THE NEWS BYTE

Where nip meets nibble...

Message from the Principal

I am very pleased with the initiative of the Computer Science Department to bring out a Department Newsletter. It will undoubtedly serve as a platform for news about developments in a dizzyingly fast-moving field, where it is mandatory for the students and the teachers to remain abreast with the latest.

I am sure that the members of the department will also use the medium to learn and teach the skills of writing and publishing articles. The field of publishing is extremely competitive in the outside world and this in-house newsletter can serve as a friendly platform for acquiring the skills of writing scholarly articles, using the appropriate formats, and very importantly, proof-reading whatever you have written.

I urge the department to strive towards the highest standards of knowledge and skills. I say this because I see great potential in our students and teachers of Computer Science department and know that they are capable of doing outstanding work.

All my best wishes for this new venture! Make us proud!

Dr. Nita N. Kumar

Quantum Computing

Ms. Reema Thareja

Quantum computing is focused on developing computer technology based on the principles of quantum theory (which explains the nature and behavior of energy and matter at the quantum or atomic level). These days lot of research is being done in MIT, IBM, Oxford University, and the Los Alamos National Laboratory to develop quantum computers.

Development of a quantum computer, if practical, would mark a leap forward in computing capability. These computers implementing the laws of quantum physics would gain enormous processing power through the ability to be in multiple states, and to perform tasks using all possible permutations simultaneously.

The essence of quantum theory lies in Niels Bohr's explanation of the superposition principle. This principle claims that while we do not know what the state of any object is, it is actually in all possible states simultaneously, as long as we don't look to check. To understand this principle, consider an analogy.

Intelligent Machines to Imitate Human Learning

Dr. Shweta Tyagi

Since the inception of the idea of computational intelligence by Alan Turing in 1950, Scientists and engineers dreamt of an artificial intelligent (AI) machine, which can match the intelligence of the human race. A lot of progress has been made in this regard and computers can now recognize the face and the meaningful message from a speech etc. However the dream of human level intelligence by machines is still far away. Some researchers predict that it may happen in the next two decades while others put it more distant on the time line. Therefore, there is one point where all leading investigators agree that it will happen one day!

Intelligent Machines to Imitate Human Learning *(contd.)*

To imitate the human behavior, initially computers should learn like babies who get reward for every right move and develop the habits of decision making at a later stage based on the positive and negative experiences in the past. Memory Nets of Facebook is such example in which programs learn like kids do and apply the learned reasoning in unfamiliar situations. Also, Google has developed new services like Smart Reply and acquired Deep Mind to advance the research in artificial intelligence that uses deep reinforcement learning algorithms by adding a sense of time (or memory or history) with weights to a situation. Google has recently developed the software to play the video game like humans. Furthermore, a startup Osaro has the plans to deploy the deep reinforcement learning algorithms into the market of the research labs. These products would help our society by recognizing the objects in nature and replying the phone calls and emails without any human intervention. Till now the engineers program these decisions. However, the deep reinforcement learning enables the computer to identify the goal and take the decision itself based on reward based on earlier experience. These learning algorithms are not reactive like rule-based algorithms, rather weigh the different parallel approaches to solve a single problem like humans who always look into the different aspects of every situation. The judgment of the right context in similar situations or similar set of words or pictures paves the way to choose the correct line of reasoning for a decision-making.

These hard AI approaches can be implemented in existing available hardware and internet technologies through neural networks. However, these methods are not energy efficient as human brains. Therefore, alternative approaches to understand, to model, and to simulate the human brain have been started in Europe and USA. Recently proposed neuromorphic cross-net chips are considered to have the potential to mimic our brains and store the data in latch switches with weights that too with very small power consumption. The component density in this technology matches with the human brain and a weight to the stored bit can be added at each memory location by varying the physical quantity such as capacitance or resistance of latch at that position. Memristors could be an ideal component here, which is also a potential candidate of future flash memories and random access memories. Since these hardware components need small power and have an extremely high density, therefore, it would be installed even in the mobile phones to assist the humanity.

However, any human-level machine intelligence may pose a great threat to the society itself. The reason of this fear is founded on the basis of the development of AI that is being developed as an independent agent that can set its goals itself. Any general intelligent system may become super-intelligent if it has the access to Internet and quest to improve its performance. The continuous improvement in technologies such as Internet of Things (IoT) would complicate the matter further. The installation of these intelligent hardware and software into the weapon system may wreak havoc in the society. Therefore, safeguards can be put into place by developing the counter mechanism so that any hypothetical superiority of a machine can be contained and human-like intelligent machines could be used to advance the frontiers of humanity.

Editor's Note

Hi everyone!
Welcome to our first newsletter. Thanks to those of you who contributed to it as these contributions are essential to the newsletter's success. We have feature articles by our distinguished faculty members. We also have articles, poems and fun activities by the students. The Events and Achievements section talks about all the activities organized by the department of Computer Science in the past year and the Coming Up bulletin tells about the activities planned for the not-so-distant future.
Hope you would enjoy this edition! If you have any ideas that you would like to share with us, please contact us at *thenewsbyte.spmc@gmail.com*.

Quantum Computing *(contd.)*

If you place a living cat in a thick lead box, seal it and then throw it in a vial of cyanide, nobody knows whether the cat is alive or if it has broken the cyanide capsule and died. Since we do not know, the status of the cat (dead or alive), according to quantum law - is a superposition of states. It is only when we break open the box and see what condition the cat is in that the superposition is lost, and the cat must be either alive or dead.

Stephen Hawking and Richard Feynman have also given a many-worlds theory. It says that whenever a potential exists for any object to be in any state, the universe of that object transmutes into a series of parallel universes equal to the number of possible states in which that the object can exist, with each universe containing a unique single possible state of that object. Moreover, these universes interact to permit all states to be accessible in some way and for all possible states to be affected in some manner. Whichever theory one may choose, the basic is that one particle can exist in numerous states.

A Comparison of Classical and Quantum Computing

Classical computing relies on principles expressed by Boolean algebra. Data must be processed in an exclusive binary state at any point in time - that is, either 0 (off / false) or 1 (on / true). These values are binary digits, or bits. The Quantum computer, on the other words, can work with a two-mode logic gate: XOR and a mode QO1 (the ability to change 0 into a superposition of 0 and 1). In a quantum computer, a number of elemental particles such as electrons or photons can be used with either their charge or polarization acting as a representation of 0 and/or 1. Each of these particles is known as a quantum bit, or qubit. The nature and behavior of these particles has laid the foundation of quantum computing.

Superposition

According to quantum law, the particle enters a superposition of states, in which it behaves as if it were in both states simultaneously. Similarly, each qubit could take a superposition of both 0 and 1. This means that the number of computations that a quantum computer could undertake is 2^n, where n is the number of qubits used. These particles interact via quantum entanglement.

Entanglement

Particles (such as photons, electrons, or qubits) that have interacted at some point retain a type of connection and can be entangled with each other in pairs, in a process known as *correlation*.

While a 2-bit register in an ordinary computer can store only one of four binary configurations (00, 01, 10, or 11) at any given time, a 2-qubit register in a quantum computer can store all four numbers simultaneously. If more qubits are added, the increased capacity is expanded exponentially.

Quantum computing is not well suited for tasks such as word processing and email, but it is ideal for tasks performing cryptography, DNA modeling, indexing very large databases, complex material science analysis, etc.

CONGRATULATIONS

Third year:

1.	Moni Arora	96.09%
2.	Tanu Satija	95.04%
3.	Manasvi Aggarwal	92.1%

Second year:

1.	Rajni Dabas	95.2%
2.	Vidhi Kumar	91.71%
3.	Zeenat Jahangir	91.15%

First Year:

1.	Prachi Arora	8.32
2.	Kritika Hasija	7.91
3.	Pranjal Bajaj	7.73

Congratulations on your success! Hope you keep bringing laurels to our institute.

DIGITAL INDIA

Charu Sharma
IV Year, B. Tech. Computer Science

Introduction of Information Technology is required to empower people in areas like health, education, labour and employment, banking etc. With the aim to impart knowledge to people and to empower them, the Digital India Program was initiated by the Government of India on 2 July, 2015.

Various initiatives are being taken under this single program and these initiatives are targeted to prepare India for becoming a knowledgeable economy and for bringing good governance to citizens.

The Digital India program aims at inclusive growth in areas of electronic services, manufacturing and job opportunities etc.

VISION

"Digital Infrastructure as a Utility to Every Citizen

Governance & Services on Demand and

Digital Empowerment of Citizens"

With this vision, the program aims to provide Broadband Highways, Universal Access to Mobile Connectivity, Public Internet Access Program, E-Governance: Reforming Government through Technology, eKranti - Electronic Delivery of Services, Information for All, Electronics Manufacturing: Target Net Zero Imports, IT for Jobs and Early Harvest Programs.

Several projects/products have already launched already or about to be launched. These include:

Digital Locker System which aims to minimize the usage of physical documents and enable sharing of e-documents across agencies.

MyGov.in has been implemented as a platform for citizen engagement in governance, through a "Discuss", "Do" and "Disseminate" approach.

Swachh Bharat Mission (SBM) Mobile app would be used by people and Government organizations for achieving the goals of Swachh Bharat Mission.

eSign framework would allow citizens to digitally sign a document online using Aadhaar authentication.

The **Online Registration System.** This application provides important services such as online registration, payment of fees and appointment, online diagnostic reports, enquiring availability of blood online etc.

National Scholarships Portal is a one stop solution for end to end scholarship process right from submission of student application.

DeitY has undertaken an initiative namely **Digitize India Platform (DIP)** for large scale digitization of records in the country.

The Government of India has undertaken an initiative, **Bharat Net**, a high speed digital highway to connect all 2.5 lakh Gram Panchayats of country. This would be the world's largest rural broadband connectivity project using optical fiber.

The estimated impact of Digital India by 2019 would be cross cutting, ranging from broadband connectivity in all Panchayats, Wi-Fi in schools and universities and Public Wi-Fi hotspots. The program will generate huge number of jobs in IT, Telecom and Electronics, both directly and indirectly. Success of this program will make India digitally empowered and the leader in usage of IT in delivery of services related to various domains such as health, education, agriculture, banking, and many more.

From the Diary of a Research Scholar…

That day, it seemed; "Yes! I was destined to achieve it." Throughout my struggles to achieve the doctorate degree, every passing day made me believe more firmly in a very famous quote by *Paolo Coelho, `The Alchemist';*

"And, when you want something, the entire universe conspires in helping you to achieve it ..."

But it was not that easy. For several years, I lived with my (seemingly) distant dream of being addressed as Dr. Pooja. At certain times it felt as if I were at a dead end, that actually it's not possible. But sooner or later, with the support of my mentor, friends and family I realized that it was all about being consistent with one's efforts. Only when one reaches the crossroads while traversing, there comes the time to decide a direction taking you closer (may be) to the goal.

Perhaps unsurprisingly, doing a Ph.D. is like going through hardship; it bonds you with those people who, in the midst of all your random wandering, help you, support you, listen to you, care about you, pat on your back, provide you with directions, or simply, love you. These people deserve a great deal of credit, because the accomplishment would not have come to existence without them.

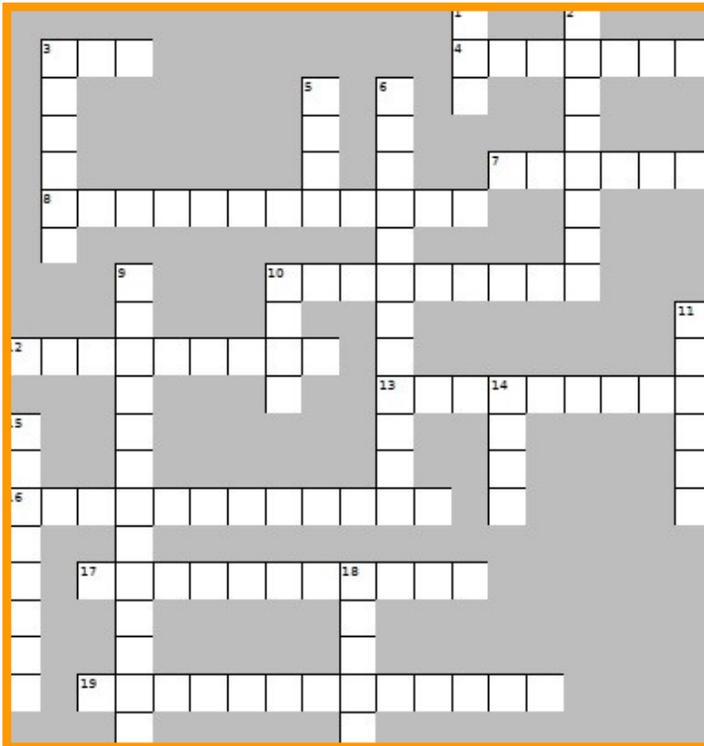My mentor, Dr. Punam Bedi has been a truly inspiring figure in my life, and has changed me forever. I idolize her and my gratitude to her is limitless. Becoming a doctorate is beginning of a new phase in the life of a scholar. It broadens your horizons, shapes your thinking mechanism in the most positive way and to such a level that even impossible starts reading "I M POSSIBLE".

A scholar by heart,
Dr. Pooja Vashisth

Mark My Words

Ridhi Gupta
B.Tech. Computer Science
IV Year

MONITOR KEYBOARD MOUSE PRINTER SPEAKER TABLE CPU SCREEN MOTHERBOARD KEYS SOFTWARE HARDWARE BROWSER FOLDERS NOTES ICONS REBOOT USB DVD SEARCH USB

R	D	E	N	E	E	R	C	S	E	T	S	S	B
D	H	O	O	E	K	R	N	R	K	N	C	D	R
R	F	O	L	D	E	R	S	E	D	L	V	U	O
A	O	S	T	R	Y	O	Y	O	R	D	A	S	W
O	B	H	P	O	S	B	K	R	E	A	W	B	S
B	T	M	R	E	O	S	O	F	T	W	A	R	E
R	S	S	O	A	A	B	S	E	N	R	R	S	R
E	F	E	R	N	E	K	E	E	I	E	H	E	P
H	P	D	T	T	I	P	E	R	R	L	I	A	D
T	N	R	A	O	T	T	O	R	P	B	C	R	R
O	U	P	C	S	N	O	O	E	R	A	O	C	O
M	R	H	A	R	D	W	A	R	E	T	N	H	S
Y	E	T	D	K	R	M	O	U	S	E	S	K	D
A	Y	O	A	S	S	E	E	T	E	E	E	I	A

Across
3 Random Access Memory
4 Setting that is automatic unless changed by user
7 Electronic mail
8 Printers and Monitors (2 words)
10 Area on screen where the user interacts with the software application
12 A small window with options for completing an action (2 words)
13 Miniature version of the document
16 Allows more than one application to run at a time
17 Keyboard, Mouse, Disk Drive, USB Drive (2 words)
19 A tab added to the Ribbon for certain activities (2 words)

Down
1 Format widely used because all document formatting is preserved
2 Expands the window to fill the screen
3 Related commands that are divided into tabs
5 Collection of related data stored on a hard disk
6 Displays a menu of commands for opening, saving, and printing (2 words)
9 Indicates the file type and is used by the application to recognize files (2 words)
10 Little pictures that represent programs on the desktop
11 Used to organize files
14 A list of commands
15 Follows a program; designed to compute
18 Malicious code that appears like a useful program

Do You Know?

1. In SQL, which command is used to make permanent changes made by statements issue since the beginning of a transaction?
   (a) ZIP
   (b) COMMIT
   (c) SAVE
   (d) PACK

2. The tracks on a disk which can be accessed without repositioning the R/W heads is
   (a) Surface
   (b) Cylinder
   (c) Cluster
   (d) None of the above

3. An AI technique that allows computers to understand associations and relationships between objects and events is called:
   (a) Heuristic Processing
   (b) Cognitive Science
   (c) Relative Symbolism
   (d) Pattern Matching

4. Frames from one LAN can be transmitted to another LAN via the device
   (a) Router
   (b) Bridge
   (c) Repeater
   (d) Modem

5. Which of the following flip-flops is free from race around problem?
   (a) T Flip Flop
   (b) SR Flip Flop
   (c) Master Slave JK Flip Flop
   (d) All of the above

Tamanna Arora
B.Tech. Computer Science
IV Year

NCACIT 2016

With the aim to develop individuals who will be successful professionals in industry, research and entrepreneurial pursuit, the Department of Computer Science, Shyama Prasad Mukherji College, brings to you National Conference on Advances in Computer and Information Technology (NCACIT) 2016.

The conference strives to bring together experts from industry, governments and academia, experienced in engineering, design and research. It is an ideal platform for people to share views and experiments in Computer Science and Information Technology related areas. It provides opportunities for delegates to exchange new ideas and application experiences, to explore and share innovative work carried out by individuals and presents the latest research related to Computer Science and Information Technology.

The two day conference that will begin on 19 December, 2016 will be inaugurated by Dr. Nita N. Kumar (Principal, SPM College) and will be graced by the presence of the following eminent speakers: Dr. S.K. Muttoo (Department of Computer Science, Delhi University), Dr. Naveen Garg (Department of Computer Science and Engineering, IIT Delhi), Mr. Sanjeev Bhavnani (CEO, Mentorpreneur valYou ADD), Mr. Ravindra Joshi (HOD, Special Consumer Group), Dr. Sanjeev Singh (Deputy Proctor, Delhi University, South Campus), Mr. Anil Bahl (Practice Head-ITSM, Tech Mahindra Ltd) and Mr. Nitin Sood (Founder and CEO, Happy Shappy).

Further information can be found on ncacit2016.in

Poets of the Fall

इक्कीसवीं सदी में जहाँ व्हाट्सएप्प जैसी technology ने मचा दिया धमाल तो आओ सुनाऊँ आप सभी को व्हाट्सएप्प युग में कान्हा की यशोदा मईया से शिकायत:

मईया मोरी व्हाट्सएप्प
बहुत सतायो
सब ग्वाल बाल मिल जुल
नया ग्रुप बनायो
मईया मोरी व्हाट्सएप्प
बहुत सतायो

मैं सबसे छोटा सा बालक
ग्रुप में जगह न पायो
सब बैठे चैटिंग करते है
मोसो गाय चरवायो
मईया मोरी व्हाट्सएप्प
बहुत सतायो

बलदाऊ कहते है मुझसे
बंसी मती बजायो
बंसी की धुन सुन सुन के
रिंगटोन भूली जायो
मईया मोरी व्हाट्सएप्प
बहुत सतायो

किसके घर कितना माखन है
सब गूगल पर आयो
माखन मिश्री छोड़ ग्वाल सब
बर्गर पिज़्ज़ा खायो
मईया मोरी व्हाट्सएप्प
बहुत सतायो

मईया technology ने सब कुछ बदल दियो
अब कोई किसी से पता ना पूछे जब से GPS आयो।
सब अपनी selfie खींच कर व्हाट्सएप्प पर Dp लगायो।
मईया मोरी व्हाट्सएप्प
बहुत सतायो

अब राधा मुझसे ना मिलने आयो
जब से उसको मोबाइल भायो।

Technology technology
वाह क्या ज़माना है।
एक पल भी मोबाइल बिन ना गुज़ारा है।

कोई तो इन लोगों को समझाओ
कि हाथ में फोन होना status के लिए अच्छा है
लेकिन सब के touch में रहना इन लोगो के लिए अच्छा है।

Ashna Kapoor
B.Sc. (H) Computer Science
III Year

My Computer

My computer has a language
That is foreign to me
It speaks of RAM and Gigabytes
And what could ROM be!

I don't understand the Windows
My computer says are there
Nor the Gem Clip at the side of my page
With eyes that blink and stare!

I don't understand the cures
That maintenance wizards do
It's called defragmenter, scan disk,
And virus cleaning too!

Yet, computer and I work hand and eye
With a mouse to translate
The tasks that I want it to do
While it points out my mistakes!

Ayushi Goyal
B.Sc. (H) Computer Science
III Year

The Making of the Time Table Management Software—a Memoir

Time Table Management software is SPM's in-house tool developed for easy management, creation and distribution of the time table. It took a team of 5 members—Anchal Dua, Divya Singhal, Manisha Vashishth, Sneha Bharti and myself, a period of 7 months (development began in February 2016) and guidance of two teachers—Dr. Pooja Vashisth and Ms. Akanksha Bansal Chopra to turn this "idea" of ease in time table management into a proper working software.

This project was one of the most memorable and challenging software for us to build. It had to be done in PHP language, of which we knew little. So as we began making of the software so began our "PHP classes". Two of the five of us decided to develop the software from backend, creating databases, writing codes to display the data on the browser, while the other three managed the front end, as to how the data will be displayed, what color scheme will seem fit etc. Apart from PHP, we used several other technologies while making the software like AJAX, HTML, CSS, JAVASCRIPT and JQUERY. The department had organized a seven days long website development workshop which proved to be great source of help for the project.

We met several challenges on our journey. For example, simplifying the entry and modification forms and adding more features to it. The most challenging one was to implement a logic to accommodate BA program time table and Generic Elective Time Table but with very helpful gestures by Principal ma'am, Ravi Sir, Sarabjit Sir, we succeeded always and I am sure, as time passes, we'll be able to include more and more features into our software and watch it grow and prove to be a boon for the time table committee.

As a team leader, I have to figure out everything that could go wrong, before it does. Dividing the work among all team members, then integrating it, taking care of each aspect of time table software are some of my duties.

This project enhanced my knowledge and skills. I got a chance to learn PHP and implement it at the same time. I learnt to work in a team and think as a team leader. Also I got a better understanding of software development cycle. It helped me in emerging out as a stronger person. The important thing I learnt being a part of this project was how to think according to the client and respond according to the client needs. This skill can't be learnt alone and thankfully, we learnt it from our teachers. A special thanks to Dr. Nita N. Kumar for providing us with this opportunity and our teachers, Dr. Pooja Vashisth and Ms. Akanksha Bansal Chopra for their constant support and guidance throughout the project.

Anjali Bansal
III Year, B.Sc.(H) Computer Science

Events and Achievements

We, at the Computer Science Department, believe in the holistic, all round development of our students. To achieve our aim of creating industry ready professionals, we organize activities to expose our students to the trials and rigours demanded by the industry.

Throughout the year, we conduct a multitude of activities that push students to discover their potential and expand their skill-set beyond the prescribed curriculum. In addition to holding workshops on topics such as Web Development, Cloud Computing and Robotics, we conduct workshops to help our students to refine their interpersonal skills.

Our students have been proactive in using their skills to digitize the system for an improved experience. Pritika Mathur, a fourth year student, has developed an Android based application for the college which eases the dissemination of messages, access to time table and other information. Geetika Luthra, Pritika Mathur, Moni Arora, Nisha Kaushik, Shivangi Bansal, Tanya Jain (IVth year, B.Tech.) and Rajni Dabas (IIIrd year, B.Sc. Hons.) have been working on the CIC project funded by the UGC to create HumSafar—the Android based application that promotes pooling in public transit with the objective of enhancing women safety. Second and third year students are busy developing a software that eases the creation and distribution of time

table for the college. Fourth year students are creating several applications including canteen management software, online admission and test conducting software to streamline the work process in our college.
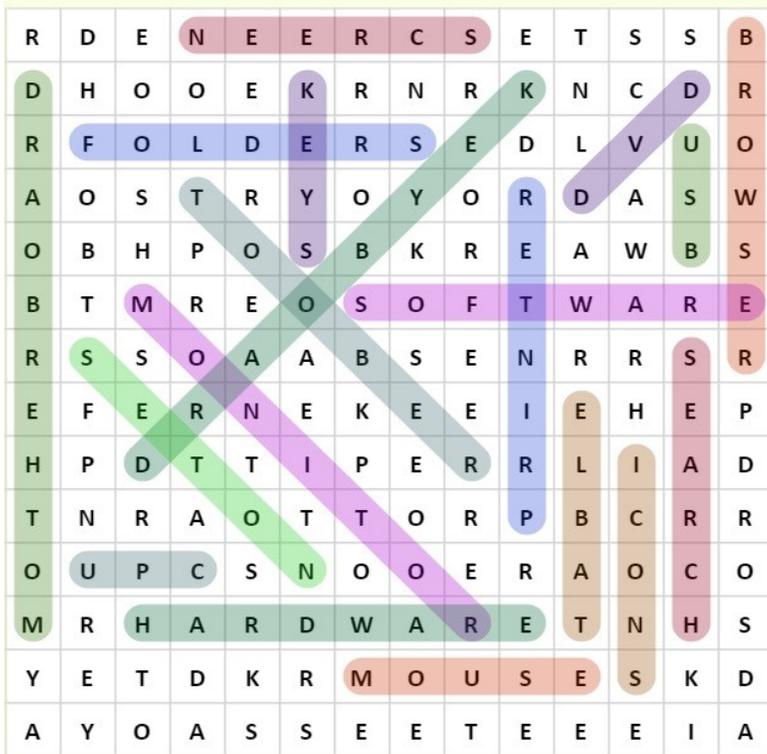
We host the SPMC ACM Student Chapter, a subsidiary of the Association for Computing Machinery, which organizes learning sessions to update the students on the latest trends with the best minds in the industry. The National Seminar On 'Emerging Trends and Technologies' and the Seminar cum Hands-on learning session on Python organized in collaboration with IIT Bombay and PSSI (Python Software Society of India) are some of the recently concluded events which saw tremendous success.

We strive to preserve the balance between work and frolic. Sangtaraash—the annual technical fest hosted by the Department provides the students the opportunity to learn what it takes to organize a mega event. This year, the fest saw an even larger footfall with students from colleges from all over Delhi putting their best foot forward to reveal their talents and win some coveted prizes offered in the various contests. The events are designed such that the students are tested for their technical skills as well as for their prowess in co-curricular arenas.

With many more intriguing activities planned for the coming year, we promise you a stupendous experience, for the best is yet to come!

Solutions

R D E N E E R C S E T S S B
D H O O E K R N R K N C D R
R F O L D E R S E D L V U O
A O S T R Y O Y O R D A S W
O B H P O S B K R E A W B S
B T M R E O S O F T W A R E
R S S O A A B S E N R R S R
E F E R N E K E E I E H E P
H P D T T I P E R R L I A D
T N R A O T T O R P B C R R
O U P C S N O O E R A O C O
M R H A R D W A R E T N H S
Y E T D K R M O U S E S K D
A Y O A S S E E T E E E I A

Crossword (across & down):

RAM
DEFAULT
OFF
E-MAIL
OUTPUTDEVICE
INTERFACE
DIALOGBOX
THUMBNAIL
MULTITASKING
INPUTDEVICE
CONTEXTUALTAB

Do You Know ?

1. *(b) Commit*
2. *(b) Cylinder*
3. *(d) Pattern Matching*
4. *(b) Bridge*
5. *(c) Master Slave JK Flip Flop*