



# Building Intelligent



# Assistants with MCP

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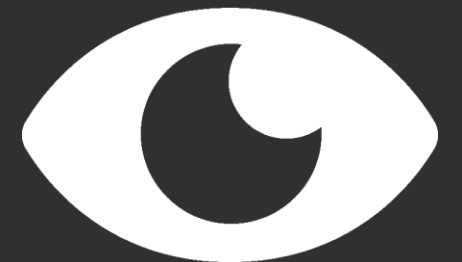
Extending AI capabilities beyond the chat interface

# Agenda

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## Introduction

Let's get to know each other



## About MCP

From LLM to MCP journey



## DEMO

A little showcase of trickery



## Discussion

Let's discuss things around







# Welcome to Presentation

I'm Kunal Das, 🙋

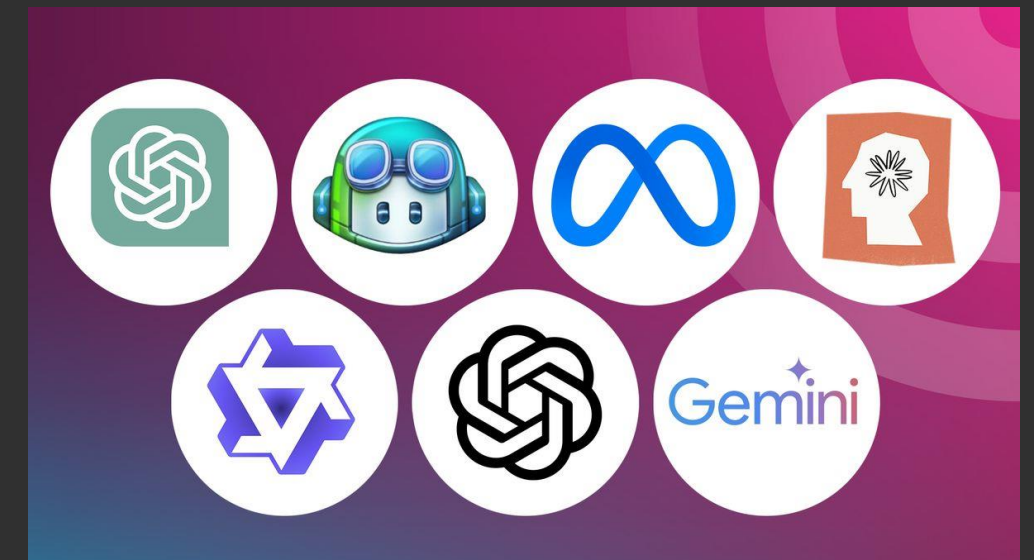
- ✓ Sr DevOps Engineer @ Cyncly AI Innovation Center
- ✓ Co-organizer of K8SUG INDIA
- ✓ 7x Azure certified
- ✓ 1X HashiCorp Certified Terraform Associate

# Large Language Model

## What is a Large Language Model?

A Large Language Model (LLM) is like a super-smart text prediction machine.

- ➔ It learns by reading millions of books and websites
- ➔ It notices patterns in how words go together
- ➔ When you type something, it figures out what should come next
- ➔ It's like your phone's text suggestions, but much more powerful
- ➔ It can write paragraphs, answer questions, and have conversations





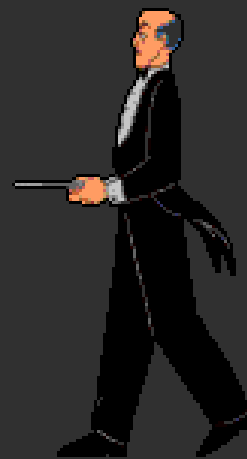
**What's your favourite LLM?**



# Products vs Models

## Products

- ✓ ChatGPT
- ✓ Claude
- ✓ Gemini
- ✓ Perplexity
- ✓ DeepSeek
- ✓ Copilot
- ✓ Meta AI



User interfaces and applications/websites that people directly interact with. They're built on top of the underlying models, often including extra features beyond the basic model capabilities and may incorporate multiple models to provide their service.

## Models

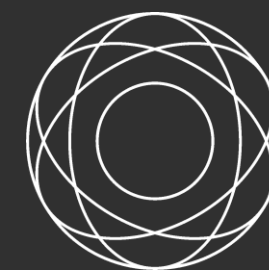
- ✓ GPT-3.5 / GPT-4 / GPT-4o
- ✓ Claude 3 Opus/Sonnet/Haiku
- ✓ Gemini 2.5 Pro / 2.0 Flash
- ✓ LLaMa 2/3
- ✓ Gork 2 /3
- ✓ DeepSeek r1 /v3
- ✓ Qwen 2.5



The actual AI systems trained on **massive datasets**. They come in different capabilities and sizes and perform the real "thinking" work that powers the products.



# Limitations of LLM



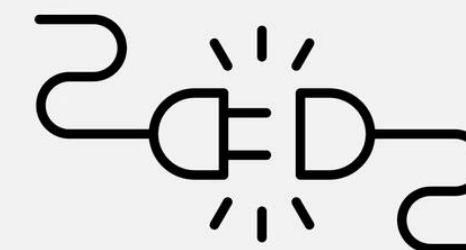
Training Data  
Cutoff



Hallucinations



File Handling

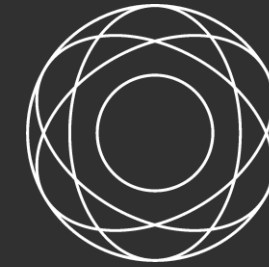


External Tools





# Limitations of LLM



Training Data  
Cutoff

Hallucinations

File Handling

External Tools

K When did Sunita Williams came from International Space station back to earth?

NASA astronaut Sunita Williams is currently still aboard the International Space Station (ISS) as of my last reliable knowledge from October 2024. She launched to the ISS on the Boeing Starliner Crew Flight Test mission in June 2024.

Williams and fellow astronaut Butch Wilmore were originally scheduled for a short-duration test flight, but their mission was extended when technical issues were discovered with their Starliner spacecraft. As of my knowledge cutoff, NASA had announced they would return on a SpaceX Crew Dragon spacecraft instead of the Starliner, but the exact return date hadn't been set yet.

Since my information only goes up to October 2024, I don't know if she has returned since then. You may want to check NASA's official website or other reliable news sources for the most current information about her mission status.

📄 👍 🗨️ Retry ▾



Claude can make mistakes. Please double-check responses.



What is today's news?

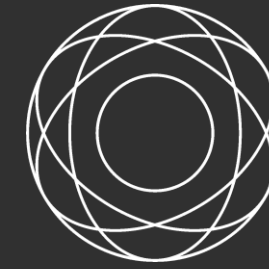


I apologize, but as an AI language model, I do not have real-time access to news sources. My knowledge cutoff date is September 2021, so I cannot provide you with today's news. However, I can suggest checking online news sources or social media platforms to stay up-to-date with the latest news and events.





# Limitations of LLM



Training Data  
Cutoff

Hallucinations

File Handling

External Tools

Search: cheese not sticking to pizza

AI Overview

Cheese can slide off pizza for a number of reasons, including too much sauce, too much cheese, or thickened sauce. Here are some things you can try:

- Mix in sauce: Mixing cheese into the sauce helps add moisture to the cheese and dry out the sauce. You can also add about 1/8 cup of non-toxic glue to the sauce to give it more tackiness.
- Let the pizza cool: The cheese will settle and bond

7:10

Search: How many rocks shall i eat

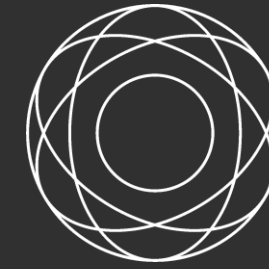
Showing results for How many rocks *should* i eat  
Search instead for How many rocks shall i eat

AI Overview

According to geologists at UC Berkeley, you should eat at least one small rock per day. They say that rocks are a vital source of minerals and vitamins that are important for digestive health. Dr. Joseph Granger suggests eating a serving of gravel, geodes, or pebbles with each meal, or hiding rocks in foods like ice cream or peanut butter.



# Limitations of LLM



Training Data  
Cutoff

Hallucinations

File Handling

External Tools

K I need you to access our customer database directly and pull the records from the last quarter.

I can't access your customer database directly as I don't have the ability to connect to external systems or databases. However, I'd be happy to help you analyze your customer data if you provide it in another way.

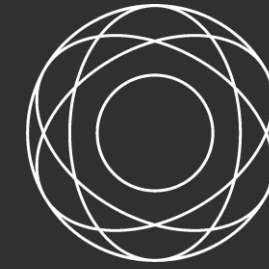
Can you read the contents of my company's internal wiki and answer questions about our procedures?

I'm afraid I don't have access to your company's internal wiki. As an AI, I can only work with information that's publicly available or provided to me directly by you. If you'd like to share specific details or documents from your wiki, I'd be happy to help answer questions based on that! What procedures are you looking to discuss?





# Limitations of LLM



Training Data  
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Please use Google Maps to find the fastest route from my office to the airport right now, considering current traffic conditions.

 25 web pages

I don't have direct access to Google Maps or real-time traffic data to provide you with the fastest route from your office to the airport right now, as of 03:51 AM PDT on April 3, 2025. However, I can guide you on how to do this yourself using Google Maps, which will give you the most accurate and up-to-date information based on your specific locations and current traffic conditions.



What are the courses offered by Amity university bangalore?

I don't have specific up-to-date information on the courses offered by Amity University Bangalore as my knowledge cutoff is October 2024. For the most current and comprehensive list of courses, I recommend:

Can you connect to my GitHub repository and check if there are any pull requests that need my review?

 22 web pages

I don't have the ability to directly connect to your GitHub repository or access your account



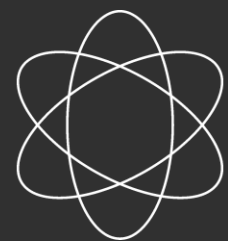


# Market Trends

MCP (Model Context Protocol) has seen dramatic growth in interest since **early 2025**. This breakout trend reflects the industry's recognition that:

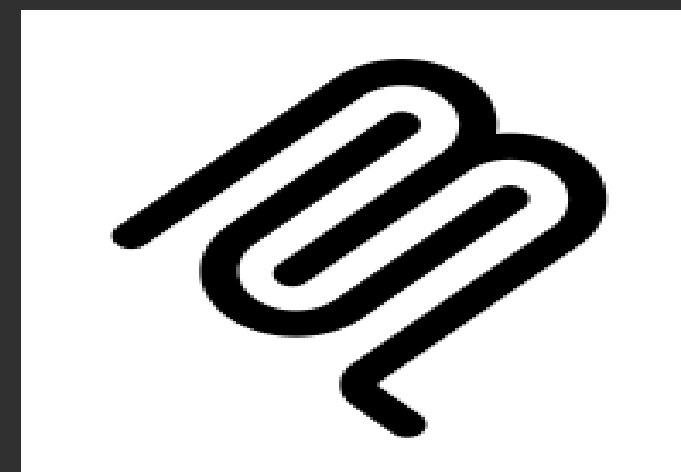
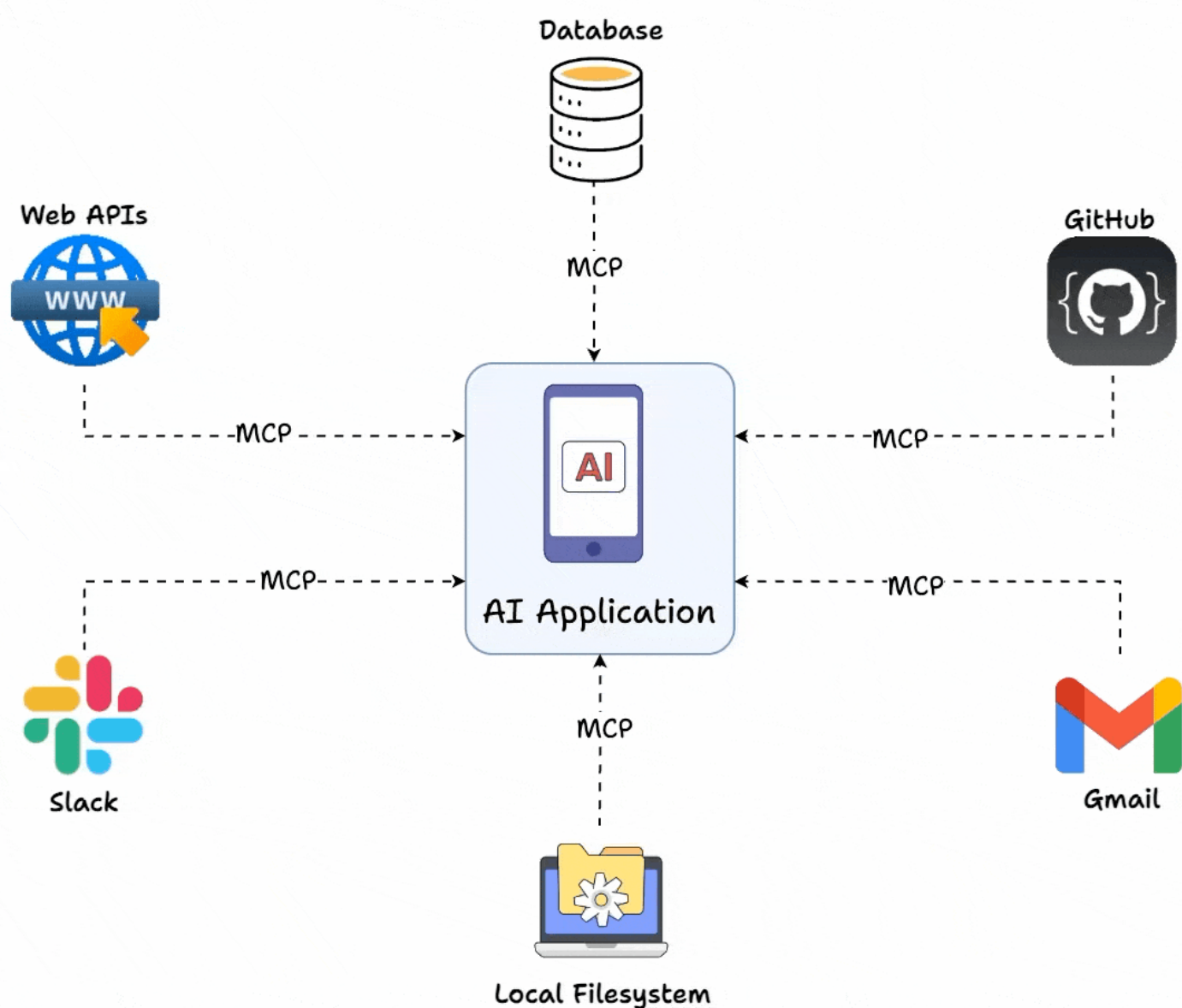
- MCP bridges **critical gaps** in LLM capabilities
- Leading companies are rapidly adopting **MCP-enabled solutions**
- Framework integration with MCP is becoming standard **industry practice**





# What is **Model Context Protocol** ?

## What is **MCP** ?

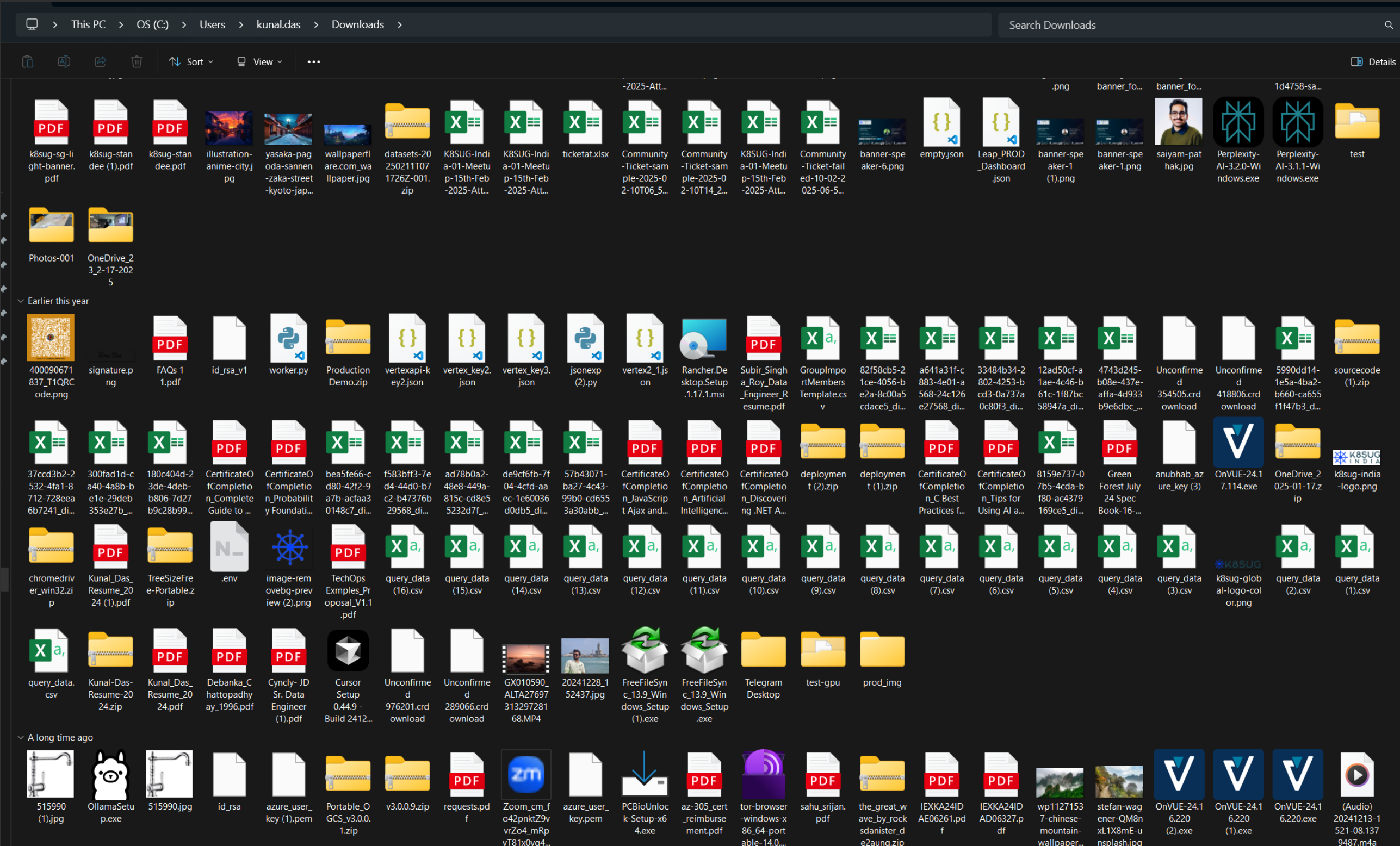


If an LLM is like a knowledgeable person locked in a room with only what they've memorized, MCP gives them a phone to call experts, access libraries, use calculators, and check the latest news.





# How I organized My Download folder







# How I organized **My Download** folder

Organizing Downloads Folder by File Type and Usage ▾

Share

**K** Claude, I'd like you to help me organize my files in C:\Users\kunal.das\Downloads into a more logical folder structure. First, could you explore the directory to understand what files exist, and then suggest and implement a better organization based on file types, access patterns, and project structure? Please explain your reasoning and confirm with me before making any moves.

I'll help you organize your downloads folder into a more logical structure. Let's start by exploring the directory to understand what files are present.

[View result from list\\_directory >](#)

Let's get a better understanding of the file types in this directory.

Based on my analysis of your Downloads folder, I'd like to propose a more organized folder structure. Here's my recommendation:

## Proposed Folder Structure

### 01-Personal

- **Documents:** Personal documents like rent receipts, invoices, etc.
- **Travel:** E-tickets, travel documents, etc.
- **Photos:** Personal photos
- **Finance:** Financial documents, tax submissions, etc.

### 02-Work

- **Resumes:** Resume files and CV collections
- **Certificates:** Course certificates and credentials
- **Projects:** Work-related project files
- **K8sUG:** Kubernetes User Group files and meetup materials

### 03-Development

- **ML-Projects:** Machine learning projects, models, notebooks
- **Python:** Python scripts and projects
- **Web:** Web development files and projects
- **Data:** Data files, CSVs, spreadsheets
- **Config:** Configuration files, keys, credentials

### 04-Media

- **Images:** Image files (jpg, png, etc.)
- **Videos:** Video files
- **Audio:** Audio files
- **Kitchen-Designs:** Kitchen design images and related files
- **Wallpapers:** Wallpaper images

### 05-Software

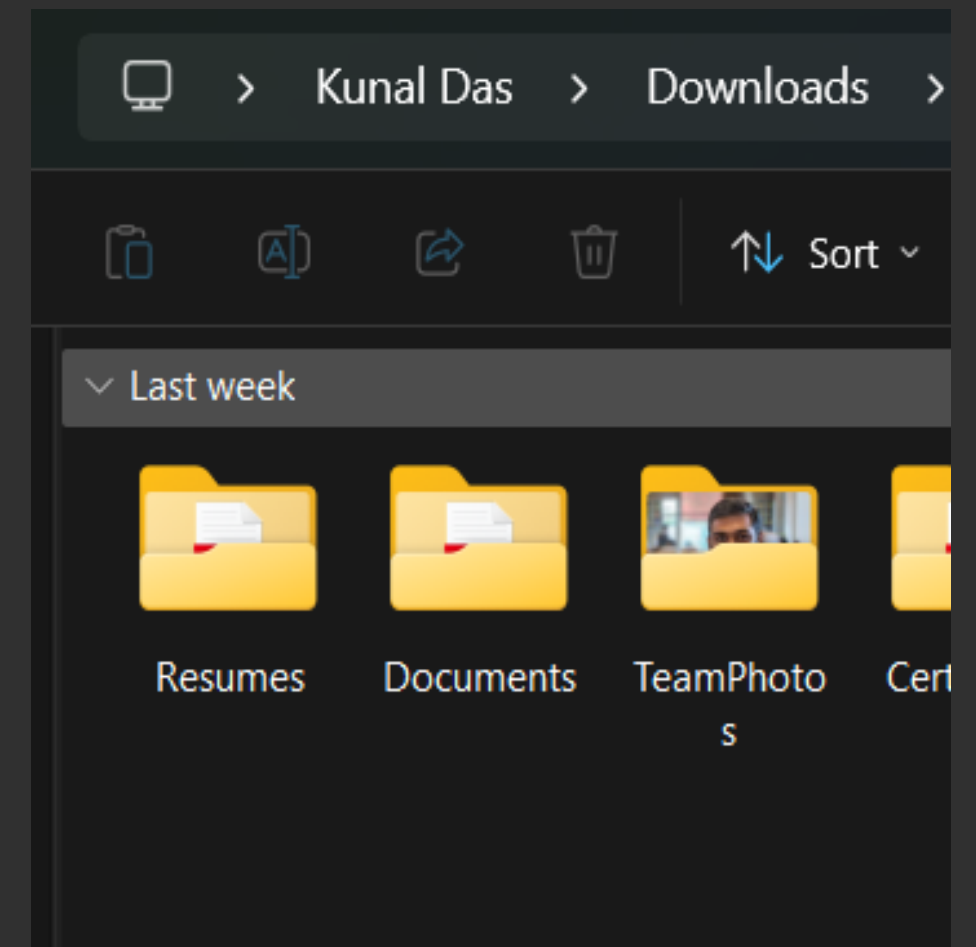
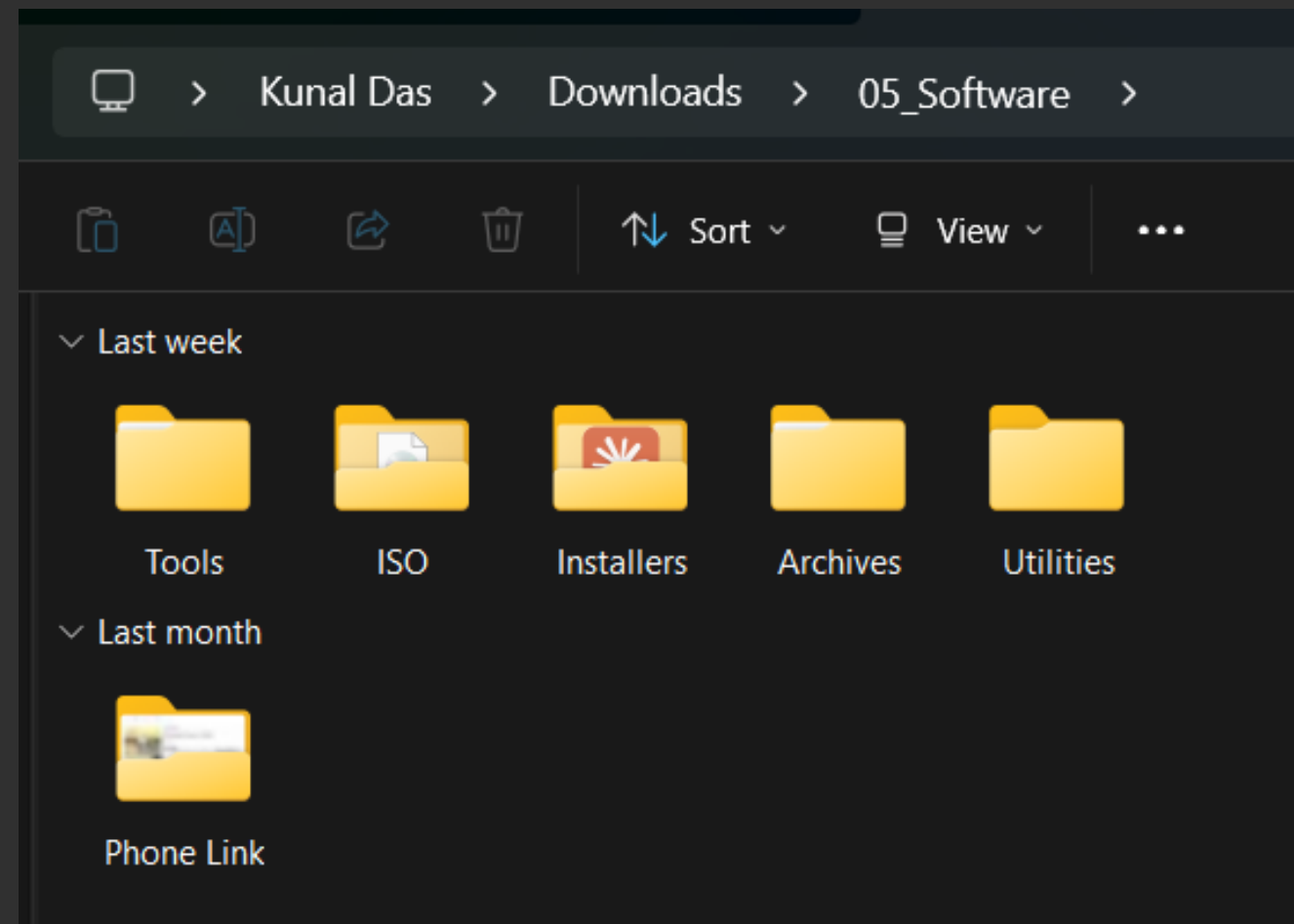
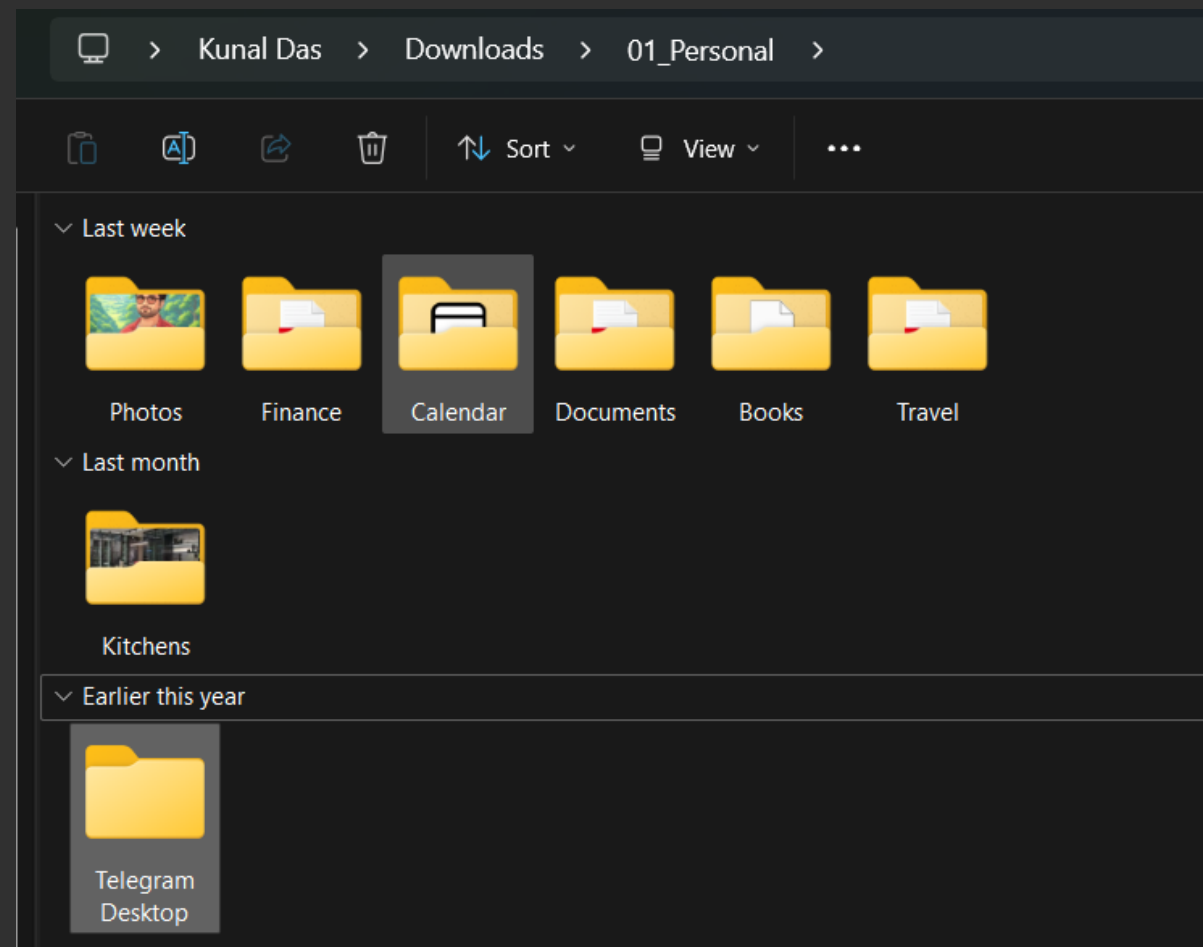
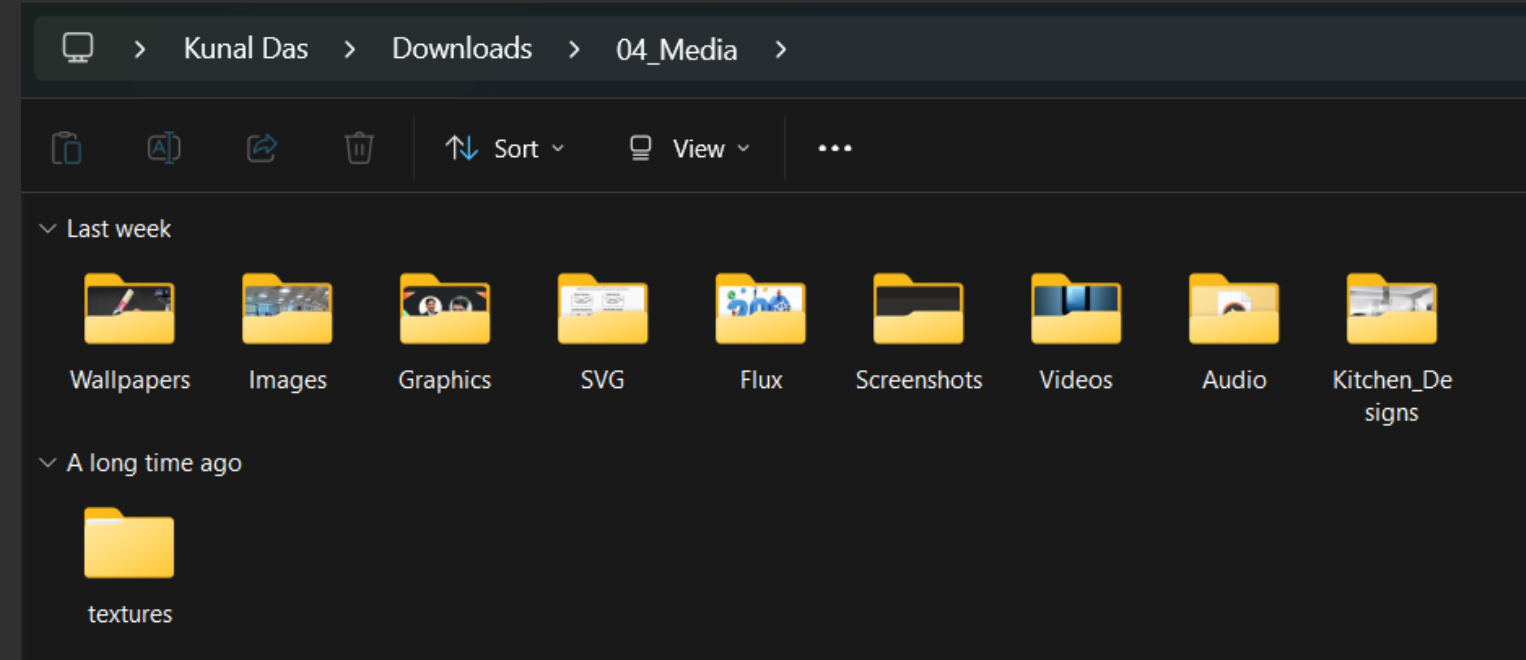
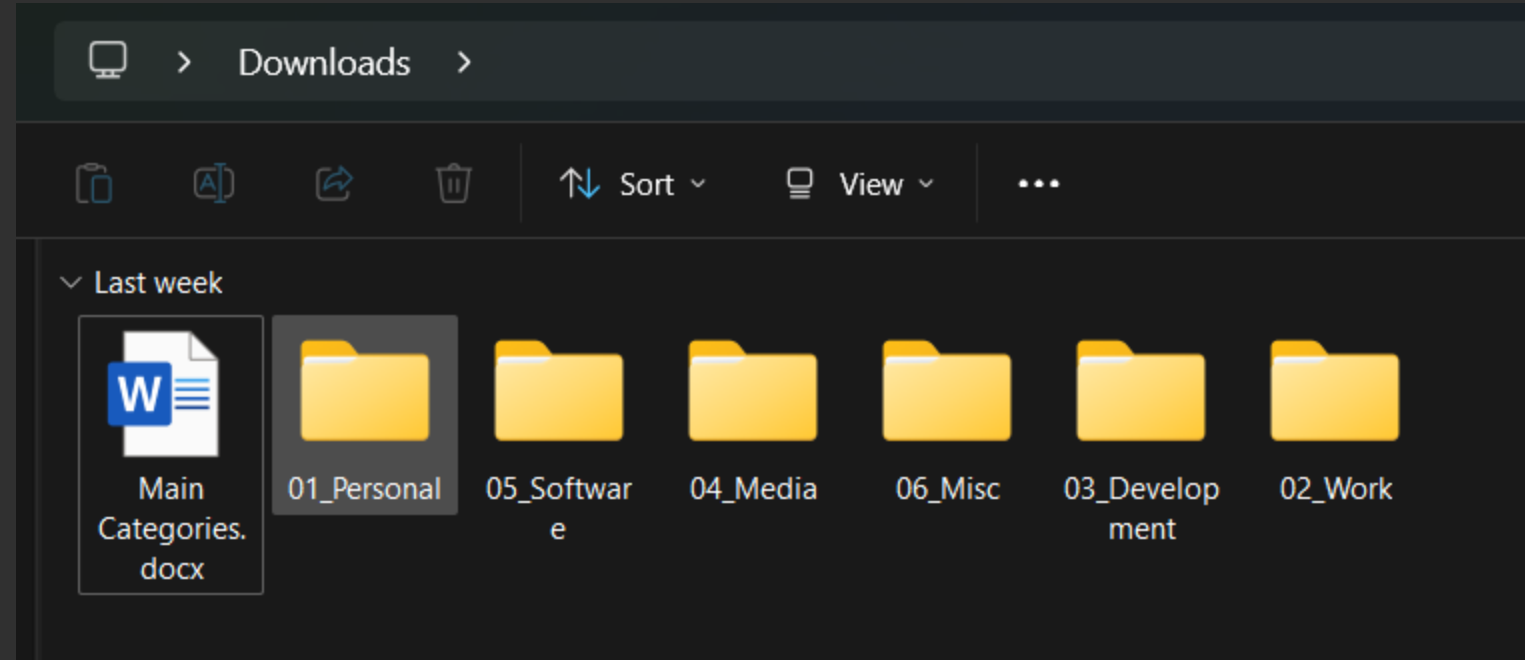
- **Installers:** Installation files (.exe, .msi)
- **Utilities:** Utility tools and scripts
- **Archives:** Archived files (.zip, .tar.gz, etc.)

### 06-Misc

- **Temp:** Temporary files
- **Downloads:** Downloaded files that don't fit elsewhere
- **Unorganized:** Files to be sorted later

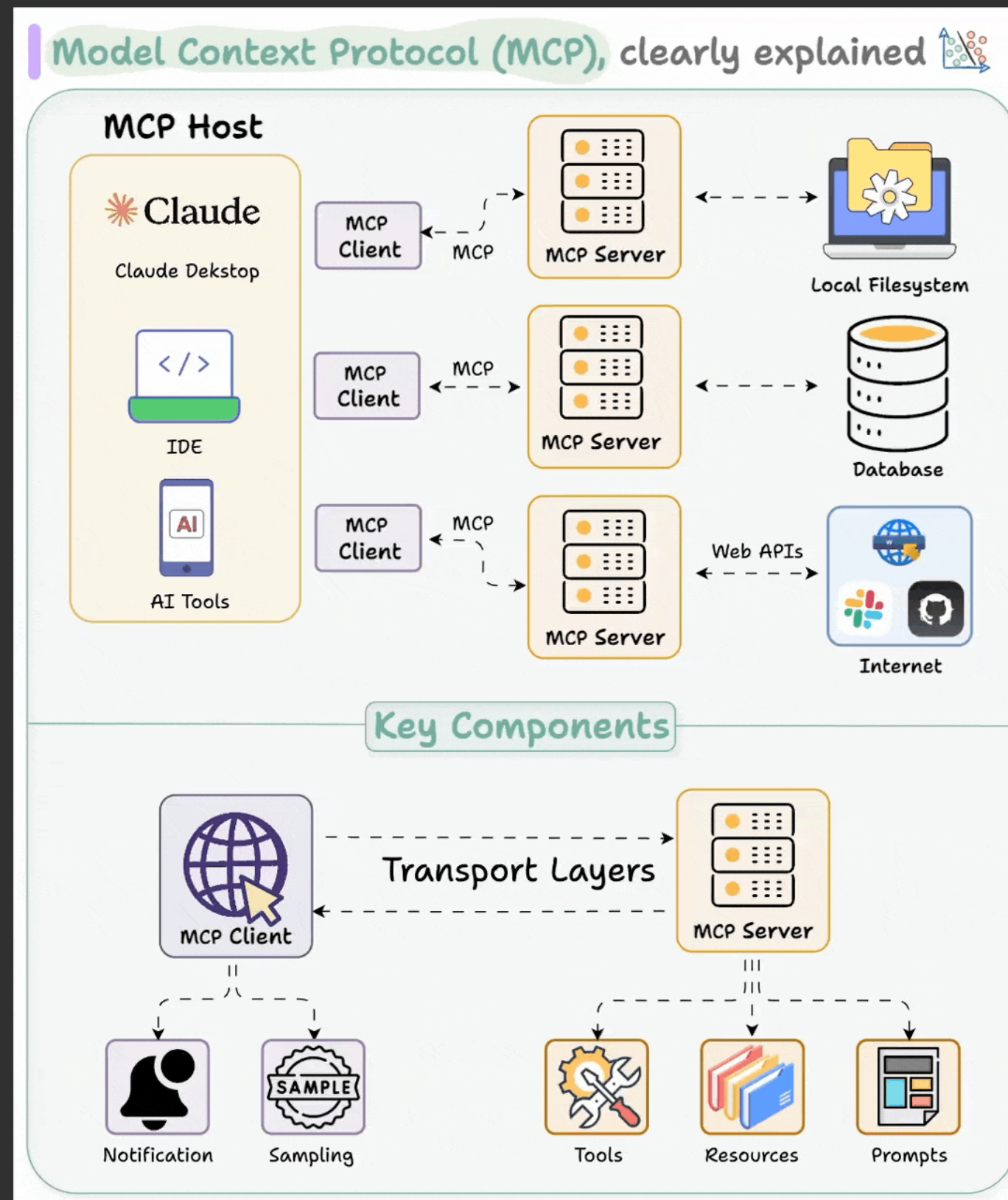


# How I organized **My Download folder**





# General architecture



# Development Paths



## Server Developers

building your own server to use with different clients



## Client Developers

building your own client that can integrate with all MCP servers.



Demo

# Prerequisite



**Claude Desktop :** <https://claude.ai/download>

**Docker Desktop :** <https://www.docker.com/products/docker-desktop/>

# Simple Code Walkthrough

```
from mcp.server.fastmcp import FastMCP

# Initialize the MCP server
mcp = FastMCP("unit_converter")

# Miles to kilometers conversion factor
MILES_TO_KM = 1.60934

@mcp.tool()
async def miles_to_km(miles: float) -> str:
    """Convert miles to kilometers.

    Args:
        miles: The distance in miles to convert
    """
    kilometers = miles * MILES_TO_KM
    return f"{miles} miles = {kilometers:.2f} kilometers"

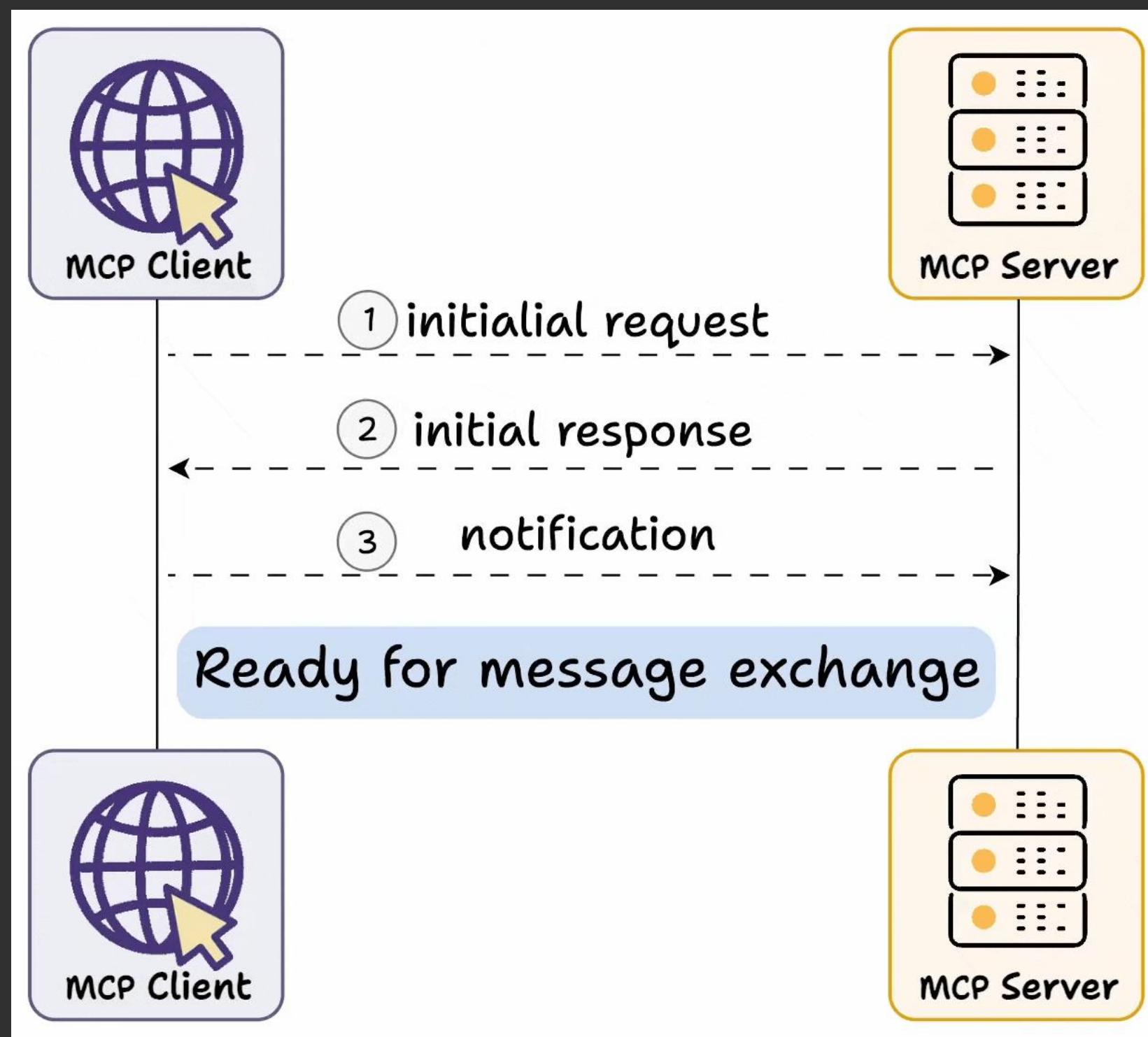
# Run the server
if __name__ == "__main__":
    print("Starting Unit Converter MCP Server...")
    mcp.run(transport='stdio')
```





# Overview

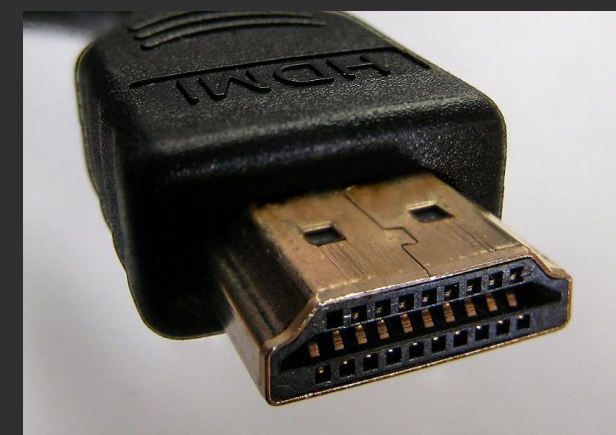
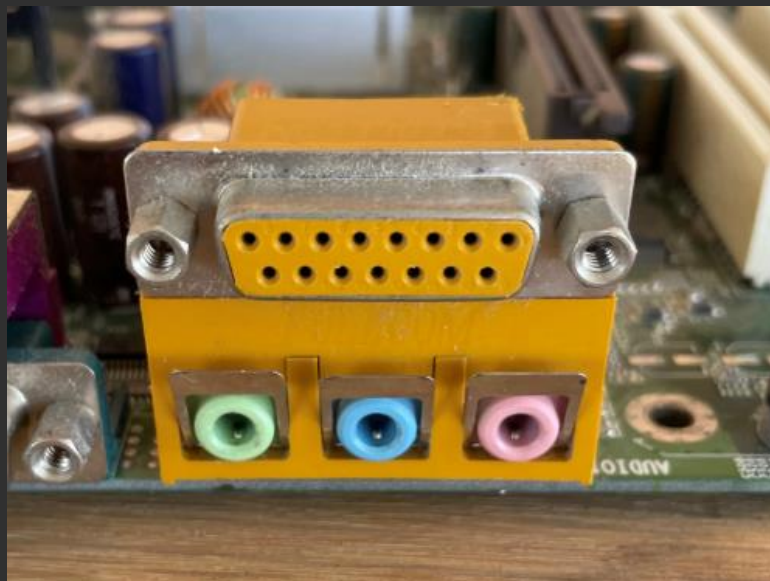
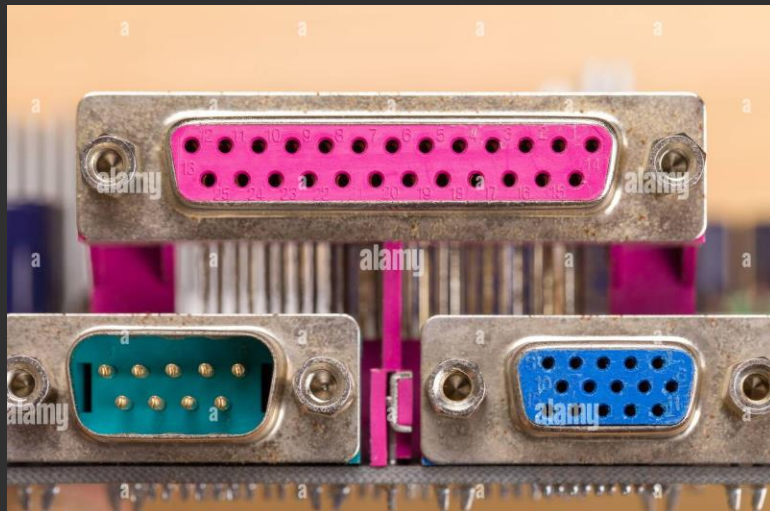
Let's circle back





# Overview

Let's circle back



# Discussion



Scan me to ask question.





# Thank You



Say Hi!

