

L-1 INTRODUCTION TO NUMBER SYSTEMS**Do it yourself 1A:**

1. Identify the systems that these numbers belong to:

- a. $(1010101)_2$ Binary
 b. $(541)_8$ Octal
 c. $(79)_{10}$ Decimal
 d. $(C)_{16}$ Hexadecimal

Do it yourself 1B:1. Convert $(442)_{10}$ into binary, octal and hexadecimalAns. Binary : $(110111010)_2$ Octal : $(672)_8$ Hexadecimal: $(1BA)_{16}$ **Do it yourself 1C:**

1. Convert the following numbers into the decimal form.

- a. $(1010)_2$ a. $(10)_{10}$
 b. $(437)_8$ b. $(287)_{10}$
 c. $(A9C)_{16}$ c. $(2716)_{10}$

Do it yourself 1D:1. Convert $(1001001001)_2$ into its octal and hexadecimal form.Octal: $(1111)_8$ Hexadecimal: $(249)_{16}$ **Do it yourself 1E:**

1. Convert the following numbers into the binary form.

- a. $(174)_8$ a. 11111100
 b. $(B12)_{16}$ b. 101100010010

Do it yourself 1F:

1. Convert the following:

- a. $(764)_8$ a. $(1F4)_{16}$
 b. $(2B1)_{16}$ into its octal form b. $(1261)_8$

Do it yourself 1G:

Add	Subtract
$(101101)_2 + (111111)_2 = (0110110)_2$	$(1111)_2 - (0001)_2 = (01110)_2$
$(1110001)_2 + (1010101)_2 = (11000110)_2$	$(110011)_2 - (01010)_2 = (0101001)_2$

CHAPTER CHECKUP**A. Fill in the blanks:**

1. A binary number system uses two digits : 0 and 1
2. The Binary digit is also known as : bit
3. The Decimal number system is a base 10 number system.
4. In Octal and Hexadecimal Number systems, we have 8 and 16 digits, respectively.
5. When converting binary numbers to their octal form, we put digits together in groups of 3.

B. Tick the (✓) the Correct option.

1. Which number system uses only two digits, 0 and 1?
 a. Decimal ✓b. Binary c. Octal d. Hexadecimal
2. The Decimal Number System is also known as the _____ system.
 a. Base 2 b. Base 8 ✓c. Base 10 d. Base 16

3. What does "A" represent in the Hexadecimal Number System?

- a. 7 b. 9 ✓c. 10 d. 12

4. Which number system is used by digital devices like computers and calculators?

- ✓a. Binary b. Decimal c. Octal d. Hexadecimal

5. When converting a binary number into an octal number, we will form groups of how many digits?

- a. 1 b. 2 c. 3 ✓d. 4

C. Who am I?

1. I only understand two digits, 0 and 1. Computers use me to store and process information.

Binary Number system

2. I am used in counting and doing calculations every day. I have 10 digits, starting from 0 to 9.

Decimal Number system

3. I am number system that uses base 8.

Octal Number system

4. I am a unique as I let you see letters of the alphabet as my digits too. Programmers love using me.

Hexadecimal number System

5. I am common to all number systems. My value is also the same in all the number systems.

Number 0

D. Write T for True and F for False.

1. The Decimal number system is based on the digits 0 to 10.

False

2. In the Hexadecimal number system, the letter "D" represents the digit 10.

False

3. The Binary number system is the foundation of how computers understand and process information.

True

4. Computers can only perform addition, not subtraction.

False

5. $(D716240234)_{16}$ is an octal number.

False

E. Answer the following.

1. What is a number system?

Ans. A Number System is a way of representing and expressing numbers using a set of symbols or digits.

2. What is the base of a number system? Why it is important?

Ans. The base of a number system is the total number of digits the system uses. It is important to understand how numbers are represented and manipulated in that number system.

3. What does the term "hexadecimal" mean in the context of numbers system?

Ans. 'Hexa' means and 'Decimal' means .So, in a hexadecimal number system, total 16 digits are considered. It has digits from 0 to 9 and letters of the alphabet A to F, where A is 10, B is 11 and so on up to F as 15.

4. Why do we need to convert a decimal number into binary?

Ans. To process any number into the computer, we need to convert a decimal number into a binary.

L- 2 CYBERSECURITY

Do it yourself 2A:

1. What is cybercrime, and how is it different from real-world crime?

Ans. Crimes related to the internet are called cybercrime. Real-world crime targets individuals, such as theft or fraud. Cybercrime may target a large number of people. For example: if the website of the bank got hacked, then looting can be done.

2. What are the different categories of cybercrimes? Briefly define them.

Ans. There are different types of cybercrime, such as phishing, cyberbullying, and cyberstalking.

Phishing: It is the attempt to trick a user to get his or her personal information. This is generally done through fake emails.

Cyber bullying: Targeting a user on social media to emotionally harm him or her by creating fake accounts of him or her.

Cyber stalking: Using the internet to follow a user's location, monitoring his or her actions, and harming that person's privacy.

3. Read the strips and identify the cybercrime.

Ans. a. Type of crime- Phishing

b. Type of crime- Cyberbullying

4. Matching:

Column A		Column B	
Cybercrime		Tricking a user to steal his personal information	4
Corporate Espionage		The Stealing government information and demanding money for its return	3
Ransomware attack		The act of breaking the law using the internet	1
Phishing		Illegally spying in a business	2

Do it yourself 2B:

Read the paragraph and answer the following questions.

As time goes by, families sometimes move to different cities. We can stay in touch with them even if they're far away using the internet. We can also make new friends online, but we need to be careful. Not everyone online is who they say they are. Since we can't see them in real life, it is best not to share personal things like our name, where we live, or our phone number with them. Some people might want to make us uncomfortable or trick us, so it's important to let the elders we trust know if something feels strange.

We should never share passwords of our online accounts with anyone. A strong password has a mix of letters, numbers, and special characters. Also, it's a good idea to have different passwords for different things. If one gets compromised, the others will still be safe. By being cautious and using the Internet responsibly, we can have fun and stay safe at the same time.

Questions:

1. What's an important thing to remember when making new friends online? Why?

Ans. Since we cannot see an online friend in the real world, we should not provide our personal details.

2. Why is it risky to share personal information like your name, address, or phone number with people you meet on the Internet?

Ans. Some people might want to make us uncomfortable or trick us, so we should not share any personal information online.

3. If something feels strange while you're using the Internet, what should you do?

Ans. We should inform our elders about it.

4. Why is it a bad idea to share your online account passwords with anyone, even your friends?

Ans. One should not share his or her online account password, as it can be used for malicious activities.

5. Imagine you met someone online who was really nice, but they started asking for your personal information. What should you do in that situation?

Ans. You should block that person online and also inform your parents.

CHAPTER CHECKUP

A. Fill in the blanks:

- Cybercrime is a wrong or harmful action done through **digital devices**.
- Cybercrimes against individuals can involve the theft of personal information like **password**.
- E-mail Spoofing** is when an attacker sends an email with a fake sender address to deceive the recipient.
- Cyberbullying** involves using digital platforms to harm others through aggressive and hurtful messages.
- Installing and maintaining **antivirus** on your computer can help protect it from viruses.

B. Tick the (✓) the Correct option.

1. What should you do if you encounter cyber bullying?
 - a. Ignore it and don't tell anyone
 - b. Stand up to the bully and respond with hurtful messages
 - ✓c. Report it to a trusted adult and seek help
 - d. Get worried and panic
2. What is the goal of cyber terrorism?
 - a. To bring peace and harmony to society
 - ✓b. to create fear, panic and disturbance using technology and the internet
 - c. To cause directly physical harm or casualties.
 - d. To improve cyber security
3. How can you protect your online accounts?
 - a. Use weak and simple passwords
 - c. Create strong passwords and enable MFA
 - ✓b. Avoid using Multi Factor Authentication (MFA)
 - d. Share your passwords only with your close friends
4. What can antivirus software do for your computer?
 - a. provide entertainment and games
 - c. Increase computer speed and performance
 - ✓b. Protect against viruses and malware
 - d. Help to play games easily
5. What is the purpose of MFA in cyber security?
 - a. To block access to all websites
 - b. To act as a gatekeeper and protect against unauthorized access.
 - c. To slow down internet connection speed
 - ✓d. To make your computer more secure by providing additional passwords.

C. Who am I?

1. Cyber security threat that comes from someone within the organization who has authorized access to its resources and can carry out harmful actions. Insider Attack
2. False schemes aimed at tricking people into giving away personal information or money, such as phishing or lottery scams. Phishing
3. Communication device that allows you to browse the internet and access various online platforms. Firewall
4. Strong code that only you know and can keep your online accounts safe from hackers. Strong Password
5. Practitioner of protecting computers, systems, and networks from digital attacks to keep your online world safe from bad guys and hackers. Ransomware Attack

D. Write T for True and F for False:

1. Multi Factor Authentication (MFA) adds extra security to online accounts. True
2. It is safe to click on links or download files from unknown sources. False
3. Email spoofing is a safe and harmless activity. False
4. Ransom attacks involve stealing sensitive government data. True

E. Answer the following.

1. What do you mean by corporate espionage?

Ans. Corporate espionage is the illegal spying on a business or office to steal their information. This can be done through "Hacking".

2. What is cyber security and how can you implement it?

Ans. Cybersecurity is the practice of protecting computers, systems, and networks from digital attacks.

Cybersecurity is important because it functions like a digital shield, ensuring that your computer and personal information remain safe and secure from threats on the internet.

3. What is cyber stalking?

Ans. Cyberstalking is using the internet to follow another user's location, monitor his or her actions, and harm that person's privacy.

4. What is multi-factor authentication (MFA), and why is it a good practice?

Ans. Multi-Factor Authentication (MFA) is like having a double or even a triple lock on your online accounts. It is a good practice because MFA makes your account extra secure by adding more layers of verification.

5. What is identity the

6. ft and why is it important to protect your personal information online?

Ans. Identity theft is when a criminal pretends to be someone else on the internet to fool and steal more information from other users. It is important to protect our personal information as it can be wrongfully used for scamming, where the criminal will send believable-looking emails or advertisements to steal banking information and money from the users. The personal information can also be used for blackmailing or harassing a user.

L-3 COMPUTATIONAL THINKING

CHAPTER CHECKUP

A. Fill in the blanks:

1. In computational thinking, we break down a complex problem into smaller sub-problems to make it easier to solve.
2. Decomposition means breaking down a big, difficult task into smaller, easier ones.
3. An algorithm is a set of step-by-step instructions that a computer can follow to solve a specific problem.
4. When writing an algorithm, it is important to use simple language to ensure that the computer understands the instructions.
5. Computers use mathematical formulas to find a pattern in data.

B. Tick the (✓) the Correct option:

1. What is an algorithm?
 - a. A type of computer hardware
 - ✓b. A step-by-step procedure to solve a problem
 - c. A computer program
 - d. A mathematical equation
2. Which of the following is NOT an example of an algorithm?
 - a. A recipe for baking a cake
 - ✓b. Instructions for assembling a piece of furniture
 - c. Steps to tie your shoelaces
 - d. A list of your favourite movies
3. In computational thinking, what does “decomposition” mean?
 - ✓a. Breaking down a problem into smaller, manageable parts
 - b. Making something more complex
 - c. Combining two problems into one
 - d. Ignoring unnecessary details
4. Which of the following is an example of abstraction?
 - a. Following a map
 - ✓b. Watching a TV serial
 - c. Using a recipe to make dinner
 - d. Playing games
5. Handwriting recognition is an example of _____.
 - a. Abstraction
 - ✓b. Pattern recognition
 - c. Decomposition
 - d. Algorithm design

C. Match the following:

Column A	Column B
Algorithm	Includes moving away from the detailed details and focusing on the important aspects of a problem 4
Computation	By breaking a big problem into smaller parts 3
Decomposition	The process of solving a problem using a computer 2
Abstraction	A step-by-step procedure for solving a problem 1

D. Write T for True and F for False:

1. An algorithm is a step-by-step set of instructions for solving a specific problem.

True

2. Computation refers to the process of performing calculations and solving problems using computers.

True

3. Algorithms can be used to solve real-life problems, such as finding the shortest path between two locations on a map. False

4. Pattern recognition involves breaking down complex problems into smaller, manageable steps that can be solved systematically. False

5. Algorithms always have a single, fixed solution to a problem and cannot be adapted or modified.

False

E. Answer the following questions:

1. What is an algorithm? Provide a simple example of an algorithm.

Ans: Algorithm can be defined as step-by-step instructions to be followed for a machine to carry out a task. A simple example of an algorithm is baking a cake. We can divide the entire process into the following steps:

- Collect the ingredients.
- Mix them in proper portions.
- Switch on the oven.
- Bake for the suggested period of time.

2. Define abstraction. Give an example.

Ans: Abstraction means focusing on the most important parts and ignoring the details that don't matter. Maps are a great example of abstraction. Taking the help of a map to look at the hiking route using the concept of abstraction allows you to focus on the hiking route you will take, leaving out all the unnecessary details on the map that you don't need to know to go on the hike.

3. Why it is important to break down complex problems into smaller, manageable steps when solving them?

Ans: Breaking down complex problems into smaller, manageable steps is crucial for effective problem-solving because it fosters clarity, reduces overwhelm, and allows for focused, efficient progress towards a solution.

4. Can you name three common tasks in your daily life that can be simplified or improved by applying the concepts of computational thinking?

Ans: The three common tasks in our daily life that can be simplified or improved by applying the concepts of computational thinking are:

- Getting ready for a school.
- Making a cup of tea.
- Addition of two numbers.

5. What is pattern recognition?

Ans: Pattern recognition is the process of identifying patterns in data or information.

L-4 CALCULATIONS USING SPREADSHEETS

Do it yourself 4A:

1. Matching: 3,4,2,1

2. Write the formula to calculate the total of cells A1, B1, C1, and D1 in cell E1.

$= (B1 + C1 + D1)$

Do it yourself 4B:

1. A group of friends went on a trip. Their individual expenses are given in the table below. Calculate the total expense of the trip in the cell B10.

Ans: Total Expense: $= \text{SUM} (B2:B8)$

Do it yourself 4C:

1. Label the parts of the given function.
 - a. Function name
 - b. Cell range
2. What will be the output of following functions?
 - a. 87
 - b. My Rules
 - c. 23
 - d. 20^2

CHAPTER CHECKUP

A. Fill in the blanks:

1. A **cell** is a rectangular block in a spreadsheet that can hold data.
2. To refer to a cell in a spreadsheet, we use a combination of letters and **numbers**.
3. The **max** function finds the maximum value in a range of numbers.
4. The **average** function is used to find the average of a range of numbers.
5. The **now** function returns the current date and time.

B. Tick the (✓) the Correct option:

1. Which function is used to find the minimum value in a range of numbers?
✓a. MAX b. MIN c. AVERAGE d. COUNT
2. How do you create a cell range for cells A1 to A4?
a. A1,A4 ✓b. A1:A4 c. A1-A4 d. A1 to A4
3. Which function would you use to join text strings together?
a. UPPER ✓b. CONTATENATE c. LEN d. SUM
4. To get the current system date in a cell, which function would you use?
a. NOW() ✓b. TODAY() c. DATE() d. TIME()
5. The function =SQRT(16) returns:
✓a. 4 b. 8 c. 16 d. 2

C. Who am I?

1. I return the highest value from a set of numbers. **MAX Function**
2. I count the number of cells that contain numeric values in a range. **COUNT Function**
3. I add all values in a specified cell range together. **SUM Function**
4. I convert all text in a cell to lowercase letters. **LOWER Function**
5. I provide the current date and time. **NOW Function**

D. Write T for True and F for False:

1. Google Sheets is a licensed software like Microsoft Excel. **False**
2. The COUNT function counts the number of cells that contain text. **False**
3. The SUM function adds up all the values in a specified cell range. **True**
4. The MOD function returns the remainder when one number is divided by another. **True**
5. The LOWER function converts all the text in a cell to uppercase letters. **False**

E. Answer the following questions:

1. What is the purpose of the LEN function?

Ans: This function counts the number of characters in a cell, including letters, numbers, spaces and punctuation.

2. How do you move to the next cell in a row after entering data?

Ans: Press the **Tab** key to move to the next cell in a row.

3. What is a cell range in Google Sheets?

Ans: A cell range is a group of cells selected together.

4. Which function calculates the square root of a number?

Ans: SQRT function returns the square root of a number.

5. Describe the process to find the total expense using the SUM function.

Ans: The SUM function is used to add the values given in a specific cell range. To use the SUM function, follow the given steps:

1. Click on the cell where you want the sum to appear, for example, cell B13.

2. Type an equal to symbol “=” and then the function name SUM.
3. Type the opening parentheses “(“ after the function name.
4. Inside the brackets, add the cell range for which you want to calculate the total. For example, B3:B12.
5. Press Enter to complete. You can see the result in the cell B13.

L-5 VISUALISING DATA USING SPREADSHEETS

Do it yourself 5A:

1. You have a list of animals in a spreadsheet, and you want to see only the ones that are mammals. What should you use?
 - a. Sorting
 - ✓b. Filtering
 - c. Formatting
 - d. Deleting
2. Write T for True and F for False:
 - a. You have created a list of cars and their speeds in a Google Sheet. You can use the sorting feature to put them in order from the highest to the lowest speed to view the fastest car at the top.

True

- b. Grouping data is only useful when working with numbers, and it does not apply to other types of information.

False

Do it yourself 5B:

Tick the (✓) the Correct option:

1. Why do we use charts in Google Sheets?
 - a. To make the data look fancy.
 - b. To make the number bigger
 - ✓c. To help understand and analyse data more easily
 - d. To hide the data from others
2. Which type of chart looks like a pizza divided into slices?
 - a. Bar chart
 - b. Line chart
 - ✓c. Pie chart
 - d. Scatter plot

Chapter Checkup:

A. Fill in the blanks:

1. A bar chart is like a group made up of colourful rectangular bars, where each bar represents a category, and its **length** shows the value or amount.
2. **Sorting** data helps to organize data in rows or columns based on specific criteria.
3. Charts are **visual** representation of data.
4. **Grouping** data means putting similar things together to keep the data tidy.
5. A **line** chart uses lines to show how something changes over time by connecting dots.

B. Tick the (✓) the Correct option:

1. Which type of chart would you use to display the progression of a plant's growth?
 - a. Column chart
 - b. Bar chart
 - c. Pie chart
 - ✓d. Line chart
2. Grouping in spreadsheet refers to:
 - a. Colouring sheet tabs
 - b. arranging data in a specific order
 - ✓c. Combining related rows or columns together
 - d. creating formulae to perform calculations
3. What do charts do in spreadsheets?
 - a. Perform calculations
 - b. show data visually and help understand it
 - c. Sort data alphabetically
 - d. change the font style of the spreadsheet
4. What symbol is used to show a grouped set of rows in Google Sheets?
 - a. '*'
 - b. '-'
 - ✓c. '+'
 - d. '#'
5. What feature in Google Sheets helps you to display only items that meet certain conditions?
 - a. Sorting
 - b. Grouping
 - ✓c. Filtering
 - d. Charts

C. Who am I?

1. I help you to reorganize data to make it simpler to locate and understand. **Sorting**
2. I put similar items together to keep things tidy in a spreadsheet. **Grouping**

3. I am type of chart that uses colourful and rectangular vertical bars to compare quantities or values.

Column chart

4. I am a process in worksheets that involves arranging data in a specific order based on certain criteria.

Sorting

5. I am a symbol that used to add sheets tab in google sheets.

'+' symbol

D. Write T for True and F for False:

1. Pie charts are suitable for comparing quantities or values, while line graphs are used show changes over time. **True**
2. Filtering data in spreadsheets permanently removes hidden rows or columns from the dataset. **False**
3. Sorting in spreadsheets refers to arranging data in a specific order based on certain criteria, making it easier to locate and analyse. **True**
4. You can colour sheet tab in Google Sheets to organize different sheets better. **True**
5. Grouping data helps you to display items without repeating them multiple times. **True**

E. Answer the following questions:

1. How does grouping data help in organizing a spreadsheet?

Ans: In Google Sheets, grouping means putting similar things together. Grouping keeps things tidy and helps you find what you need faster.

2. What is a line chart used for?

Ans: A line chart uses lines to show how something changes over time by connecting dots.

3. Describe the steps to apply a filter in Google Sheets.

Ans: The steps to apply a filter in Google Sheets are:

- a. Select the range to which you want to apply the filter.
- b. Go to **Data** menu and choose **Create a filter** option.
- c. Select **Filter by condition** and choose your rule.
- d. After selecting the required rule, click **OK**.

4. How can you add a new sheet tab in Google Sheets?

Ans: To add a new sheet tab in Google Sheets, follow the given steps:

- a. Click on the "+" symbol at the bottom left corner of the Google Sheets.
- b. A new sheet tab will appear.

5. What type of chart would be appropriate to display the names of different sports and the number of students who like each other?

Ans: Bar chart or a column chart