

UNIVERSITY OF DELHI DEPARTMENT OF COMPUTER SCIENCE

April 2025

FROM ACADEMIA TO INDUSTRY

CRACKING PLACEMENTS AT DUCS

LIGHTS, CAMERA, INNOVATION

THE IMPACT OF TECHNOLOGY ON FILM





SAIR-SAPATA

d¦S

olume

FIRSTHAND EXPERIENCES AT SOME OF THE MOST TALKED-ABOUT SPOTS IN DELHI

Website cs.du.ac.in

SRIJAN The inception of ideas

SRIJAN is a periodical designed to gather reflections and expressions that foster dialogue. The annual publication captures the dynamics of contemporary technological landscapes and amalgamates the viewpoints of the new generation. SRIJAN seamlessly integrates creativity with commentary and presents the intrinsic culture prevalent at DUCS. It constitutes a compendium of imagination, insights, and artistic expression. serving as a robust emblem of the DUCS community.



The magazine publishes analytical and feature articles, highlights the exciting, enjoyable, and educational events of the DUCSS, welcomes voices from the department, and honors the craftsmanship of the writers. SRIJAN aligns with the mission established at the inception of the Department of Computer Science, which is to nurture minds in computer science with unparalleled excellence. Each page of this magazine is dedicated to the individuals who are companions on this incredible journey.

SRIJAN 2025 marks our 15th edition, celebrating the wonderful ideals woven into the fabric of the DUCS communities. This edition takes us on a journey through inspiring ideas that are shaping the future of science, technology, engineering, and mathematics. As the American writer John Jay Chapman (1862 - 1933) wisely noted, "A magazine or a newspaper is a shop. Each is an experiment, representing a new focus, a new balance between commerce and intellect." Enjoy the rich exchange of ideas and "shop" for information and viewpoints.

OUR PREVIOUS EDITIONS





MPUTER SCIENCE + UNIVERSITY OF D

SRIJAN







University of Delhi



Department of Computer Science, University of Delh





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The Delhi University Computer Science Society (DUCSS) proudly represents the Department of Computer Science at the University of Delhi, fostering innovation, research, and collaborative learning. Through engaging technical events, DUCSS creates valuable opportunities for students' personal and professional development.

The department offers diverse academic programs at postgraduate, doctoral, and undergraduate levels. The Master of Computer Applications (MCA) program, launched in 1982 as one of the country's earliest, is now a two-year course. The M.Sc. Computer Science program, introduced in 2004, focuses on developing core competence and preparing students for research and industry challenges. Internship and placement activities further enhance career readiness.

At the undergraduate level, the department offers B.Sc. (H) Computer Science, B.Sc. Physical Science with Computer Science, B.Sc. Mathematical Science with Computer Science, and a B.A. program with Computer Applications through various constituent colleges.

The department also offers a Ph.D. program supported by research fellowships and guided by an esteemed faculty, including research supervisors from affiliated colleges. Faculty members actively contribute to extramural research projects, enriching academic excellence.

DUCS is more than an academic entity—it's an emotion that profoundly shapes the lives of students admitted to this prestigious institution. Its vibrant societies and impactful events create lasting memories and foster lifelong connections.



ducsofficial 🐽 cs.du.ac.in

BOUT DUCS



Neelima Gupta

Senior Professor

Head of the Department & Dean, Faculty of Mathematical Sciences

"At the Department of Computer Science, University of Delhi, we are dedicated to creating an environment that nurtures innovation and creativity. Our commitment to academic excellence is exemplified by our diverse array of programs, courses, and outstanding research projects. Alongside our rigorous academic focus, we offer a vibrant platform for various activities, like sports meets and recently organized trekking trips, that cultivate a well-rounded environment that encourages teamwork, leadership, resilience, and adaptability.

I am very pleased to present to you this magazine that encapsulates all these ideas through words and images. SRIJAN transcends the typical boundaries of conventional publications by not only offering articles and poetry but also addressing pressing global issues in technology, alongside showcasing charming hand-drawn artworks. The section titled Life @DUCS vividly reflects the vibrant spirit of our department. This edition also introduces a new segment called Sair-Sapata, which provides a poetic glimpse into the many unique corners of Delhi.

I see this magazine as a celebration of the cultural roots of DUCS. I see it as an invitation for the readers to think critically and creatively about the future of technology. I hope insights contained within its pages will inspire the readers to contribute to the ongoing dialogue of innovation and progress. I would like to express my gratitude to the editors, authors, and designers for their commitment to curating this edition. I am confident that SRIJAN will continue to present insightful and contemporary discussions in the forthcoming years."



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The Coding Society at DUCS: Fostering Creativity and Teamwork

This society is run by our seniors and managed and incorporated with coding enthusiasts, who know programming , problemsolving and up-to-date with industry-level technological exposure. The aim is to establish an atmosphere where every participant eager to learn can exchange knowledge, learn from themselves, and advance their technical proficiency.

Our Goal

The aim is to build a strong coding culture and give each participant confidence, up-to-date technical skills, and all essential resources. The sessions incorporate peer-to-peer learning and foster an inclusive environment for development.

What we do

• Coding Challenges: Develop your problem-solving abilities by participating in sites like GeeksforGeeks, LeetCode, and Codeforces.

• **Knowledge Sharing:** Peer-to-peer interaction, coding resources, and tutorials in software development and competitive programming.

• **Project-Based Learning:** Working on real-world projects for skills improvement and creativity while being given feedback.

• Hackathons & Contests: They motivate us to participate in such competitions to test and enhance our coding skills while encouraging teamwork to participate in the contests in DU colleges.

• Workshops & Expert Talks: The recent workshop, provided by quantum computing and cryptography, will close the gap between academia and industry, learning from experts on Software Development, Cybersecurity, and Artificial Intelligence subject matter experts from the industry.

Delhi University Computer Science Research Club: DUCS RC

This club encourages the students of DUCS to join research as a passion, it now comprises 24 active members, including PhD, MSc, and MCA scholars who are committed to advancing their knowledge in the field of Computer Science and making a significant contribution through their research.

Our area of Interest

• **Discussions about Research Papers:** Regular discussions about how to approach reading research papers in innovative areas like AI, Machine Learning, and cryptography.

• Collaborative Learning: Peer-to-peer ideas reviews and approaches to improve research ability and foster a culture of critical thinking.

• Workshops and Guest Lectures: Provide a series of guest experts and discussions and/or sessions on research methods to assist students with their research initiatives.

• Open Source & Practical Research: Encourage research contributions that are practical and promote experiential learning.

Get Involved, Join us, and explore more at the DUCS RC Website.

DUCS Placement Society: Bridging Talent with Opportunity

This society aims to help students of DUCS get ready for the job world with these companies and come up with advice on internships and placements.

Goals and Tasks

• Mock Interviews & Resume Building: Students improve their job application skills by practicing for interviews and attending resume workshops.

• Industry insights & networking: To offer career guidance, host panel discussions and guest lectures with professionals.

• Job and Internship Opportunities: Work with recruiters to provide internships and placements specifically tailored to each individual.

• Skill & Soft-Skill Development: Workshops focus on problemsolving and communication to improve employability.

Recent Outcomes: They've connected students with job prospects by showing them hiring processes, growing industry contacts, and using special course programs.

Current Efforts

• Ciena Placement Event: Special hiring event offering job opportunities.

• 7-Day Faculty Development Program (FDP): Classes on Cryptography & Quantum Computing.

• Kickstarter Session: Expert advice on placement strategies.

• Crack the Code: Students team up with industry pros in a Q&A format to tackle placement hurdles.

• Network Bulls Industrial Visit: Students get hands-on exposure to networking tech, explore NATs, and learn about real-world networking answers.

For updates, stay in touch and follow DUCS Placement Society: <u>LinkedIn</u>.



DR. OM PAL Faculty Advisor



Abhishek Mahar Coordinator



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Pardeep Singh PhD Coordinator



Deepak Jangir Treasurer

"This literary piece would not have come into existence without the continued and combined efforts of all the Juniors and Seniors, Editors and Designers, Contributors and Critics alike.

What began with extensive planning and brainstorming eventually transformed into a whirlwind of deadlines for many, as team members juggled multiple roles along the way. However, this made the journey all the more exhilarating and worthwhile. Moving forward (pun intended ;)) is always easier once you've taken that first big step, after all.

Our heartfelt gratitude goes out to everyone who influenced the creation of this magazine in one way or another. Without your contributions, this would have remained a distant dream. So, give yourself a pat on the back if you were one of those contributors, or be ready to give one to yourself regardless, for picking this up, because you are about to embark on a journey that goes beyond broadening your horizons with enlightening articles. You'll also challenge your mind with a crossword, reimagine the famous corners of Delhi all while sipping a cup of tea, enjoying some poetry, and appreciate the paint strokes on the canvas of reality. The possibilities are limitless (so are you! <3).

As we pass the baton of "SRIJAN" into your capable hands, we bid you farewell (or Freshwell :p), hoping that your experience will be as joyful as it was for us to curate."

> Till we meet again, Team SRIJAN

Publication Designer



Aditi Sharma

"I have too many tabs open . Both in my browser and my brain"

Publication Designer



Riya Tyagi "Life's an open-source project, and I'm still committing updates"





Sankalp Tiwari "Two things about me: I love CS and I only talk in Sarcasm."

Visual Editor



Ritesh Gupta "sudo rm -rf/"

Publication Designer



Soubhadra Kayal

"Life gives me too many lemons, so now I make lemonades for everyone."

Publication Designer



Megha Kumari "Done and dusted because procrastination wasn't an option!"

Editor-in-Chief



Arsh Pathak "AI will replace you, they said..."

Managing Editor



Rohan Kumar "Somehow managed to make this team"

Writer & Editor



Varsha Saini "Motivation didn't push me this far; the fear of deadlines did..."

Writer & Editor



Jishnu Bandyopadhyay "I was promised food for this"

Writer & Editor



Harsha Vardhan " I colour outside the lines on purpose"

Writer & Editor



Vansh Garg "Code is my languages, silence is my vibe"

Writer & Editor



Prachi Bhatia "If it ain't broke, don't fix it" -Adam Sandler

Writer & Editor



Priyanka Kumari *"Humble at heart, curious by nature."*





FACULTY DEVELOPEMENT PROGRAMME



























MOU with CDAC

Empowering the next generation of tech leaders!

C-DAC Noida and University of Delhi's new partnership will provide unparalleled opportunities in Quantum Computing, Artificial Intelligence, VLSI and secure hardware. Students and faculty will gain hands-on experience through training, internships, and collaborative research.



Organized under ISEA Project Phase III, in association with C-DAC and the University of Delhi, the event successfully promoted cybersecurity awareness with the vision of "Empowering Minds, Securing Digital Lives." It marked a collective step towards building a safer and more informed digital world.







Departmental Trek



















The Department crafted an unforgettable escape -away from our screens and into the heart of nature. From dancing and singing on the way to Devprayag Sangam to trekking up Tungnath with its breathtaking snow-capped views, every moment was filled with adventure. Deoria Taal's serene beauty, made even more magical by the rain, left us in awe. And finally, Holi in Rishikesh brought out everyone's playful side in a riot of colors.

prayag

Strangers became friends, supporting each other through every challenge—and in the end, we walked away with memories we'll cherish forever.











S Sports Day





Games & Fun

Sports Day, '25 was the remarkable day to celebrate athletes within the DUCS committee. The excellent and energetic performance of sportsmanship in their

respective sport was shown by the students; from volunteering to judging the specific sports, everything was done under the guidance of the DUCS panel, who made sure every sport was fair and under the time limit. Lastly, the active participation of students makes this event remarkable in DUCS's journey.

CRICKET, BADMINTON, CHESS AND BEYOND





LIGHTS, CAMERA, INNOVATION: THE IMPACT OF TECHNOLOGY ON FILM

Harsha Vardhan (M.Sc. 2024-26)

inema has been, and will continue to be, the epitome of human imagination. Its ability to narrate stories will continue to enchant people in the future. Since technological advancements affect the approach to making films, how these stories are delivered is ever-changing. With the integration of Artificial Intelligence, Virtual Reality, and Machine Learning with cinema, the future of filmmaking is set to become even more dynamic and immersive than imagination itself; such technologies are capable of improving how stories are told and experienced. The question of how to maintain the correct balance between technological advancement and artistic integrity is intact and vital.

Al has not only made it easier to write scripts but has also improved production outcomes. Some new tools - including automated storyboarding- help directors seamlessly create a framework of shots required in a scene. Al-powered editing software comes with suggestions for the best cut which reduces time spent on postproduction tasks. Furthermore, digital deaging techniques and deepfake technology have changed the way actors appear on screen- make older ones appear younger!and have made it possible to even simulate the past.

Speaking of the revolution in cinematography, the industry has seen a rise in the popularity of robotic cameras. Famously known as "mocobots," these



bots make capturing complex, crisp, and precise shots much easier. Besides them, drone-to-hand cameras have become incredibly useful, allowing filmmakers to seamlessly capture aerial shots of landscapes and instantly shift to a character's point of view-something that typically requires expensive gear and machinery. Not only have visually stunning landscapes become easier to film, but achieving satisfyingly detailed microcinematic shots has also become less of a hassle with the help of special lenses called diopters.



Filmmaking styles are now being redefined right from the initial stage of scriptwriting to the visualization of storyboards, providing filmmakers with a clearer connection between imagination and execution. This clarity makes the production process more cost-efficient, as the requirements are identified in advance. As a result, filmmakers have greater creative freedom to curate compelling plots and deliver a more immersive experience.

RTICLES

Animated films—surprisingly underrated but one of the most beautiful forms of storytelling—are now being created entirely with the help of artificial intelligence! From designing characters to animating life-like expressions, AI is revolutionizing animation production. What's baffling is that Al-driven software can automatically generate inbetween frames, allowing for smoother animation without extensive manual intervention. This not only speeds up production but also enhances the level of character emotions, detail in making animated storytelling highly immersive. To conclude, filmmaking is evolving at a

pace that matches—or perhaps even surpasses—other technological advancements. The future of filmmaking is not just about technology; it is about striking the perfect balance between innovation and the timeless art of storytelling.





IMPACT OF OPEN SOURCE Community



Vansh Garg (M.C.A. 2024-26)

f you want to become an Open Source Contributor- or already are- then you must know about the importance of Version Control System along with the platforms that allow you to contribute towards open source projects. Open source contribution refers to actively participating in projects or applications developed by others, from adding exciting features to fixing bugs. Open source contributors collectively form the foundation of the open source community.

The term Version Control System immediately brings to mind Git and GitHub. Git is a distributed version control system that runs locally on your system and operates through the Command Line Interface. It manages logs of any changes committed in the project. On the other hand, Github is a remote cloud based software that helps manage version control systems through Graphical User Interface. The Open Source Community uses both

Git and Github extensively as they are one of the main pillars of Open Source. Once a contributor has decided to initiate a change, they generate a pull request. These changes are made available locally from the remote repository and committed to the project under development. Lo and behold, this request is finally merged at the discretion of the project owner, who must be satisfied with the quality and correctness of these changes!

It is common to misunderstand the essence of a contribution. With their fascination and eagerness to simply contribute, developers often correct a mere two or three lines in the README.md file. This is not believed to be а good practice. **Open-source** contributions provide real-world experience, enhance understanding of professional workflows, and offer recognition along with perks and networking opportunities related to one's contributions.



There exist several open-source software, tools, and systems. This means you can contribute by adding new features or fixing Some notable bugs. examples include WordPress. VLC Media Player, and LibreOffice in Linux, as well as Sanity and Strapi. Even operating systems like Linux, Unix, Android, and openSUSE are open source! Unlike proprietary software, where development is limited to in-house teams, projects benefit open-source from worldwide contributions. This ensures fast bug fixes, security updates, and the incorporation of diverse ideas, ultimately increasing accessibility for contributors and the community.

Hackathons such as Hacktoberfest, GSSoC(Girlscript Summer of Code), Social code of Winter, GSoC(Google Summer of Code) among several more encourage the community to participate in Open Source



Contribution. Such competitions motivate through diverse winners perks and encourage participants to subsequently do better. Such contests instill a sense of competitiveness within the community-one that inspires participants to enhance their logical skills, improve their reasoning, and apply their expertise to building efficient fixing complex features and bugs. Developers-finding this competitive environment lucrative-dive headfirst into making meaningful contributions that not only positively impact projects but also enhance their own skills.

Besides welcoming contributions, the opensource community also lends a helping hand friends to both and rivals alike. Acquaintances support one another, share knowledge, and grow together as a community. The open-source community is more than just a group of contributors or a collection of feature additions and bug fixes; it is a movement driven by collaboration, transparency, and innovation. For students, researchers, and aspiring tech professionals, contributing to open source provides valuable experience, opens doors to new opportunities, and helps shape the future of technology. Additionally, contributors and members community qain alobal networking opportunities, fostering connections across the industry.

CROSSWORD Prachi Bhatia





(M.Sc. 2024 - 26)

Blue's Clues

Across

1. Transforms polynomials in a flash—just like its Fourier cousin does for signals!

3. Indian statistician who developed a namesake distance metric used in machine learning

7. Alan Turing cracked the code of this German cipher Machine which eventually helped shorten WWII—his genius inspired a 2014 movie starring Benedict Cumberbatch.

8. The OS that keeps robots up and running

11. According to this paradox, for AI hard is easy, and easy is hard!

13. A Russian mathematician who solved the Poincaré Conjecture with Ricci Flow, then rejected a million-dollar prize—his work shapes deep learning today. GNNs reshape graphs using Ricci curvature to ease bottlenecks and improve message flow.

14. World's largest biometric database, using AI and pattern recognition for authentication

Down

2. A small unit of data sent over a network

3. Turns digital dreams into signals your ISP understands—but has the memory of a goldfish when powered off.

4. Supplied by a Kyoto-based motor maker to Apple, this engine makes virtual buttons feel real.

5. This Indian scientist developed an algorithm that finds an item in an unsorted database in \sqrt{N} time.

6. The 2015 CV system that mistakenly labeled a Black couple as gorillas

9. Where code takes flight—sometimes all the way to Mars!

10. When this protocol glitched in 2021, Facebook accidentally removed itself from the internet!

12. His cat's fate is a quantum debate!

15. Whether in circuits or sprints, this switches things up! A tiny switch that lets robots make big decisions.

Across: J. FPT 3. Mahalanobis 7. Enigma 8. ROS 11. Moravec 13. Perelman 14. Aadhar Down 2. Packet 3. Modem 4. Taptic 5. Lov Grover 6. Google 9. NASA 10. BGP 12. Schrödinger 15. Relay

ANSWERS

COMPUTER SCIENCE: A ROLLER-COASTER OF FUN AND PAIN



Jishnu Bandyopadhyay -(M.Sc. 2024-26)

Motivation is what drives people to do things. It mostly comes from love and wanting to do something, and sometimes it comes from hatred towards something. Here I present some sweet and sour tales of computer science.

There was a time when the 'goto' statement was a thing in programming languages. A man named Edsger Dijkstra hated it for its lack of logic, creating 'spaghetti code'. In his famous letter 'Go-to statement considered harmful,' he argued any prograspite, he proceeded to create Linux. He later returned with Git, frustrated again, this time with the BitKeeper version control system. Donald Knuth was annoyed when he saw the bad typography of his new book. The frustration reached a level so high that he created TeX, now considered a gold standard for academic papers.

Recently a petty drama between two X (Twitter) users resulted in one person recreating the other's project, The Little Guy (the user claimed it raised \$1.2 million), from



mming concept that is written with goto written usina could also be loops. conditional statements, and other jump statements. Today it is rarely used in modern standards. Dijkstra was not the only person driven by anger and spite. Irritated by proprietary software like printer drivers and compilers, Richard Stallman proceeded to start the Free Software Foundation and GPL Licensing, which paved the path for open-source projects. Microsoft, once an avid hater of this, later contributed to various open-source projects.

Once upon a time, Linus Torvalds wanted to experiment with MINIX, an educational OS by Andrew Tanenbaum. But he could not due to its closed-source property. Fueled by scratch in 200 lines of code and opensourcing it. Even today, fueled by sheer spite and hatred towards big companies, many are working for free on ad-blockers, piracy sites, and software mods, although ethically debatable.

Well, things are not always fun and easily appreciated. There are some tragic counterparts to it too. Every computer science introduction class includes the historic significance of Alan Turing. The 'Father of Modern Computer Science' laid the foundation of many important concepts with the idea of the Turing Machine, the Church-Turing Thesis, the Turing Test, and many more. In World War 2, he deciphered the German Enigma code, which saved millions of lives and ended the war early.The government later appreciated it and pointed out he was gay, so naturally his groundbreaking work becomes meaningless. We, the generous creatures called humans, thanked him by chemical castration. He later committed suicide with cyanide.



Geoffrey Hinton was a well-known man in computer science; the public has known him since he won the Nobel Prize in Physics (first the market hype, then CS took the Nobel Prize from physics!). Not everyone is happy. You would think it is normal Hinton would do impressive things when you realize he comes from the family of George Boole (yes, inventor of Boolean Algebra), Howard Everest (guess it!), etc.



The father of Geoffrey Hinton, Howard Hinton, was a famous entomologist, and he did not have the best relationship with his son. His father would regularly belittle him for not reaching his expectation. Howard Hinton's university study room was filled with boxes; one small box labelled 'Not Insects' was reserved for things related to his family. When Geoffrey Hinton was trying to simulate neurons in a computer to study the human brain, his PhD advisor told him to drop the idea, or it might ruin his career. Today Hinton is called the Godfather of AI, but it was not always fun and games.

In the end, today, there might be many Turings and Hintons who are trying to figure out the secrets of the world and struggling. If you, the reader, believe in yourself and look after the beautiful human beside you, the world might become a better place, and discovering & creating things will only be fun and not sad.

FROM ACADEMIA TO INDUSTRY: Cracking placements at ducs

Varsha Saini (M.Sc. 2024-26)

A s the second semester is approaching its end, we are constantly pestered by one thing - PLACEMENTS.

But our dear seniors did exceptionally well, and our department's alumni are thriving in various industries. So, where to start?

With this question, I approached some of our seniors for some tips and tricks (WHO KNOWS IT BETTER THAN THEM). A very special thanks to Navin Maheshwari from (MCA 23-25) and Yashi Sharma from (MSc 23-25) as they were kind enough to let me share their placement experiences with me and bring them to you all via SRIJAN. After

all, we're in this together!

START EARLY: THE GOLDEN RULE

The key to successful placements is to start early. The early bird catches the worm. "But how to start?"

Start as early as possible. There's no such thing as 'too early.' A strong grip on your core subjects like operating systems, data structures, DBMS, and computer networks is essential.

DSA takes up most of your preparation time. Start slow but be consistent. Learning DSA is what most people find difficult, but with the right strategy, you can master that. Allot proper time to the subject. Don't try to jump directly to LeetCode. Here's a step-bystep approach for a better learning experience:

• KNOWLEDGE

- 1. Learn about the fundamentals of each topic.
- 2. Attend college classes and refer to YouTube and books for deeper explanations.
- 3. YouTube is helpful, but books must be your best friends (they have the true knowledge).

DRY RUN

- 1. Understand how things work behind the scenes.
- 2. Use open paper to analyze the working of data structures.
- 3. Solve the questions manually before coding. This step helps you to understand the workings of the data structures, especially structures like trees, linked lists, heaps, etc.

IMPLEMENTATION

- 1. Once you get the concepts, start implementing them using coding.
- Don't hold yourself back; experiment with possibilities and have some fun with the coding.
- 3. Experiment, debug, and refine your approach.

• QUESTIONS

- 1. After following the above, solve problems on platforms like LeetCode.
- 2. Integrate what you learned into problems.
- 3. Check your knowledge, evaluate yourself, and keep improving.

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WHICH PROGRAMMING LANGUAGE TO CHOOSE?

Language is not a barrier in Computer Science. Choose one language for yourself and be the master of it. Cover all the concepts for a programming language. However, if choosing a language like Python, ensure you understand concepts like pointers, which are present in basic languages like C or C++ but rarely used in Python.

CGPA MATTERS!!

Don't ignore your college classes because maintaining a CGPA > 7.5 is important. Without crossing this threshold, all that work is in vain. Many companies visiting have an eligibility criterion of 7.5+ CGPA. Attending classes makes it easier to meet this requirement.

VACATIONS ARE THE GOLDEN PERIOD

Vacations are coming, but if you want placements, make the best out of it. Work hard, give it your all, and you will not regret it.

- Revise what you have learned.
- Identify your weaknesses and work on them.
- Solve problem sheets (Striver's A2Z Sheet is suggested).
- Be more active on LeetCode and practice consistently.

PROJECTS: YOUR INTERVIEW REFLECTION

Focus on quality over quantity. 2-3 solid projects are better than many unfinished ones. Keep it simple but interesting.

Have at least one project out of coursework. Avoid focusing too much on data science unless it aligns with your goals. Keep it simple but impactful.

MOCK INTERVIEWS TO THE RESCUE

Interviews can be daunting, but preparations make all the difference. But the DUCS placement cell has got your back. They conduct mock interview sessions, where seniors and super seniors interview students. Take them seriously, and give them your all.

If you feel you couldn't do well in your mocks, get your friends to conduct additional mock sessions and improve continuously.

STAY POSITIVE

Stress is inevitable, and so are disappointments when even after all the hard work you put in, things don't work out your way. Don't be disappointed. Today was just a bad day, and tomorrow will be better.

Don't block your opportunities. Keep an open mind and apply for off-campus opportunities as well.

Whenever in doubt, reach out to a senior or the faculty. We at DUCS are a family and strive to help each other out in times of need. You will always find guidance here.

FINAL WORDS

Placement is a journey, not the destination. Work hard, stay consistent, and believe in yourself. ALL THE BEST!!

Sair-Sapata

Sair-Sapata isn't just an article - it's an attempt to capture firsthand experiences at some of the most talked-about spots in Delhi. Instead of relying on word of mouth, the curious trio (Varsha, Harsha and Jishnu) decided to explore these places themselves to bring you an unfiltered experience, shared here respectively.

THE FIRST SPOT: MAJNU KA TILA

Our first stop was Majnu ka Tila (MKT)—also known as Mini Tibet—a paradise for café lovers. Whether you're celebrating a birthday, catching up with friends, or looking for a cozy date spot, MKT has something for everyone!

As you enter, you instantly understand why it's called Mini Tibet. The aroma of Tibetan food, the bustling streets lined with charming shops, the people, and the vibrant culture make it a sanctuary of its own. We spent our evening soaking it all in, but the true highlight of the day was the cheesecake at Wongdhen Café. The café's ambiance was spectacular, but the company made it even better.

MKT also offers some exquisite Korean products and souvenirs. Of course, we had to try "Laphing" - a popular Tibetan snack. The first stall we visited was a letdown, but the next one exceeded our expectations, proving that where you eat matters just as much as what you eat. To experience the real deal, we recommend visiting after sunset. As the skyline falls, the streets glow with warm lights, and live karaoke spills from cafés, creating pure magic. With endless options to explore, each place offers something new and unique to discover.

We ended our day with dosas at Harsha's place (bro could open a dosa joint), and as we walked away, full-bellied and content, we realized that some places aren't just about what they offer—they're about the stories you take home.





DISCOVERING THE DIVERSITY OF THE SUNDAY BOOK MARKET

Sundays are for sleeping? No! Sundays are for Daryaganj's book market.

Amidst stalls brimming with everything, From NCERTs to NEET and JRF guides, You will find rows bridging the gap Between Dostoevsky and Nietzsche. Well, not them, but their works-Metamorphosis, White Nights, Beyond Good and Evil-Scattered along the path, Nestled beside magnetic bookmarks And fancy journals, Waiting to be found. How is this place so magnificent? Is it really? Or is it, as Huxley suggested In The Doors of Perception, "Just an illusion"? Yet, if there's a door to heaven,

My all-time favourite? The Fountainhead by Ayn Rand A philosophical and psychological exploration-Of individualism versus collectivism, Woven into the tapestry of architecture

This must be it.

Arundhati Roy's Azadi rests atop the Shiva Trilogy, A contrast so striking It almost seems intentional. Perhaps it is. After all, Isn't life just a series of contradictions? Hawking's Big Questions beside Terence McKenna's Food of the Gods, Camus' The Myth of Sisyphus next to Sartre's existential works.

This place doesn't just sell books, it teaches life. From absurdity to existentialism Politics to philosophy, it all comes in a full circle, Like existence itself.

And if you miss a book this Sunday? Don't worry The doors will be open for you next Sunday. After all, life is a vicious circle.







A PIECE OF NATURE: LODHI GARDEN

For our last bit of Sair-Sapata, we went to Lodhi Gardens with a bag of books. As we entered, we were promptly greeted by a sign about how dangerous a monkey's bite is (fortunately, we did not encounter any). Varsha did not carry her handbag because, "You don't lose what you don't bring."

As we took a left turn, we walked onto a green patch. From the first glance, it was evident that the place was a paradise for photographers. Varsha almost recreated a scene from the Mahabharata by mistaking the small green pond for the ground. We had a good laugh and proceeded to take photos. We made the best use of the books by using them as photography props.

Besides its picturesque landscape, Lodhi Gardens contains various tombs. The monuments are breathtaking. We took several pictures, but you should witness them with your own eyes. The place was lively and full of intricate details. We also saw some wedding photoshoots and a quarrel between a cameraman and security guards. Disappointed by the quick ending, we decided to continue our photo session. Varsha tired Harsha out by constantly telling him to relax while posing, and later, Harsha took his revenge by asking her to change poses every second. At this point, taking pictures became a staring contest with the sun.

We rested for some time, judging each other's old social media posts. When we started walking again, we noticed many people having picnics and enjoying their time. The greenery, the flowers, the large trees—everything was beautiful. Suddenly, we got a message in the group and realized that our assignment was due at 5:00 p.m., not midnight. So, we called it a day and rushed back home.







MANHATTAN DISTANCES OF ALL Arrangements of Pieces

0 cm 1 2

Mayank Sharma (MCA. 2024-26)

Abstract: The following article comprises of a beautiful combinatorial optimization problem. The solution starts with an exponential time complexity and gradually reduces to linear using mathematics, observations and clever thinking.

1 The Problem

You are given three integers *m*, *n*, and *k*.

There is a rectangular grid of size $m \times n$ containing *k* identical pieces. Return the sum of Manhattan distances between every pair of pieces over all valid arrangements of pieces.

A valid arrangement is a placement of all k pieces on the grid with at most one piece per cell.

The Manhattan Distance between two cells

2 Example

Consider m = 2, n = 2 and k = 2

• In the first 4 arrangements, the Manhattan distance between the two pieces is 1.



Ρ

Ρ

• In the last 2 arrangements, the Manhattan distance between the two pieces is 2.

Thus, the total Manhattan distance across all valid arrangements is 1 + 1 + 1 + 1 + 2 + 2 = 8.

3 Brute Force

- Let, *M* = *m* * *n*
- Let the cells be numbered from {1, 2, 3......*M* }
- We have to select k cells from M cells, number of ways of doing this is $\binom{M}{k}$
- Let S be one of the valid arrangement: $S \subseteq \{1, 2, 3, ..., M\}, |S| = k$
- Let *d*(*i*, *j*) be the Manhattan distance between cells *i* and *j* in *S*
- For a particular subset S, we want

$$\sum_{i,j \in S; i < j} d\left(i,j
ight)$$

• Finally we have to sum this quantity over all possible $\binom{M}{k}$ subsets

$$\sum_{\{1,2,\ldots,M\},|S|=k} \sum_{i,j\in S,i< j} d(i,j)$$
 (3.1)

• This approach is very inefficient and has exponential time complexity $O(M^k * n^2 * m^2)$ making it a bad choice.

4 Moving Towards Optimality

 $S \in$

• Let's now consider just 2 pieces i, j : i < j. If we fix any two pieces on the grid then we have to arrange other k - 2 pieces and the number of ways of doing this will be $\binom{M-2}{k-2}$ • The distance between the 2 fixed pieces will be counted in all $\binom{M-2}{k-2}$ arrangeme-

nts.

• A generalization to this approach will be

$$egin{pmatrix} M-2 \ k-2 \end{pmatrix} * \sum_{1 \leq i < j \leq M} d_{ij} \qquad (4.1) \end{cases}$$

The time complexity of this approach will be $O(M^2) = O(m^2n^2)$, which is indeed a huge improvement over the previous one.

5 Digging in Deeper

So the main step to calculate the answer is finding:

 $\sum_{1 \leq i < j \leq M} d_{ij}$

Let *i* denotes (x_i, y_i) and *j* denotes (x_j, y_j) . A naive approach will be finding:

$$\sum_{1 \leq i < j \leq M} d_{ij} = rac{1}{2} \sum_{x_i=1}^m \sum_{y_i=1}^n \sum_{x_j=1}^m \sum_{y_j=1}^n \left(|x_i - x_j| + |y_i - y_j|
ight)$$

This further is solved in the equation box.

Now the problem is reduced to $O(m^2 + n^2)$, which is more optimal than previous one.

6 Can We Improve More

The main bottleneck from the previous approach is $\Sigma \Sigma (|x_i - x_j|)$ and $\Sigma \Sigma (|y_i - y_j|)$. If we can figure out some way of efficiently calculating them, our job is done.

Lets shift our focus on the first summation -

$$\sum_{x_i=1}^m \sum_{x_j=1}^m |x_i-x_j|$$

What are we actually finding:

$$\begin{split} |1-1|+|1-2|+|1-3|+\cdots+|1-m|+\\ |2-1|+|2-2|+|2-3|+\cdots+|2-m|+\\ |3-1|+|3-2|+|3-3|+\cdots+|3-m|+\\ \vdots\\ |m-1|+|m-2|+|m-3|+\cdots+|m-m| \end{split}$$

Which is further equivalent to:

Equation Box

$$\begin{split} \sum_{1 \le i < j \le M} d_{ij} &= \frac{1}{2} \sum_{x_i=1}^m \sum_{y_i=1}^n \sum_{x_j=1}^m \sum_{y_j=1}^n (|x_i - x_j| + |y_i - y_j|) \\ &= \frac{1}{2} \left[\sum_{x_1=1}^m \sum_{y_1=1}^n \sum_{x_j=1}^m \sum_{y_j=1}^n |x_i - x_j| + \sum_{x_1=1}^m \sum_{y_1=1}^n \sum_{x_j=1}^n |y_i - y_j| \right] \\ &= \frac{1}{2} \left[\sum_{x_i=1}^m \sum_{x_j=1}^m (|x_i - x_j|) \sum_{y_i=1}^n \sum_{y_j=1}^n (1) + \sum_{y_i=1}^n \sum_{y_j=1}^n (|y_i - y_j|) \sum_{x_i=1}^m \sum_{x_j=1}^m (1) \right] \\ &= \frac{1}{2} \left[n^2 \sum_{x_i=1}^m \sum_{x_j=1}^m (|x_i - x_j|) + m^2 \sum_{y_i=1}^n \sum_{y_j=1}^n (|y_i - y_j|) \right] \end{split}$$

We can actually see the matrix is symmetric and since (i, j) is an unordered pair we can only consider the upper triangular or the lower triangular matrix, as it will eliminate the need of division by 2.

Lets figure out the sum of the upper triangular matrix:

$$egin{array}{lll} ext{First row:} & \sum_{i=1}^{m-1} i & ext{Second row:} & \sum_{i=1}^{m-2} i \ ext{Third row:} & \sum_{i=1}^{m-3} i & ext{M}^{ ext{th row:}} & \sum_{i=1}^{m-m} i \end{array}$$

Hence, the total sum will be:

$$\sum_{k=1}^{m}\sum_{i=1}^{m-k}i$$
 (6.1)

6.1 can further be simplified as:

$$egin{aligned} &\sum_{k=1}^m \sum_{i=1}^{m-k} i = \sum_{k=1}^m rac{(m-k)*(m-k+1)}{2} \ &= rac{1}{2} \sum_{k=1}^m \left(m^2+m-2mk+k^2-k
ight) \ &= rac{m(m^2-1)}{6} \end{aligned}$$

Hence,

$$\sum_{x_i=1}^m \sum_{x_j=1}^m |x_i-x_j| = \sum_{k=1}^m \sum_{i=1}^{m-k} i = rac{m(m^2-1)}{6}$$

Similarly,

$$\sum_{y_i=1}^n \sum_{y_j=1}^n |y_i-y_j| = \sum_{k=1}^n \sum_{i=1}^{n-k} i = rac{n(n^2-1)}{6}$$

So the final answer to the problem is:

$$\binom{mn-2}{k-2}*\left[(n^2*\left(\frac{m(m^2-1)}{6}\right)+\left(m^2*\left(\frac{n(n^2-1)}{6}\right)\right]$$

We can clearly see there are a bunch of multiplicative operations which are O(1) and there is O(mn + k). This is really impressive and is a linear time complexity.

7 Bibliography

[1] Leetcode Problem 3462 [2] Mine C++ Solution

THE BATTLE WITHIN...



Anonymous

here's a student I always see around quiet, withdrawn, and perpetually on the periphery. You wouldn't really notice him in a sea of people. He moves with a quiet smile, speaking a few courteous words, faking it until he makes it. But if you really look at him, you'll notice the weight that he carries—the pressure of wanting to belong in a space that still feels alien.

He was from another university, optimistic and hungry. But as soon as he arrived on this campus, he knew he was already behind. The others were quick at academics, talented in ways he knew he could master quickly—yet he was bewildered about where to begin. Even when he did begin somewhere, the nagging question hung over him:

"Will I ever be as good as they are?" That doubt started to rot him from the inside out. As others walked confidently through classes, events, and competitions, he hung back, wondering if he really belonged.

I've seen him in class. He listens intently, sometimes jotting down notes, but he never says much. I know he has ideas—keen ones. Sometimes his eyes light up with a thought, but it never crosses his lips.

Fear keeps him silent. The fear of sounding foolish, of getting it wrong, of being judged.

During events, he often lingers at the back. I've noticed him watching the participants those who walk onto the stage with unwavering confidence. I can tell he has ideas of his own, maybe even better ones. The way he observes the details—the arrangement, the flow, the flaws—tells me he could organize it more efficiently. But he never steps forward. When it comes to academics, he struggles not because he lacks intelligence but because his memory fails him. He is miserable at mugging up facts, often mixing up details and making errors that cost him dearly. But I know he is a quick thinker, able to spot solutions others may not. His analytical mind is his forte, but the grades do not show it. They never do.

He does have friends, but I know he always feels like he doesn't quite fit in. Even while laughing with them, he carries a distance in his eyes. It's not because he doesn't care it's because he feels misplaced. He remembers the version of himself from his previous university—the one who was happier, more carefree. The one who didn't second-guess everything he did.

Now, I see him staring at the placement board. The names of students getting selected by prestigious companies appear one after the other. He glances at it, his expression unreadable, but I know what he's thinking.

"Will my name ever be there?"

He wonders if he'll ever overcome the fear that keeps him on the sidelines.

Will he ever lead, participate, and take the chances he knows he is capable of?

Or will he always be the one watching from the crowd, quietly cheering for others, while still waiting for his turn?

THE 2024 NOBEL PRIZE IN PHYSICS A milestone in artificial neural networks

Priyanka Kumari (M.Sc. 2024-26)

The most prestigious of the Nobel Prizes in Physics for the year 2024, which is awarded by the Royal Swedish Academy of Sciences, goes largely to John J. Hopfield and Geoffrey Hinton for their pioneering research that ushered machine learning into the artificial neural network (ANN) era. They revolutionized computational sciences and smoothed the paths linking physics and artificial intelligence.

THE EVOLUTION OF ARTIFICIAL NEURAL NETWORKS

The first ideas were on the basis of biological neurons in the 1940s. Some early models like the McCulloch-Pitts neuron and Frank Rosenblatt's perceptron, created in 1957, fell short of being able to deal with the bottlenecks created with non-linear problems, and progress was not forthcoming until the 1970s.



The 1980s. as Hopfield and Hinton demonstrated, saw a whole new dawn. In the fact. Hopfield invented Hopfield Network, which is a recurrent network that has an associative memory capacity. In his vision of a new paradigm that he described back in 1982. emergent collective computational abilities in neural networks provide a new paradigm for understanding memory; hence, his model showed how interlinked neurons effectively store and reminisce about things.

Hinton made a further extension of the domain with his Boltzmann Machine, which he regarded as a stochastic version of Hopfield's model for statistical learning. He currently extended multilevel neural networks for efficient training using a contrary propagation algorithm. According to him, "using backpropagation allowed us to train networks that could generalize from examples—an important towards step modern deep learning."

REVOLUTIONARY DEVELOPMENTS LEADING TO DEEP LEARNING

Methods developed by Hopfield and Hinton set the pace for new advancement in ANN frameworks, which became focused findings with respect to Hinton in the 2000s: by advancing new methods with which one could integrate aspects of learning in deep networks. His argument compared the contrastive divergence method with its algorithmic approaches before it was established. "By pre-training each layer separately, we enabled deep networks to be trained efficiently," he said in 2006.



It is possible to use ANNs in almost all science areas. starting from quantum analysis and spanning into medical diagnosis. Scientists use them for material discoveries, detection of exoplanets, and even, as seen with DeepMind's AlphaFold project, predicting the structure of proteins. Hopfield stated, "Today most fields of science have become dependent on artificial neural network technology from quantum analysis to medical diagnosis."

It impacts science beyond just physics and machine learning. They include image analysis and speech recognition, driverless vehicles, climate patterning, and studies in high-energy particle physics where ANNs serve the basic purpose of improving data analysis towards the detection of CERN's Higgs boson. In addition, they allow disease diagnosis in medicine, the creation of medical images, and customized treatment. Opposite to physics-reductionistic themes, their research would affect lives from recommendation systems upwards to voice assistants. As Hinton said, "We are at the beginning of understanding the full power of deep learning and its implications on society."

For NEURAL NETWORKS, the recognition by the Nobel Prize of Hopfield and Hinton gives the winks of breakthrough prowess of ANNs concerning technology and science. Further, their research has put more dollars into machine intelligence, with more doors opening into the future. Improvement is at the core of neural networks, and in all this, the potentials are boundless. As Hopfield put it, "The future of artificial intelligence is bright, and it is up to us to ensure its responsible and beneficial application."





लोक लाज के भय खातिर एक सिंहनी वो क्रत कर आई। हृदय पर पत्थर रखके कुंती, गंगा को शावक दे आई।

अहो! कुंती ने क्या ये कर डाला, मानो सीना चीर कलेजा दे डाला। इस दृश्य ने दिल दहला डाला, इन्द्र क्या स्वयं इंद्रासन तक को हिला डाला। थर थर नर नारी कांप गए, सुर असुर देवता भाप गए। कुंती का हृदय यूं सूख गया, ज्यो कोई पुष्प पेड़ से टूट गया।

> जब कर्ण धरा पर आये थे, नक्षत्र देख डगमगाए थे। ऐसा न धरा पर आया था, वो सूत पुत्र कहलाया था।

Vivek Kumar (M.C.A. 2024-2026)

जब कर्ण धरा पर आये थे, नक्षत्र देख डगमगाए थे। ऐसा न धरा पर आया था, वो सूर्य पुत्र कहलाता था।

डगमग कर तिभून डोल गया, मानो ब्रह्मास्त्र हो छूट गया। धरती का केंद्र है यू डोल गया, मानो हरि ने बैकुंठ पे वार किया। माँ की ममता यूं कॉंप गई, मानो स्वयं सिंहनी हिरनी से हर गई। उर पर पाहन यूं टूट पड़ा, ज्यो विष बाण प्राण पर छूट पड़ा।

अब हुआ वही जो होना था, उसे लोक लाज न खोना था। लोक लाज के खातिर ही , माता को कुमाता होना था। जब ममता पर संकट आता है त्रिभुवन में अंधकार छा जाता है त्रिभुवन में अंधकार छा जाता है त्रब नारी का विवेक मर जाता है स्वयं शेषनाग घबराता है। क्या करे कराए हरि जाने, फिर सोच न वो कुछ पाता है। स्वयं काल देख घबराता है, जब दृश्य ये सम्मुख पाता है।



मेरे कन्हेंया

माधव तू ही कन्हैया औ कान्हा सही, प्रेम के इस जहां का दीवाना सही। यूं तो मौसम जहां में थे आए बहुत, ऐसा मौसम जहां में फिर आया नहीं। प्रेम के मद में मस्त जवाना दिखा, हर एक दानव ने राधे औ कृष्णा जपा।

कृष्ण काले को कहते है काला सही, काला होना भी सबके यूं बस का नही । श्यामल रंग से वो दुनिया चलाते रहे, न जाने कितने आते औ जाते रहे।

नंद बाबा के बहुतै दुलारे हो तुम, माँ जसोदा के अखियन के तारे हो तुम। ग्वाल-बालो की धड़कन तुम्ही में बसे, देवकी माँ की आस तुम्ही पर लगे। आएगा लाल मेरा वो कहती सदा, स्वप्न उसके हृदय में सजोती सदा।

माना मेरा कन्हिया है छलिया बड़ा, फिर भी उसपर निछावर करू मैं जहां।

Vivek Kumar (M.C.A. 2024-2026)

कुछ पंक्तियाँ

ख़्वाहिशें तो बहुत हैं मन में, पर कंजूसी उनसे ज़्यादा है।

इसलिए नहीं बचाता मैं पैसे, कि मन में कंजूसी ज़्यादा है।

देखा है घर को साथ बड़े होते हुए मैंने, ख़्वाहिशों को मार, अपने पिता को कमाते देखा है।



तितलियों के पास बाग़ान और भी हैं, पाने को जहाँ और भी हैं। और थककर बैठ गए तुम पहले ही पैदान पर? अभी आगे मुक़ाम और भी हैं।

> Ankur Tripathi (M.Sc. 2024-2026)



CODER'S JOURNEY!

Running the code, Forgetting the colons—oh, what a load! Committing mistakes, line after line, Yet hoping the compiler says, "It's fine." But no alarms, no sirens blare, The code still runs—wait, is that fair? It's not just you, don't take the blame, Syntax tricks us—it's part of the game. Playing with code, A battle unseen. Bugs attack, but you're the machine! You debug, you fight, you never resign, With patience, you'll make it shine. The compiler whispers: "No need to return," Yet errors pop up, Forcing a U-turn. Corrections, corrections-endless they seem, But that's the coder's journey, The path to a dream!

> Megha Kumari (M.C.A. 2024-2026)

THE IOT

The physical objects having sensors; Making the world more fencer, IOT makes advanced technologies, By introducing the modern cryptology; Building up connections, With a great intensions; Pertaining to the concept of "SMART HOME", Providing the facility of security system; Automating to the transmit data; To and from the internet; As long as to rescue from cybercrime; And awake as a criminal offence IOT is big and getting bigger, Already with more connected things, Billions of connected devices: And inventing the devices.....

> Megha kumari (M.C.A. 2024-2026)









Neeshu Saini (M.Sc. 2023-2025)

Artworks



Artworks





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RETU





SAL SE



Credits where they are due...

There are various places where we are using resources provided by our lovely readers but were unable to quote them for their contribution. We can't thank you enough!

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Thank you for your reputable report... Priyanka Kumari (M.Sc. 2024-26)

Rest of this page is dedicated to all those who worked hard and sent us their lovely piece of work but due to some reason or another weren't able to make it to the final version of this magazine. The whole SRIJAN team is grateful for your efforts and wants you to know that you are valued and appreciated!

> Thank you for your pacific photographs... Sawan Bagle (M.Sc. 2024-26)

Thank you for your articulated article...

Vani Tyagi (M.Sc. 2024-26) Vansh Garg (M.C.A. 2024-26)

Thank you for your spectacular story...

Dheeravath Bhagavan (M.C.A. 2023-25)

Thank you for your passionate poem...

Shivam Yadav (M.Sc. 2024-26) Sawan Bagle (M.Sc. 2024-26)



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