

ALGORITHM

Newsletter of the Department of Mathematics, JMC

THE FRESHERS' SURVIVAL KIT

It's scary. It's exciting. It's something you have always wished to go through. No, we are not talking about a gargantuan rollercoaster (at least not in the literal sense). We are, in fact, talking about a rollercoaster of the metaphorical kind, arguably the most important one in life – college. The past few months (years – we are looking at you, school toppers and over achievers) have been tedious – first the board examinations, then the results and then the gruelling DU admission process. Now, you just need your first year to be great, and we get it (been there, done that).

So, in this inaugural edition of Algorithm, we set out to do the impossible – give a lot of unsolicited advice to a bunch of teenagers. Presenting the 'Survival kit for freshmen', compiled with much love and nostalgia by the second and third year students, for your perusal. Read on freshers, it's going to be a ride!

The Important Stuff

First, let us talk about all the things like academics, attendance, library etc. – you know all the important things that should be numero uno on our priority list.

Out of the four papers you will study this semester, each paper will be marked out of 100 – 25 for internal assessment and 75 for external assessment. The external assessment is the end of semester exam, you will sit in November and December. The internal assessment will have 20 marks for whatever test/ assignment you are given by your teachers, and the remaining 5 marks for attendance.

Attendance (we are sure we have caught every freshers' attention here). You need 66.67 % to sit in your end semester exams. Any less and there is trouble. Signing of bonds and what not. Moreover, the 5 marks for attendance are graded i.e. 5 marks for 85% +, 4 marks for 80% to 85% and so on. Keep track of your own attendance regularly. If you are bad at remembering dates, then we suggest you download apps for attendance records.

ECA – For all of those who have already joined societies or are ECA students and think ECA is the panacea for their attendance woes, do pay attention. First of all, how do you get an ECA? You keep a record of all the classes you miss for society work, get the ECA forms from the Storeroom, fill the student, teacher and office copy, give it to the person responsible for getting ECAs signed in your society, submit the signed teacher's copy to the teacher, the office copy in the office and keep the student's copy with yourself. Now, how exactly does ECA work? Contrary to popular belief, ECA does not get you marked present for the class missed. It simply removes those classes from the number of classes held for you. For e.g.: A certain teacher took 50 classes in one semester and you attended 40. An ECA submission for one class only makes the classes taken 49 for you, not the number of classes attended 41. Also, most importantly, you can submit ECA for at most one-third of total classes held for a particular paper.



Illustration by: Tanya Agarwal, 3rd Year

Library – Soon enough you will get your permanent ID cards. These ID cards will also serve as your library cards. Do try and not lose them (seriously don't). Simultaneously, you can issue three books from the library and you will need to reissue them in a week again. Again, do try and not lose them (you will have to pay the entire price of the book if you do). You can easily search for the required title through the library computer, and find whether it's been issued or not. Also, there are a number of laptops available in the main reading hall, which you can use for your work (by work we do mean work, no idle internet surfing).

Compulsory Societies – As you might already know from your orientation, you need to join one of the eight societies i.e. NSS, JMCEP, NSO, NCC, WSC, Green Society, Peace Society, Ethnic Eight and AICUF, compulsorily. Completing the stipulated hours is pretty important, in the view that if you don't, you won't get the clearance to sit in your end of semester exams in the second semester.

Practical Files – If by this time you've figured out how to maintain your practical file, congratulations! If you haven't, then welcome to the club (not implying that we still don't know how to maintain our files; we had figured it out by the second semester, thank you very much). It's pretty simple really. Copy and paste your commands from the Editor window (and/or Command window) on a word file. Similarly, copy paste the graph from MATLAB onto the Word file. Mail this document to yourself or transfer it to a pen drive (although there is a risk of the PD getting corrupted).

The Stuff You Would Have Regretted Not Knowing (but you won't because we are writing it down for you)

Explore. Yep, that's pretty much it. Explore the college, find the spots where you can hangout, talk and just be at peace with yourself (read: Snapchat and Instagram). Our college has one of the most beautiful campuses in Delhi University. Your spot could be in the MPH stairs, or somewhere by the book shop, or the open gym or maybe the gardens near Sisters' Convent. Explore the canteen menu, which with it's huge number of dishes will take at least 3 years to go through, so start now (personal recommendation: Masala Dosa and Bhelupuri)! Explore the wonderful three-story library with it's vast collection. The room for reference books on the top floor is a real treat (if a bit dusty) and the superb air-conditioning doesn't harm either. We have our own gym with super affordable membership fees.

Mostly there are two kinds of freshers – ones who will get in every society and the ones who will prioritize their studies, and at most get into one society. The thing is, there is no correct way of doing this. Some people can manage everything, others need to put something above the other. We think there are only two things worth keeping in mind while making a decision. Firstly, the societies at college level are very serious about their work, so you can't hope to wing it and get a certificate at the end of the year. Hence, the smart thing to do would be to get into a society that is doing something you are really passionate about. Some classes would have to be sacrificed and at the end of the day, it's your call. On the other hand, first year is the only time when you can actually afford to explore your talents. Give auditions, work in fests, participate in events and then decide for yourself what you like and what you don't. Many people end up surprising themselves!

For the outstation students, we know how difficult it is for you. Delhi is not home, probably won't be, even after 3 years. But it won't remain unfamiliar forever, that we can promise. Talk to people, make friends (we know, we know, if only it were that easy) and have fun. Soon you'll realise how much power independence gives you (although the high amounts of uncharacteristic smothering from your family when you return back home will be both a blessing and a curse). One really important piece of advice: we know how attractive going back home during extended weekends or fests is, but do try and stay. Missing out on these moments robs you of the most precious memories of your college life.

Despite all of the excitement, first year of college has to offer, this period can also be the most trying period of your life till now. There are too many changes happening far too quickly to comprehend. What you're going through, many of us have already gone through and many of your peers might be going through as well. Communicate with your classmates, with your wonderful seniors (we speak for ourselves), and your teachers about any problem you are facing. Suffering is not a lonely country, but pride is. We think that is enough advice for now. After all, we can't spoil the entire season for you just yet. Some things you have to figure out on your own and you are better off for it.

Article by: Ananya Mishra, 3rd Year

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Archimedes



"Mathematics reveals its secrets only to those who approach it with pure love, for its own beauty." These were the words of a Greek mathematician, scientist and inventor who could very well be dubbed the founder of theoretical mechanics. But you would know him better from his infinitely more iconic words, or rather singular word in this case – Eureka! We are, of course, talking about Archimedes. Born in Ancient Greece, the cradle of Science, Mathematics, Philosophy, and Arts in classical antiquity, Archimedes was different from his contemporaries. At a time when Greeks greatly valued pure thought because of their disdain for observations, he pioneered deduction of mathematical laws from experimental observations.

Early Life

Archimedes was born in the city-state of Syracuse, in modern Sicily, around 287 BC. His father, Phidias, was an astronomer. It appears that he was closely associated with, and possibly related to, *Heiron II* the king of Syracuse and his son Gelon. Archimedes had his education in Alexandria in Egypt, which had by this time become a great centre of learning. He then returned to his native city to a life of mathematical and scientific research and invention.

His Contribution

The geometry of three-dimensional objects: In his treatise, *On the Sphere and Cylinder*, Archimedes dealt with the geometry of three-dimensional objects such as spheres, cylinders and cones. The books *On Conoids and Spheroids*, and *On Spirals* further deal with solids of revolution generated by conic sections and with spirals. In fact, such was his love for these figures, that his tomb carried a sculpture illustrating his favourite mathematical proof, consisting of a sphere and a cylinder of the same height and diameter. An approximation for pi: In the short book *Measurement of the Circle*, Archimedes shows that the circumference of a circle is less than $3\frac{1}{7}$ and greater than $3\frac{10}{71}$ of its diameter, thus putting narrow limits to what we now call pi.

The method of exhaustion – ancient calculus: This method is credited to Eudoxus of Cnidus (c. 390-c. 340 BC) and was used by Euclid. The idea is to find the area of an irregular figure by filling it with smaller regular figures of known area, filling in the spaces with smaller figures of known area and so on until the given figure is approximated to the desired degree. Archimedes ingeniously extended the method of exhaustion so that in some cases, e.g. for the volume of a sphere and of a paraboloid of revolution, it was actually equivalent to integration. These remarkable results are given in *Quadrature of the Parabola* and *The Method*.

The foundations of theoretical mechanics: He was one of the first to apply mathematics to physical phenomena, founding hydrostatics and statics, including an explanation of the principle of lever. He is credited with designing innovative machines, such as his screw pump, compound pulleys and defensive war machines to protect his native Syracuse from invasion, all with an unusual degree of accuracy.

The iconic Eureka moment, the very first in history, accredited to Archimedes has an interesting legend associated with it. According to this legend, Archimedes was tasked with determining if the king's crown was solid gold or had some parts of silver mixed in it. The hardship of the task lay in the irregular shape of the crown. It was only while taking a bath in a tub that Archimedes had his moment of epiphany in the form of a theory that we now know as the Archimedes' Principle. Armed with the knowledge that densities of different materials could be used to solve this problem, Archimedes proved that the king had indeed suffered a loss at the hands of his goldsmith, at the same time enriching the scientific community significantly.

Archimedes has left a rich legacy behind. He directly inspired Galileo Galilei and Isaac Newton to investigate mathematics of motion. Many of his inventions remain relevant even after two millennia of existence, very much in use. Perhaps the most lasting part of his legacy is his contribution towards the (stereo-) typical image of mathematicians and scientists, so engrossed in their study that they forget about everything else, even threats to their own life, as was Archimedes' case. He famously said, "*Do not disturb my circles*", to the Roman soldier who disturbed his study of a mathematical drawing during the Siege of Syracuse. Iconic last words to have.

Article by: Ananya Mishra (Third year) and Ishika Bhutani (Second Year)

The Beauty Norm: The undefined defined

Physical appearance has played an important role since historical times. In fact, today various social media platforms have become important tools for shaping views and perceptions of people. Moved by this reality of our time, three students of the Department of Mathematics- Jasmine Saluja, Sheetal and Vibhu Sachdeva, decided to study and analyze how social media is playing an important role in setting beauty standards for women as well as men, thus emerging as a powerful socialization agent.



Physical appearance has played an important role since historical times. The main objective of the research paper 'BEAUTY NORMS: THE UNDEFINED DEFINED' was to examine the effect of social media on the body image of millennials in India and how it is different for males and females. It is no secret that in today's day and age, social media platforms like Instagram, Snapchat, Facebook etc. promote a biased and distorted representation of what beauty should mean to us. These platforms not only enhance our lack of belief in ourselves, but also fix societal perceptions; skin-deep and shallow. To quantify their subjective claims, the group of students utilised one of the many reliable methods of conducting any feedback mechanism – an equitable survey, followed by critical analysis and clear and direct presentation.

The team carried out the same as follows: In order to get a detailed analysis, first hand data was collected through a survey which was conducted by circulating a Google form online. The form was circulated among the age cohort of 15-30 years, living in metropolitan cities of India. This ensured a greater range of feedback, regardless of social strata, gender, colour etc. which is a pre-requisite for a non-biased result. The questionnaire developed for the purpose was quantitative and hence, all the questions were close-ended. Another aspect of the study was the literary review – digging into the archives. Second hand data sources including studies, articles, data related to basically three aspects related to body image: Eating disorders, cosmetic surgeries and fitness were reviewed as well.

Once the data was collected, it was then quantified and analysed thoroughly. The results found from the study were statistically significant and very satisfactory. It came to notice that social media does shape the views of men and women but the influence was much higher in women. Further, it was highlighted by female respondents that social media has standardized beauty and has rendered personal beauty standards insignificant in several instances. This has led to a fall in confidence and self-esteem, and consequently the general performance of any individual.

The study proved that portrayal of men and women body ideals in a stereotyped way had no effect on men but a negative impact on women's body perception. While women focus on losing weight, men focus on being muscular. Social media facilitates social comparison to peers as well as Indian celebrities which affect Indian men more more as compared to women. The research paper thoroughly discussed the impact of globalization and acculturation on body image and prevalence of eating disorders as well as how growth in media, specifically social media has had its effects. The study emphasized the need for media literacy programmes in order to promote physical and mental well-being of individuals and to minimize the seemingly inevitable consequences of the omnipresent social media.

The research paper was presented and lauded for its commendable structure at the International Conference organized by the Management Interaction Cell of Jesus and Mary College.

Written by: Purty Kapoor, Second year

Batch '19

Kanika: Delhi Technological University
Surabhi Khare: IIIT Bangalore also working as Data Analyst at City Montessori School
Sanjana Verma: IIT Bhubaneswar
Annie: St. Xavier's College (Autonomous), Mumbai
Samiksha Badoni: NIT Jamshedpur
Shriya Mehrotra: Sri Ram College of Commerce
Radhika Sharma: Analytics Executive - Eessense Global
Anika Singhal: MDI Gurgaon
Kritika Jaggi: Delhi School of Business, VIPS Technical Campus
Arunima Sharma: London School of Economics and Political Science
Diksha Jain: Tathgat
Sakshi Mittal: London School of Economics and Political Science
Ananya Pandey: Monash University, Melbourne, Australia
Kairavi Bhargav: Consultant T-Protiviti
Garima Madaan: Lady Shri Ram College
Shriya Jain: Indira Gandhi Delhi Technical University for women
Kripa V John: Bed – IP University
Merina Francis: IP University

From the Team.

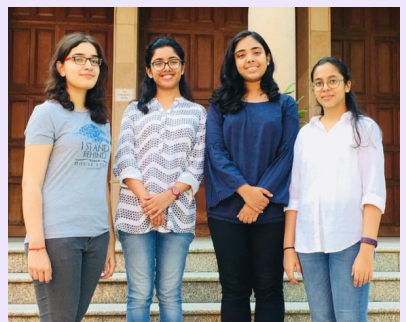
With sugar and spice and everything nice, we present before you the inaugural edition of Algorithm, the newsletter of Department of Mathematics, Jesus and Mary college. It gives me immense pleasure to write on behalf of a very hardworking team, who burnt the midnight oil to bring to you this little treat to groove on. The Summer of '19 was fully devoted to brainstorming creative ideas so as to bring the best and only the best to you. What you now see as four colourful sheets in your hands is the fruit of the diligence and determination of a group of gifted women, who put their heart and soul into making their vision, a tangible reality. Recollecting half a year back, as we set sail on the voyage of this newsletter, one of the most important challenges we faced after the inception of this idea, was to give it a name that justified its purpose.

After days of googling and seeking suggestions, we finally had the Eureka moment as we came across a word that perfectly fit into place. That's the story of how this newsletter received its name, Algorithm. In the most literal sense, 'Algorithm' refers to a set of rules to be followed in problem solving, the labour of Mathematicians before us and a boon to all the students of Maths (especially those who hope to pass). And this is precisely what this newsletter hopes to embody. It is an amalgamation of out of the box ideas, a bunch of intriguing caricatures, a couple of recommendations (or should I say Algorithms), and a set of must knows.

After successfully reaching a consensus over the name of the newsletter, the next big decision had to be the theme of this edition. The next couple of days were filled with intense deliberations, and the entire team put their heads together to come down to that one theme which makes this edition even more special. The team wanted the inaugural edition to have a fresh take, something that could stand out and, what could be better than dedicating the first attempt to the newly inducted freshers. Once, Algorithm was conceived, there was no stopping. Throughout this journey, we are grateful to have been supported by our teachers and fellow students of the department who have been extremely cooperative, and have been the inspiration behind this newsletter.



Junior team (L-R): Row 1 – Khushboo Karamchandani, Diksha Jha, Ishika Bhutani; Row 2 – Amisha Singh, Ruchi Singh, Purty Kapoor, Row 3 – Additi Pandey, Suruchi Beck, Ishika Bansal



Senior Team (L-R): Ananya Mishra, Jessintha Mathew, Neha Sam, Tanuja Agarwal

Algorithm is more than just a bulletin of the Mathematics department of JMC. It has been created to serve as a platform where people from different courses and colleges and students within the department feel connected. We want the youth to relate to the algorithms we present and maybe let us know if better algorithms exist. As an attempt to do the same we want all our readers to write back to us, suggestions, improvisations, queries anything! If you have something worth sharing, send it to us, if you have a question that has been puzzling you, write to us. Your question may very well become the inspiration behind the next edition of Algorithm. Indubitably, it's been a while of a time for each one of us and in this tailor-made edition for freshers, we have put in as much as you can take.

We hope you will have the time of your life as you savour through this newsletter, as much as we did while we created it. So break a leg until the next edition!

Written by: Neha Sam, Third Year | Photos by: Yukti, Third Year

गुरु

सूर्य सी उज्ज्वल ये काया
चन्द्र सी ममता की माया
हे गुरु मेरा प्रणाम ।
गुरु ही ब्रह्मा, गुरु
ही विष्णु
गुरु, तू
ही रूप महाकाल का
तेरे शरण पर स्वतः ही
झुकता है शीश संसार का
तेरी यह छवि अटल अमर को
हे गुरु मेरा प्रणाम ।
धर्म-अधर्म
तूने सिखाया
वास्तविकता का ज्ञान कराया
तूने ही इस मनुष्य को
ममता की गोद से
कटु विश्व में प्रवेश कराया
तेरे समर्पण और त्याग को
हे गुरु मेरा प्रणाम ।



Poem by: Diksha Jha, Second year

A Few Questions

There are a few questions
which I absolutely have to ask to get to know someone
The first one is easy
Do you like dogs?
And I'll slowly walk away
from you if you say you don't
Because they are the most
precious creatures on the planet and you cannot fight me on that
Second is a personal
choice
Do you smoke cigarettes?
Because I don't understand
why people want to die a bit daily even if it takes them away from
their
problems for a while
Third is about how they
see themselves
What kind of a person are
you?
This usually makes people
really wonder
And I get to know if I
have to make up for the love they don't feel for themselves
Fourth is my favorite
What makes you happy?
Because who doesn't like
to see a person light up when they talk about things they love to do, or
the
things that make them excited
Fifth is a bit gloomy
What are you afraid of?
Because what if I need to
protect you someday from that, I need to know
Sixth is a bit personal

What changed you?
Because there was this
point we changed, a point we realized we are better than this
Seventh is the complete
opposite
What do you want to
change?
Because in the crazy
world, so many things are wrong and so many things make us tick
Just hearing out another
person could make us a bit sane
And if I didn't really ask
you all this upfront
Maybe I got to know when
we talked
You are a beautiful human
That is if you love dogs,
of course



Poem by: Manali Sethi, Third year

The Editorial Board

Senior Team

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Ananya Mishra (CONTENT STRATEGIST)
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ALGORITHM RECOMMENDS

All Math and no play makes any Math-loving fanatic a very dull human (who's entirely incapable of performing a simple two-digit addition). In order to refresh, regroup and return to productive work, Algorithm puts forward its humble recommendations of mind fresheners.

Book

The Testaments (2019)

The much-awaited sequel to Margaret Atwood's 1985 dystopian masterpiece, the Handmaid's Tale, is set to be published in September 2019. The novel will reportedly be set 15 years after the final scene of the first novel, and will be narrated by three female characters.



TV Series

Chernobyl (2019)

This five-part miniseries based upon the real-life events of the Chernobyl Nuclear Disaster of 1986, is a far cry from a documentary. Instead, the series puts forward the compelling tussle of truth and accountability against the establishments whose very purpose is to protect the truth, set against the backdrop of a collapsing Soviet Union. This series is definitely not meant to be light-hearted, but it does have its moments of brevity.



2018-2019 AT A GLANCE

The Department of Mathematics has always strived for perfection and consequently endeavoured to achieve greater heights. In the academic year (2018-19), the Department under the guidance of Dr. Anu Saxena, Teacher in charge and Dr. Indrakshi Dutta, Association in charge organised several events from talk sessions and research projects to fun-filled departmental trip and sports day. The post holders for the session were: President - Richa Bhatia, Vice President - Neha Sam, and General Secretary - Yashika Kapoor.

Freshers' and Teachers' Day

The session (2018-19) began with the fresher's and teachers' day celebration. The theme for the party was "Dress to Impress yourself". It started with an ice breaking session, followed by some amazing cultural performances and pageant for Miss Mathematics and Miss Congeniality which was won by Rimjhim Singh and Bhargavi Raj and to the immense pleasure of department Vanshika of our Department was crowned as Miss JMC for session 2018-19.



Farewell

Spirits were high, despite the bittersweet feeling that farewells tend to bring along with them. Dance and musical performances by juniors, culminating with a flash mob involving over 50 students filled the atmosphere with gaiety. The Batch of 2019 was bid farewell by the faculty and juniors amidst much nostalgia and good wishes.



Research and Workshop

Under the guidance of Dr. Anu Saxena, The Department of Mathematics, along with teachers from the Economics and Commerce departments, organized an *Econometrics and R programming* workshop extending from August '18 to January '19. The workshop, aimed at encouraging undergraduate research, was a useful introduction to the field of data analysis and programming. With lectures on key concepts such as hypothesis testing and regression analysis, in addition to practical application using data visualization tools, the workshop was attended by students from the Maths, Commerce and Economics departments.

Talk on Number Theory

A lecture titled 'The World of Prime Numbers', delivered by Dr. Shanta Laishram, Associate professor of Mathematics at The Indian Statistical Institute, Delhi, was held on the 20th of February '19. The conclusion that the elementary school concept of prime numbers was the very foundation of cyber security as we know it, was a difficult one to swallow by the undergraduate Math majors. Nevertheless, it certainly made for a most engaging session for teachers and students alike.



Department Trip

The Department of Mathematics organised a trip to Jaipur from the 28th September 2018 to the 30th September 2018. Jaipur is among the best travel destinations of India, with amazing forts and palaces. Students visited all the tourist attractions like Amer Fort, Chokhi Dhani, Birla temple and City Palace. It was indeed a memorable experience that provided students an opportunity to know and bond with each other.



Matharena

Matharena, the annual fest of the Department of Mathematics was held on the 30th of January, 2019. This year it had been indeed a tremendous success! With generous contribution and laudable participation from the students, the festival certainly lived up to expectations. The day commenced with the lighting of the lamp by chief guest, Sr. Dr. Molly, followed by an interactive talk titled "A Mathematical Love Story" by Mr. Bhanu Prakash, one of the world's fastest human calculators. The speaker shared with us his story and how anybody could attain extraordinary mental calculation skills and left us speechless with his jaw dropping talent. This was followed by facilitating the winner of the logo making competition Anjaleena George, for giving our department its own logo! Matharena then unfolded a plethora of interesting events, some exciting, others challenging.



Committee Simulation, addressing the issue of syllabi based learning in Mathematics and Get Set Solve, the ultimate Mathematical quiz, turned out to be the most appreciated events of the fest. Premier games like *Kill Deal*, *Code Breaking*, and *Geometry Symmetry* also garnered a lot of enthusiasm from participants. The day concluded with a screening of the film, *Theory of Everything*, based on the life of famed theoretical physicist, *Stephen Hawking*.



Integrating Infinities

Logo by: Anjaleena George, Third year

Written by: Ishiki Bansal, Second Year

Sports' Day

The Department of Mathematics enthusiastically participated in the Sports Day, which was held on the 7th of March 2019. The event inculcated in students qualities like sportsmanship and team spirit. The Department secured the 1st position in the relay race and the third position in the tunnel race. Suruchi Beck brought laurels to the Department by securing the 1st and 3rd position in the 400m and 200m race respectively.



Our Little Guide to JMC!

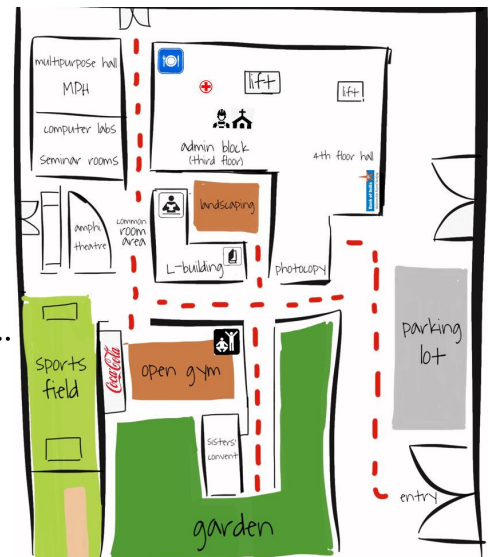


Illustration by: Tanya Agarwal, Third Year