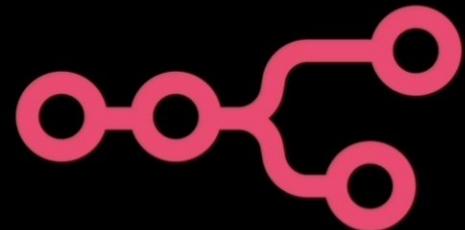


N8N CRASH COURSE



Beginner to Advanced Level Course

Chapters :

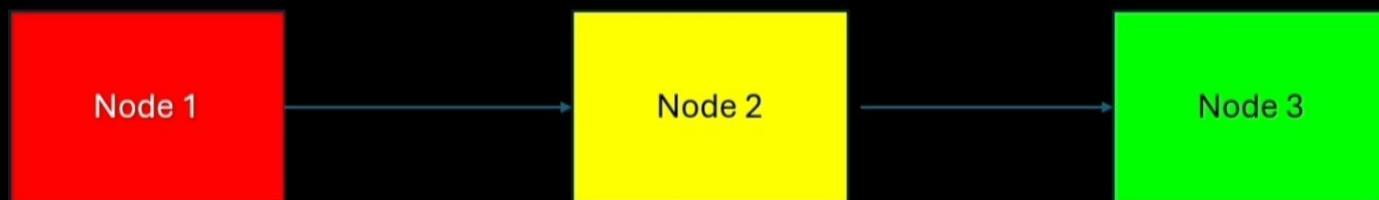
- 1. Introduction**
- 2. What is n8n?**
- 3. Key Philosophy of n8n**
- 4. What is Workflow?**
- 5. Parts of a Workflow**
- 6. Workflow Terms in n8n**
- 7. What is an AI Agent & It's Parts**
- 8. What are Nodes & Their Types**
- 9. Node Anatomy**
- 10. Node Configuration**

Chapters :

- 11. How Data Moves in n8n**
- 12. Credentials & Authentication**
- 13. What is Automation**
- 14. Difference Between Traditional & AI Automation**
- 15. n8n Dashboard Introduction**
- 16. Creating an AI Agent**
- 17. AI Agent 1**

What is N8N ?

- **N8N Means “Node to Node”**



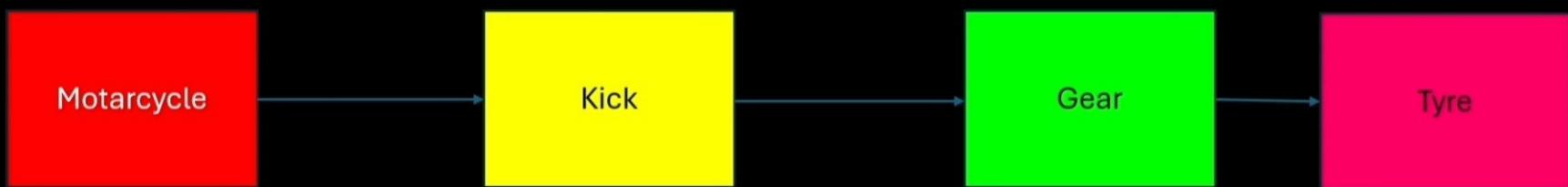
What is N8N ?

- **N8N Concept : Data Flow → Node To Node → Left to Right**



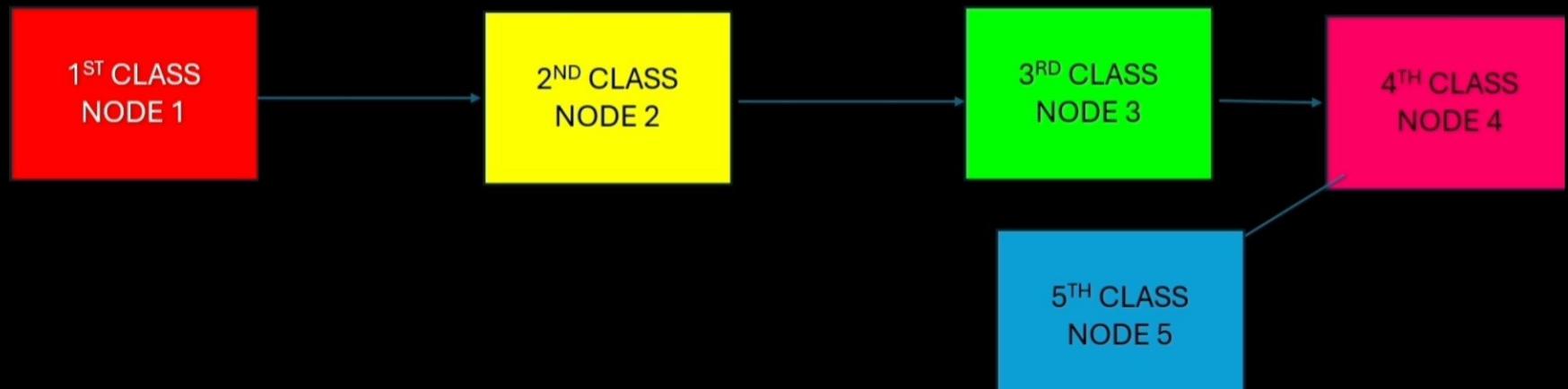
KEY PHILOSOPHY OF N8N

- **1. Visual Programming – No Need to write code**
- **2. Node-Based Architecture – Every Action has its own box.**
- **3. Flow-Based Processing – Data always flows left to right**



WHAT IS WORKFLOW?

- A Workflow is a collection of connected nodes that form a complete automation. It is the journey from start to end



WORKFLOW HAS 3 PARTS

- 1. Entrypoint(Start)**
- 2. Processing Chain(Middle)**
- 3. End Point(Exit)**



WORKFLOW HAS 3 PARTS

1. **Entrypoint(Start) : Every work flow starts with a trigger node.**
 - **Note : Trigger Node → Not Working → Then Next Flow → Not Work**
 - **Entrypoint → Trigger Node → Workflow Start → Ex. 9 Am Sunday Schedule Video → Schedule Trigger**



WORKFLOW HAS 3 PARTS

2. Processing Chain(Middle) : Processing starts from here.

What we can do : Logic & Condition Nodes: If do this else do that, Data Transformation Nodes, API Calls/Integration, Validation & filtering etc.



WORKFLOW HAS 3 PARTS

3. End Point(Exit): Final actions happen here like sending an email, saving data, notifying etc.

Ex. Bike → Kick Start → Engine Process → Tyre Moving End



WORKFLOW TERMS TO REMEMBER

1. Draft : Workflow not yet saved

Ex. Instagram → Video → Edit → Not Publish

2. Saved : Workflow Stored but inactive

Ex. Instagram → Reel → Saved

3. Active : Green Button Highlight → Workflow Working → Currently running / live

4. Paused : Temporarily stopped → Manually Stop

5. Error : Something went wrong → Issue → Come → We Have to Resolve that issue/error/bug

Execution Modes : Start or Execute

1. Manual : You press a button to run.

Ex. Instagram → You → Manual Video Upload

2. Automatic : Runs when trigger condition is met.

Ex. Instagram Video → Schedule → Automatic

3. Test : For Checking if workflow works or not.

WHAT IS AI AGENT ?

- **AI Agent means : Daily Routine Task → Autonomous Tasks(Easy Task) → Ex. PPT Fill, Email Sent to Person → This Tasks → Automate → AI Workflow**
- **Note : AI Workflow + Brain → AI Agent → Decision → By Own → Option/Power**
- **AI Agent → Have Brain → But → Our Side We Tell Them → Take Decision Or Not → Ex. Employee → Boss Tell What to do**

WHAT IS AI AGENT ?

- **AI Agent : Digital Employee**

1. Make Decisions

2. Use Tools (APIs, search, databases)

**Ex. Gmail → Automatic Email Send, Instagram →
Acess Automatically**

3. Remember Past Conversations

Ex. Chatgpt → Memory Used

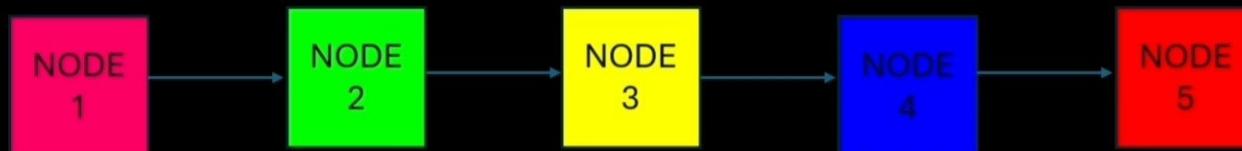
**4. Work autonomously(Daily Routine Task
Automatically)**

AI Agent has 4 Parts :

- 1. Brain (LLM like GPT, Claude, Gemeni) → LLM :
large language model → They use their brain but
in the end we tell → Decision Take or Not**
- 2. Memory (remember context) → Ex. Chatgpt →
They must have memory → No memory → Gajni**
- 3. Tools (APIS, email, web search) → Ex. Google
sheet, Google docks, Gmail → Tools Access**
- 4. Triggers (user message, schedule, events) →
When Start → We have to give Input**

WHAT IS NODES?

- **Workflows – Soul**
- **Nodes – Muscles & Organs**
- **Techinally, nodes are the building blocks of N8N.**



3 MAIN TYPES OF NODES :

- 1. Function Nodes (Trigger Nodes) Ex. Motarcyle – Kick – Start**
- 2. Regular Nodes**
- 3. Core Nodes**

1. FUNCTION NODES (START THE WORKFLOW)

**1. Trigger Nodes : Start the workflow. Ex. Motarcycle
→ Kick → Trigger Nodes**

**2. Webhook Trigger Nodes : Receive data from
external systems (real-time). Ex. Google Sheet →
Data Come from Outside(Facebook ADS) → That
Node Start**

**Note : Node → Data not Come → Next Flow → Not
Start**

1. FUNCTION NODES (START THE WORKFLOW)

3. Schedule Trigger Nodes : Time-based automation(Daily Reports, backups).

Ex. 9 AM Video Start → 9 AM Data Come

Ex. You Buy Something → They take → Your DOB → XYZ Company → Next Year → Wishing You Happy Birthday → Email → Automatically Send

4. Email Trigger : Fires when incoming emails arrive.

Note : No Incoming Email → Email Trigger → Not Work → You have to make sure → Email Come → ET Working Start

1. FUNCTION NODES (START THE WORKFLOW)

5. Manual Trigger Nodes : Testing/ development

Note : We are manually Testing/Check → Trigger work or not

Ex. Motarcycle → Kick → Manually → Start

6. Webhook Response : Sends response back

**Note : Webhook Trigger & Webhook Response → Both Works
Nearly Same → If Webhook Trigger → Happen → Webhook
Response → Also Goes**

**Ex. You Fill Form → Email,Name,Ph No → Submit Btn → Click
→ Trigger Start → E,N,P → Next Work Start**

**Ex. Last trigger → Response → “Thank You” after form
submit, Thank you purchasing This Headphone/Order**

**Note : When You start Trigger → Webhook Response or
Webhook Trigger → Happen**

1. REGULAR NODES (MAIN ACTIONS)

Regular Nodes : Ex. Motarcycle → Kick Start → Gear → Main Action

1. Communication Nodes : Gmail, Slack, WhatsApp, Social Media Posting, etc.



Note : In CN → They Talk with → Next Front Tool → 1st is Trigger Node Start Work → But 2nd is Main Action → Ex. They Talk with Gmail, Google Sheet, Whatever you attach they talk with them

1. REGULAR NODES (MAIN ACTIONS)

2. Data Storage Nodes : Google Sheets, Airtable, MySQL, Dropbox etc.

Note : Talking About Data → Here Data Saved → Google Drive, Google Sheets, Airtable, MySQL, Dropbox → This are Main Actions

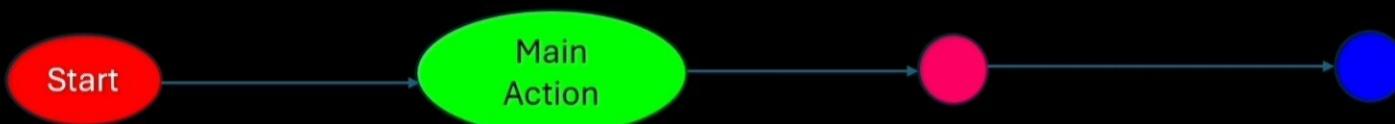


Note : If Data not Saved → Next Work not start

1. REGULAR NODES (MAIN ACTIONS)

3. CRM/ Business Nodes : Salesforce, HubSpot, Shopify, WooCommerce etc.

Note : Order Comes → Next Process Start → Ex. You Noticed → Product Order Received → Automatically Email Received to You



Note : Ex. Product Out for Delivery → Automatically Email Comes → How This Possible → Automation → Your Name Dynamic → Ex. Hi MBS, Hi MS etc.

1. REGULAR NODES (MAIN ACTIONS)

4. Utility Nodes : HTTP Request, file ops, image processing, PDF generation

Note : Helping → Workflow → Working → Ex. I Want Final Output
→ PDF Generate → Output Comes → Text → Utility Node → Convert
PDF(Text to PDF Convert)

3. CORE NODES (FOUNDATION)

- **Core Nodes → We Call Them → Logic Nodes**
- **Ex. If This Happens → This(A) Workflow Start → Else(If This Not) Happens → This(B) Workflow Start**

1. Logic Nodes : IF/ Else Conditions, Merge Node

Ex. My Bike Not Working → Behind Brothers Bike Come → As Backup

Note : Merge Node → All If But → Merge → Final Output

3. CORE NODES (FOUNDATION)

2. Data Manipulation Nodes : Set Node, Function Node(Custom Javascript)

Note : Data Manupulation → We are Changes Something → Just Word Not a Feature

3. Flow Control Nodes : Split in batches, Wait node, Stop/Error.

Note : We wait → Flow Wait Here → For 2 Minutes → After 2 Minutes we goes ahead

Ex. Bike Kick Start → Traffic Red light → We Wait for 1 Minute

3. CORE NODES (FOUNDATION)

4. Utility Core Nodes : DateTime, Crypto, XML/HTML, Spreadsheet.

Note : Helping → Workflow → Working

NODE ANATOMY

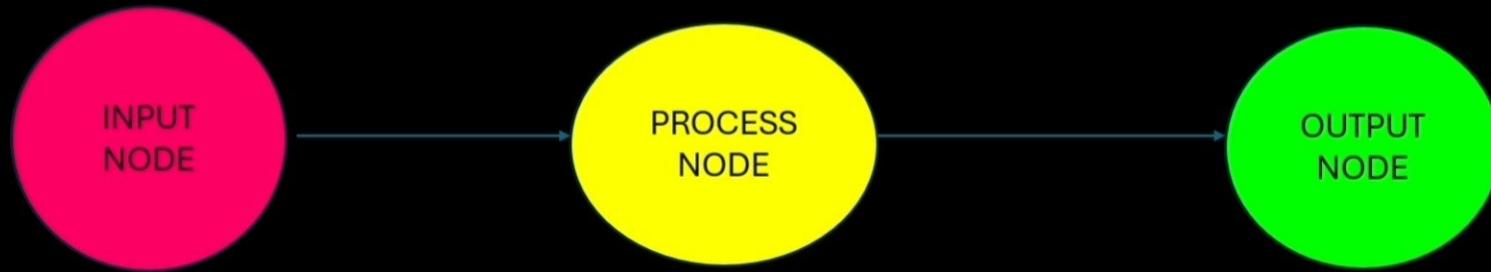
Anatomy → How Flow Work

Note : Every Node has some → Input

Note : Input → L To R → Data Goes

Note : Output → Data Received

Anatomy : INPUT → PROCESSING → OUTPUT

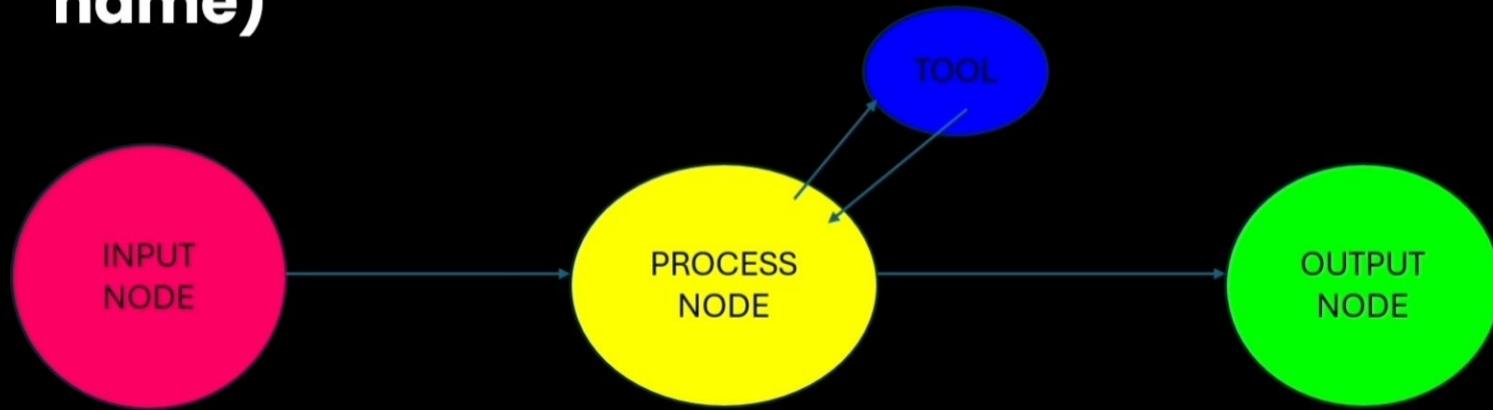


NODE ANATOMY

Input connection point (left side of the panel, receive data)

Output connection point (right side of the panel, sends data)

Icon & Name (logo of service/tool, editable name)



STATUS INDICATORS :

- **Green – Success → Working**
- **Red – Something Error**
- **Grey – Not Executed , Orange – Running**



NODES CONFIGURATION :

- **Parameters Tab : What the node does.**
- **Setting Tab : How it behaves**
- **Credential Tab : Secure Login / API access.**

HOW DATA MOVES IN N8N ?

- **INPUT – RAW Vegetable**
- **PROCESSING – Cooking**
- **OUTPUT – Ready Dish**



EXPRESSIONS & FIXED : PARAMETER

- 1. Expression :** Handle dynamic data → DT → Those data which changes everytime → Ex. 1000 Persons → Email Send Bunch → But Real Name Fixed → Ex. Hi MBS,Hi MS,Hi Joe,Hi Sachin → Dynamic Names → Automatically Add

- 2. Fixed :** Apply constant prompts → Ex. MBS Name Person → Email Everytime Goes → Fixed or Customer Support Email → 1,2,3,..... Fixed

WORKFLOW & EXECUTION STATUS

- 1. Active : Active workflows Running, listening for triggers. Green toggle button on will execute automatically → Working Workflow**



- 2. Fixed : Inactive workflows only run manually. Green toggle button On will execute automatically**



EXECUTION STATUS

- 1. Waiting :** Trigger node Waiting for Next workflow(Event) to happen
- 2. Executing :** Means Currently processing
- 3. Success :** Completed Successfully
- 4. Error :** Failed during an execution
- 5. Cancelled :** Manually Stopped
- 6. Timeout :** Exceeded Time Limit

CREDENTIALS & AUTHENTICATION

API Key Authentication :

- Note: We use → APIs → Get Data

- Example Flow:

- Facebook Ads → Leads → Google Sheet → Save → Send Email

↓

Email → AI Agent (ChatGPT) → Has Brain → Every Email Different → But Context Same

↓

Process → AI Agent (ChatGPT) → Needs API (Application Programming Interface) → Acts as Bridge

↓

n8n Tool + ChatGPT → Connected via API

↓

ChatGPT → Paid API

n8n → 100 Free Credits → Workflow → Test + Run

OAUTH2 Authentication :

- Concept: We take Consent (Permission) → From User/Platform → To Access Their Data Securely
- Example Flow:
 - User → “Connect My Account” → Redirected to Service Login → Grant Permission
↓
Platform (Google / Facebook / Microsoft) → Has Own OAuth System → Needs Credentials to Connect
↓
Simple Connection → Google Sheet → Sign In → Connect 
 - Advanced Connection → Google Drive Folder → Needs Authorization (OAuth) 
- Process → Permission Granted → Token Generated → Auto Refresh → Handled by n8n 
↓
Examples → Gmail → Google Sheets → Slack → LinkedIn → All Use OAuth2

Basic Auth(Username / Password) :

- **Concept: Use Username + Password → To Get Access**
- **Example Flow :**
- **User → Sign In → Enter Username + Password → System Grants Access ✓**
 - ↓
Full Access → Can Make Changes → Complete Consent
 - ↓
Process → Basic Authentication → Simple & Straightforward
 - ↓
Example → Google Sheet → Easy Authentication → Sign In → Full Access

Custom Headers Authentication :

- **Concept:** Header Name → Authorization → Provide Token
- **Example Flow :**
- **Requirement** → **Get Token** → **Copy-Paste** → **Authentication Process** 
 - ↓
Configuration → **Header Name: Authorization** → **Value: Bearer <Your Token Here>**
 - ↓
Token → **Received from Platform** → **Used for Authentication**
 - ↓
Process → **Secure Connection** → **APIs** → **Simple & Straightforward**

What Is Automation ?

- **Concept: Repetitive Tasks → Done Automatically**
- **Example Flow :**
- **Task → Schedule / Trigger → System Performs Automatically ✓**
 - ↓
Email Example → Google Sheet → Pick Email → Send Automatically
 - ↓
Daily Life Example → Product Delivery → Notifications → WhatsApp / Email Updates
- **Components of Automation:**
 - **Trigger → Event pe Automation Start (Trigger Node)**
 - **Condition & Process → Logic / Processing**
 - **Action (Execution) → Final Output**
- **Formula:**
- **Automation = Input → Processing → Output ✓**

Difference BTW Traditional & AI Automation

- Concept: Traditional Automation → Fixed Rules → Predetermined Responses
AI Automation → Dynamic → Self-Learning → Smarter with Data
- Example Flow:
- Traditional Automation:
Fixed Rules → If-Then Logic → Predetermined Responses → No Learning ✗
↓
AI Automation:
Dynamic Responses → Self-Learning → Memory Updates → Smarter & Contextual ✓
↓
Example:
 - ChatGPT updates memory with each input
 - Same question by someone else → Answer based on updated knowledge
 - Data collected → AI agent becomes more intelligent

Traditional Automation Example: Zapier & Mailchimp

- **Concept : Traditional Automation → Fixed Rules → No Intelligence**
- **Example Flow :**

Task → Email Send



**Subject Line → Fixed
Email Content → Fixed**



System → Sends Same Email Automatically

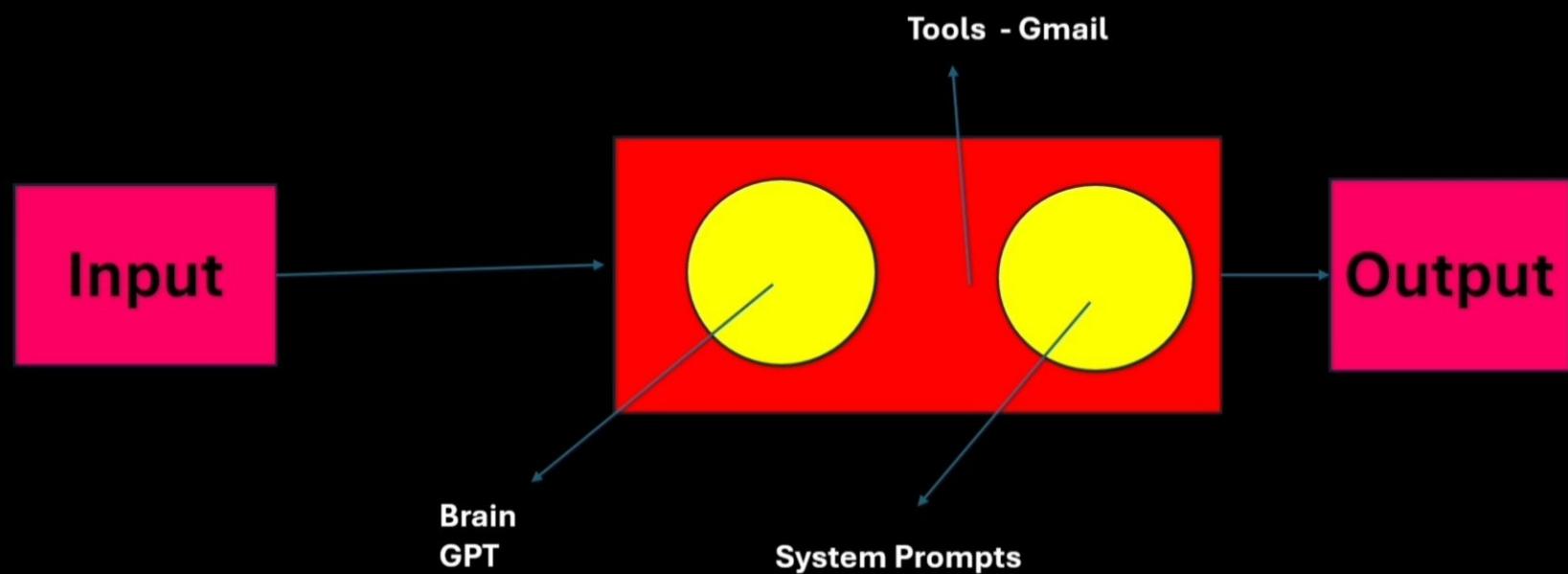


No Intelligent Decision Making → Works on If-Then Logic

AI Automation :

- **Concept : AI → Intelligent Decisions → Context Awareness → Learning Capability → NLP**
- **Example Flow :**
AI → Understands Context → Determines Relevant Answer
↓
Learns from Interaction → Continuously Improves → Becomes Smarter ✓
↓
Example → Claude / GPT Models → Concise & Relevant Answers
↓
Process → Uses Natural Language Processing (NLP) → Generates Better Responses

AI Agent :



AUTOMATION VS AI AUTOMATION VS AI AGENT

FEATURE	AUTOMATION	AI AUTOMATION	AI AGENT
Decision	Rule-Based	Context-aware	Intelligent & Autonomous
Learning	None	Limited	Continuous
Memory	None	None	Yes
Tools	Basic	AI + API'S	Multiple advanced tools
Complexity	Simple	Medium	Complex

Business Impact:

Concept :

Automation → 60% Time Saved

AI Automation → 75% Time Saved

AI Agents → 85% Time Saved 🎉

- **Example Flow :**

Traditional Automation → **Fixed Repetitive Tasks** → **Limited Flexibility**



AI Automation → **Smarter Rules** → **Adaptive Decisions**



AI Agents → **Autonomous Systems** → **Handle Complex Tasks Automatically**



- **Business Insight :**

**AI Agents don't replace humans,
they free humans from repetitive work →
so we can focus on creativity, innovation & strategy**💡

- **Summary :**

AI Agents = Maximum Efficiency + Human Empowerment🚀

More N8N Terms :

-  **1. Canvas**
- **Jahaan hum workflows design karte hain**
- **Nodes connect karte hain**
- **Platform ka main workspace**

More N8N Terms :

-  **2. Template**
- **Ready-made workflow**
- **Direct use karne ke liye**

More N8N Terms :

-  **3. Workflow**
- **Step-by-step process**
- **Trigger → Execute → Output**

More N8N Terms :

-  **4. Node**
- **Har node ka ek specific kaam hota hai**
- **Example: “Agar yeh huा → toh yeh karo”**

More N8N Terms :

-  **5. Trigger Nodes**
- **Workflow ka starting point**
- **Input yahin se start hota hai**

More N8N Terms :

-  **6. Expression**
- **Dynamic field – har run me change hoti hai**

More N8N Terms :

-  **7. Static Data**
- **Fixed message, same sabko jaayega**

More N8N Terms :

-  **8. Dynamic Data**
- **Input ke hisaab se badalta hai**
- **Workflow dependent**

More N8N Terms :

-  **9. Queue**
- **Nodes line me execute hote hain**
- **Node 1 → Node 2 → Node 3**

More N8N Terms :

- **⚡ 10. Execution**
- **Workflow chalu ho gaya**
- **Data next node tak pohonch gaya**

More N8N Terms :

-  **11. Parallel Execution**
- **Multiple workflows ek saath run karte hain**

More N8N Terms :

-  **12. Execution Logs**
- **Har run ki history**
- **Kya hua, kab hua, kis node me hua**

More N8N Terms :

-  **13. Variable**
- **Small data holder**
- **Ek baar banao, baar-baar use karo**

More N8N Terms :

-  **14. Credential**
- **API keys, passwords, tokens – secure access**

More N8N Terms :

-  **15. OAuth Authentication**
- **Secure 3rd-party connection (ex: Gmail, Facebook)**

More N8N Terms :

-  **16. Conditional Logic**
- **If true → Do this**
- **Else → Do something else**

More N8N Terms :

-  17. Loop
- Same task repeat karta rahega



More N8N Terms :

-  **18. Webhook**
- **Input gate – jab kuch aata hai to start hota hai**

More N8N Terms :

-  **19. Webhook Response**
- **Response message (e.g. "Thanks for submitting...")**

More N8N Terms :

-  **20. Data Mapping**
- **Har node me data configure karna**

More N8N Terms :

-  **21. Metadata**
- **Extra info: timestamps, IDs, system-generated data**

More N8N Terms :

-  **22. Workflow Chaining**
- **Ek workflow ka output = Dusre ka input**

More N8N Terms :

- 22. **Workflow Chaining**
- Ek workflow ka output = Dusre ka input



More N8N Terms :

-  **23. Database Integration**
- **Data store/read from MySQL, PostgreSQL, etc.**

More N8N Terms :

-  **24. Data Transformation**
- **Data me small changes karna workflow ke dauraan**

More N8N Terms :

-  **25. Error Handling**
- **Errors ko detect aur fix karna**

More N8N Terms :

-  **26. Project**
- **Workflows + Variables + Credentials = Project**

More N8N Terms :

-  **27. Data Pinning**
- **Temporary lock/test ke liye fixed data**

More N8N Terms :

-  **28. Evaluation**
- **Performance compare & optimize karna**



More N8N Terms :

-  **29. Function Node**
- **Custom JavaScript ke liye**

More N8N Terms :

-  **30. Split & Merge**
- **Workflow todna aur dobara jodna**

More N8N Terms :

-  **31. Cron Job / Schedule Node**
- **Time-based automation (daily, weekly, hourly)**

More N8N Terms :

-  **32. Cluster Node**
- **Group of nodes ek main node ke andar**

More N8N Terms :

-  **33. Root Node**
- **Main controlling node**

More N8N Terms :

-  **34. Sub Node**
- **Root node ke supporting tasks**

More N8N Terms :

-  **35. Custom Node**
- **Custom actions ke liye manually added node**

More N8N Terms :

-  **36. API**
- **2 apps ke beech data exchange bridge**

More N8N Terms :

- ⚡ **37. Real-Time Workflow Execution**
- Instant data processing

More N8N Terms :

- 🔎 **38. Workflow Optimization**
- **Unwanted steps remove karna**

More N8N Terms :

-  **39. Retry Logic**
- **Fail hone par auto re-run**

More N8N Terms :

-  **40. Timeout**
- **Node kitne time tak wait kare**

More N8N Terms :

-  **41. LLM**
 - **Large Language Model (ChatGPT, Gemini)**



More N8N Terms :

-  **42. AI Agent**
- **Automated decision-maker**

More N8N Terms :

-  **43. AI Memory**
- **AI ko context yaad rahta hai**

More N8N Terms :

- **44. AI Chain**
- **Sequential AI process (Node 1 → Node 2 → Node 3)**

More N8N Terms :

-  **45. AI Tool**
- **Extra integrations (Gmail, Sheets, Docs, etc.)**

More N8N Terms :

-  **46. AI Embedding**
- **Text → Numbers → Output**

More N8N Terms :

-  **47. AI Vector Store**
- **Special AI data storage (like library)**

More N8N Terms :

-  **48. Persistent AI Memory**
- **Long-term memory across sessions**

More N8N Terms :

-  **49. Autonomous AI Agent**
- **Fully independent, self-decision maker**

More N8N Terms :

-  **50. Prompt Engineering**
- **AI ko sahi prompt dena for best output**

More N8N Terms :

-  **51. RAG (Retrieval-Augmented Generation)**
- **External knowledge se data fetch karna**

More N8N Terms :

-  **52. Fine-Tuning AI Model**
- **Apne data se AI ko train karna**

More N8N Terms :

-  **53. Multi-Modal AI**
- **Text, Image, Audio, Video ek hi model me**

More N8N Terms :

-  **54. LangChain**
- **LLMs + Tools + Memory = AI Workflow Framework**