SS2 3RD TERM COMPLETE NOTE

Week 1 - 10

Week 1: ALGORITHMS AND FLOW CHART

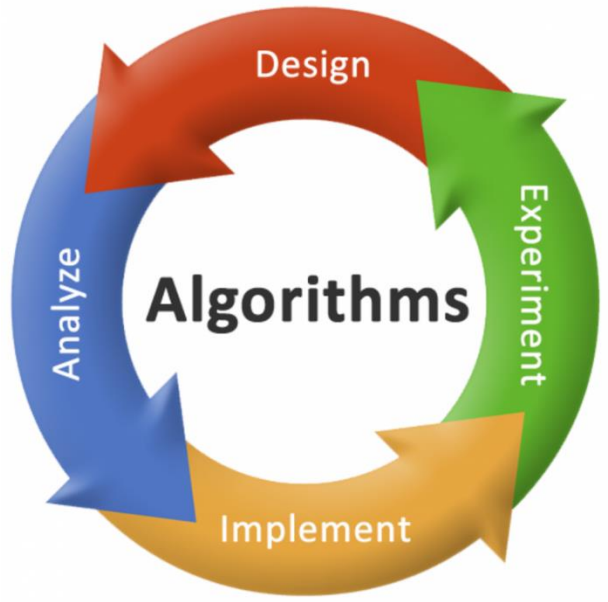
Introduction

In solving problems using computers, it is important to have a clear sequence of steps that the computer can follow. This step-by-step solution is called an algorithm. Flow charts are used to graphically represent these steps. Understanding algorithms and flow charts helps programmers design efficient programs.

Definition:

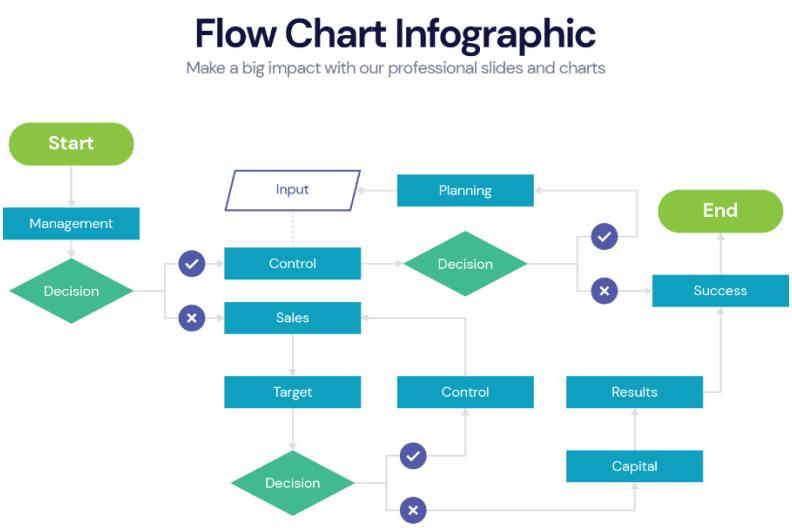
Algorithm

An algorithm is a finite set of well-defined instructions to solve a particular problem.



Flow Chart

A flow chart is a diagrammatic/graphic representation of an algorithm using symbols.



Characteristics of an Algorithm:

1. **Finiteness:** The algorithm must terminate after a finite number of steps.
2. **Effectiveness:** Each step must be basic enough to be carried out precisely.
3. **Definiteness:** Each instruction must be clear and unambiguous.
4. **Input:** An algorithm must have zero or more inputs.
5. **Output:** It must produce at least one output.

Functions of Algorithms:

1. Helps in problem-solving and program design.
2. Provides a clear sequence of instructions.
3. Facilitates debugging and maintenance.
4. Reduces complexity.

Week 2: ALGORITHMS AND FLOW CHART (Writing Algorithm for Solving Problems)

Introduction

Once we understand what algorithms are, the next step is to learn how to write them for solving specific problems. Writing algorithms trains the mind to break complex tasks into smaller manageable steps.

Writing Simple Algorithms:

Examples:

1. Compute the average of a set of numbers:

- Step 1: Start
- Step 2: Input numbers
- Step 3: Sum the numbers
- Step 4: Divide sum by the count of numbers
- Step 5: Output average
- Step 6: End

2. Evaluate the equation Y = a(b-c)^2/d + 2:

- Step 1: Start
- Step 2: Input values for a, b, c, and d
- Step 3: Compute (b-c)
- Step 4: Square the result
- Step 5: Multiply by a
- Step 6: Divide by d
- Step 7: Add 2
- Step 8: Output Y
- Step 9: End

Week 3: ALGORITHMS AND FLOW CHART (Flowchart Symbols and Their Uses)

Introduction

A flow chart helps to visually understand an algorithm. Specific symbols represent different types of actions or steps in a process. Mastery of these symbols makes it easier to design clear and effective flow charts.

Common Flowchart Symbols:

Symbol	Meaning	Description
Ovals	Start/End	Shows the beginning or end of a flowchart.
Parallelogram	Input/Output	Shows data input into or output from the system.
Rectangle	Process	Represents a process, operation, or task.

Symbol	Meaning	Description
Diamond	Decision	Represents a decision-making step.
Arrows	Flowlines	Show the direction of flow of the process.

Name	Symbol	Usage
Start/Stop		Used only at the beginning and end of the flowchart.
Process		Used to 'do something' for example, assign a variable a value, or carry out a calculation.
Decision		Used to change the direction of a program. This is the only block that can have more than 1 arrow coming out of it, and any arrows should be labelled with possible answers to the question posed.
Input / Output		Used for a user input or to output or print something.
Connector		If there is not enough space to fit the flowchart on one page, connectors can be used to show where the flowcharts should be joined together.
Direction of flow		Arrows show how to travel through the flowchart.

Uses of Flowchart Symbols:

1. **Ovals:** Begin or end the process.
2. **Parallelogram:** Indicate where inputs are received or outputs are displayed.
3. **Rectangle:** Indicate operations like calculations.

4. **Diamond:** Represent choices leading to different paths.

Sample Problem (Drawing a Flowchart):

Problem: Calculate the average of two numbers.

Flowchart Steps:

1. Start
2. Input two numbers
3. Add the numbers
4. Divide sum by 2
5. Display the result
6. End

(Draw flowchart based on the steps using correct symbols.)

Step	Description	Symbol Type	Symbol Shape
1	Start	Terminator	⬭ (Oval)
2	Input two numbers (A, B)	Input/Output	⭳ (Parallelogram)
3	Add the numbers (Sum = A+B)	Process	▭ (Rectangle)
4	Divide sum by 2 (Avg = Sum/2)	Process	▭ (Rectangle)
5	Display the result (Avg)	Input/Output	⭳ (Parallelogram)
6	End	Terminator	⬭ (Oval)

Week 4: BASIC PROGRAMMING II (Built-in Functions and Basic Notations)

Introduction

Programming languages often provide built-in functions to perform common tasks such as mathematical calculations, simplifying the programmer's job. Understanding these functions helps in writing efficient programs quickly.

Built-in Functions:

Functions provided by programming languages to perform common operations without needing to write complex code.

- Examples of mathematical built-in functions:
    - **SQR(X):** Returns the square root of X.
    - **INT(X):** Returns the integer portion of X.
    - **SIN(X):** Returns the sine of X (X in radians).
    - **COS(X):** Returns the cosine of X.
    - **TAN(X):** Returns the tangent of X.
    - **ABS(X):** Returns the absolute value of X.
    - **LOG(X):** Returns the natural logarithm of X.
    - **EXP(X):** Returns e raised to the power of X.
    - **RND(X):** Returns a random number.

Basic Notations:

Simple algebraic expressions that can be programmed using built-in functions.

Week 5 & 6: BASIC PROGRAMMING II (Basic Notations in Algebraic Expressions)

Introduction

In programming, algebraic expressions are often translated into a form that a computer can understand and execute. Understanding how to write these expressions correctly is essential for creating accurate programs.

Translating Algebraic Expressions:

- Some common expressions:
    - $\sqrt{((b^2 - 4ac) / 2a)}$ ➔ SQR((b^2 - 4*a*c) / (2*a))
    - (x - y)(x + y) ➔ (x - y)*(x + y)
    - (a + b) + c/sin d ➔ (a + b) + (c / SIN(d))
    - b = 1/4ac ➔ b = 1 / (4*a*c)

- e^(x+y) - sin(x + ny) ➔ EXP(x + y) - SIN(x + n*y)

Week 7: INTERNET (Definition and Some Computer Internet Terms)

Definition of Internet

The Internet is a global network connecting millions of private, public, academic, business, and government networks to share information and resources.

Basic Internet Terms

1. **Browse:** To navigate through websites on the Internet.
2. **Browser:** A software application used to access and view websites (e.g., Chrome, Firefox).
3. **Chat Room:** A virtual space where users can communicate in real-time.
4. **Cyber Café:** A place where people can pay to use computers connected to the Internet.
5. **Cyberspace:** The virtual environment of computer networks and the Internet.
6. **Download:** The process of copying data from the Internet to a local device.

Advanced Internet Terms

1. **Home Page:** The first page of a website.
2. **HTML (HyperText Markup Language):** The standard language used to create web pages.
3. **HTTP (HyperText Transfer Protocol):** The protocol used to transfer data over the Internet.
4. **Intranet:** A private network accessible only to an organization's staff.
5. **Internet Service Provider (ISP):** A company that provides Internet access to users.
6. **Upload:** Sending data from a local computer to a remote server or website.
7. **Protocol:** A set of rules governing data communications.
8. **Web Browser:** Software used to access web pages.
9. **Web Page:** A single document on the Internet.
10. **Website:** A collection of related web pages under a domain name.

Week 8: INTERNET II (Main Browsers and Their Features)

Introduction

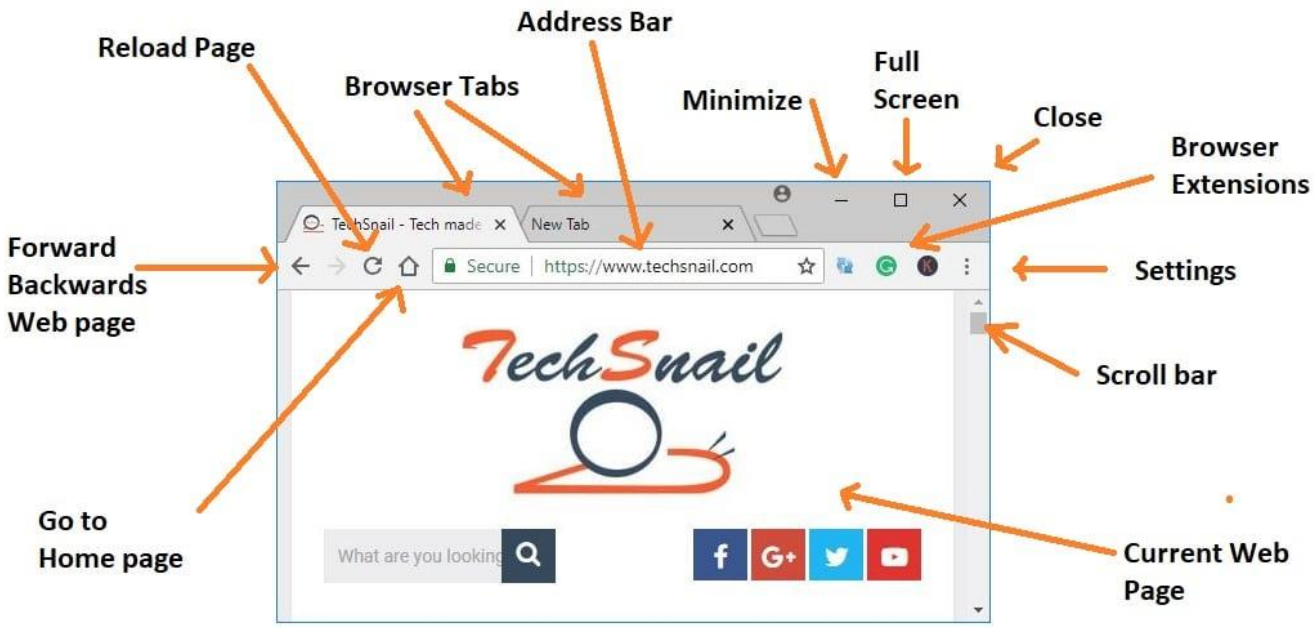
Web browsers are essential software/tools for accessing information on the Internet.

Main Browsers

1. **Internet Explorer (Now "Microsoft Edge"):** Developed by Microsoft.
2. **Opera:** A fast and lightweight browser.
3. **Mozilla Firefox:** Popular for its speed and security.
4. **Google Chrome:** Most popular browser

Features of Main Browsers

1. **Window:** Displays the content of web pages.
2. **Title Bar:** Shows the title of the web page.
3. **Menu Bar:** Contains options like File, Edit, View, etc.
4. **Tool Bar:** Quick access to common functions (back, forward, reload).
5. **Address Bar:** Used to type the URL (website address).



Week 9: INTERNET (Internet Services)

Introduction

The Internet provides numerous services that facilitate communication, learning, and business transactions globally.

Internet Services

- **E-mail:** Sending and receiving messages electronically.
- **Discussion Groups:** Platforms for group communication and discussions.
- **Telnet:** Remote login to another computer.
- **Usenet:** A global discussion system.
- **FTP (File Transfer Protocol):** Used for transferring files across the Internet.
- **WWW (World Wide Web):** A system of interlinked hypertext documents.

Week 10: ELECTRONIC MAIL (E-MAIL SERVICES) – Definition and Usage

Introduction

Electronic Mail, commonly known as email, is one of the most widely used services of the Internet.

It allows users to send and receive messages and documents instantly across the globe, transforming how people communicate in personal, academic, and business settings.

Definition of E-mail

E-mail stands for *Electronic Mail*.

It is a method of exchanging digital messages over the Internet.

E-mail Services

1. **Sending and Receiving Emails:** Allows users to communicate quickly and efficiently.
2. **Chatting:** Real-time communication with other users, also known as *instant messaging*.

Steps Involved in Operating a Mailbox

1. **Logging In:** Enter username and password.
2. **Reading Messages:** Clicking on inbox and selecting emails.
3. **Composing a New Message:** Writing and sending a message to another user.
4. **Replying or Forwarding Messages**
5. **Attaching Files:** Adding documents, images, etc., to an email.
6. **Logging Out**

Steps Involved in Creating an Email Account

1. Visit a mail provider website (e.g. gmail.com).
2. Click "Create Account."
3. Fill in personal information (name, birthdate, desired username, password).
4. Verify with phone number or email.
5. Confirm and login.

Week 11: ELECTRONIC MAIL (E-MAIL SERVICES) – Features and Chatting

Introduction

Understanding the features of email addresses and distinguishing them from websites helps students navigate online communication more efficiently. Chatting, another feature of digital communication, allows real-time interaction across distances.

Features of an E-mail Address

A standard email address has three parts:

1. **Username:** The user's chosen name (e.g., finemail)
2. **@ symbol:** Separates the username from the domain
3. **Domain name:** The provider (e.g., finegoving.org)
   - Example: finemail@finegoving.org

Website Address (URL)

A website typically begins with www. and ends with a domain extension.

Example: www.finegoving.org

Differences Between E-mail and Website Addresses

Email Address	Website Address
Contains @	Contains www.
Used for messaging	Used for browsing web content
Example: user@gmail.com	Example: www.google.com

Definition of Chatting

Chatting is a real-time exchange of typed messages over the Internet.

Platforms include: WhatsApp, Facebook Messenger, Gmail chat, etc.

Steps Involved in Chatting

1. Log in to a chat-enabled platform.
2. Select or search for a contact.
3. Type and send messages.
4. Receive and respond in real-time.

1. Write a correct example of an email address and a website address.
2. Identify the three parts of an email address.
3. What is chatting, and how does it differ from sending an email?