

# ALGORICA

3RD EDITION | SEPTEMBER 24

ARTIFICIAL INTELLIGENCE  
DIVE INTO THE TECHNOLOGY OF FUTURE

CYBERSECURITY  
A SHIELD OF DIGITAL LIFE

CAREER OPTIONS  
INNOVATE YOUR FUTURE IN I.T. SECTORS

&  
MUCH  
MORE

WILL  
VR BE  
THE NEXT FRONTIER?

TODAY IS THE OPPORTUNITY TO  
BUILD THE TOMORROW YOU WANT



# Computer Engineering Society

Madan Mohan Malaviya University of Technology

## ALGORICA

3rd Edition 2024

# THE CORE OF CES DELVING INTO THE



## Vision

To facilitate and promote studies, research, technology and to foster the students into globally competent professionals with expertise in software field and Management Education and also to achieve excellence in higher technical education.

## About

The Computer Engineering Society provides a platform to the students to share and increase their knowledge. Apart from improving technical awareness, the society has also emphasized on the overall development of the students. It also conducts Data Structures and Competitive programming classes for first year. The society conducts various C quizzes to enhance the grasp on C language. It organizes events such as Game of codes and Weild the Web. Ennexus, the annual techno event of the society offers the students a platform to turn daydreams into a realm human imagination and delve deeper into the aspects of technology and innovation.

## History

The Computer Engineering Society has been functioning since 1993 with the collective efforts of a group of B.Tech. students who had a strong urge to complement the theoretical and practical knowledge imparted in the classroom and laboratory, with emphasis on development of overall personality of budding engineering graduates. With a humble beginning, the society has grown steadily to its great strength of students as well as teacher members and is one of the most active and popular technical societies in the campus. The society can proudly boast of having actively working and highly enthusiastic, committed executive members.

# CES ARCHIVE





# Asst. Prof. Sushil Kumar Saroj



*Message from*

## FACULTY ADVISOR

**Dear Readers,**

As the faculty advisor of CES, I am thrilled and immensely proud to present the third edition of Algorica, our highly anticipated tech magazine. The passion, dedication and pursuit of excellence of CES members are truly commendable that marks another milestone in our journey of fostering knowledge, innovation and excellence within the CES society.

Our CES society has been great at organizing events that help our freshmen grow and develop. We hold development workshops to improve practical skills and competitive programming contests to boost problem-solving abilities. Each event is designed to encourage continuous learning and improvement. These activities not only build technical skills but also promote teamwork among our members.

I want to express my heartfelt appreciation to the team of Computer Engineering Society. Their hard work, dedication and passion have made CES thrive. The events CES organizes, the support team provide to each other and the excellence, strive for make me incredibly proud to be CES faculty advisor.

Every challenge is an opportunity to grow and every effort you put in today will pave the way for tomorrow's achievements. The journey ahead is bright and I'm confident that with the passion and determination of CES members, CES will reach new heights.

# *Message from* **PRESIDENT**



As my college life comes to an end, I am overwhelmed with gratitude and pride to present the third edition of ALGORICA. I still remember the dedication and hard work my team and I put into starting this incredible journey with the first edition of our renowned tech magazine, ALGORICA, in 2022. Now, I want to express my heartfelt gratitude for the tireless hard work and passion of the second-year team. I am also truly proud of my third-year team for their significant contributions and supervision. I convey my sincere thanks and appreciation to our faculty advisor, Professor Sushil Kumar Saroj, for his invaluable guidance and support. Lastly, I would like to extend my deepest thanks to my batchmates, with whom I started this journey in CES. Now, as it comes to an end, the hard work, brilliant ideas and relentless pursuit of excellence have made this magazine a reality.

Over the past 31 years, the Computer Engineering Society (CES) has experienced remarkable growth and development. ALGORICA, as the latest addition, marks the beginning of an exciting tech journey for freshmen, particularly Computer Engineering undergraduates. It aims to guide them in making informed decisions, building a strong foundation and securing valuable tech internships and job opportunities. With events like Capture the Flag, Wield the Web and Código, CES provides exposure to ethical hacking, development and competitive programming. Our goal is to make complex tech topics accessible and engaging, helping freshmen get a solid start, understand the tech landscape, and find opportunities to grow and succeed in their new field.

In conclusion, CES has played a vital role in my development, whether in shaping my personality, enhancing my professionalism or preparing me for placements. I can confidently say that my first interview for the role of an executive member during the induction process made me more self-reliant. Additionally, when I had the opportunity to recruit the next executive members for the team, it gave me valuable insights into interviews. Overall, CES has provided me with opportunities that have made me a better version of myself. The responsibilities of organizing exciting events and conducting the annual fest, ENNEXUS, have made me more creative and enriched my thought process. I proudly believe CES has everything a beginner needs. It helps you learn for placements and also guides your personal growth. I strongly encourage every CSE freshman to join CES events and become a part of this exciting journey as executive members.

**Manvendra Sharma**

# *Message from*

## **VICE-PRESIDENT**



As I come near the end of my graduation, I am very grateful to have this chance to thank the entire CES team and our faculty advisor, Prof. Sushil Kumar Saroj, for the successful publication of the third edition of Algorica. The hard work, passion and ideas of the second-year team, along with the guidance of the third-year team, have made this edition possible. I also want to thank my CES teammates and friends for their support and motivation that have brought us this far.

Thinking back on my time with CES, from being an executive member to becoming vice-president, CES has been a big part of my growth. Whether it's in competitive programming, development or soft skills, CES has given me the chance to improve. I still remember feeling nervous and underconfident during the induction process. But as I grew with CES, I became more confident and learned to handle interview pressures.

For about 31 years, the Computer Engineering Society (CES) has been thriving, with Algorica being the latest addition to its successes. Algorica has made it easier for freshmen to navigate placements and preparation. It offers helpful information about internships, programming languages, and job placements. The events run by CES, like Wield the Web, Algo Hunt, Capture the Flag and many more, have been a great help to freshmen. I remember participating in these events and also helping to organize them as an executive member. These experiences have been crucial in my development and have given me a clear idea of what I need to do in the future.

Being a part of CES has been one of the most rewarding experiences of my college life. It's not just a place to learn and grow, but a community where you can find support, make lifelong friends and discover your true potential. Whether you're passionate about coding, development or just want to improve your soft skills, CES offers countless opportunities to explore and excel. Don't miss out on the chance to be part of this amazing team. Embrace the opportunity to learn, contribute, and make lasting memories. Joining CES can be the stepping stone to a fulfilling and successful college experience.

**Pankaj Rana**

# ABOUT THE MAGAZINE

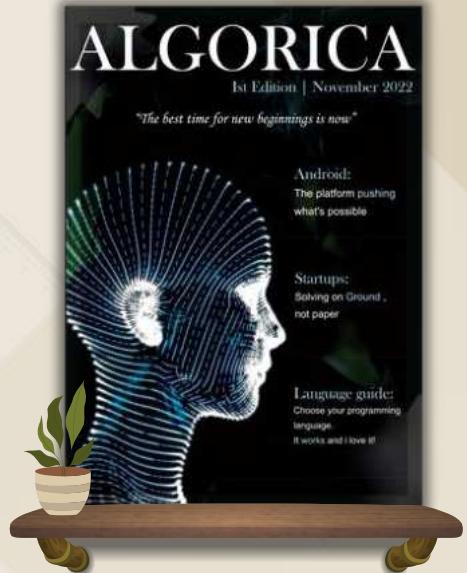
Algorica is an annual magazine produced by the Computer Engineering Society (CES) that serves as a comprehensive resource for computer science enthusiasts. It covers various topics, including technical education, career guidance, and community engagement, making it an invaluable tool for students and professionals alike.

## What will you gain from Algorica?

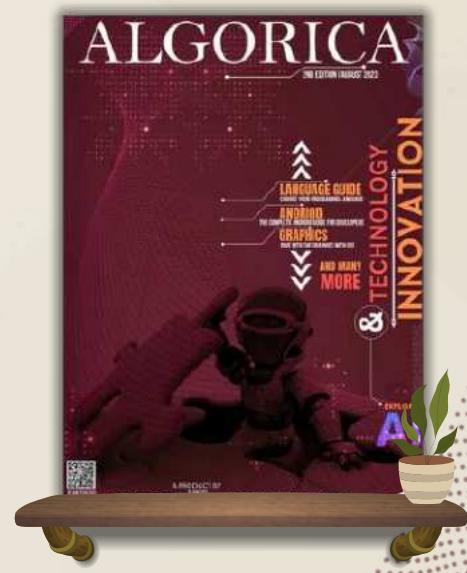
The topics in Algorica provide a blend of technical education, career guidance, and community engagement, making it an essential resource for computer science enthusiasts. It delves into programming, web and app development, and competitive coding, offering structured roadmaps and practical tips to help readers build a solid foundation in these areas. Additionally, it explores emerging technologies such as artificial intelligence (AI), virtual reality (VR), and cybersecurity, equipping readers with insights into the future of tech and preparing them to be part of it.

The magazine celebrates the achievements of CES members, highlighting their contributions and innovations, which fosters motivation and a sense of community within the society. By encouraging active participation in CES events and connections with like-minded individuals, Algorica is a comprehensive guide that empowers students and professionals to excel in their technical journeys while staying engaged in a vibrant community.

## PREVIOUS EDITIONS



EDITION - 1 (2022)



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# EVENTS UNDER

Collaborate, **Code,**  
**Conquer**

**CES**

01

## CAPTURE THE FLAG

Dive into the thrilling world of cybersecurity with Capture the Flag! Test your cryptography and cyber forensics skills, uncover hidden keys, decrypt codes and outsmart your opponents.



02

## GAME OF CODES

Ready to be the ultimate coding champion? Join Game of Codes, showcase your skills, tackle complex challenges and compete with top coders in the field.



03

## CONNOISSEUR

Join our freshmen webinar! Connect with accomplished alumni, gain valuable insights, receive tailored advice and uncover expert tips to kickstart your college journey and ensure success.



04

## CODE CRUSADE

At Code Crusade, elevate your coding skills, tackle complex problems and master data structures and algorithms, whether you're a beginner or an experienced coder.



05

## ENNEXUS

Join us for the annual celebration of innovation at CES. This fest offers diverse events where participants can enhance their tech skills, collaborate in exciting challenges, and push the boundaries of creativity and problem-solving.



## The Annual Fest of CES

At Ennexus ,  
we innovate with passion  
and celebrate with pride.

### CODIGO

Codigo provides a platform to showcase your programming skills and expertise. Compete, collaborate, and demonstrate your coding abilities in this exciting challenge.

### DEBUGGER KING

Debugger King helps you master debugging skills. Errors are inevitable in coding, but perfecting your ability to fix them is crucial. Join us to enhance your debugging expertise.

### WIELD THE WEB

Join us at Wield The Web to master HTML, CSS, JavaScript, Git, GitHub, and more. Enhance your web development skills through hands-on learning and collaboration with fellow developers.

### CAPTURE THE FLAG

Capture The Flag challenges you to explore topics like Binary Exponentiation, Reverse Engineering, Forensics, and more. Push your skills to the limit in this thrilling competition.

### FLIP FLOP

Flip Flop tests the compatibility and collaborative thinking between you and your teammate. Discover how well-bonded teams can achieve their best work in this engaging event.

# GATEWAY TO DIGITAL WORLD

# LAPTOP GUIDE

Finally, I've made it to the college. With a new chapter unfolding, I am thinking of purchasing a laptop.



After exploring several options in the market, each with its own specifications, I am wondering which laptop would best suit my requirements.

Congratulations! Now that you have decided to purchase a laptop, which laptop model are you considering?



Before jumping to conclusions, you should first determine your college requirements. Then, take into account factors like CPU, RAM, processor, storage, battery life, graphics card, display type, screen size, and refresh rate. These considerations will be very helpful and will guide you in selecting the perfect laptop for your needs in your college journey.

Well! These are a lot of points I have to consider before buying a laptop. It would be really helpful if you could please elaborate these points.



Fine! I will explain it in an easy way.



- **CPU & Processor:** Go for a CPU that suits your needs, there are two major processor manufacturers namely, AMD and Intel. You should go for Intel Core i3/i5 or AMD Ryzen 5 for general use, i7/Ryzen 7 for heavier tasks and i9/Ryzen 9 for tasks like gaming or video editing.
- **RAM & Storage:** Aim for at least 8GB of RAM for smooth performance of the laptop, 16GB or more is preferable for heavier tasks such as gaming or video editing. Decide between SSDs for speed and reliability or HDDs for larger storage capacity. SSDs are recommended for faster performance.
- **Battery Life:** Look for laptops with long battery life, especially if you need to work for longer continuous duration. Aim for a laptop with at least 5-6 hours of battery backup so that you don't have to rush for the charger in between your work.
- **Graphics:** Integrated graphics are fine for regular use such as browsing on Internet, watching YouTube etc. For gaming or graphics-intensive work such as video editing, consider the laptops with dedicated GPUs from NVIDIA or AMD.
- **Display and Refresh Rate:** Choose a screen size and resolution that suits your preferences and work style. Higher resolutions are better for multimedia and design work. OLED/IPS type displays are recommended with screen size of 15.6 inches which will give you the best viewing experience, also refresh rate of 120 Hz or more is recommended.

That was really helpful! Keeping all these points in mind, I can buy a laptop that fulfills my requirements in the college life.  
Thanks for your help!



# PATH TO PROFICIENCY

## FIRST LANGUAGE GUIDE



CPP

PYTHON

JAVA



Starting your programming journey can be exciting and also a bit overwhelming due to the numerous languages to choose from. The right language results in a robust software solution that makes debugging, documentation, enhancement, and maintenance quick and easy. It also streamlines the development workflow.

Here's a guide to help you decide which language to start with-

### C/C++: Speed and Control Unleashed.

C++ is a powerful programming language frequently used to create embedded software, system software, application software, device drivers, and games. It is an extension of the C programming language with additional features such as classes and objects, making it suitable for both low-level system programming and high-level application development.

#### Why go with C/C++?

C/C++ helps to build a strong foundation in programming concepts. It enhances problem-solving skills, and prepares students for various career opportunities. C++ is a great option if you're interested in professions that need high performance and efficiency.



#### Limitation of C/C++

C/C++ unlike newer languages, does not have features such as automatic memory management. It can be complex and challenging to master due to its intricate syntax. This complexity often leads to longer development times and increased potential for bugs.

### JAVA: Empowering Cross-Platform Innovation

Java is a high-level, class-based, and object-oriented programming language. It is a platform independent, versatile language having various industrial applications.

#### Why go with JAVA?

Java is a powerful, secure language with good exception handling and memory management. Because it is platform-independent, programs can operate without recompiling on many computers. Furthermore, Java allows for multi-threading, which increases productivity by enabling simultaneous task execution.



#### Limitations

Java has certain drawbacks, such as increased memory usage since it depends on the Java Virtual Machine (JVM) and poorer performance when compared to languages like C++ because of its runtime interpretation. Java's robust security features and portability limit low-level access to hardware and system resources.

# PYTHON: Elegant Code, Endless Possibilities

Python is a high-level, general-purpose programming language. It is a beginner friendly language due to its readability and easy syntax.

## Why go with Python?

Python offers a wide range of tools and frameworks that speed up development in a number of fields, including data analysis and web development. Python is a well-liked option for a variety of programming tasks because of its large documentation and strong community support, which also enhance the language's usability and problem-solving skills.

## Limitations

Python's interpreted nature and dynamic type make it slower than compiled languages like C++. Python's large memory footprint may potentially be a problem for programs that require a lot of memory.



**06**

Machine learning

**01**

Artificial intelligence

**05**

Data analysis

**02**

Web development

**04**

Software development

**03**

Data visualization



# JAVASCRIPT: The Art of Web Elegance

JavaScript is a lightweight, cross-platform programming language used to create dynamic and interactive content on websites. It is interpreted line by line, which offers flexibility in web development.

## Why go with Javascript?

JavaScript is crucial for developing interactive and dynamic web experiences. It supports a wide range of applications across desktop, mobile, server, and web platforms. With a great ecosystem, active community, and continuous updates, it guarantees that it is among the significant, highly in-demand tools for developers.



## Limitation of Javascript

JavaScript has certain weaknesses, such as inconsistent behavior in different browsers, performance issues since it is executed single-threadedly, and specific security breaches like cross-site scripting. The dynamic nature of JavaScript can also lead to unpredictable bugs and a challenging maintenance process in huge codebases.

# Conclusion

C++ is an advanced language that offers insightful knowledge about low-level programming and great performance. Java is a platform-independent language used to develop enterprise-level applications and Android apps. Python is simple, easy to learn and a versatile programming language. JavaScript is a versatile language for building interactive web applications and managing dynamic content.

Each language has its strengths and ideal use cases, so selecting the one that aligns best with your goals will be most beneficial.



# ULTIMATE CODING TOOLKIT



**01**

## Books



- Let Us C: Authentic guide to C programming language (Yashavant Kanetkar).
- Data Structures and Algorithms made easy (Narasimha Karumanchi).
- JavaScript and Query: Interactive Front-End Web Development, by (Jon Duckett).
- Android Programming with Kotlin for Beginners by John Horton.
- Android Programming (Bill Phillips).

## YouTube

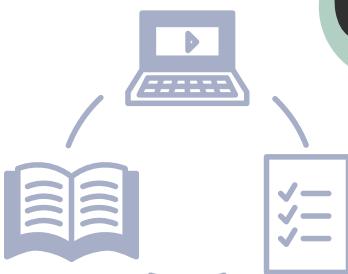
**02**



- take U forward DSA-A2Z Series by striver ( DSA).
- Luv programming (For beginning CP).
- Love Babbar (For CP and Programming languages).
- CodeWithHarry (For Programming languages and development).
- Thapa Technical (For Web Development).
- Anurag Singh ProCodrr (For Web Development).

**03**

## Courses



- Supervised Machine Learning: Regression and Classification by Andrew Ng.
- Data Structures and Algorithms Specialization by Michael Levin.
- Competitive Programmer's Core Skill by Alexander S. Kulikov

## Other useful links

**04**

- <https://www.geeksforgeeks.org/>
- <https://www.w3schools.com/>
- <https://takeuforward.org/>
- <https://www.tutorialspoint.com>
- <https://stackoverflow.com/>



# PATH TO PROFICIENCY

## ROADMAP TO DSA



1

### Learn Collection Frameworks

Get familiar with Java's Collection Framework, C++'s Standard Template Library (STL), and Object-Oriented Programming (OOPS). These tools help you manage data effectively and design better applications.



3

### Master Basic Techniques

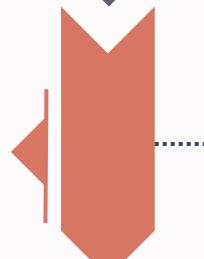
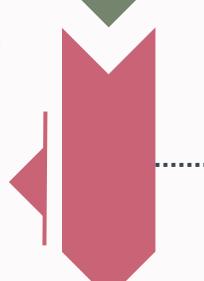
Before jumping into data structures and algorithms (DSA), understand key techniques like two-pointer, recursion, backtracking, and sliding window. These strategies are essential for solving problems effectively.



5

### Explore Advanced Topics:

To further learn advanced topics, dive into more complex concepts like Dynamic Programming and Graph theory. Always practice as you learn to reinforce your knowledge and build confidence in your skills.



### Choose a Programming Language

Pick a language that you enjoy, like Python, Java, or C++. However, it's recommended to start with C++ for Competitive Programming. Mastering a programming language is the first step to becoming a great coder.



2

### Understand Time & Space Complexity

Learn about time and space complexity to evaluate how efficient your algorithms are. This knowledge helps you write faster and more efficient code.



4

### Study DSA in Order



Start your DSA journey with a clear path, focusing on these topics:  
Arrays > String > Stack > Queues > Linked List > Hash Table > Tree > Graph > Heap.

6

## NAVIGATING LEADING CODING WEBSITES

**CODEFORCES**

Codeforces is a competitive programming platform with contests divided into Div. 1 (1900+), Div. 2 (1400-1899), Div. 3 (below 1600) and Div. 4 (below 1400). It features regular, educational and global contests, real-time rankings and a problem archive for practice, making it ideal for skill development.

**GEEKSFORGEEKS**

GeeksforGeeks is a platform for learning computer science and coding. It offers tutorials on programming, algorithms, and data structures, along with coding problems and interview prep guides.

The site includes articles, coding competitions, a Q&A section and certification courses.

**CODECHEF**

CodeChef is a competitive programming platform hosting monthly contests (Long Challenge, Cook-Off, Lunchtime) and Weekly Starters. It offers a wide problem archive, a global ranking system, prizes for winners and educational initiatives like College Chapters and Go for Gold.

**TOPCODER**

Topcoder is a competitive programming platform known for hosting challenging algorithmic contests and coding challenges. It features Single Round Matches (SRMs) and marathon matches across various domains like data science and software development.

**HACKERRANK**

HackerRank is a beginner-friendly platform for coding practice, offering challenges in programming, algorithms and data structures. You can earn badges for problem-solving and can take certification tests. It features tutorials and coding contests.

**LEETCODE**

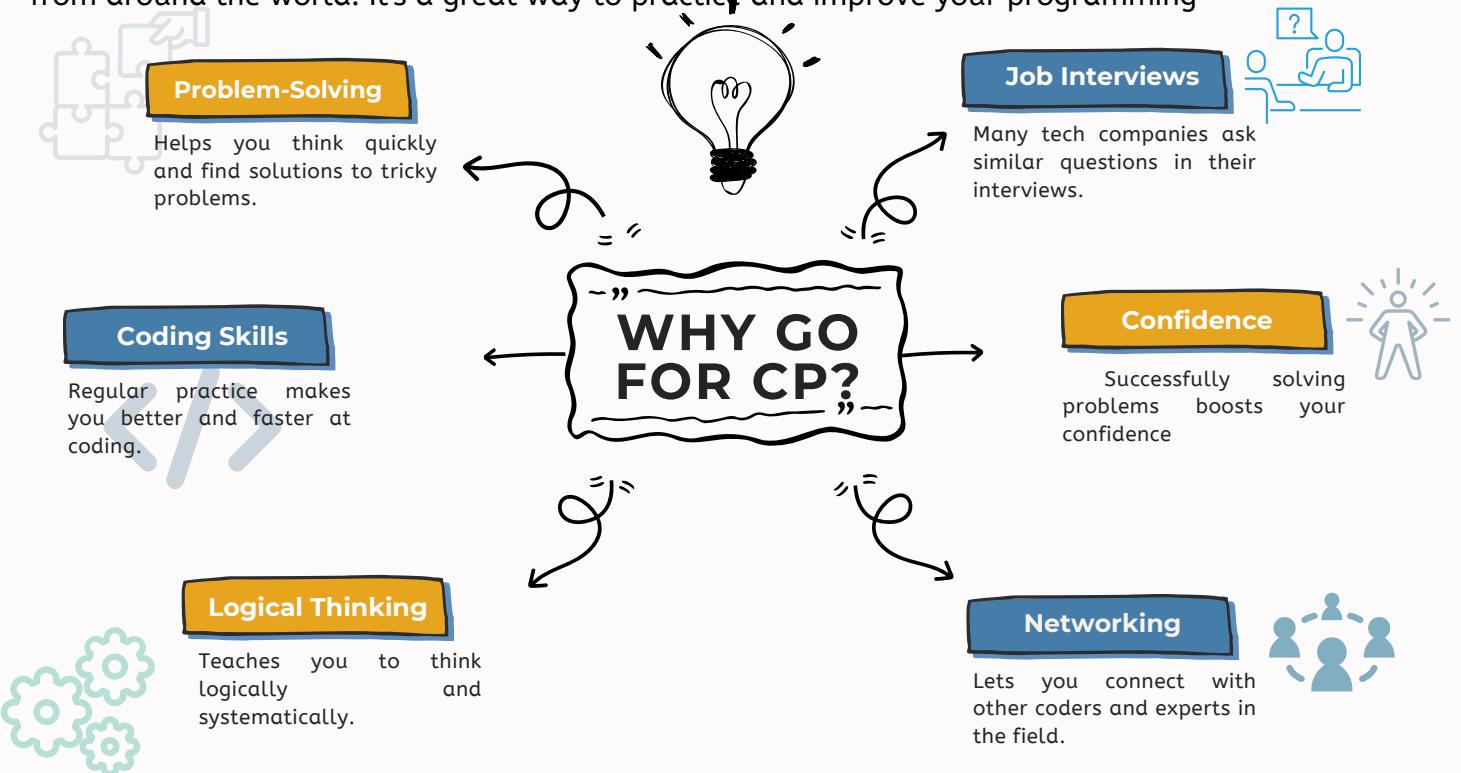
LeetCode is an online platform designed for coding practice and technical interview preparation. It offers community and discussion forums where you can discuss problems. It conducts weekly and biweekly contests where based on your performance you can increase your ratings.



# STRATEGIES FOR COMPETITIVE PROGRAMMING

Competitive programming is a fun activity where you solve problems using coding. You get a problem, write a program to solve it, and try to do it as fast and accurately as possible.

People compete against each other, and it helps you get better at thinking logically and solving problems. It's like a game for people who enjoy coding, and you can join competitions with others from around the world. It's a great way to practice and improve your programming.



## PRACTICE MAP OF CP

### Beginners

- HackerRank
- Codewars

### Intermediate

- CodeForces
- Atcoder

### Advanced

- Topcoder
- Google Code jam

### All Levels

- CodeChef
- Geeks for Geeks
- Leetcode

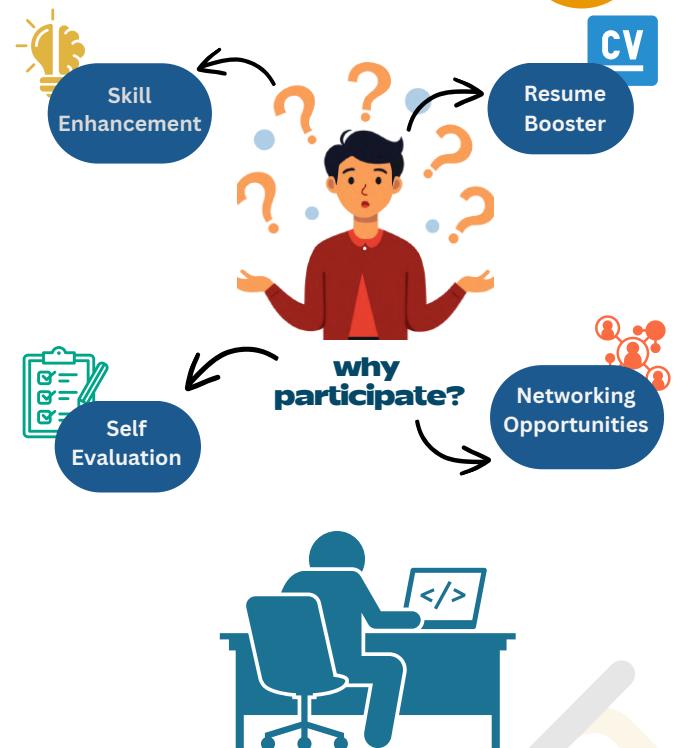
# THRIVING IN CODING COMPETITIONS

In the ever-evolving world of Computer Science, coding competitions stand out as a thrilling arena where skill meets strategy.

These contests offer more than just a chance to showcase your programming prowess—they can be a gateway to exciting opportunities and personal growth.

Coding competitions are not just about solving problems; they're a platform to challenge yourself, learn new techniques, and connect with a community of like-minded enthusiasts.

"Practice makes you perfect,  
but competition reveals  
how close you are to  
perfection"



## Popular Coding Competitions

Here are some renowned coding contests that you might want to check out.



### ACM ICPC

Known as one of the most prestigious collegiate programming competitions, ACM ICPC brings together the brightest minds to tackle algorithmic challenges.

It is a team-based contest that focuses on solving complex algorithmic problems under time constraints.



### HACKER CUP

The HackerCup is organized by Facebook (now Meta), and it is known for its challenging algorithmic problems.

The HackerCup provides a platform for practicing and enhancing programming skills. It helps participants improve their problem-solving abilities and learn new techniques.



### CODECHEF STARTERS

CodeChef Starters is a series of online programming contests organized by CodeChef, aimed at beginners in competitive programming.

These contests are held regularly and are designed to provide a platform for newcomers to practice and improve their problem-solving skills.



### LEETCODE WEEKLY/BIWEEKLY

LeetCode Weekly and Biweekly Contests are a series of online programming contests organized by LeetCode, a popular platform for practicing coding problems.

These contests are designed to test participants' problem-solving skills and algorithmic knowledge in a competitive environment.



### CODEFORCES

Codeforces is a competitive programming platform hosting regular contests for different skill levels (Div. 1 to 4). Participants solve algorithmic problems within a set time, typically 2 hours.

The platform uses a rating system to rank users, encouraging continuous improvement.

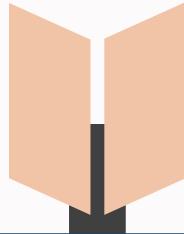


# TIPS FOR CONTESTS



Coding contests are a fantastic way to sharpen your programming skills, solve interesting problems, and compete with others.

To excel in coding competitions, consider these tips:



## Practice Regularly

Consistent practice on platforms like LeetCode, Codeforces, and HackerRank can help you improve your problem-solving skills and speed.

01

## Understand the Basics

Ensure you have a strong grasp of algorithms and data structures. This foundational knowledge is crucial for tackling complex problems.

02

## Analyze Past Problems

Review previous competition problems and solutions to understand different approaches and strategies.

03

## Participate in Mock Contests

Simulate the competition environment by participating in mock contests. This helps you get accustomed to the pressure and time constraints.

04

## Stay Updated

Follow blogs, forums, and communities to stay informed about upcoming contests and trends in competitive programming.

05



Coding competitions offer more than just a test of skill—they're a gateway to a vibrant community of problem solvers and innovators. Whether you're a novice or a seasoned coder, there's always something new to learn and explore.

So, gear up, pick a contest, and start coding. Your next challenge is just around the corner!



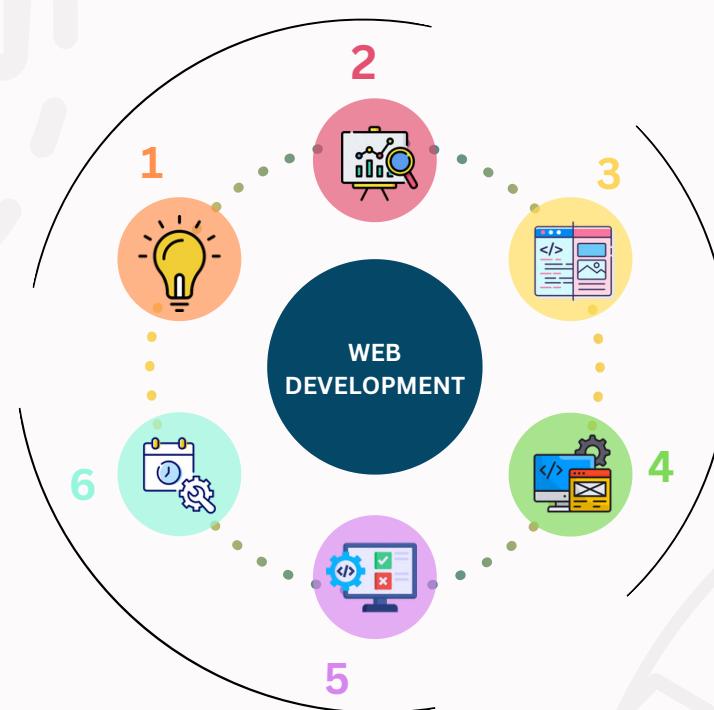
# GETTING STARTED WITH WEB DEVELOPMENT



Web Development is the craft of transforming abstract ideas into dynamic digital experiences, blending creativity and technical skill. From visual elements that captivate users to the backend processes that ensure seamless functionality, web development involves a diverse set of skills and technologies.



**"WEB DEVELOPMENT UNFOLDS LIKE A JOURNEY WHERE EACH STEP IS A CRITICAL WAYPOINT!"**



## INNOVATIVE IDEA

A great website starts with creativity. Developers think outside the box, proposing innovative features and functionalities that stand out and effectively serve user's needs.

1

2

## WEB DESIGN

The design phase crafts visual magic by creating mockups of layout, color schemes, and typography, ensuring the website is appealing and easy to navigate.

3

4

## TESTING

Before launch, the website undergoes rigorous testing to ensure quality, checking for bugs, broken links, and performance issues across various browsers and devices.

5

6

## STRATEGIES AND PLANNING

With a great idea, developers and managers create detailed plans, set milestones, and assign tasks to team members for efficient project execution.

## WEB DEVELOPMENT

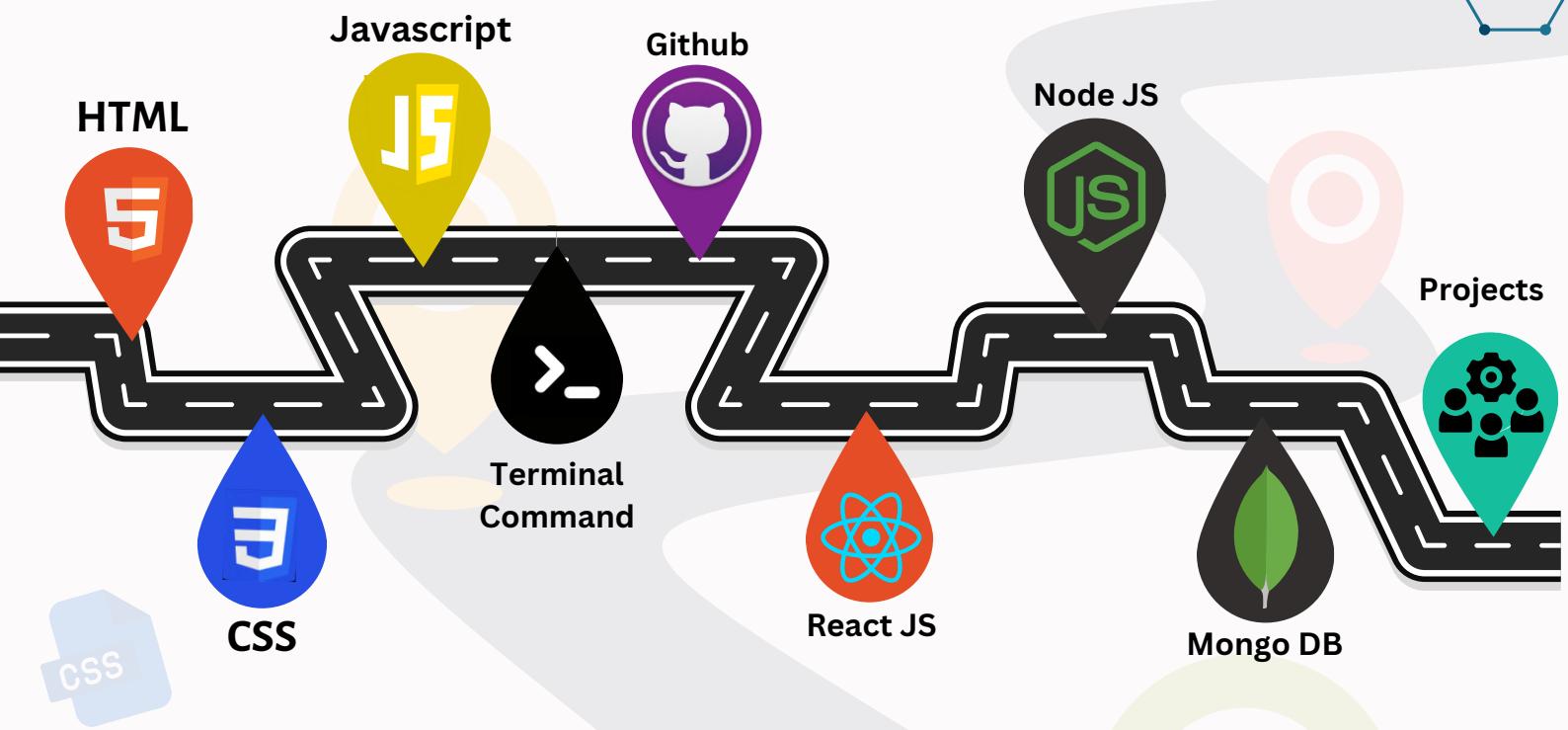
With a solid design, developers use front-end technologies like HTML, CSS, JavaScript, and back-end tools like Python, Ruby, Node.js to build the website.

## LAUNCHING AND MAINTAINANCE

Finally, the website goes live, akin to opening a new store. Post-launch, ongoing maintenance is crucial for keeping the site up-to-date, secure, and functional.

# WEB DEVELOPMENT

## ROADMAP AND CSS BATTLE



### CSS Battle >>>

CSS Battle is an online game that challenges players to replicate a given target image using only HTML and CSS code.

#### > What is CSS Battle?

It is an online competition in which coders have to use their HTML and CSS skills to complete a given target.



#### > How to Play?

To play CSS battle participant have to write most efficient code (using least characters) to visually replicate "Targets" and battle it out to get to the top of the leaderboard.



#### > Evaluation of score:

- The closeness of the replicated target image.
- Number of characters used

➡ <https://cssbattle.dev/>



# ESSENTIAL HACKS

## CSS CHEAT-SHEET



### QUICK TIPS

Elevate your web design skills with these CSS game-changing tips and tricks!



#### Filter Property:

```
img {  
    filter: grayscale(100%);  
}
```

#### Add Stroke Around Text Using CSS

```
-webkit-text-stroke:1px #000000;
```

#### Webkit-text-stroke:

```
h1 {  
    -webkit-text-stroke: 2px skyblue;  
    background-color: transparent;  
}
```



#### Image in text:

```
h1{  
    background-img: url(path/to/image);  
    background-size:cover;  
    background-clip:text;  
    -webkit-background-clip:text;  
    Color:transparent;  
}
```

#### Box shadow:

```
div {  
    width: 284px;  
    padding: 10px 10px 20px 10px;  
    border: 1px solid #BFBFBF;  
    background-color: white;  
    box-shadow: 10px 10px 5px  
              #aaaaaa;  
}
```

# ESSENTIAL HACKS

## GITHUB COMMANDS



### QUICK TIPS

Take your Git skills to new heights with these Git game-changing tips and tricks!

#### Git Configuration

`git config --global user.name "Your Name"`  
set name

`git config --global user.email "abc@gmail.com"`  
set e-mail address

#### Advanced Commands

`git rebase branch-name`  
rebase a branch

`git stash`  
stash changes

`git stash apply`  
apply stashed changes

`git revert commit-id`  
revert a commit

`git log`  
view commit history

#### Git Initialization

`git init`  
initializes a new Git repository in your current directory

`git clone <repo url>`  
create a copy of an existing Git repository

`git add README.md`  
add a README.md file to the staging area in your git repository

`git status`  
check status

`git add .`  
add all files in the directory

`git commit -m "first commit"`  
save the changes you've staged with a descriptive message

`git remote add origin`  
if this is your first time pushing to this repository, you need to link your local repository to a remote one on github

`git push -u origin main`  
push the commit to your Github repository

`git pull origin branch-name`  
pull all the latest changes

`git checkout -b new-branch-name`  
create a new branch

`git checkout branch-name`  
switch between branches

# UNLEASH YOUR APP-TITUDE THE BEGINNER'S GUIDE

One of the more popular forms of coding in recent times is the creation of applications, or apps, that run on mobile devices like phones and tablets. You probably use a range of different apps in your everyday life. Wouldn't it be cool to create one of your own?

The processes and the ways of developing apps varies according to the platform we are developing it for. Major platforms for Mobile App Development includes:

1. **Android**
2. **iOS**

## Android Development

In Android Development, main programming languages like **Java** & **Kotlin** are used prominently.

Although **Java** is very stable and has a vast community support, **Kotlin** is now the recommended language for modern **Android Development**. Not only does Kotlin make development more concise, pleasant, and idiomatic, it also offers some great toolkits like **Jetpack Compose**, **Coroutine** which is not available in Java.

**Flutter** is an open-source framework by Google for building natively compiled applications for mobile, web, and desktop from a single Dart codebase, featuring customizable widgets, hot reload, and scalable architecture.

NASA once used **Nexus S** handsets having Android Gingerbread as the sensors which were used to monitor about International Space Station.



## iOS Development

iOS application development is the process of making mobile applications for **Apple hardware**, including iPhone, iPad and iPod Touch. The software is written in programming languages like **Flutter**, **Dart** and **Swift** and then deployed to the **App Store** for users to download.

Coming to **IDEs ( Integrated Development Environments)** most famous among Android Developers is **Android Studio** and **Xcode** among iOS Developers.



## Some useful links

Below are some suggested links for more info:

1. [GeeksforGeeks](#)
2. [Udemy.com](#)
3. [Coursera.com](#)



# UNLEASH YOUR APP-TITUDE

## A DEVELOPER'S JOURNEY



### PROGRAMMING FOUNDATIONS

Start by gaining proficiency in the following languages:

- **Flutter:** enables building natively compiled applications for mobile, web, and desktop from a single codebase
- **Kotlin:** The modern language endorsed by Google, known for its conciseness & safety features.
- **XML:** Used for building user interfaces for mobile applications.

### UNDERSTANDING UI-UX DESIGNING

Study the principles of UI-UX designing to create intuitive applications. Key concepts include :

- **Layouts :** Learn about different layout types.
- **View Elements :** Understand how to use buttons, text-fields and images effectively.
- **Complex UI Components :** Learn to use RecyclerView, ViewPager and custom views for dynamic interfaces.

### ADVANCED TOPICS & LIBRARIES

As you progress, delve into advance topics & popular libraries:

- **Jetpack:** Understand the activity life cycle and how to manage user interactions.
- **Retrofit:** Learn about background tasks that run without user interface.
- **Room:** Handle system wise broadcast messages.
- **RxJava:** Manage & share content between applications.

1

3

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4

6

### UNDERSTANDING ANDROID STUDIO

Learn to use **Android Studio**, the official IDE for Android Development. Key Components to focus on includes:

- Project Structure & File organization.
- Basic functionalities like creating new projects, running activities, running apps on emulators.
- Gradle for build management.

### CORE ANDROID COMPONENTS

Familiarize yourself with the main building blocks of Android Applications.

- **Activities :** Understand the activity life cycle and how to manage user interactions.
- **Services :** Learn about background tasks that run without user interface.
- **Broadcast Receivers :** Handle system wise broadcast messages.
- **Content Providers :** Manage & share content between applications.

### CONTINUOUS LEARNING & DEVELOPMENT

Stay updated with the latest trends and technologies in Android development. Engage with the community through forums, blogs, and social media. Consider contributing to open-source projects to gain practical experience and improve your skills.

# THE VR FRONTIER

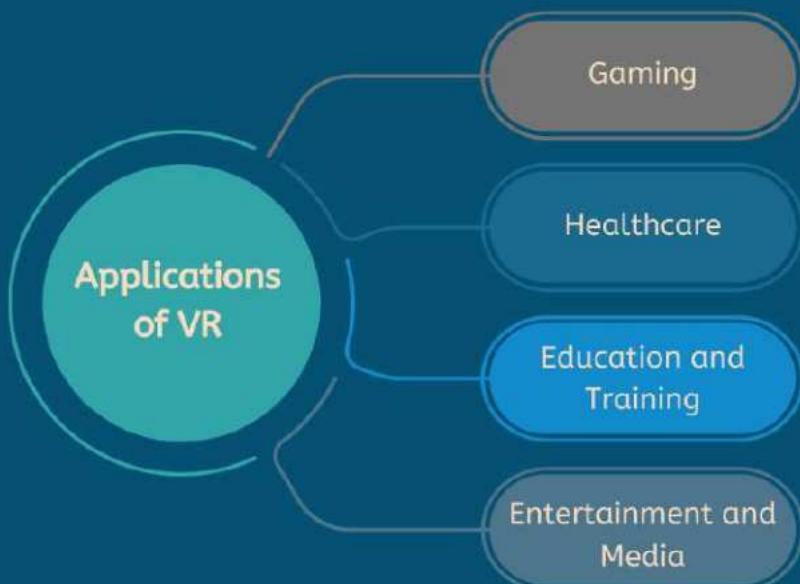


EXPLORE NEW REALMS  
BEYOND DREAMS

Imagine you're sitting in your living room, but with a VR headset on, suddenly, you're transported to a bustling city or a tranquil forest. You look around, and the world moves with you as if you're really there.

So, Virtual Reality, or VR, is like stepping into another world entirely. You put on these special goggles, and bam! You're not just seeing things on a screen, you're in the scene. You can look around, interact with objects, and feel like you're actually there.

**"It's like teleporting, but through technology."**  
It's not just for fun. VR is being used in education, training, therapy, you name it. The possibilities are endless.



# SCIENCE BEHIND

# VR



**Displays:** High resolution screens create a 3D effect by showing slightly different images to each eye.

**Motion Tracking:** Sensors track your movements, allowing the virtual world to respond in real-time.

**Field of View:** Lenses expand your view to mimic real-world vision.

**Rendering:** Graphics are rendered in real-time for smooth, immersive experiences.

**Haptics:** Controllers provide tactile feedback, simulating touch.

**3D Audio:** Spatial sound effects enhance immersion by placing sounds in different directions.

## FUTURE OF VR



**Personalized Worlds:** VR environments adapt to your preferences, offering tailored experiences.

**Enhanced Social Interaction:** Attend virtual events with friends worldwide, feeling the energy through advanced haptics.

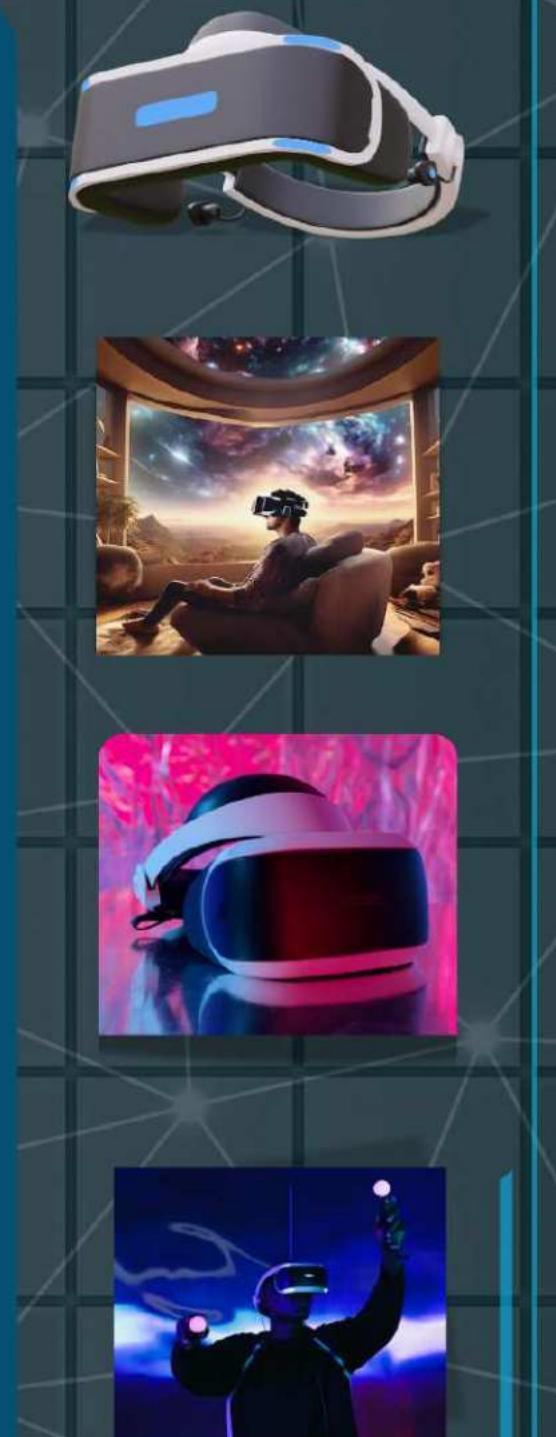
**Seamless Mixed Reality:** Envision a future where VR and AR merge seamlessly, allowing you to switch between real and virtual worlds with a simple gesture, blending both experiences effortlessly.

**VR Workspaces:** Collaborate in virtual offices with holographic colleagues and immersive 3D brainstorming.

**Hyper-Realistic Avatars:** Create lifelike avatars mirroring your expressions and movements for authentic interactions.

**Global Learning:** Explore history, science, and more in immersive VR classrooms from home.

**Health Revolution:** Use VR for personalized fitness, meditation and therapeutic experiences.





## ARTIFICIAL INTELLIGENCE

is a fascinating field within computer science focused on building systems that can perform tasks usually requiring human intelligence. Think of AI as a super-smart robot friend who never sleeps, learns incredibly quickly, and can juggle multiple tasks effortlessly. It's the technology behind many of the advancements we see today, from healthcare and finance to manufacturing and education.



## Amazing features of AI

**Super Brain Power:** AI is like a brainy detective that can spot patterns, solve problems, and even predict future events. For instance, it can analyze tons of weather data to forecast if it's going to rain tomorrow.



**Creative Genius:** Ever wanted to create something artistic but didn't know where to start? AI can lend a hand by generating artwork, writing stories, or composing music based on what it has learned from existing creative works. It's like having a little artist or writer right at your fingertips.



**Voice and Face Recognition:** AI can recognize your voice and face, which means you can unlock your phone or start your favorite playlist just by speaking. It's like magic, but it's real!

**Problem-Solving Wizard:** AI excels at tackling tricky problems, whether it's finding the best route for deliveries or solving complex scientific puzzles.



## Bright side of AI

**Helpful Hero:** AI can make our lives easier by assisting with everyday tasks, helping doctors make better decisions, and even suggesting new songs or shows you might enjoy.

02

**Creative Companion:** It sparks creativity by creating art, music, and stories, opening new avenues for inspiration.

**Smart Problem-Solver:** From easing traffic congestion to solving intricate puzzles, AI helps things run more smoothly.

03

**Personalization:** AI-driven systems can offer personalized experiences, from product recommendations to tailored healthcare treatments, enhancing user satisfaction and outcomes.



## Dark side of AI

**Job Stealer:** There's a concern that AI might replace certain jobs, potentially leading to fewer opportunities in some fields.

01

**Privacy Invader:** Without careful management, AI could collect and misuse personal information, like a spy with too much access.

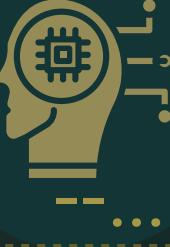


**Uncontrolled Power:** If AI becomes too powerful and isn't properly regulated, it might make decisions that aren't beneficial for everyone, like a rogue robot going off-script.

02

**Bias and Discrimination:** AI systems can inherit biases from their training data, leading to unfair or discriminatory outcomes in areas like hiring, policing, or lending.

# Machine Learning



## DID YOU KNOW?



The global machine learning market is on a rapid growth trajectory, with an impressive forecasted expansion rate of 38.76% from 2020 to 2030. This growth is driven by ML's integration into various fields, including image classification, speech recognition, and even genetics.

Also, Machine learning is helping to revolutionize healthcare. By 2026, the AI healthcare market is projected to reach \$45.2 billion, with machine learning playing a critical role in diagnosing diseases and personalizing treatments.

INTERESTING FACT

## Challenges to Consider:

- Privacy Concerns:** The use of personal data in datasets raises issues around data protection and security.
- Job Impact:** Automation could potentially lead to job losses and shifts in the job market.
- Economic Disparities:** Advanced economies might gain more from automation, potentially widening the gap between different regions.

## A Cool Use Case

Machine learning excels at personalized recommendations. Services like Netflix, Spotify, and Amazon use ML algorithms to analyze what you watch, listen to, or buy, and then suggest new content or products tailored just for you. It's a great example of how ML can enhance user experiences by predicting preferences.



## What is Machine Learning?

Machine Learning (ML) is a fascinating branch of artificial intelligence (AI) and computer science. It's all about teaching computers to learn from data and improve over time, much like how we humans learn from our experiences.



## Why Python is a Go-To for Machine Learning ?

Python has become a favorite for machine learning enthusiasts and professionals for several reasons:

- User-Friendly Syntax:** Python's straightforward and readable syntax makes coding more intuitive and less cumbersome.
- Rich Ecosystem of Libraries and Frameworks:** It boasts powerful libraries like NumPy for numerical tasks, Scikit-Learn for various ML algorithms, Pandas for data manipulation, and PyTorch for deep learning.
- Cross-Platform Flexibility:** Python works seamlessly across different operating systems like Windows, Mac, and Linux, making it a versatile choice for developers.



## Looking Ahead: The Future of Machine Learning

One exciting future direction for ML is neuromorphic computing. This technology aims to emulate the human brain's structure and function using specialized hardware. By using spiking neural networks, neuromorphic systems could significantly improve efficiency and speed, allowing for real-time learning and more energy-efficient models.

# CYBERSECURITY

## YOUR DIGITAL BODYGUARD



### The Super Tools

**Password:** Think of these as secret keys to your personal digital castle. To keep things secure, come up with strong, unique passwords for each of your accounts—like having a special lock that only you can open.

**Antivirus Software:** Picture this as a team of vigilant detectives on patrol. They're constantly scanning your computer, searching for viruses and other troublemakers to keep them at bay.

**Firewalls:** Imagine firewalls as a high-tech security fence around your network. They block unwanted guests from sneaking into your system, keeping the intruders out.

**Encryption:** Encryption is like sending your messages in code. Even if someone intercepts them, they won't be able to understand anything without the secret key.



### The Cyber Villains

**Hackers:** These are the sneaky characters trying to break into your digital space and steal your secrets. They're always lurking, so it's essential to stay vigilant.

**Phishing Scams:** Think of phishing scams as crafty tricksters pretending to be someone you know, trying to trick you into revealing your secrets. They often hide in seemingly harmless emails or links.

**Malware:** Malware are like those pesky gremlins that sneak into your devices. They slow things down, mess with your data, or worse.

Imagine cybersecurity as your personal digital bodyguard, always ready to protect your online space. Just like a real bodyguard keeps you safe in the physical world, cybersecurity has your back in the digital realm.



## The Sidekicks: Safety Tips



**Strong Password:** Create passwords that are tough to crack. Mix letters, numbers, and symbols to make them as secure as possible.

**Two-Factor Authorization:** Think of this as an extra layer of protection. Even if someone guesses your password, they'll need another piece of info to get in.

**Regular Updates:** Keep your software up-to-date, just like you'd update your phone or computer. These updates patch up any vulnerabilities and keep your defenses strong.

**Be Skeptical:** If you get an unexpected email or link, take a closer look. If something doesn't sit right, it might be a scam.

**Backup Your Data:** Store copies of your important files somewhere safe. If things go awry, you'll be able to recover your data without a hitch.

**Secure Wi-Fi:** Protect your home network with a solid password to keep digital intruders out.

**Educate Yourself:** Stay in the loop about the latest cybersecurity threats and how to fend them off. Knowledge is your best defense.

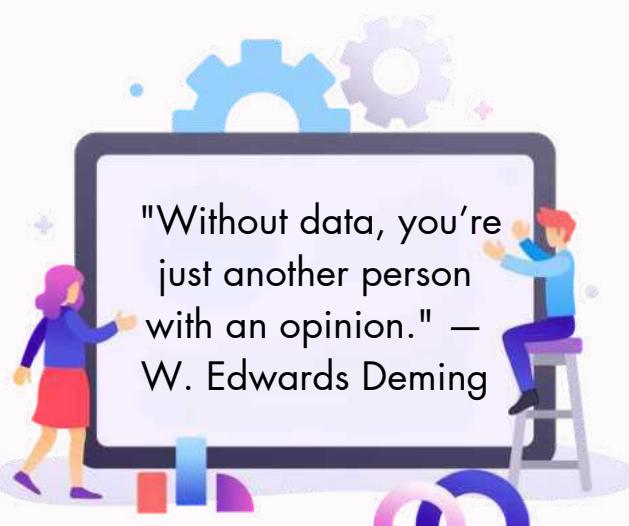
**Use a VPN:** When you're online, use a VPN to create a secure connection and keep your data shielded from prying eyes.



# EMBARK ON YOUR DATA SCIENCE JOURNEY

## Your Data Science Adventure Awaits!

Are you ready to take this adventurous journey in the field of data science? Imagine a world that exists at the junction between technology, mathematics, and storytelling to uncover hidden insights that can influence the future. In the midst of this new driving force, the role of a data scientist is more important than ever. Whether you are a fresh face looking to learn or someone looking for a career change, this roadmap is your way into endless possibilities. Picture yourself as a data detective: someone who turns trends into forecasts and forecasts into impactful decisions. It will guide you through each stage of your data science journey, from foundational skills to cutting-edge technologies. Ready to turn raw data into actionable insight?



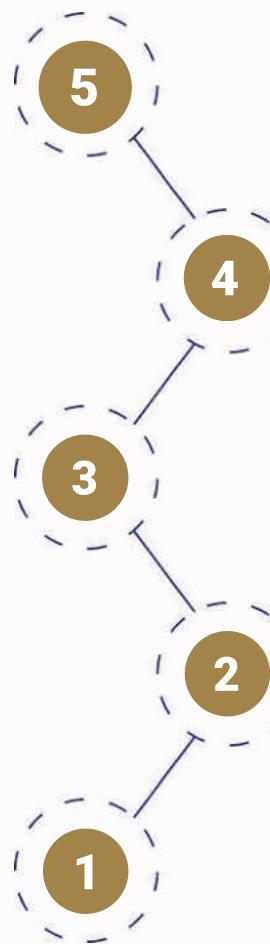
## Your Path to Becoming a Data Scientist

### Focus on Fundamentals:

Prioritize math and statistics over transient trends for a solid foundation.



**Practical Learning:** Dive into real-world projects and Kaggle datasets for hands-on experience.



**Balance Tools and Core Skills:** Learn Python and SQL, core skills like math, statistics, and communication skills.



**Networking via LinkedIn:** Build a professional profile to connect with industry experts and discover opportunities.



**Scam Awareness:** Verify course legitimacy and instructor credentials to avoid misleading offers.



## THE ROLE OF

# MATHEMATICS AND STATISTICS



Mathematics and statistics are the tools that can unlock insight into your data. One way to consider it is as your toolkit for building and refining a set of accurate models. While statistics provide you with techniques to see trends, mathematics empowers you with the ability to seek out solutions for tougher problems. Mastering these will give you a great foundation for nipping in the bud any challenge that comes your way about data efficiently. Dive deeper into probability and linear algebra to boost your analytical skills and change the way you extract meaningful insights from data.



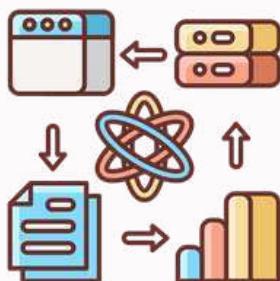
### Websites and Blogs:

- [Towards Data Science](#)
- [KDnuggets](#)
- [Analytics Vidhya](#)



### Books you can refer to:

- Python for Data Analysis by Wes McKinney
- Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow by Aurélien Géron
- Deep Learning by Ian Goodfellow, Yoshua Bengio, and Aaron Courville



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# UNLOCKING DESIGNING EXCELLENCE

## EXPLORING THE POWER OF GRAPHICS

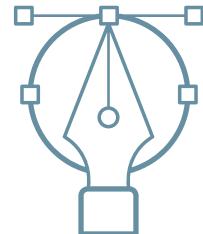
**Graphic design** is the art of composing visual elements – such as typography, images, colours, and shapes – to communicate information or convey a message effectively. From crafting a magazine layout, making a poster, to designing product packaging, it's all graphic design!

Graphic design software is like a magic toolkit for designers! These digital tools let you craft, edit, and enhance visual content. Packed with features for images, illustrations, layouts, and typography, they enable you to create everything from stunning logos to complex multimedia projects, turning your creative ideas into visual masterpieces.



Here are some of the coolest and most popular graphic design and photo editing softwares:

**Adobe Photoshop** is a raster graphics editor used for editing, retouching, and creating digital images. Photoshop can edit and compose raster images in multiple layers and supports masks and several colour models along with its PSD and PSB file formats.

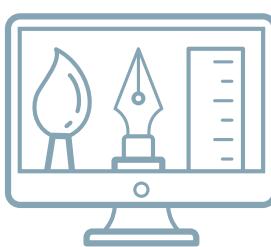


**Canva** is a software that lets you design professional visual materials without needing much in the way of graphic design skills. The tool can be used to create social media posts, videos, presentations, slides, posters, art, drawings and many other visual assets.



**Adobe Illustrator** is a design software that is centered around vector design.

You can create artwork, icons, posters, etc. and the designs created in Adobe Illustrator can be used in business cards or billboards and from smartphones to 8k screens.



**InDesign** is a desktop publishing and page layout software application. This graphic design software is used primarily in the publishing industry because you can design magazines, info sheets, books, posters, interactive PDFs, brochures, etc. with it

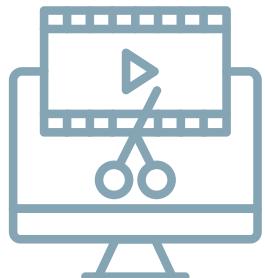


# UNLOCKING DESIGNING EXCELLENCE

## MASTERING MOTION

**Video Editing** is a dynamic process that transforms raw video clips into a polished final product. It's not just about cutting and merging footage; it also involves color correction, audio synchronization, and adding visual effects to enhance the overall aesthetic. Editors must consider pacing, continuity, and the emotional impact of each scene to ensure the narrative flows seamlessly.

**Animation** is a versatile art form that breathes life into otherwise static images. Through techniques like hand-drawn animation, stop-motion, or sophisticated computer-generated imagery (CGI), animators can create anything from simple cartoons to complex, hyper-realistic scenes. Animation can convey emotions, tell stories, or visualize abstract concepts in ways that live-action footage cannot.



**Check out these awesome tools for video editing and animations:**

**Adobe premiere pro** is one of the go-to editing tools for video, including film, TV, and clips for the web and social media. Premiere Pro's features cover almost any video editing need. It's a comprehensive and robust solution for any video production task.



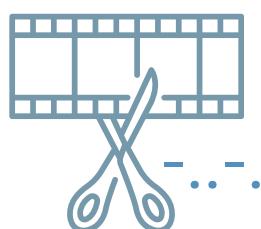
**Adobe Animate** is a versatile software used for creating interactive animations and multimedia content. It lets you design animations for websites, games, and apps using vector graphics, which means you can create smooth, scalable visuals.



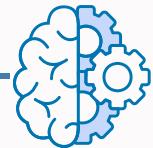
**The Character Animator** is a real-time animator that uses your facial expressions, hand movements, full-body motion capture, and various other inputs to animate characters. It is extremely smooth and fast and you can live stream your development process.



**After Effects** is a tool that's used to create animation and motion graphics effects. Unlike Adobe Premiere Pro, which is more focused on video editing, After Effects is designed to help create all the cool extras that make your motion graphics shine.



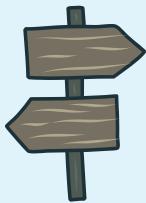
# CHECK YOUR BRAIN!



## Logical Puzzles



1. Jack is looking at Anne. Anne is looking at George. Jack is married, George is not, and we don't know if Anne is married. Is a married person looking at an unmarried person?



2. You're at a fork in the road in which one direction leads to the City of Lies (where everyone always lies) and the other to the City of Truth (where everyone always tells the truth). There's a person at the fork who lives in one of the cities, but you're not sure which one. What question could you ask the person to find out which road leads to the City of Truth?



3. A bad guy is playing Russian roulette with a six-shooter revolver. He puts in one bullet, spins the chambers and fires at you, but no bullet comes out. He gives you the choice of whether or not he should spin the chambers again before firing a second time. Should he spin again?

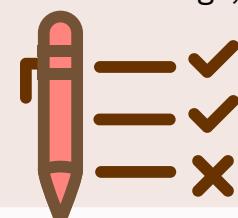
4. There are three crates, one with apples, one with oranges, and one with both apples and oranges mixed. Each crate is closed and labeled with one of three labels: Apples, Oranges, or Apples and Oranges. The label maker broke and labeled all of the crates incorrectly. How could you pick just one fruit from one crate to figure out what's in each crate?

5. Let's pretend we're on the metric system and use kilograms instead of pounds to give us a starting base number of 100. Four people (Alex, Brook, Chris and Dusty) want to cross a river in a boat that can only carry 100kg. Alex weighs 90kg, Brook weighs 80kg, Chris weighs 60kg and Dusty weighs 40kg, and they have 20kg of supplies. How do they get across?

## ANSWERS -----



1. Yes
2. "Which direction do you live?"
3. Yes
4. Chris and Dusty row across (combined 100kg), Dusty returns. Alex rows over, and Chris returns. Chris and Dusty row across again, Dusty returns. Brook rows across with the supplies (combined 100kg), and Chris returns. Chris and Dusty row across again.
5. Pick a fruit from the "Apples and Oranges" crate. If it's an apple, that crate is "Apples," the "Apples" crate is "Oranges," and the "Oranges" crate is "Apples and Oranges." If it's an orange, the labels adjust accordingly: "Oranges," "Apples," and "Apples and Oranges."



# Algorithmic Puzzles

**1. Coins and bags-** A dealer has 1000 coins and 10 bags. He has to divide the coins over the ten bags so that he can make any number of coins simply by handing over a few bags. How must divide his money into the ten bags?



**2. Place numbers:** Place the numbers 1 to 9 in a circle, so that wherever there are three in a straight line they shall add up to 15.

**3. WIN WIN-** Suppose two player, player A and player B have the infinite number of coins. Now they are sitting near a perfectly round table and going to play a game. The game is, in each turn, a player will put one coin anywhere on the table (not on the top of coin already placed on the table, but on the surface of the table). And the player who places the last coin on the table will win the game. Given player A will always move first suggest a strategy such that player A will always win, no matter how player B will play.

**4. The Poisoned Wine-** You are a king and have 1,000 bottles of wine. One of the bottles contains poison, and anyone who drinks it will die within 24 hours. You have 10 prisoners whom you suspect might try to assassinate you. You decide to find the poisoned bottle of wine by feeding it to the prisoners. You have only 24 hours to determine which bottle is poisoned. How do you do it?



## ANSWERS -----

1. Filling coins in the powers of 2.

2. Label the bottles from 1 to 1,000 in binary. Feed each prisoner a mix of wine from bottles where the corresponding binary digits are 1 in their number.

3. On the first move place the coin on the center of the table. Then player B will place his coin anywhere on the table

4. The pair elements (1, 9), (2, 8), (3, 7), (4, 6) must be placed opposite to each other to attain the required sum. It implies 1 is placed opposite to 9, 2 is placed opposite to 8, 3 is placed opposite to 7, 4 is placed opposite to 6 and 5 is placed at center.



# MAPPING CAREER JOURNEYS

## ROADMAP TO SECURE TECH INTERNSHIP

Starting your journey in Computer Science, IT or any tech-related field is exciting, but it can also feel overwhelming. One of the most significant achievements during your academic career is securing an internship, which can open doors to future job opportunities. This guide will help you focus on what is essential to land an internship.

### Master the Fundamentals

Building a strong foundation is essential to impress potential employers during interviews and assessments.

#### Focus Areas

- Programming Languages:** Start with C, C++ or Java.
- Data Structures & Algorithms:** Learn about arrays, linked lists, stacks, queues and basic algorithms.
- Computer Science Basics:** Get a grasp of operating systems, databases and networking.

1

2

### Begin Coding Early and Consistently

Regular practice sharpens your problem-solving abilities and prepares you for the coding challenges in internships.

#### Action Steps

**Daily Practice:** Dedicate time each day to solving problems on platforms like LeetCode, HackerRank, Codechef or Codeforces.

**Participate in Contests:** Join coding competitions on these platforms to test your skills in a competitive environment.

**Learn from Mistakes:** Review and understand the solutions to problems you struggle with, rather than just moving on.

### Prepare a Standout Resume

**Highlight Key Skills:** Focus on technical skills like programming languages, tools (e.g., Git, SQL) and frameworks.

**Concise Format:** Keep your resume clear and concise, typically within one page.

**Project Details:** Include descriptions of your projects, emphasizing your role, the technologies used and the impact of the project.

**Continuous Updates:** Regularly update your resume with new skills, certifications and project.

### Work on Personal Projects

Projects are a practical demonstration of your skills and creativity. They show employers that you can apply what you have learned to real-world scenarios.

#### Types of Projects

**Web Development:** Create a personal portfolio website or a small web application.

**Mobile Apps:** Build simple mobile apps using tools like Android Studio or React Native.

**Open Source Contributions:** Contribute to open-source projects on GitHub, which helps in networking with other developers.

3

4

### Learn and Use Version Control

Version control systems like Git are essential in collaborative environments, a skill that is often required in internships.

#### Action Steps

**Set Up Git:** Learn how to set up and use Git for managing your project versions.

**Use GitHub:** Create a GitHub account to host your projects and start contributing to open-source repositories.

**Collaborate:** Work on group projects with peers, utilizing Git for version control.

# MAPPING CAREER JOURNEYS

## OPPORTUNITY HUB

### Internships

Internships are a gateway for students to gain hands-on experience in real-world projects, working alongside industry professionals.

### Hackathons

Hackathons are an exciting opportunity for students to collaborate, innovate and solve real-world challenges in a competitive environment.

### Mentorship Programs

Mentorship programs provide students with guidance and support from experienced professionals or senior students to help students in their career.



## Explore and Elevate Schedule



### Scholarship Program For First Year Student

Program Names	Tentative Months
1.Nutanix Advancing Women in Technology Scholarship	February-May
2.Google WE Program	July-August
3.Amazon Future Engineers Scholarship and Internship program (for female students only)	September-October
4.Siemens Scholarship Program	November-December

### Some Useful Links

- Youtube Channel: <https://www.youtube.com/@ArshGoyal>
- Platforms:[LinkedIn](#) , [Wellfound](#) , [Naukri](#), [Indeed](#), [AICTE](#)
- Career Sites:[Amazon](#) , [Google](#) , [Microsoft](#) , [Goldman Sachs](#)

### Internship,Hackathon & Mentorship Program For Second Year Student

Program Names	Tentative Months
1.JP Morgan Chase & Co - code for good	January-February
2.LinkedIn Mentorship Program (for female students only)	January-February
3.Flipkart Runaway	February-March
4.Google Summer of Code (GSOC)	February-March
5.American Express Makeathon	April-June
6.Google Girl Hackathon (for female students only)	May-June
7.Microsoft Engage Mentorship program	May-June
8.Atlan Engineering Fellowship	July-August
9.Flipkart Grid	July-August
10.NXP WIT Mentorship Program	July-August
11.DE Shaw & Co. Ascend Educare Program (for female students only)	August-September
12.Smart India Hackathon	August-September
13.Google Step Internship	November-December

### Internship & Hackathon Program For Third Year Student

Program Names	Tentative Months
1.Flipkart Girls Wanna Code	January-February
2.Service Now Internship Program	March-April
3.American express codeStreet	April-May
4.Amazon ML Summer School program	May-June
5.Myntra HackerRamp	May-June
6.RazorPay Internship	May-June
7.Siemens Internship	May-June
8.Google - SWE Intern	May-July
9.Flipkart Grid	June-July
10.Goldman Sachs - Summer Analyst	June-July
11.Groww - Web Development Internship	June-July
12.Microsoft-SWE Internship	June-July
13.Salesforce - SDE Internship	June-July
14.Swiggy - Data Science Internship	June-July
15.Walmart Sparkathon	June-July
16.Amazon ML Challenge	July-August
17.Atlassian Women In Tech	July-August
18.Cisco-SDE Intern	July-August
19.Goldman Sachs - Engineering Campus Hiring Program	July-August
20.MongoDB - Data Engineer Internship	July-August
21.Zuno Fellowship Program(for female student only)	September-October
22.Amazon Wow	November-December
23.Intuit Program	November-December
24. Morgan Stanley Internship Program	November-December

### Stay Updated on Internship Opportunities

- Regularly Visit Company Websites
- Set Reminders for Application Dates
- Subscribe to Newsletters and Job Portals
- Follow Companies on Social Media

NOTE:Dates are provisional,keep visiting the career portal of the companies for the most up-to-date information.



# ENTREPRENEURSHIP

The path to entrepreneurship is filled with excitement and challenges. This guide is here to help you navigate the twists and turns from that initial spark of an idea to building a successful tech startup.

1

## Ideation

Your idea should be something innovative, practical, and scalable. Take your time in brainstorm, research and refine until your concept is ready to shine.

2

## Market Research

Dive deep into market research to understand your audience, competitors and industry trends. This step is crucial to help you figure out if there's real demand for your product or service.

3

## Building the Right Team

Find people who bring complementary skills. Whether it's a co-founder, employees or freelancers, ensure everyone is on the same page about your company's values.

4

## Product Development

To develop your product or service, start with something that meets the basic needs of your target audience.

5

## Funding

Look into different options like bootstrapping, angel investors, venture capital and crowdfunding. Each has its pros and cons, so pick what best suits your business model and growth plans.

6

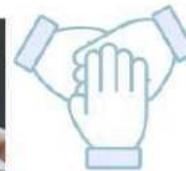
## Scaling and Growth

As your startup gains momentum, it's time to think about scaling. This means expanding your product offerings, entering new markets and optimizing your operations in sustainable way.

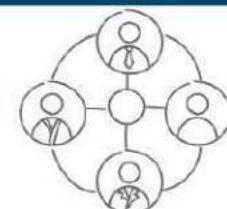
7

## Continuous Innovation

In the ever-evolving tech industry, constantly seek feedback from customers, keep an eye on emerging trends and invest in research and development.



To register a startup, first choose your business structure (e.g., sole proprietorship, LLC, corporation), then select and register a unique business name. Next, file the necessary documents with your local, state, or national government, such as Articles of Incorporation or a Doing Business As (DBA) name.



Government policies supporting startups often include tax incentives like R&D tax credits, grants and subsidies to encourage innovation and growth. They simplify registration processes, offer access to government-backed loans and create venture capital funds to improve financing options.

# ULTIMATE FUTURE PROSPECTS



Navigating the diverse landscape of tech careers can be both exciting and overwhelming. From software development to machine learning, each role offers unique opportunities and challenges. Here's a concise guide to understanding different tech roles, their perks, and where you can find job opportunities to kickstart your career.

## Software Engineer (SWE)

**Google - Software Engineering Intern/Full-time**  
[Google Careers](#)

**Microsoft - Software Engineering Roles**  
[careers.microsoft.com](#)

## Software Development Engineer (SDE)

**Amazon Software Development Engineer (SDE)**  
[amazon.jobs](#)

**Google Engineering Residency**  
[careers.google.com](#)

## UX/UI Designer

**IBM Design Program**  
[IBM Careers](#)

**Microsoft Design Careers**  
[careers.microsoft.com](#)

## Cybersecurity Analyst

**Cisco Certified CyberOps Associate**  
[learningnetwork.cisco.com/s/certifications/cyberops-associate](#)

**Accenture Cybersecurity Analyst Program**  
[www.accenture.com/us-en/careers/cybersecurity-analyst](#)

## Machine Learning Engineer (MLE)

**IBM Data Science and AI Residency Program**  
[IBM Careers](#)

**Facebook AI Research (FAIR) Residency**  
[Meta Careers](#)

# EVENT CALENDAR

## GAME OF CODES

Which offers you the opportunity to sharpen and improve your programming skills.

AUG

SEP

## ORIENTATION

To inspire freshers with enthusiasm to begin their technical journey and offer them an introduction to CES

## CONNOISSEUR

A webinar aimed at guiding newcomers on academic choices, career paths, and specialization options

OCT

DEC

## CODE CRUSADE

An exciting event that helps you to test your coding skills and mental ability

## CTF 1.0

A 24-hour CTF event offering an immersive experience in cryptography and cyber forensics on a dedicated website

JAN

MAR

## ENNEKUS

A fest of unforgettable events.  
The annual fest of CES



## CODIGO

The event offers a platform to display your programming skills and expertise.



## CAPTURE THE FLAG 2.0

Exploring new areas in cybersecurity and tackling exciting challenges, including topics like Binary Exponentiation, Reverse Engineering, Forensics, and more.

## DEBUGGER KING

In the coding world, errors don't yield the results you want. To achieve perfection, this event is designed to help you master your debugging skills.

## FLIP FLOP

The best work happens when your team is well-bonded. To test the compatibility and collaborative thinking between you and your teammate, we present the Flip Flop event.



## INDUCTION

Advance your tech journey by becoming part of the vibrant Computer Engineering Society. Unleash innovation, enhance your skills, and build connections that ignite your passion for technology.

MAY

# NOTABLE ALUMNI



Vaishnavi Porwal ( Batch 2024 )

@Flipkart



Sejal Gangwar ( Batch 2024 )

@Flipkart



Akriti Srivastava ( Batch 2024 )

@Amazon



Anupriya Sharma ( Batch 2023 )

@BNY Mellon



Aradhya Tripathi ( Batch 2023 )

@Google



Ujjawal Gupta ( Batch 2023 )

@Zomato



Rupal Singh ( Batch 2023 )

@PhonePe



Pawan Kushwaha ( Batch 2022 )

@Amazon

# FINAL YEAR MEMBERS



Aastha Singh  
Sachan



Anant Sharan  
Pandey



Anjali Mishra



Ankush Gupta



Ayushi Singh



Deepak Kumar



Devansh Tripathi



Gautam Kumar  
Shah



Kartikay Singh



Manvendra  
Sharma



Niraj Kumar



Pragyanand  
Singh



Prashu Verma



Pankaj Rana



Raghvendra  
Tiwari



Sheetal Singh



Somiya Kumari



Sonali Rao



Yashaswi Shahi

# THIRD YEAR

# MEMBERS



Aaradhaya  
Singh



Abhijeet Kumar  
Gupta



Anish Tiwari



Anjali Shekher



Ankush Yadav



Ashish Ranjan  
Singh



Ayush Sharma



Chandra Bhushan  
Gudheniya



Dinkar Gupta



Divyansh  
Vishwakarma



Ipshita Gupta



Ishita Srivastava



Manmeet  
Kishore Maurya



Pranvi Jaiswal



Pratham Khanna



Samriddhi  
Srivastava



Sidra Ahsan



Sparsh Gupta



Utkarsh Verma

# SECOND YEAR MEMBERS



Abhishek



Aditi Gupta



Aliya Aftab



Anand Maurya



Avinash Gupta



Awijeet Singh



Ayush Rai



Dakshita Singh



Devang Agarwal



Himanshu  
Upadhyay



Kumar Ansh



Kunal



Manya Rawat



Mukesh Kumar  
Singh



Muskan



Parv Agarwal



Priya Verma



Rajnandani  
Gupta



Shubhi  
Srivastava



Yash Sinha

# Previous Ennexus SPONSOR



Electro World

## Glimpses of ENNEXUS-2K24



## ENNEXUS-2K24 Winners



# Message from Us

We are excited to present the third edition of Algorica, our tech magazine designed to inspire and guide freshmen as they embark on their computer science journey. This edition is a complete guide that gives you helpful information about preparing for placements, choosing the right career path and learning about new technologies. With inspiring stories from successful alumni and industry leaders, this magazine is here to equip you with the knowledge and confidence needed to excel in the world of computer science. Filled with tips on how to succeed in interviews, explore different career options, and keep up with the latest tech trends, Algorica is your guide for a successful college experience.

We want to extend our heartfelt gratitude to our readers. Your support and enthusiasm inspire us to create content that truly matters. We hope Algorica continues to be a valuable resource on your journey.

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THOUGHTS ABOUT ALGORICA

# ALGORICA

COMPUTER ENGINEERING SOCIETY

*"Technology, like poetry, is the language through which we articulate our dreams and aspirations for the future."*

-Sherry Turkle



**COMPUTER ENGINEERING SOCIETY  
MMMUT, GORAKHPUR**