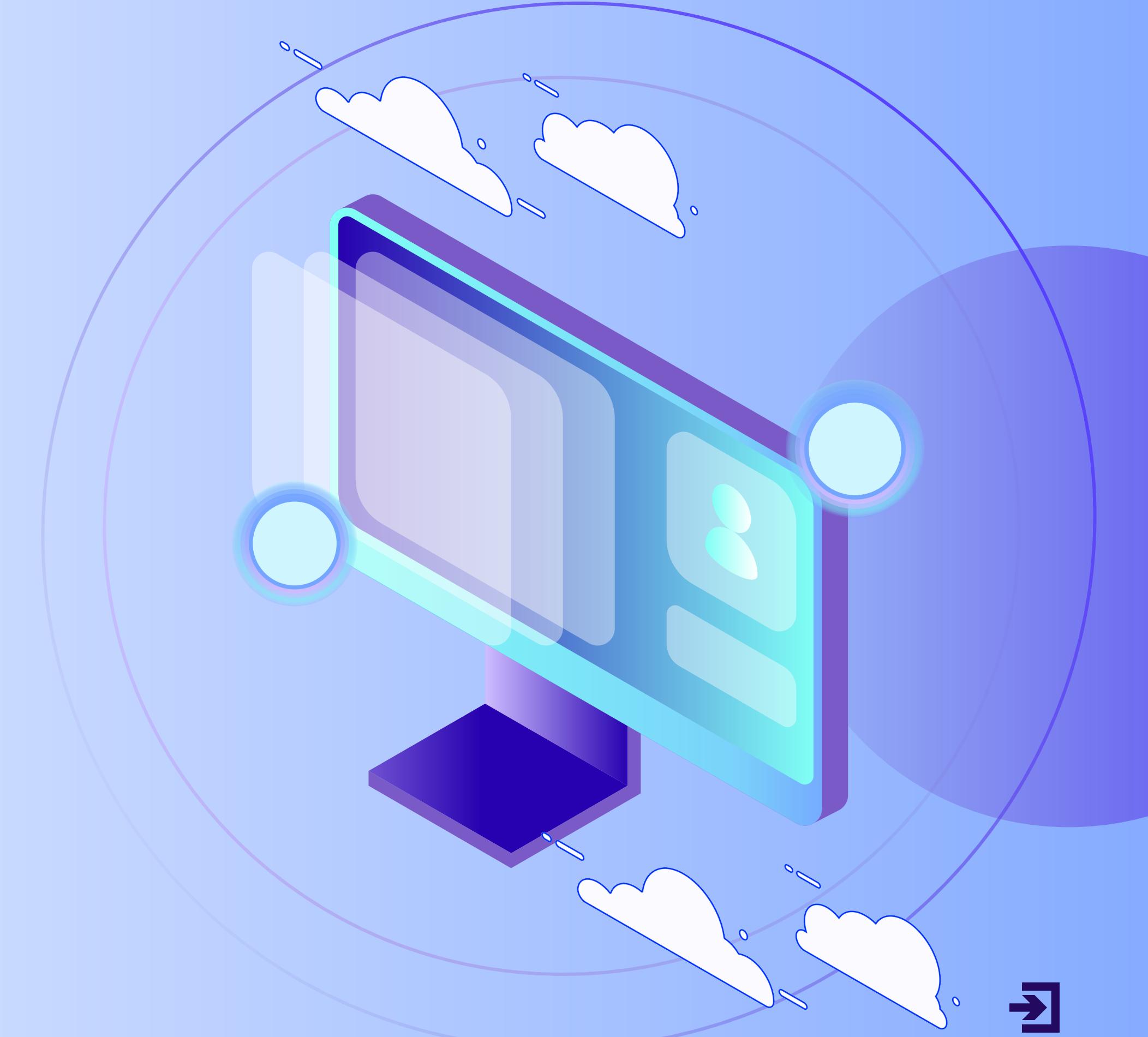


Portfolio #1

# COMPUTER SCIENCE



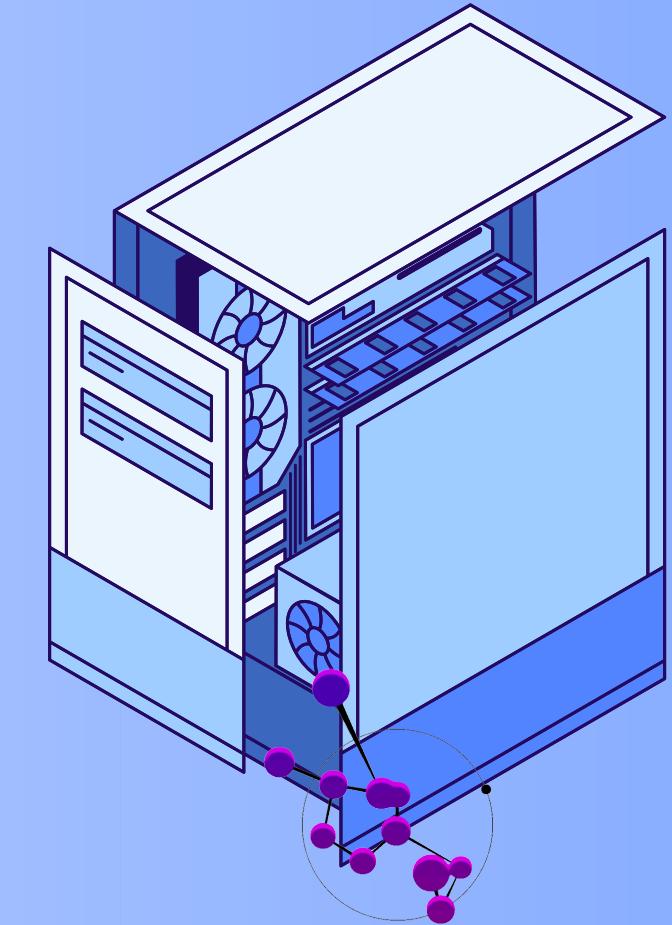
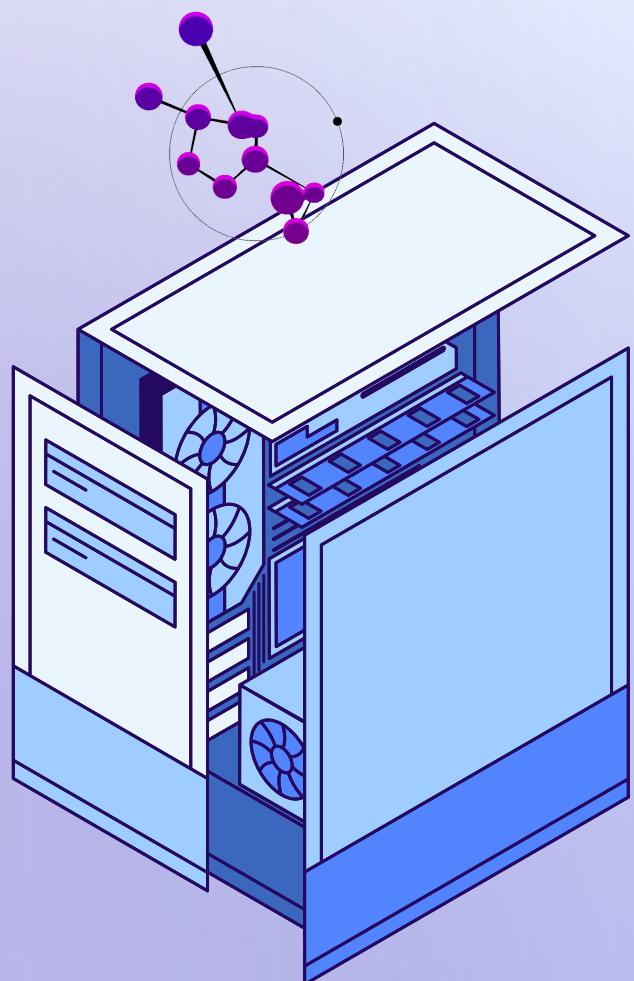
as a Discipline





# DEFINITION AND SCOPE

Computer science is a broad and dynamic field that studies the theory, design, development, and application of computer systems and software. It encompasses a wide range of topics, from theoretical foundations such as algorithms and data structures to practical applications like software engineering and artificial intelligence.



# KEY CONCEPTS



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★ **Theoretical Foundations**

★ **Software Engineering**

★ **Artificial Intelligence**

★ **Networking and Security**

★ **Databases**



## Portfolio #1

# THEORETICAL FOUNDATIONS

- **Algorithms and Data Structures:** Core to computer science, these are essential for developing efficient software and understanding computational complexity.
- **Computational Theory:** Includes the study of what can be computed and how efficiently it can be done, often involving concepts like Turing machines, automata theory, and complexity classes.





## Portfolio #1

# SOFTWARE ENGINEERING



**Software engineering** applies engineering principles to the design, development, testing, and maintenance of software systems. It emphasizes systematic approaches to software development, ensuring that projects are completed on time and within budget while meeting quality and performance standards. Effective collaboration, project management, and communication are essential for successful software engineering projects.

### Key concepts involve:

- Designing, developing, testing, and maintaining software systems.
- Focuses on best practices, methodologies (like Agile and DevOps), and tools to ensure the creation of reliable and efficient software.





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# ARTIFICIAL INTELLIGENCE

Artificial Intelligence (AI) enables machines to perform tasks requiring human-like intelligence, such as learning from data, problem-solving, and understanding natural language. AI technologies include machine learning algorithms, neural networks, and expert systems.

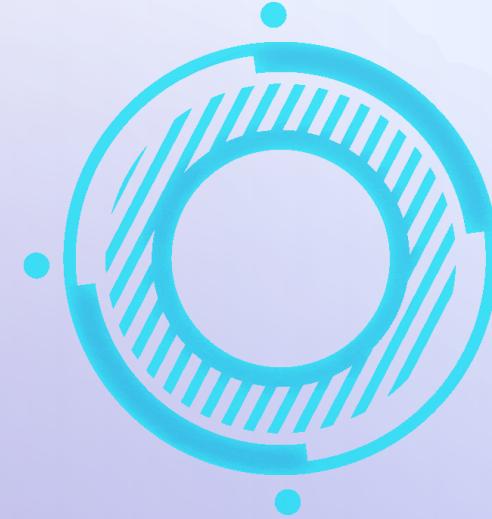
## Key Concepts:

- Explores how machines can simulate human intelligence, including learning, reasoning, problem-solving, and perception.
- Includes sub-fields like machine learning, natural language processing, and robotics.





## Portfolio #1



# NETWORK AND SECURITY

**Networking** is the study of how computers and devices communicate and share resources over a network.

### Key Concepts:

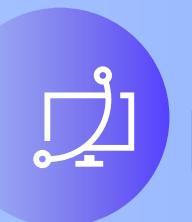
- Network Architecture: Design of networks (LAN, WAN, Internet).
- Internet Protocols: Rules for data transmission.
- Routing/Switching: Directing data packets through networks.

**Security** is the practice of protecting computer systems, networks, and data from unauthorized access, attacks, and damage.

### Key Concepts:

- Encryption: Encoding data to prevent unauthorized access.
- Firewalls: Control and monitor network traffic.
- Authentication/Access Control: Verify identities and restrict access..



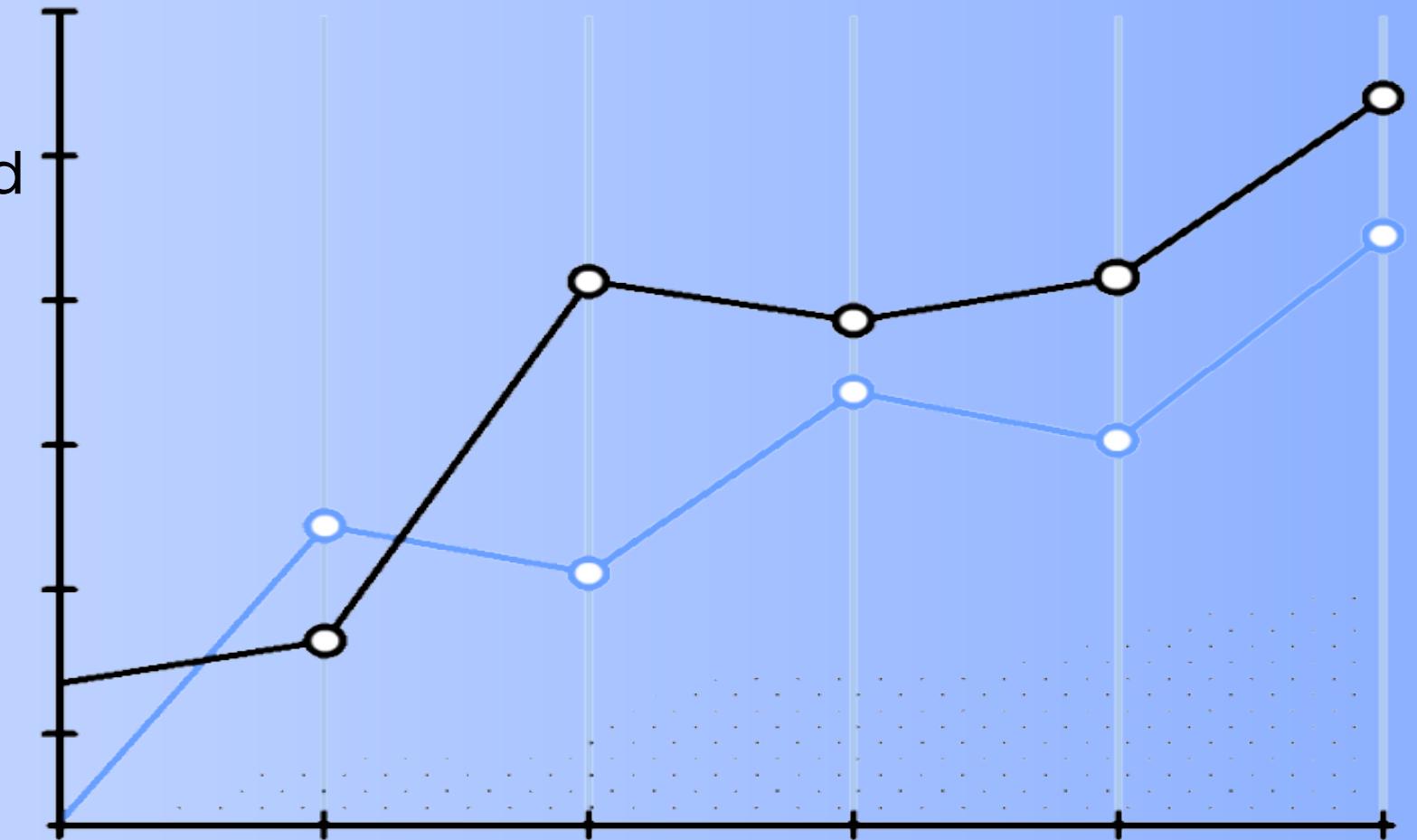


# DATABASES

**Databases** refer to organized collections of data that are stored, managed, and accessed electronically. The study and development of databases focus on how data is structured, stored, retrieved, and manipulated efficiently and securely.

### Key Concepts:

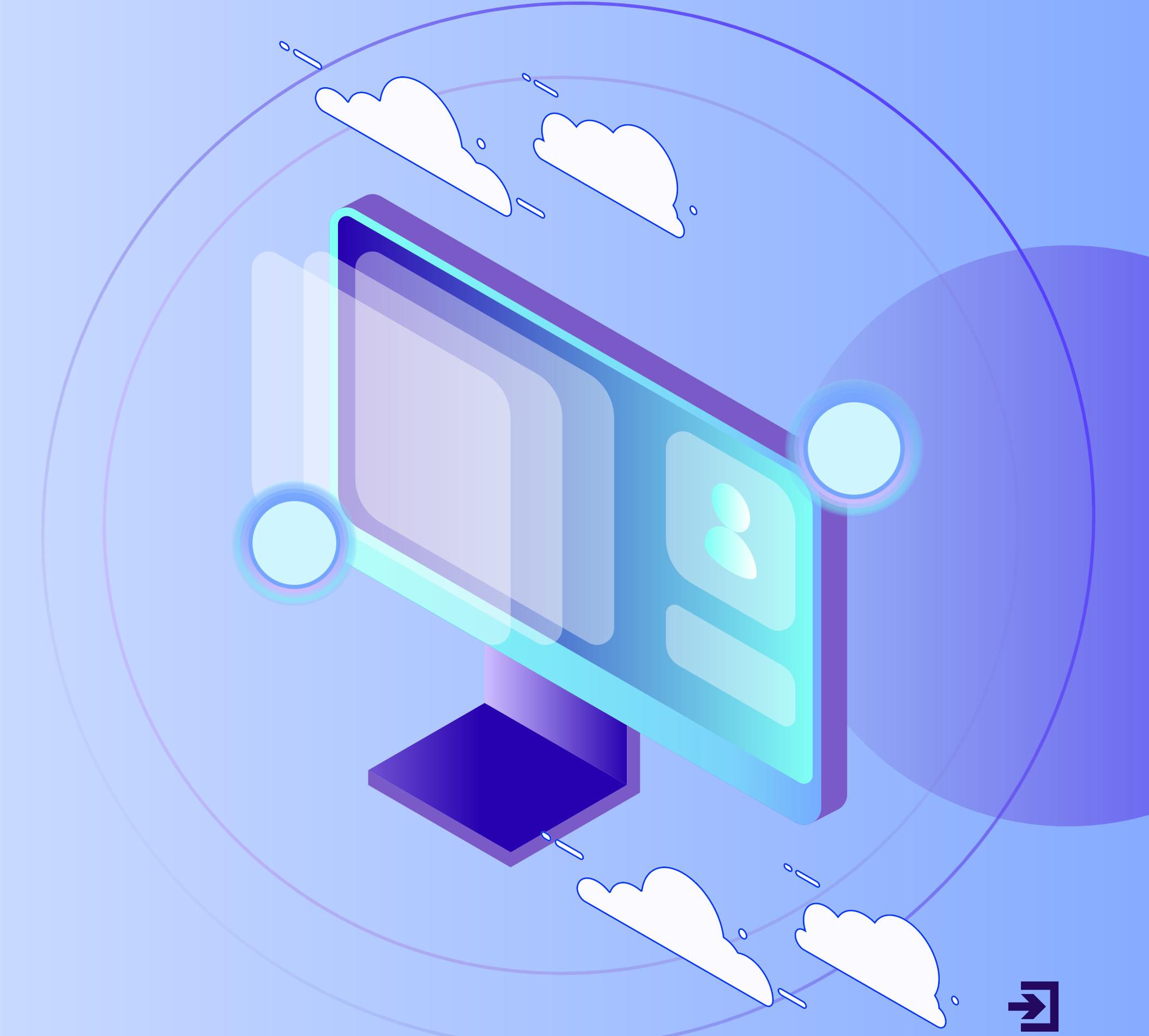
- Structures data using entities (e.g., customers) and relationships (e.g., purchases).
- Software for creating, managing, and manipulating databases (e.g., MySQL, Oracle).
- Ensures data integrity, security, and efficiency.





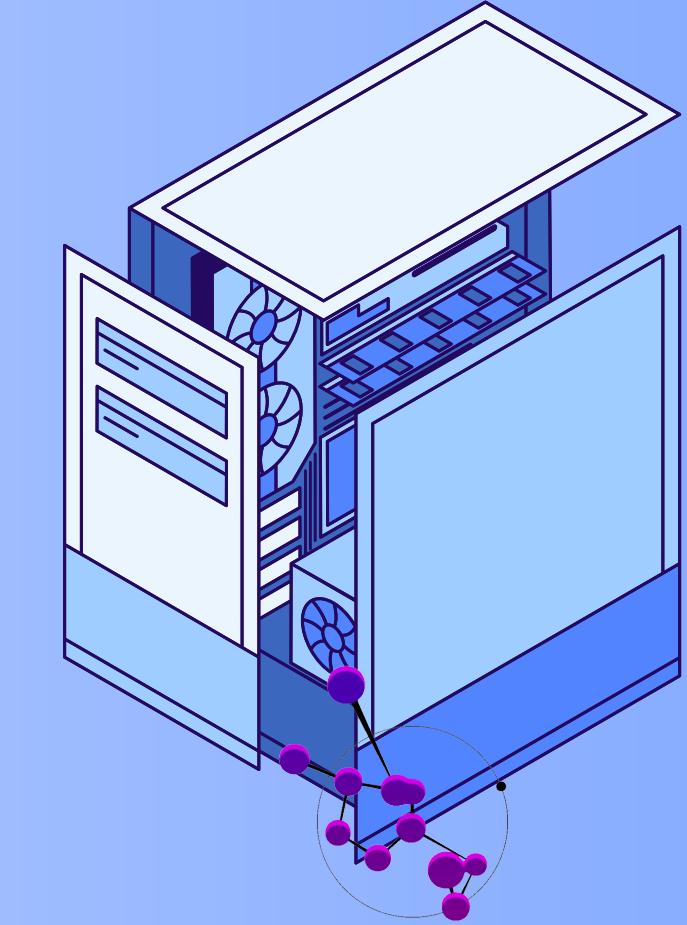
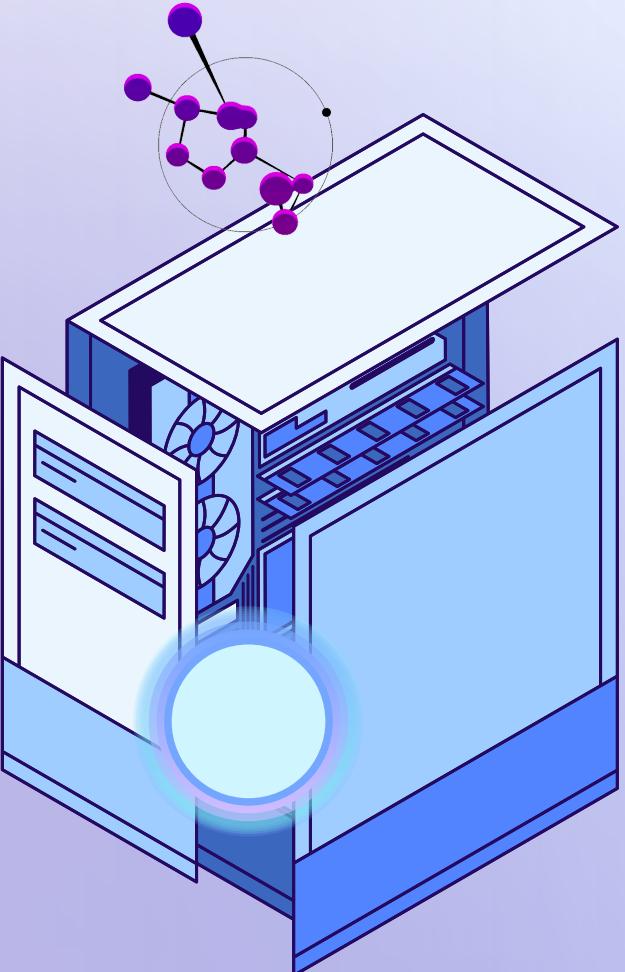
Portfolio #1

# 5 COMPUTING DISCIPLINES AND MAJORS



**In addition to traditional computer science, there are several other related disciplines and majors within the field of computing. These often overlap but have distinct focuses.**

- **Computer Science (cs)**: Broadly covers all aspects of computing, including algorithms, programming, and systems design.
- **Information Technology (IT)**: Application of technology to meet organizational needs, including systems management, network administration, and cybersecurity.
- **Information Systems (IS)**: The intersection of technology and business, focusing on how to use technology to solve business problems.
- **Software Engineering (SE)**: Systematic design, development, and maintenance of software systems with an emphasis on software quality and project management.
- **Computer Engineering (CE)**: The integration of computer science and electrical engineering, focusing on hardware, embedded systems, and low-level programming.



**Portfolio #1**





## Portfolio #1

# COMPUTER SCIENCE

It is the study of algorithms, data structures, and the principles of computing. It encompasses both theoretical and practical aspects of how computers work, how they are programmed, and how they can be applied to solve complex problems. Computer Science includes sub-fields such as artificial intelligence, machine learning, cybersecurity, and software development.

**Career Paths:** Software Developer, Data Scientist, Machine Learning Engineer, Systems Architect, Cybersecurity Analyst, etc.



# INFORMATION TECHNOLOGY

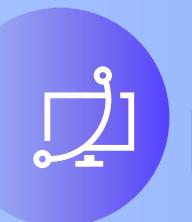
It is the discipline that focuses on the use, implementation, and management of computer systems and software to meet organizational needs. IT professionals are responsible for maintaining networks, managing databases, ensuring cybersecurity, and providing technical support. IT is practical and application-oriented, dealing with the day-to-day functioning of computer systems.

**Career Paths:** IT Manager, Network Administrator, Cybersecurity Specialist, Systems Analyst, IT Support Specialist, etc.



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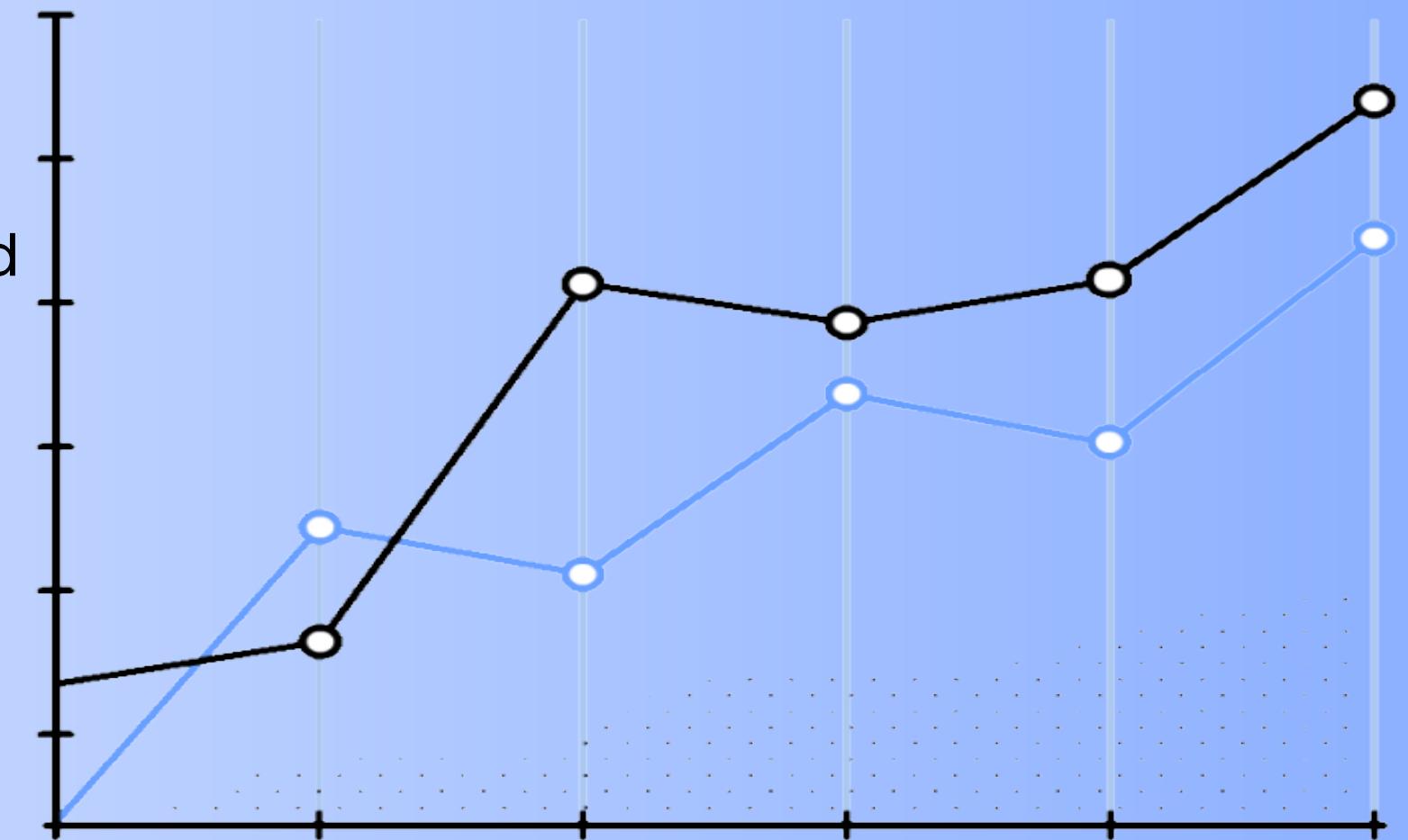




# INFORMATION SYSTEMS

It is the study of how technology, people, and processes interact to collect, process, and manage information in organizations. Information Systems focuses on designing and implementing systems that support business operations, decision-making, and strategy. It bridges the gap between business objectives and technology solutions, emphasizing the role of information in achieving organizational goals.

**Career Paths:** Business Analyst, Database Administrator, Systems Consultant, Project Manager, ERP Specialist, etc.





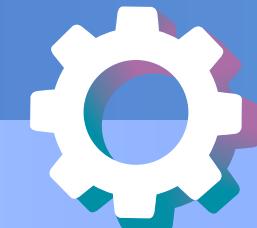
## Portfolio #1

# SOFTWARE ENGINEERING



It is the systematic application of engineering principles to the design, development, testing, and maintenance of software. Software Engineering emphasizes the use of best practices, methodologies, and tools to create high-quality, reliable, and efficient software products. It involves managing the entire software development life cycle (SDLC), ensuring that software meets user requirements, is delivered on time, and is maintainable over the long term.

**Career Paths:** Software Engineer, Quality Assurance (QA) Engineer, DevOps Engineer, Project Manager, Software Architect, etc.





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# COMPUTER ENGINEERING

It is the discipline that combines principles of electrical engineering and computer science to design and develop computer hardware and software. Computer Engineering focuses on the creation and integration of computing systems and components, including microprocessors, circuit boards, and embedded systems. It involves both hardware and software development, particularly in areas like robotics, telecommunications, and IoT.

**Career Paths:** Hardware Engineer, Embedded Systems Developer, Firmware Engineer, Robotics Engineer, Electrical Engineer, etc.





## Portfolio #1

# ANALYSIS/REACTION



While making this presentation, I realized that technology is advancing even more rapidly than ever. Just 100 years ago, we didn't even have phones, and now, most of the population has phones and computers; phones and computers that are more powerful than the machine used to send people to the moon. Even smaller and efficient hardware than the big and inefficient ones 50 years ago. And now, the hottest trend are AIs; AIs like ones used to make essays and paragraphs with a simple prompt and is accessible to everyone (ChatGPT, Google Gemini, etc.). The AI era is another era for technology and everyday, it is advancing more than ever. Humanity is really something, and people contribute to society all the time in terms of technology, the citations in the references slide being the example of contribution. I am utterly astonished that we have access to technology that we couldn't even dream of having 50, 40, 30, 20, or even 10 years ago! The era of computers is rapidly advancing, and it isn't showing any signs of slowing down.



The field of computer science is undeniably large and varies, it includes a wide range of disciplines and applications. One of the most striking aspects of computer science is its complex but essential contribution to society. The field draws heavily on concepts and techniques from mathematics, physics, and engineering. This approach has led to the development of innovative solutions to a lot of problems, from medical diagnosis to vehicles. And the career opportunities given from these disciplines, offering roles from software development and hardware engineering to cybersecurity and data analysis. The evolving technology landscape will continue to fill the holes between these areas, emphasizing the need for a comprehensive understanding of computing to aid in future advancements. This field in society is so vast and large that it can't solely be covered by one profession. Computer Scientists, Computer Engineers, IT professionals, IS professionals, and Software developers work hand in hand to further develop the field and offer even more advancements to humanity than can solve even more problems.



## Portfolio #1

# GETTING TO KNOW ME!



Ever since I was small, I was always interested with technology. I had an old office PC that I used to play games with and tinker around a bit with the hardware. I got hooked right after that and went into an IT rabbit hole. Right after everything that happened, I wanted to be a Cybersecurity Specialist ever since. That is why I took the BSIT course, to learn more about Networking and Network Security. My first goal is to be a System Administration to slowly reach my dream of being a Cybersecurity Specialist. Unfortunately, Cybersecurity isn't an entry-level role, so I want to be a System Administrator first to have experience and knowledge with servers so that I will be able to protect them in the future.



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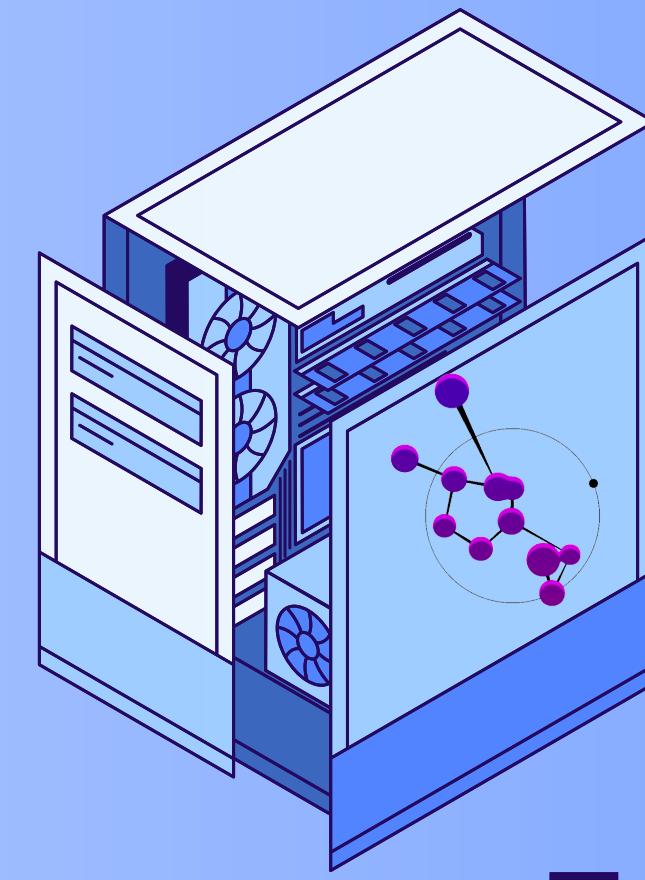
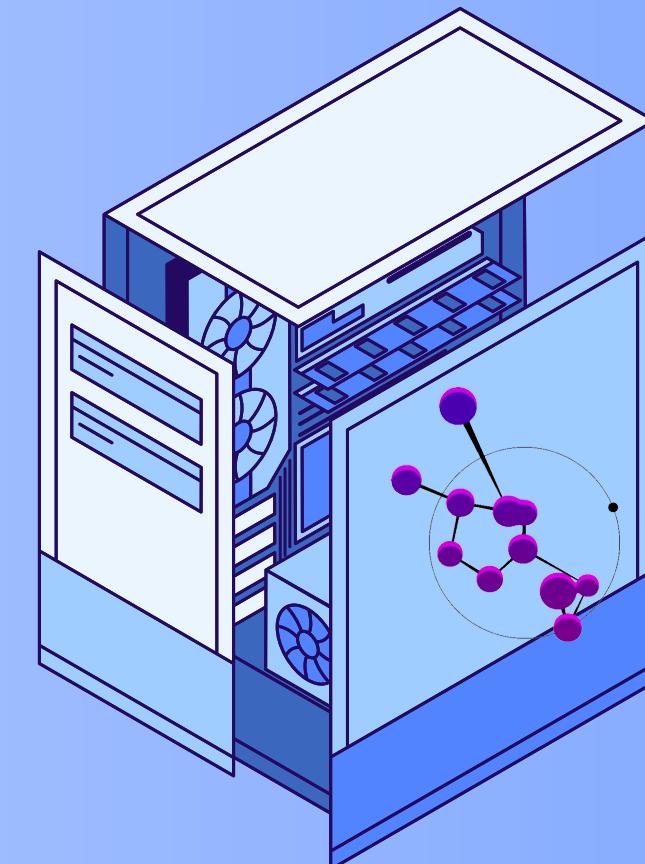
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