Department of
COMPUTER SCIENCE & ENGINEERING

TECH-EXPLORER

Technical Magazine

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CONTENTS

NARAYANA
ENGINEERING COLLEGE
NELLORE (AUTONOMOUS)

ACCREDITED WITH GRADE A+ NAAC

Vision of the institute

To be one of the nation's premier Institutions for Technical and Management Education and a key contributor for Technological and Socio-economic Development of the Nation.

Mission of the institute

To produce technically competent Engineers and Managers by maintaining high academic standards, world class infrastructure and core instructions.

To enhance innovative skills and multi disciplinary approach of students through well experienced faculty and industry interactions.

To inculcate global perspective and attitude of students to face real world challenges by developing leadership qualities, lifelong learning abilities and ethical values.

Vision of the Department

To be a choice for education in the area of Computer Science and Engineering, serve as a valuable resource for IT industry & society and exhibit creativity, innovation and ethics to cater the global challenges.

Mission of the Department

M1: To educate learners by adapting innovative pedagogies for enhancing their cognitive skills, technical competence and lifelong learning.

M2: To provide training programs and guidance to learners through industry institute partnerships, social awareness programs, internships, competitions and project works to inculcate research skills toaddress the global challenges.

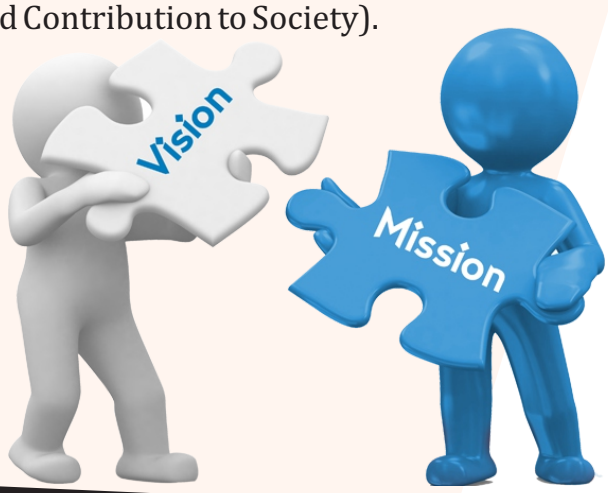
M3: To provide opportunities for students to practice professional, social and ethical responsibilities using IT expertise with a blend of leadership and entrepreneurial skills.

PEOS

PEO-1 : Procure employment/progress towards higher degree and practice successfully in the CS/IT profession. (Successful Career Goals).

PEO-2 : Address complex problems by adapting to rapidly changing IT technologies. (Professional Competency).

PEO-3 : Gain respect and trust of others as effective and ethical team member by demonstrating professionalism and functioning effectively in team-oriented and open-ended activities in industry and society. (Leadership, Ethics and Contribution to Society).



(PROGRAM SPECIFIC OUTCOMES) PSOs

Domain Specific Knowledge: Apply the relevant techniques to develop solutions in the domains of algorithms, system software, computer programming, multimedia, web, data and networking.

Software Product Development: Apply the design and deployment principles to deliver a quality software product for the success of business of varying complexity.

(PROGRAM OUTCOMES) POs

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multi disciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

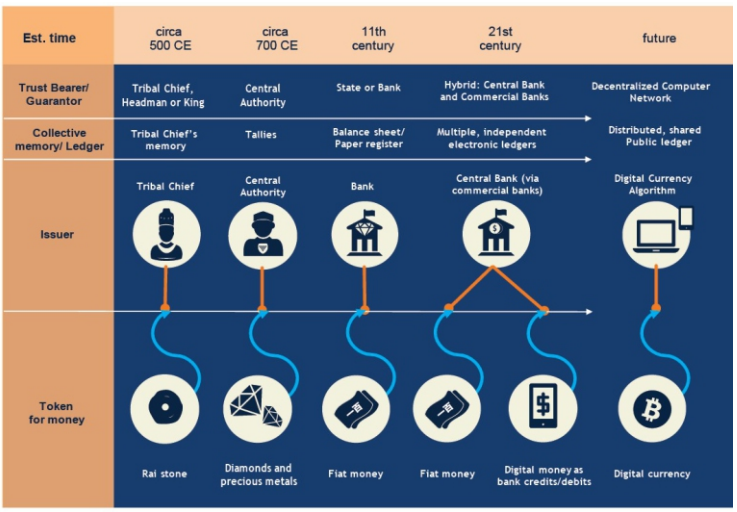
12. LIFE-LONG LEARNING: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

SPACE CONNECTS THE GLOBE

Recent scientific and technological advancements driven by the Internet of Things (IoT), Machine Learning (ML) and Artificial Intelligence (AI), distributed computing and data communication technologies have opened up a vast range of opportunities in many scientific fields—spanning from fast, reliable and efficient data communication to large-scale cloud/edge computing and intelligent big data analytics. Technological innovations and developments in these areas have also enabled many in the space industry. The successful Mars landing of NASA's Perseverance rover on 18 February 2021 represents another giant leap for humankind in space exploration. Emerging research and developments of connectivity and computing technologies in IoT for space/non-terrestrial environments is expected to yield significant benefits in the near future. This survey paper presents a broad overview of the area and provides a look-ahead of the opportunities made possible by IoT and space-based technologies. We first survey the current developments of IoT and space industry, and identify key challenges and opportunities in these areas. We then review the state-of-the-art and discuss future opportunities for IoT developments, deployment and integration to support future endeavors in space exploration.

Mr.V. Muniraju Naidu
Associate Professor

BLOCKCHAIN TECHNOLOGY FOR SUPPLY CHAIN MANAGEMENT



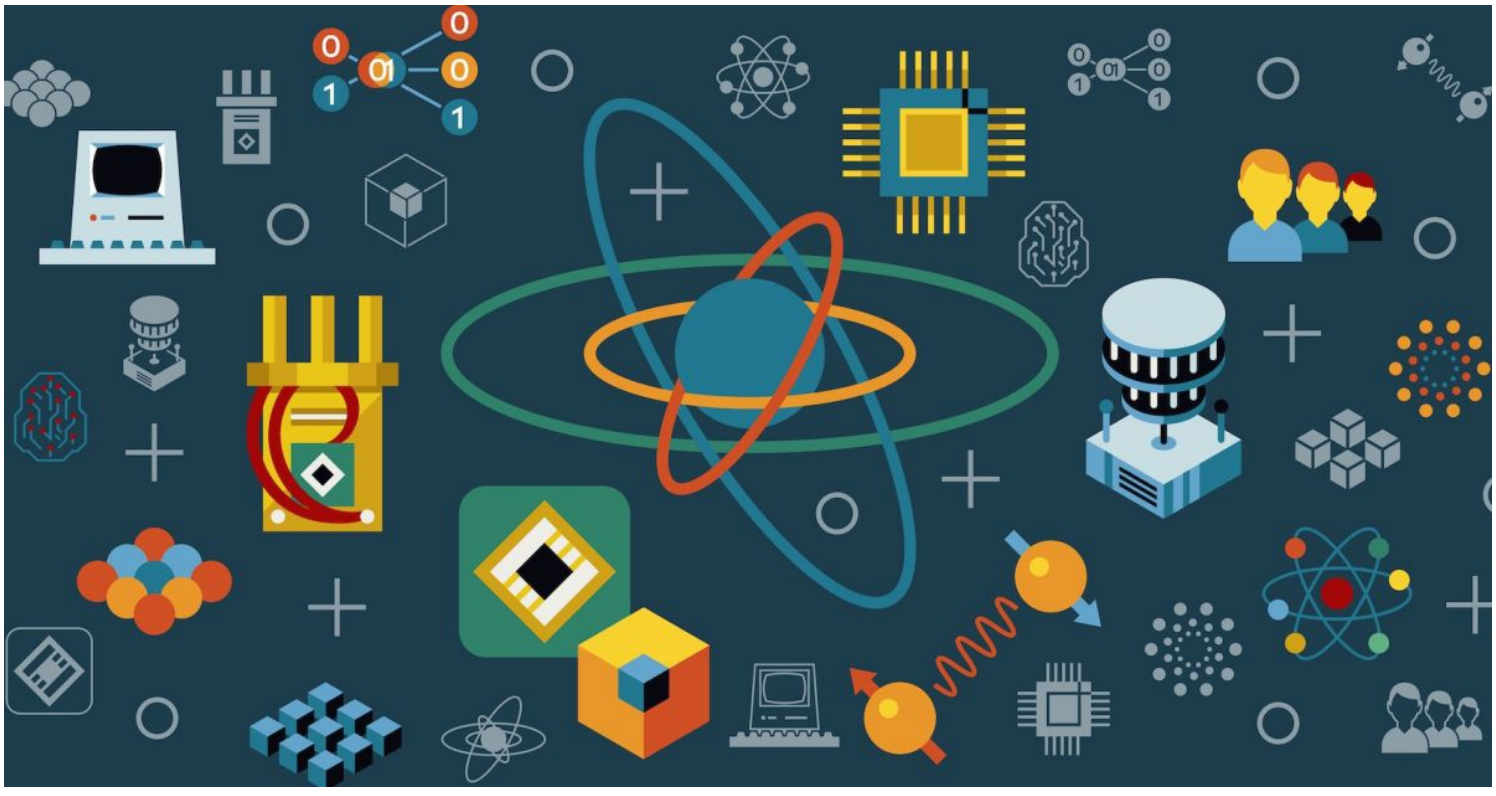
Blockchain technology offers important opportunities for the supply chain management. This paper aims to overview the employment of blockchain technology in the field of the supply chain. Although the technology has been widely associated with cryptocurrencies, non-financial applications such as supply chain, power, and food industry are also promising. Blockchain can provide a permanent, shareable, auditable record of products through their supply chain, which improves product traceability, authenticity, and legality in a more cost-effective way. In this chapter, the potential improvement expectations via blockchain technology for the case of agribusiness were discussed. The proposed case for automotive manufacturing-micro factory with blockchain technology was also introduced.

Y. Sravya
17711A05B7, IV CSE

THE GLOBAL RACE TO BUILD QUANTUM COMPUTERS

. In the global race to build quantum computers, India has so far been present only in theory compared to the US, China and the handful of other European countries that were spending large amounts of money. India has several theorists, but only a few have been trying to build a quantum computing device. Department of Science and Technology (DST), Indian Institute of Science (IISc), Tata Institute of Fundamental Research (TIFR) and Indian Institute of Science, Education and Research (IISER) are currently engaged in quantum computing research. In 2018, Microsoft India launched the Microsoft Garage – an experimentation resource for its employees, to encourage problem-solving in new and innovative ways. Microsoft Garage is collaborating with Indian engineering students by leveraging on its strength in quantum programming and algorithms, to grow the worldwide tribe of scientists, experimentalists and programmers working on quantum computing. The DST has set up a programme called Quantum Enabled Science & Technology (QuEST). As a part of the programme, it will invest a sum of INR 80 crore in a span of three years to facilitate research in this field. During January 2019, a road-map that would help in laying the groundwork for building quantum computers in India was discussed in the first meeting of QuEST connoting Phase I of India's quantum computing programme.

After three years, the Indian Space Research Organisation (ISRO), Defence Research and Development Organisation (DRDO), and Department of Atomic Energy (DAE) are expected to jointly pool in a sum of INR 300 crores to push QuEST to Phase 2 that would ensure that India's quantum computing programme matches international standards. Quo Vadis Quantum computing is real, even if it is in its infancy. It is widely believed that quantum computing will solve the increased computing needs of financial firms using far less energy than traditional computers.



P. Sri Sasmi
17711A0551, IV CSE

THE EMERGING TECHNOLOGY OF DIGITAL TRUST

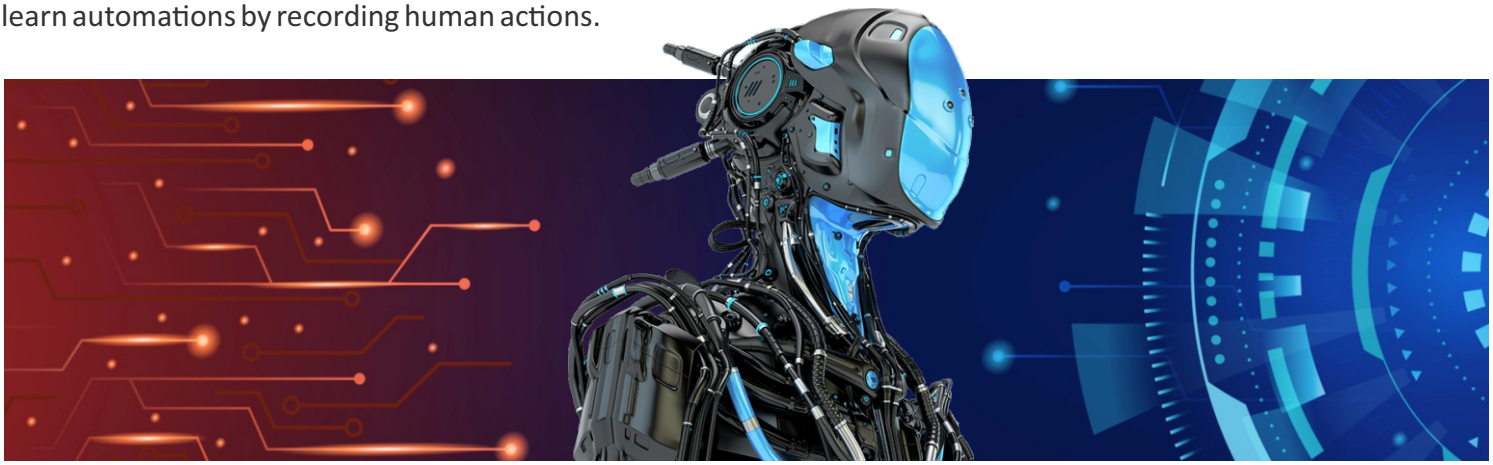
Trust in individual relationships with blockchain has become an increasingly prominent issue.

This study introduces a key heuristic used to assess trust in blockchain by analyzing how privacy and security concerns about blockchains have an impact on the user's attitude and behavior. It proposes a blockchain user model by integrating security and privacy as primary influencing factors of trust and behavioral intent. The results from a user experience model of blockchain users confirm that the model explains user experience and predicts behavioral intent of blockchain. The results establish users' cognitive role in embedding privacy and security in blockchain. The research contributes to the ongoing research by clarifying the role and dimension of trust in relation to security and privacy in blockchains and provides heuristic implications for academia and industry.

A.S. Charishma
18711A0502 (III CSE)

ROBOT PROCESS AUTOMATION (RPA) AND ITS FUTURE

Many software automation techniques have been developed in the last decade to cut down cost, improve customer satisfaction, and reduce errors. Robotic process automation (RPA) has become increasingly popular recently. RPA offers software robots (bots) that can mimic human behavior. Attended robots work in tandem with humans and can operate while the human agent is active on the computer. On the other hand, unattended robots operate behind locked screens and are designed to execute automations that don't require any human intervention. RPA robots are equipped with artificial intelligence engines such as computer vision and machine learning, and both robot types can learn automations by recording human actions.



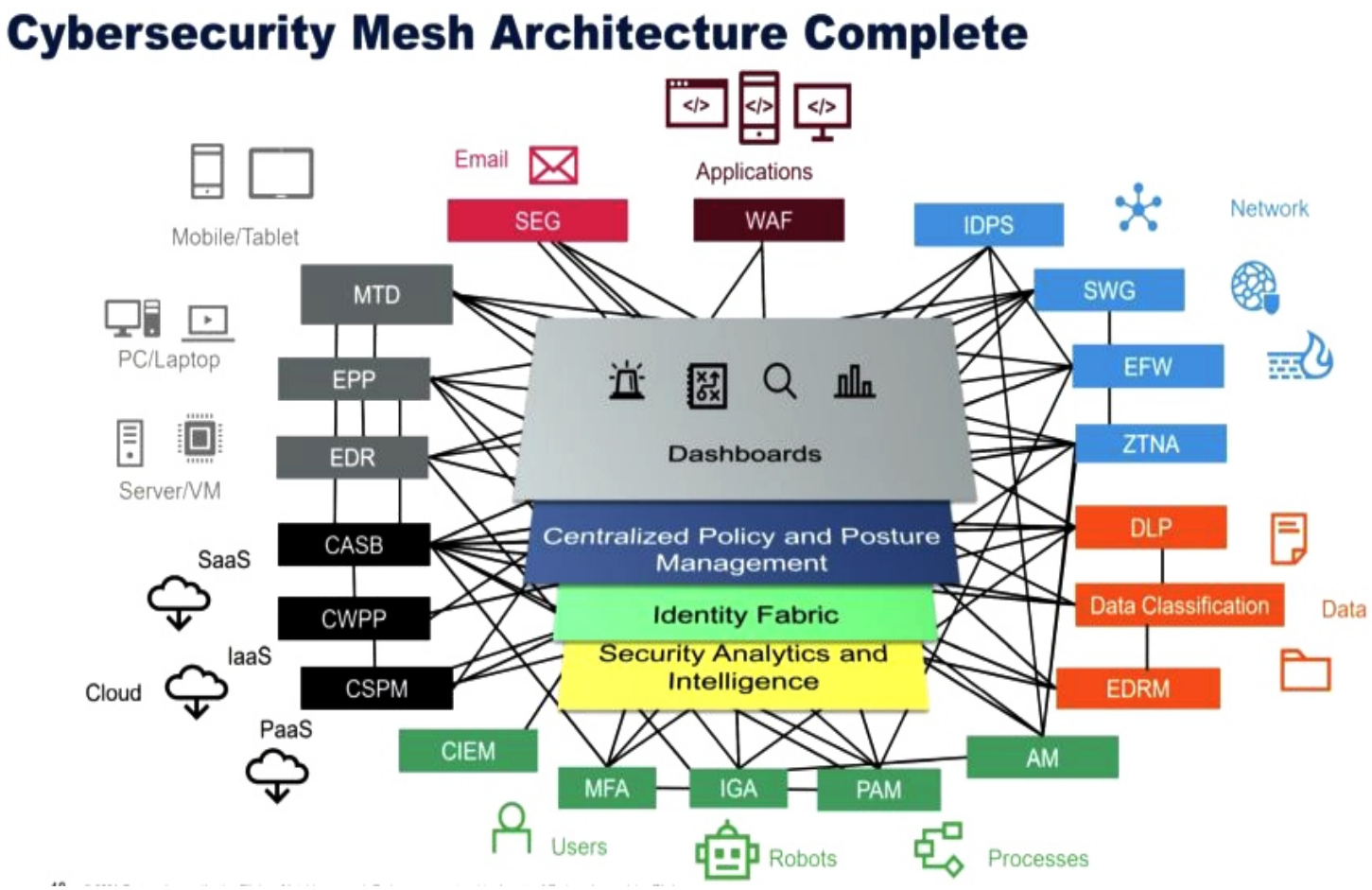
B. Jyothika
18711A0509 (III CSE)

CYBER SECURITY MESH

Gartner analyst Felix Gaehtgens said the security mesh is still a strategy rather than a defined architecture, but he said the concept better aligns organizations with threats: Attackers don't think in silos. Organizations do, he noted.

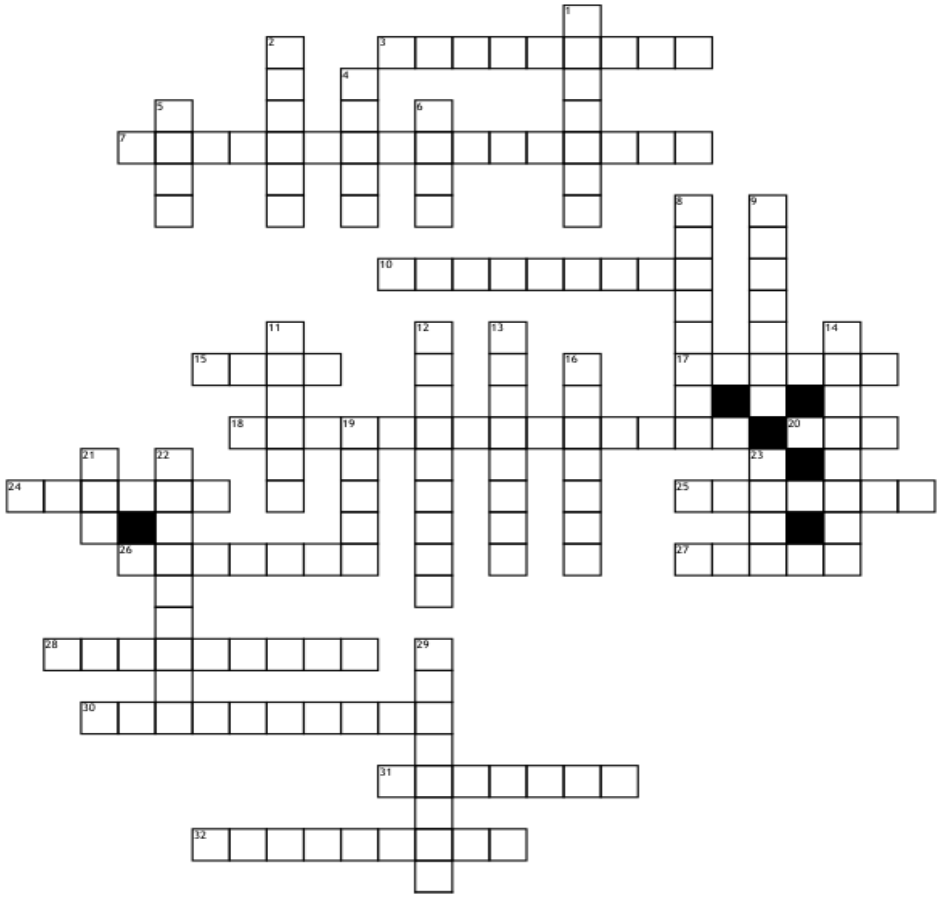
By 2024, Gaehtgens predicted that security mesh technology will lead to huge savings in the cost of breaches. “Organizations adopting a cyber security mesh architecture to integrate security tools to work as a cooperative ecosystem will reduce the financial impact of individual security incidents by an average of 90%, he said.

Instead of SIEM and SOAR integrating security tools, the security mesh will use security analytics and intelligence, he said. The mesh will also include identity, policy, posture and dashboard layers.



B. Sanjana
19711A0504, (II CSE)

CROSSWORD PUZZLES



Across

3. A number assigned to any item that is connected to the Internet

7. The information about someone on the Internet.

10. A datatype that is a single character which can be a letter, number, or symbol.

15. Information

17. A way of representing information using only two options.

18. Someone who acts safely, responsibly, and respectfully online

20. An error in a program that prevents the program from running as expected.

24. Computers that exist only to provide things to others.

25. a data type that has two possible values: "true" and "false"

26. Information in a program that is meant for other programmers (or anyone reading the source code) and has no effect on the execution of the program

27. An action that causes something to happen.

28. A list of steps to finish a task. A set of instructions that can be performed with or without a computer. For example, the collection of steps to make a peanut butter and jelly sandwich is an algorithm.

30. is a detailed, yet readable, description of what a computer program or algorithm must do, expressed in languages that humans use naturally rather than in a programming language

31. Small chunks of information that have been carefully formed from larger chunks of information

32. Finding and fixing errors in programs

Down

1. A collection of instructions (algorithms) that performs a specific task when executed by a computer.

2. The set of rules that defines the combinations of symbols that are considered to be a correctly structured document or fragment in that language.

4. A number or string (or other things to be named later) that can be stored in a variable or computed in an expression.

5. A wireless method of sending information using radio waves.

6. The construct that allows the repeated execution of segment of code until a terminating condition has been satisfied

8. A name that refers to a value. Stores a piece of data, and gives it a specific name.

9. An instruction for the computer. Many commands put together make up algorithms and computer programs.

11. Any finite sequence of characters (i.e., letters, numerals, symbols and punctuation marks)

12. A name used inside a function to refer to the value which was passed to it as an argument.

13. Sometimes called a procedure. A named sequence of statements that performs some useful operation

14. Another term for parameter

16. A data type that represents a positive or negative whole number

19. Data to be entered into a computer for processing

21. A relatively easy-to-remember address for calling a web page (like www.code.org).

22. Break a problem down into smaller pieces.

23. One or more commands or algorithm(s) designed to be carried out by a computer.

29. A repetitive action or command typically created with programming loops.