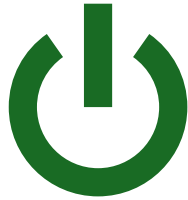




# Goal for today



Understanding the basics of LLMs



Learn how to leverage the power of LLMs to make our lives easier for free.



Engineering our existing application's code



Harnessing the power of LLM in daily activities.

# Introduction

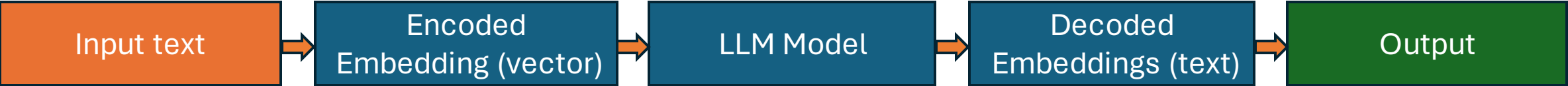
- **LLM** deep learning models are Understands & generates contextually aware text. In the simplest of terms, LLMs are ***next-word prediction engines***.
- **GPT** – GPT models are neural network-based language prediction models built on the ***Transformer architecture***. They analyze natural language queries, known as prompts, and predict the best possible response based on their understanding of language
- **Transformers** : Deep neural networks.

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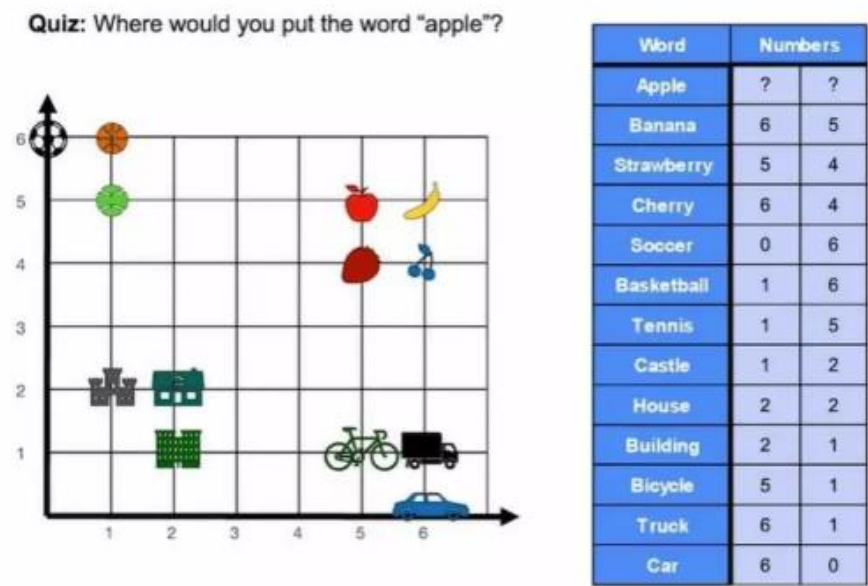
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<https://www.youtube.com/teachingmachine>

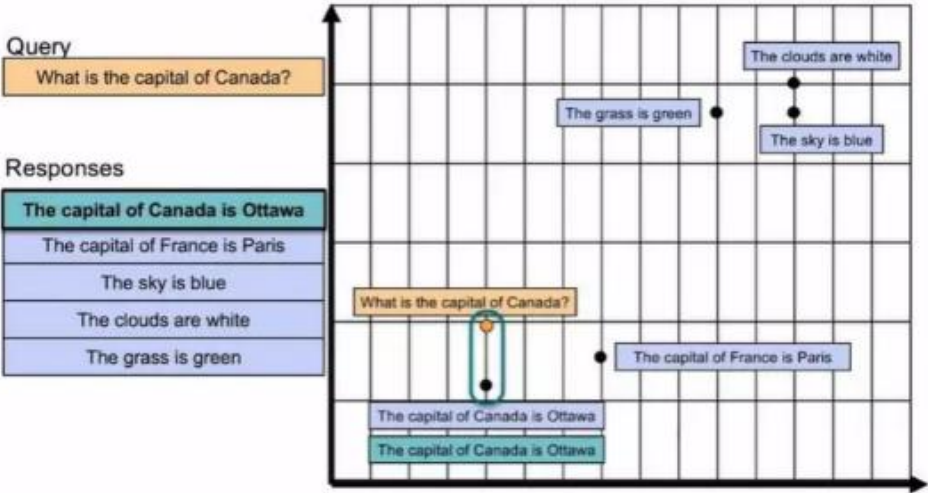
# How LLMs works?



Embeddings



Dense Retrieval



# How language model works under the hood

Probabilities  
over  
vocabulary

bread	...	cake	...	dress	...	game	...	salad
0.02	...	0.25	...	0.001	...	0.001	...	0.06

Language  
Model

Input from User

To sleep well

Run LM for the next token

sleep well you

Generate new input

you are

Sample a token from  
vocabulary

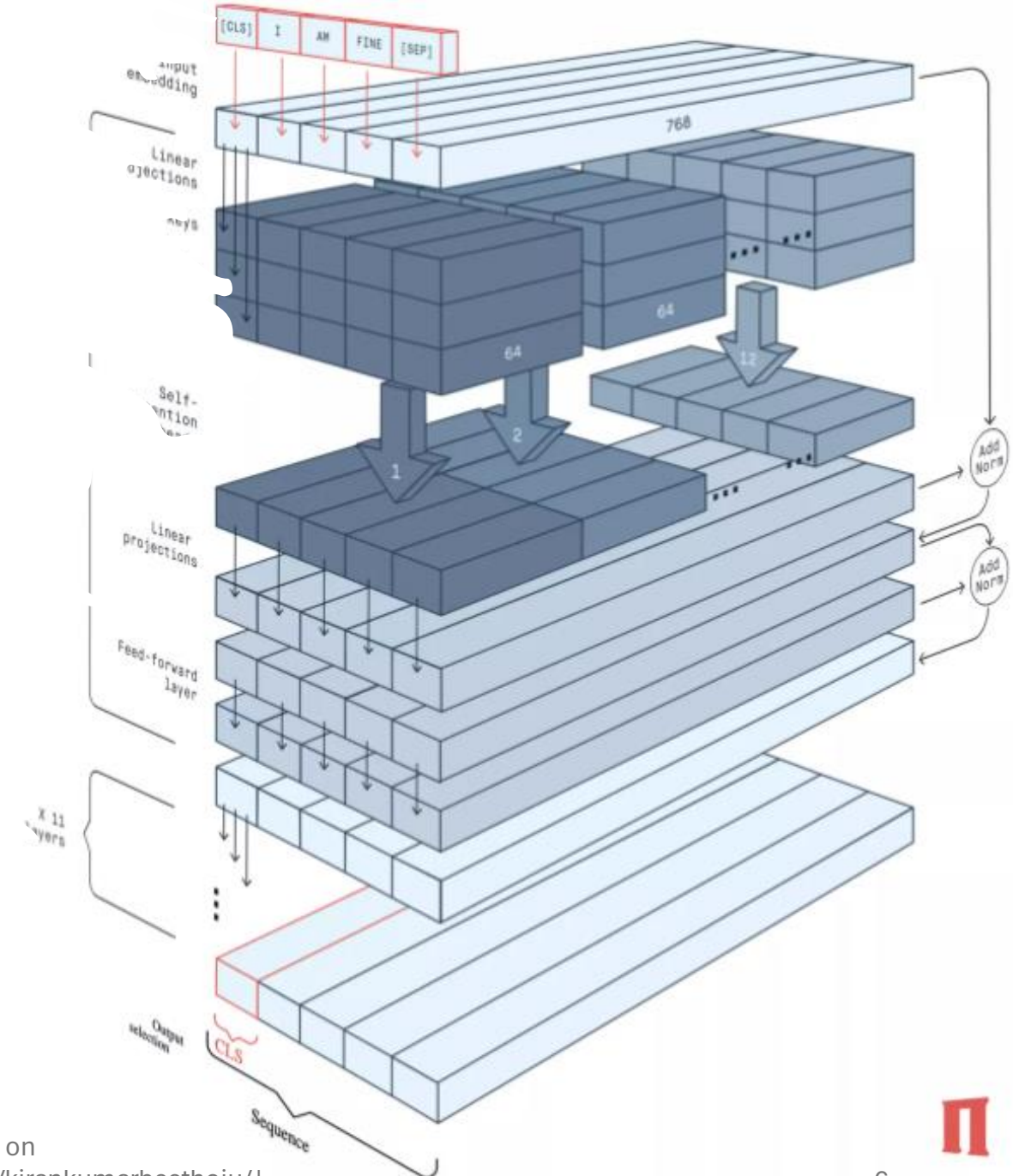
Generated text:

To sleep well Follow me on you are

<https://www.linkedin.com/in/kirankumarbeethoju/>

<https://www.youtube.com/teachingmachine>

# How language model works under the hood (Cont.)



# LLMs Datasets & benchmarks

- **Massive Multitask Language Understanding – Datasets**
  - MMLU (Medical Genetics), MMLU (College Biology), MMLU (Professional medicine), MMLU (Econometrics), MMLU (High School Computer Science), MMLU (College Chemistry), MMLU (High School Mathematics), MMLU (Electrical Engineer), MMLU (College Physics), MMLU (High School Statistics), MMLU (College Mathematics), MMLU (Abstract Algebra), MMLU (Astronomy), MMLU (Elementary Mathematics), MMLU (Formal Logic), MMLU (High School Biology), MMLU (Machine Learning), MMLU (College Computer Science), MMLU (High School Physics), MMLU (High School Chemistry)..
- **HellaSwag – Dataset**
  - Logical reasoning tasks which need commonsense like humans
- **ARC Dataset**
  - AI2 Reasoning Challenge (contain 14.5+ million multiple choice questions which are difficult and answering them need human like knowledge)
- **WinoGrad – Dataset**
  - For commonsense detection, this models contains complex dataset



# Terms used in LLM

---

1. **Instruction / Prompt** - a specific task or instruction you want to achieve using the LLM model
2. **Context** - external information or additional context that can steer the model to better responses
3. **One-shot query** – By providing some context you can ask a question  
**Example:** Translate the following English sentences into French. Here's an example: 'I love playing soccer.'
4. **Zero-shot query** – Directly asking a question  
**Example :** What is the capital city of India
5. **Few-shot query** - By providing all the information you can ask questions  
**Example:** "Here is my blood test report pls pull out hemoglobin and RBC values and WBC values along with observed values as a json object with key and values  
In this format{"observation\_name":"hemoglobin", "value":"15.6"}  
*Hemoglobin 15.6 mg/dl 12 – 16,*  
*RBC 2.7 lacs 1.5– 3.5*  
*WBC 5200 thou 4000 – 6000 "*



# Capabilities of most popular LLMs

## Most popular LLMs like ChatGPT, Google Bard

- Can summarise text
- Can generate APIs and code
- Can fix the bugs in code
- Can rewrite the algorithms in existing code
- Can generate formal mail
- Can rewrite / paraphrase context
- Can help us plan milestone and timelines of projects
- Can brainstorm and provide ideas
- Can provide us the travel plans
- Can troubleshoot anything in any domain by providing proper information to the context

# Can summarise text

pinion/op-ed/indias-ethanol-conundrum/article67654247.ece

India World Opinion Sports e-Paper

**A** renewable energy capacity by 2030, India faces a tightrope walk with regard to its ethanol blending target. While ethanol blended petrol (EBP) increased from 1.6% in 2013-14 to 11.8% in 2022-23, the 20% target by 2025 has run into trouble with low sugar stocks in 2022-23 and the impending shortfall in sugarcane production this year. As evident from Minister of Consumer Affairs Piyush Goyal's statement in May, the government is looking at a major transition towards grains-based ethanol for meeting the target. The recent authorisation of the National Agricultural Cooperative Marketing Federation of India (NAFED) and the National Cooperative Consumers' Federation of India (NCCF) to procure maize (corn) for supplying ethanol distilleries indicates emphasis on this transition and will boost an organised maize-feed supply chain for ethanol. This, however, risks creating more challenges for the economy.

The two major feedstock for ethanol production are sugarcane (Brazil) and corn (the U.S.). Ethanol production in both these countries boomed from 2000 when crude oil prices started rising and remained above a certain threshold for a decade. (At low crude prices, ethanol blending is not competitive; it is a slow process driven by heavy subsidies.) A crucial difference between the use of sugarcane and corn for producing ethanol is the degree of food-fuel conflict that emerges. In the case of sugarcane, ethanol is produced by processing the molasses (C-heavy/B-heavy) and constitutes minimal trade-off with the sugar output. The B-heavy molasses path produces less sugar compared to the C-heavy one, but both produce sugar and ethanol simultaneously from sugarcane. But using corn for producing ethanol directly reduces its use as food or livestock feed. It not only diverts grain to fuel use, but also links food prices directly with crude oil prices through the demand side. The very high crude prices that prevailed for a decade in 2004-14 pulled up ethanol and corn prices to historical highs. More importantly, the high corn prices were quickly transmitted to other grain markets as soft grains, such as wheat/barley, started getting redirected into the livestock industry as corn substitutes. Though only 5-7% of the world's corn output was used for ethanol production at the peak of the U.S.'s corn-based ethanol programme, the price effect was widespread and remained the most important contributor to the 2006-14 global food crisis. This was primarily due to the relatively easy substitutability in grain use across food, feed, and fuel.

Input prompt



Output

f5-6e09-4c0e-b1df-58d288eafcdc

AS You

summarise this

As more than 100 countries at COP28 in Dubai pledged the tripling of global renewable energy capacity by 2030, India faces a tightrope walk with regard to its ethanol blending target. While ethanol blended petrol (EBP) increased from 1.6% in 2013-14 to 11.8% in 2022-23, the 20% target by 2025 has run into trouble with low sugar stocks in 2022-23 and the impending shortfall in sugarcane production this year. As evident from Minister of Consumer Affairs Piyush Goyal's statement in May, the government is looking at a major transition towards grains-based ethanol for meeting the target. The recent authorisation of the National Agricultural Cooperative Marketing Federation of India (NAFED) and the National Cooperative Consumers' Federation of India (NCCF) to procure maize (corn) for supplying ethanol distilleries indicates emphasis on this transition and will boost an organised maize-feed supply chain for ethanol. This, however, risks creating more challenges for the economy.

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ChatGPT

At COP28 in Dubai, over 100 countries committed to tripling global renewable energy capacity by 2030. India, however, faces challenges in meeting its ethanol blending target, which had increased from 1.6% in 2013-14 to 11.8% in 2022-23 but now faces hurdles due to low sugar stocks and an impending sugarcane production shortfall. The government is considering a shift towards grains-based ethanol to meet its 20% target by 2025, with an emphasis on maize (corn) as a feedstock.

The use of sugarcane and corn for ethanol production differs significantly. Sugarcane allows for the simultaneous production of sugar and ethanol with minimal trade-off, while corn's use for ethanol directly competes with its use as food or livestock feed. High crude oil prices from 2004 to 2014 drove up ethanol and corn prices, affecting global food prices as other grains were redirected to the livestock industry as corn substitutes. Even though only a small percentage of corn output was used for ethanol, the impact on food prices was significant due to the interchangeability of grains across food, feed, and fuel markets, contributing to the global food crisis from 2006 to 2014.

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# Can generate APIs and code

## Input prompt

AS

You

Generate a post API in python which should take tenant\_id, org\_id, form\_id as input and return the same data in response  
tenant\_id and org\_id should be in my tenant\_id list and org\_id list  
tenant\_id list is contains these values (1000001, 1000248)  
org\_id list is contains these values (10001, 100337)



## Output



ChatGPT

To create a Python API that takes `tenant_id`, `org_id`, and `form_id` as input and returns the same data in the response, while also validating that `tenant_id` and `org_id` are in the allowed lists, you can use a framework like Flask. Here's a basic example of how you can achieve this:

```
python Copy code

from flask import Flask, request, jsonify

# Define allowed tenant_id and org_id lists
allowed_tenant_ids = [1000001, 1000248]
allowed_org_ids = [10001, 100337]

app = Flask(__name__)

@app.route('/post_api', methods=['POST'])
def post_api():
    try:
        data = request.json # Assuming you are sending JSON data in the
        tenant_id = data.get('tenant_id')
        org_id = data.get('org_id')
        form_id = data.get('form_id')

        # Check if tenant_id and org_id are in the allowed lists
        if tenant_id not in allowed_tenant_ids or org_id not in allowed
            return jsonify({'error': 'Invalid tenant_id or org_id'}), 4

        # Process the data as needed (here, we're just echoing it back)
        response_data = {
            'tenant_id': tenant_id,
            'org_id': org_id,
            'form_id': form_id
        }

        return jsonify(response_data)
    except Exception as e:
        return jsonify({'error': str(e)}), 500

if __name__ == '__main__':
    app.run(debug=True)
```

In this example, we use the Flask framework to create a POST API endpoint at `/post_api`. It receives JSON data with `tenant_id`, `org_id`, and `form_id`, checks if `tenant_id` and `org_id` are in the allowed lists, and then returns the data in the response. If the input is invalid or if there's an error, appropriate error responses are sent.

Make sure to install Flask using `pip install Flask` before running this code. Also, don't forget to handle error cases and customize the processing logic according to your specific requirements.

# Can generate formal mail

## Input prompt

AS

**You**

Write a mail saying that I got the requirements documents

Mail should be simple and generic

## Output



**ChatGPT**

Subject: Confirmation of Receiving Requirements Documents

Dear [Recipient's Name or Department],

I hope this message finds you well. I wanted to inform you that I have received the requirements documents that were expected. Thank you for sending them promptly.

I will begin reviewing the documents in detail to ensure a clear understanding of the project's scope and objectives. If there are any questions or further discussions needed, I will not hesitate to reach out to you.

Your prompt attention to this matter is greatly appreciated. Please feel free to contact me if you require any additional information or if there are any specific instructions regarding the requirements.

Thank you once again for providing the necessary documentation.

Best regards,

[Your Name]


[Your Contact Information]

Follow me on



# Can rewrite / paraphrase context

## Input prompt

 **You**  
Rephrase this message and make it simple, I need it only in 100 words.

Subject: Confirmation of Receiving Requirements Documents

Dear [Recipient's Name or Department],


I hope this message finds you well. I wanted to inform you that I have received the requirements documents that were expected. Thank you for sending them promptly.

I will begin reviewing the documents in detail to ensure a clear understanding of the project's scope and objectives. If there are any questions or further discussions needed, I will not hesitate to reach out to you.

Your prompt attention to this matter is greatly appreciated. Please feel free to contact me if you require any additional information or if there are any specific instructions regarding the requirements.

Thank you once again for providing the necessary documentation.

## Output

 **ChatGPT**  
Subject: Confirmation of Receipt of Requirements Documents

Dear [Recipient's Name/Department],

I received the expected requirements documents. Thanks for your prompt delivery.

I'll now review them thoroughly to understand the project's scope. If any questions arise, I'll contact you promptly.

Your swift response is much appreciated. Please share any specific instructions or additional information if needed.

Thanks again for providing the required documents.

Best regards,  
[Your Name]

# Can help us plan milestone and timelines of projects

## Prompt

**You**

Assume that you are professional technical project manager with lot of experience

Ask: I want to build a pdf to text tool

Details:

It should accept pdf as base64 string

It should also accept tenant and org details along with pdf return the response in text format

the information should be stored in database

Logs of application should be stored

Need: Give me complete project plan along with tech stack and milestones

**ChatGPT**

Creating a complete project plan for building a PDF to text tool that accepts a PDF as a base64 string, handles tenant and org details, returns text format, stores information in a database, and maintains logs involves several steps. Here's a high-level project plan with milestones and a suggested tech stack:

**Project Plan: PDF to Text Tool**

**1. Project Initiation**

- Define project objectives, scope, and requirements.
- Identify stakeholders and establish communication channels.
- Assemble project team and assign roles and responsibilities.

**2. Tech Stack Selection**

- Choose the appropriate technology stack for the project:
  - Backend Framework: e.g., Django, Flask (Python)
  - Frontend Framework: e.g., React, Vue.js (JavaScript)
  - Database: e.g., PostgreSQL, MySQL
  - PDF Processing Library: e.g., PyPDF2 (Python)
  - Logging: e.g., Log4j (Java), Winston (Node.js)
  - Deployment: e.g., Docker, AWS, or Heroku

## Output

### 3. Database Design

### 4. Backend Development

### 5. Frontend Development

### 6. PDF Processing

### 7. Testing

### 8. Deployment

### 9. Documentation

### 10. Training and Support

### 11. Maintenance and Scaling

### 12. Final Testing and Launch

### 13. Post-launch Monitoring

### 14. Milestones

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<https://www.youtube.com/teachingmachine>



# Can brainstorm and provide ideas

## Prompt

AS

You

Assume that you are multibillionaire and successful businessman

I want to build a business in reselling business / merchandise help me out on doing business with maximum ROI

Need: Brainstorm and give me the output

## Response

ChatGPT

Certainly, building a successful business in reselling merchandise can be a profitable venture. Here's a brainstorming session with some strategies and considerations for achieving maximum Return on Investment (ROI):

1. Niche Selection:

- Identify a niche that has a demand for the products you plan to resell. Consider your interests, market trends, and target audience.

2. Market Research:

- Thoroughly research your chosen niche, including competitors, pricing strategies, and consumer preferences. Look for gaps or opportunities in the market.

3. Sourcing Products:

- Find reliable suppliers or manufacturers who can provide quality merchandise at competitive prices. Consider both domestic and international options.

4. Quality Control:

- Ensure that the products you resell meet high-quality standards. Customer satisfaction is crucial for repeat business.

5. Pricing Strategy:

- Develop a pricing strategy that balances competitiveness with profitability. Consider factors like cost, market demand, and perceived value.

6. Online Presence:

6. Online Presence:

- Create a professional e-commerce website with user-friendly navigation and mobile optimization. Invest in SEO to improve online visibility.

7. Multichannel Selling:

- Utilize multiple sales channels, such as your website, online marketplaces (e.g., Amazon, eBay), and social media platforms to reach a wider audience.

8. Marketing and Branding:

- Invest in digital marketing, including social media advertising, email marketing, and content marketing to promote your products.
- Build a strong brand identity that reflects your niche and values.

9. Customer Service:

- Offer exceptional customer service to build trust and loyalty. Respond promptly to inquiries and resolve issues efficiently.

10. Inventory Management:

- Implement efficient inventory management systems to minimize carrying costs and avoid overstock or understock situations.

11. Shipping and Fulfillment:

- Partner with reliable shipping carriers for timely delivery. Consider offering free or discounted shipping to attract customers.

12. Data Analytics:

- Use analytics tools to track sales, customer behavior, and ROI. Adjust your strategies based on data insights.

13. Expansion and Diversification:

- Consider expanding your product line or entering related niches once your initial business is stable and profitable.

14. Cost Optimization:

- Continuously assess and optimize operational costs. Look for ways to reduce overhead without compromising quality.

15. Financial Management:

- Maintain a clear financial plan and budget. Keep track of your expenses and revenue, and reinvest profits strategically.

16. Scaling and Exit Strategy:

- Plan for business scalability. Consider options for growth, such as franchising or partnerships.
- Develop an exit strategy, including a plan for selling the business if desired.

17. Legal and Compliance:

- Ensure compliance with local, state, and federal regulations. Protect your business with proper licenses and insurance.

18. Customer Feedback:

- Collect feedback from customers to improve products and services continually.

19. Sustainability:

- Embrace sustainable practices if feasible, as eco-friendly initiatives can appeal to environmentally-conscious consumers.

20. Network and Partnerships:

- Build relationships within your industry, attend trade shows, and explore partnerships that can benefit your business.

Remember that building a successful business takes time and dedication. It's essential to adapt to changing market conditions and be willing to pivot your strategy when necessary. Continuously monitor your ROI and seek ways to maximize it by optimizing your business operations and customer satisfaction.

17



# Can provide us the travel plans

## Prompt

AS

**You**

Assume that you are world traveller

I want to explore some of the best places in near by Southern part of India

I have only 7 days time

Please share me the best places to visit in winter

Need approximate pricing include hotels, food places in the plan

Need: Complete plan with maximum places coverage budget is around 80000 INR

## Response

**Day 1: Arrival in Bengaluru**

- Arrive at Kempegowda International Airport in Bengaluru (Bangalore).
- Stay in budget accommodations in the city, which can cost between 1,500 to 2,500 INR per night.

**Day 2: Bengaluru Sightseeing**

- Explore Bengaluru's attractions, including Cubbon Park, Lalbagh Botanical Garden, and Bangalore Palace.
- Enjoy budget-friendly meals at local eateries, which may cost around 800-1,200 INR for the day.

**Day 3: Mysuru (Mysore)**

- Take a morning train or bus to Mysuru (approximately 3-4 hours).
- Visit the famous Mysore Palace and explore the Chamundi Hill.
- Stay in budget accommodations in Mysuru, ranging from 1,500 to 2,500 INR per night.

**Day 4: Coorg (Kodagu)**

- Take a morning bus or taxi to Coorg (approximately 3-4 hours).
- Explore Coorg's coffee plantations, enjoy the scenic views, and visit places like Dubare Elephant Camp.
- Stay in budget accommodations in Coorg, which can cost between 1,500 to 2,500 INR per night.

**Day 5: Ooty (Udhagamandalam)**

- Travel to Ooty by bus or taxi (approximately 5-6 hours).
- Explore Ooty's attractions, such as Botanical Gardens, Ooty Lake, and Doddabetta Peak.
- Stay in budget accommodations in Ooty, ranging from 1,500 to 2,500 INR per night.

**Day 6: Coimbatore**

- Drive or take a bus to Coimbatore (approximately 3-4 hours).
- Visit the Marudhamalai Hill Temple or other local attractions.
- Stay in budget accommodations in Coimbatore, which can cost between 1,500 to 2,500 INR per night.

**Day 7: Departure from Coimbatore**

- Depending on your flight schedule, explore any remaining Coimbatore attractions or do some last-minute shopping.
- Depart from Coimbatore International Airport.

**Estimated Total Budget:**

- Accommodations (6 nights): 9,000 to 15,000 INR
- Meals (7 days): 4,000 to 6,000 INR
- Transportation (including local buses and trains): 6,000 to 8,000 INR
- Entrance fees and miscellaneous expenses: 3,000 to 5,000 INR

The estimated total budget for this 7-day trip to South India would be around 22,000 to 34,000 INR, leaving you with a substantial amount of your 80,000 INR budget for additional expenses, such as shopping or more luxurious dining experiences.

Prices may vary based on the type of accommodations, dining preferences, and transportation choices. As always, it's essential to book accommodations and transportation in advance to secure the best rates and availability.

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<https://www.youtube.com/teachingmachine>

# Can troubleshoot anything in any domain by providing proper information to the context

AS You

how to block data transfer from linux machine to all external IPs except one ip

ChatGPT

You can block data transfer from a Linux machine to all external IP addresses except one IP address using the Linux firewall, often managed by iptables or firewall. Here's a step-by-step guide to achieving this:

**Note:** This guide assumes you have administrative privileges on your Linux machine.

## 1. Identify the Allowed IP Address:

Determine the IP address to which you want to allow data transfer. Let's call it `'ALLOWED_IP'`.

## 2. Install and Configure iptables (if not already installed):

If your Linux distribution uses iptables for firewall management and it's not already installed, you can install it. For example, on Debian-based systems (e.g., Ubuntu), you can use:

```
bash
sudo apt-get update
sudo apt-get install iptables
```

## 3. Create a New Chain:

It's a good practice to create a new chain to manage these rules more cleanly:

```
bash
sudo iptables -N ALLOWED_IP_CHAIN
```

## 4. Add a Rule to Allow Traffic to the Specific IP:

Add a rule to the new chain that allows outgoing traffic to your `'ALLOWED_IP'`:

```
bash
sudo iptables -A ALLOWED_IP_CHAIN -d ALLOWED_IP -j ACCEPT
```

AS You

I want to reset my Sophos firewall

ChatGPT

Resetting a Sophos firewall typically involves performing a factory reset to restore it to its default settings. Here are the general steps to reset a Sophos firewall:

**Important:** A factory reset will erase all existing configurations and settings on the Sophos firewall. Make sure you have backed up any critical data or configurations before proceeding.

## 1. Access the Sophos Firewall Console:

You need physical or remote access to the Sophos firewall device, depending on your setup.

## 2. Login to the Web Admin Console:

Use a web browser to access the Sophos firewall's web admin console. The default URL for the web admin console is typically `'https://<firewall_IP_address>:4444'`.

## 3. Login with Administrative Credentials:

Enter the administrative username and password to log in. These credentials are typically provided when the firewall is first set up.

## 4. Perform the Factory Reset:

Once logged in, navigate to the factory reset option. The location of this option may vary depending on the specific Sophos firewall model and firmware version. It is often found in the "System" or "Administration" section.

• **Sophos XG Firewall:** Go to **System > Administration > Restore Factory Default Settings**.

## 5. Confirm the Factory Reset:

Follow the on-screen instructions to confirm the factory reset. You will usually be

AS You

how to update fuzzysearch in elasticsearch

ChatGPT

To enable or update fuzzy search in Elasticsearch, you can do the following:

## 1. Use the Fuzzy Query:

Implement a "fuzzy" query in your Elasticsearch search requests. You can specify the field to search, the term to search for, and the fuzziness level (the degree of similarity). For example:

```
json
{
  "query": {
    "fuzzy": {
      "field_name": {
        "value": "search_term",
        "fuzziness": 2
      }
    }
  }
}
```

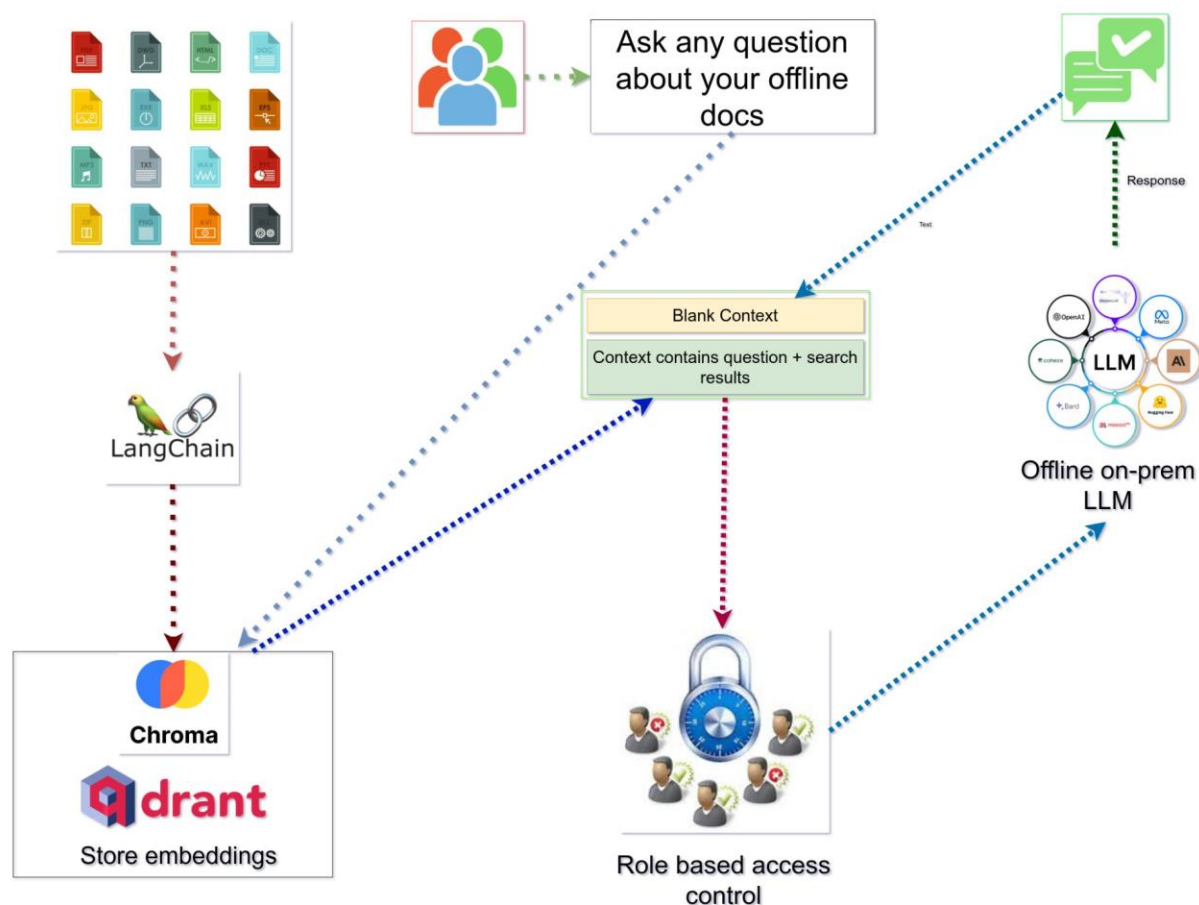
Adjust the "fuzziness" value as needed for your desired similarity threshold.

## 2. Use Fuzzy Search in Query String:

Alternatively, you can perform a fuzzy search directly in a query string by adding a tilde (~) at the end of the search term:

```
json
{
  "query": {
    "query_string": {
      "query": "search_term~"
    }
  }
}
```

# LLM based document search use case



# Media specific models

---

