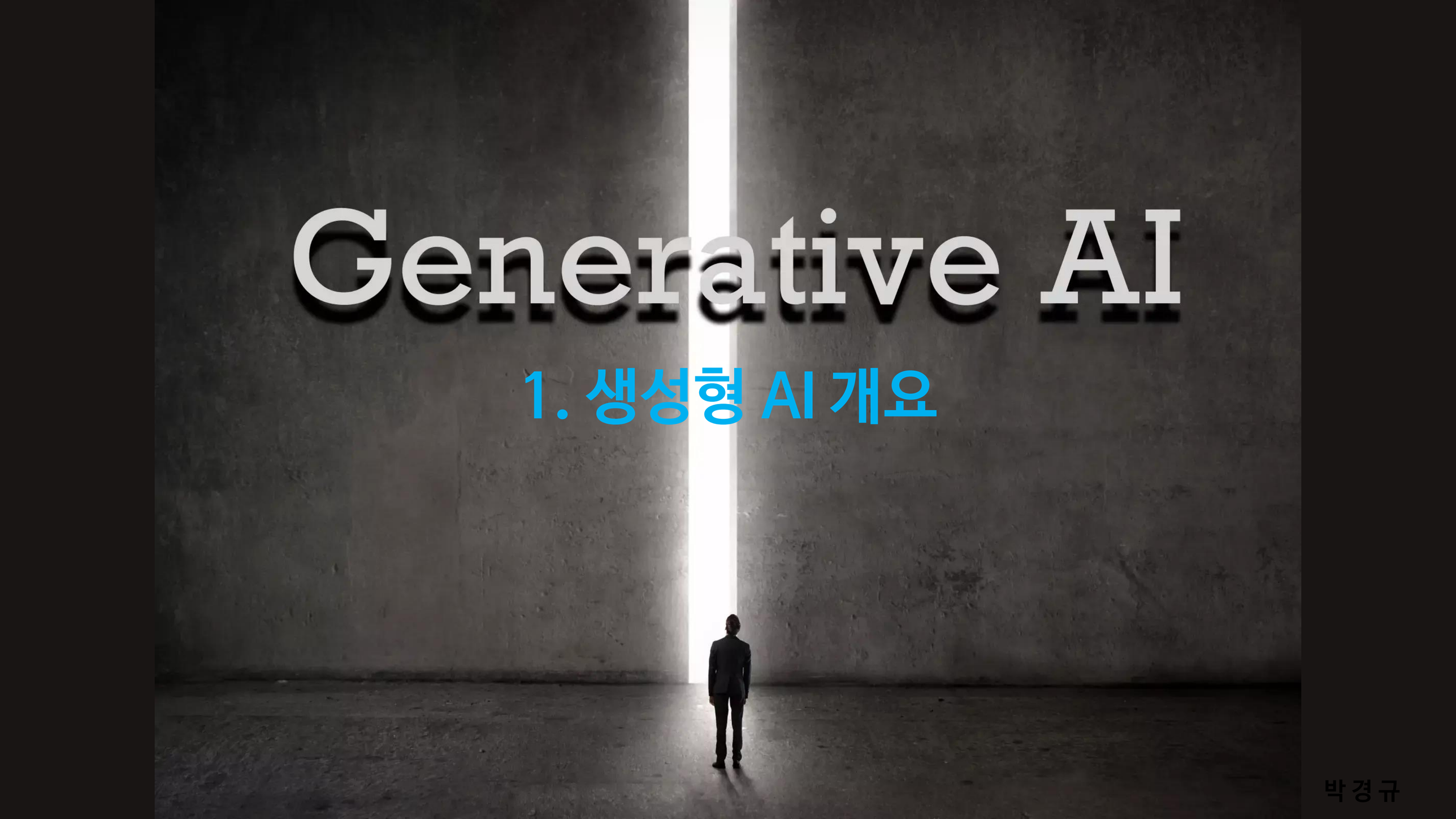


1. 생성형 AI 개요

박경규


https://youtu.be/HKoy8DAPN_0?si=YHl38jvpPqhH0nZF

인공지능(Artificial Intelligent)

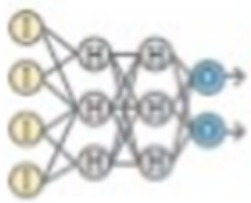
인공지능(AI)

사람의 지적능력(추론, 인지)을 구현하고 모방하는 모든 기술

머신러닝

명시적인 프로그래밍 없이 학습할 수 있는 능력

선형회귀
로지스틱회귀
K-최근접 이웃
결정트리
랜덤포레스트
서포트 벡터 머신
클러스터링
차원축소



딥러닝

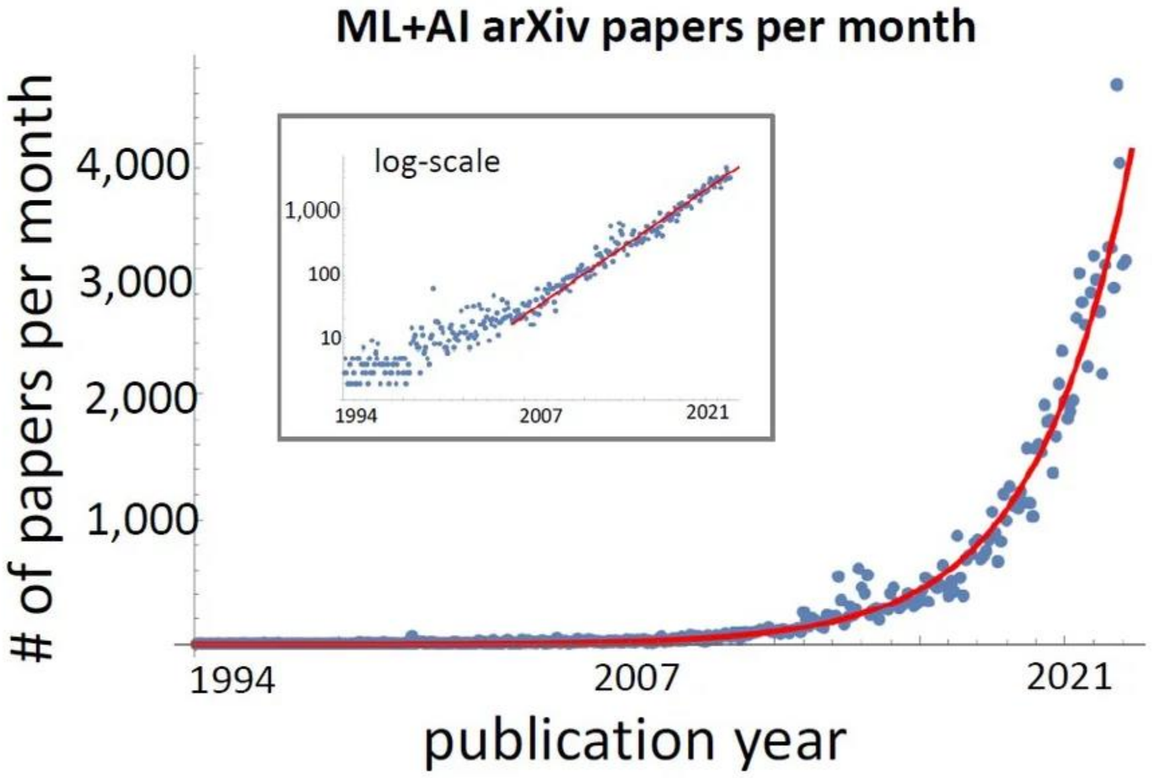
인공신경망 이용해 데이터에서 패턴을 찾아내는 기술

심층신경망(DNN)
합성곱신경망(CNN)
순환 신경망(RNN)
생성적 적대 신경망(GAN)
강화학습(RL)

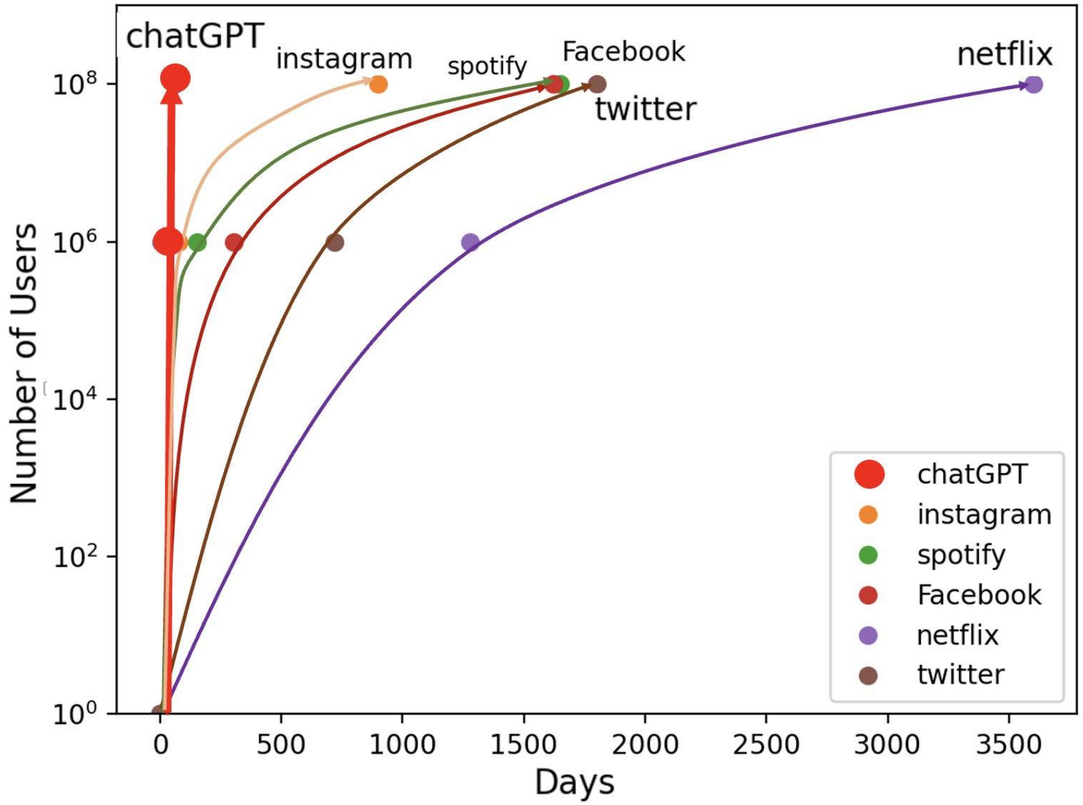
트랜스포머

BERT
GPT

AI 기술의 발전속도



Something different is happening.



https://www.reddit.com/r/singularity/comments/xwdzr5/the_number_of_ai_papers_on_arxiv_per_month_grows/

https://twitter.com/kylelf_/status/1623679176246185985?t=g9wnm52DZEfe42CJAjooRA&s=03

Generative AI

생성형 AI는 인공신경망을 이용하여 새로운 데이터를 생성해내는 기술로
명령어(Prompt)를 통해 사용자의 의도를 스스로 이해하고, 주어진 데이터로 학습, 활용하여
텍스트, 이미지, 오디오, 비디오 등 새로운 콘텐츠를 생성해내는 인공지능입니다.

ChatGPT

https://chat.openai.com/

Copilot

https://copilot.microsoft.com/

Gemini

https://gemini.google.com/

Stable Diffusion

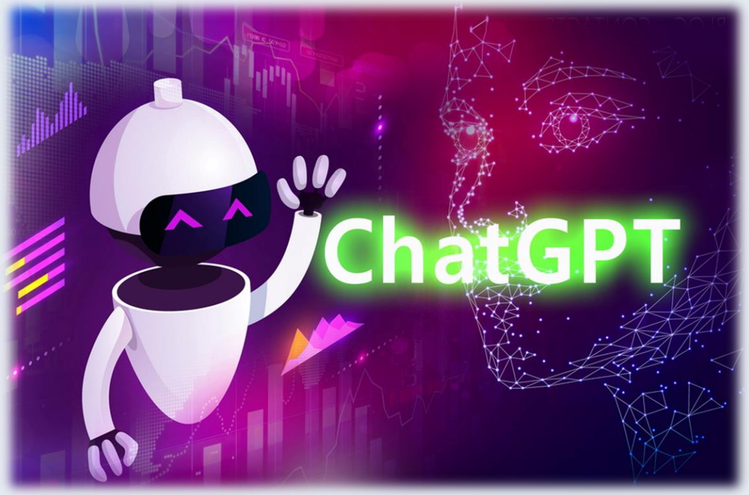
https://stablediffusionweb.com/

Midjourney

https://www.midjourney.com/

ChatGPT

https://chat.openai.com/

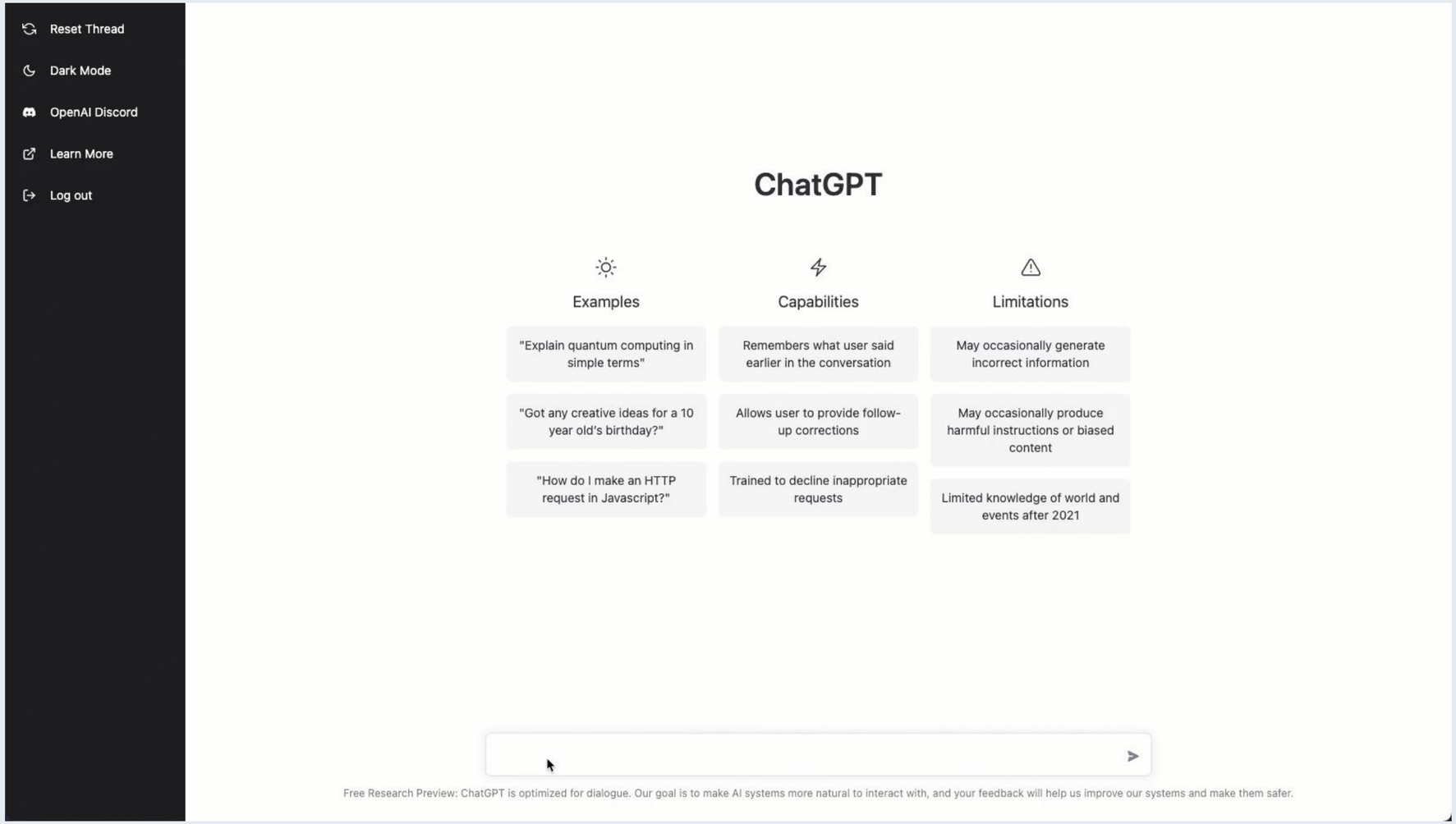


GPT = Generative Pre-trained Transformer

ChatGPT

https://chat.openai.com/

- 텍스트 이해
- 질문에 대한 답변
- 콘텐츠 생성
- 리스트 생성
- 코드 작성/디버깅
- 장단점 비교 제시
- 교육 지원
- 창의적인 글쓰기
- 아이디어 기획
- 번역
- 단계별 지침 제공
- 가상 비서 역할



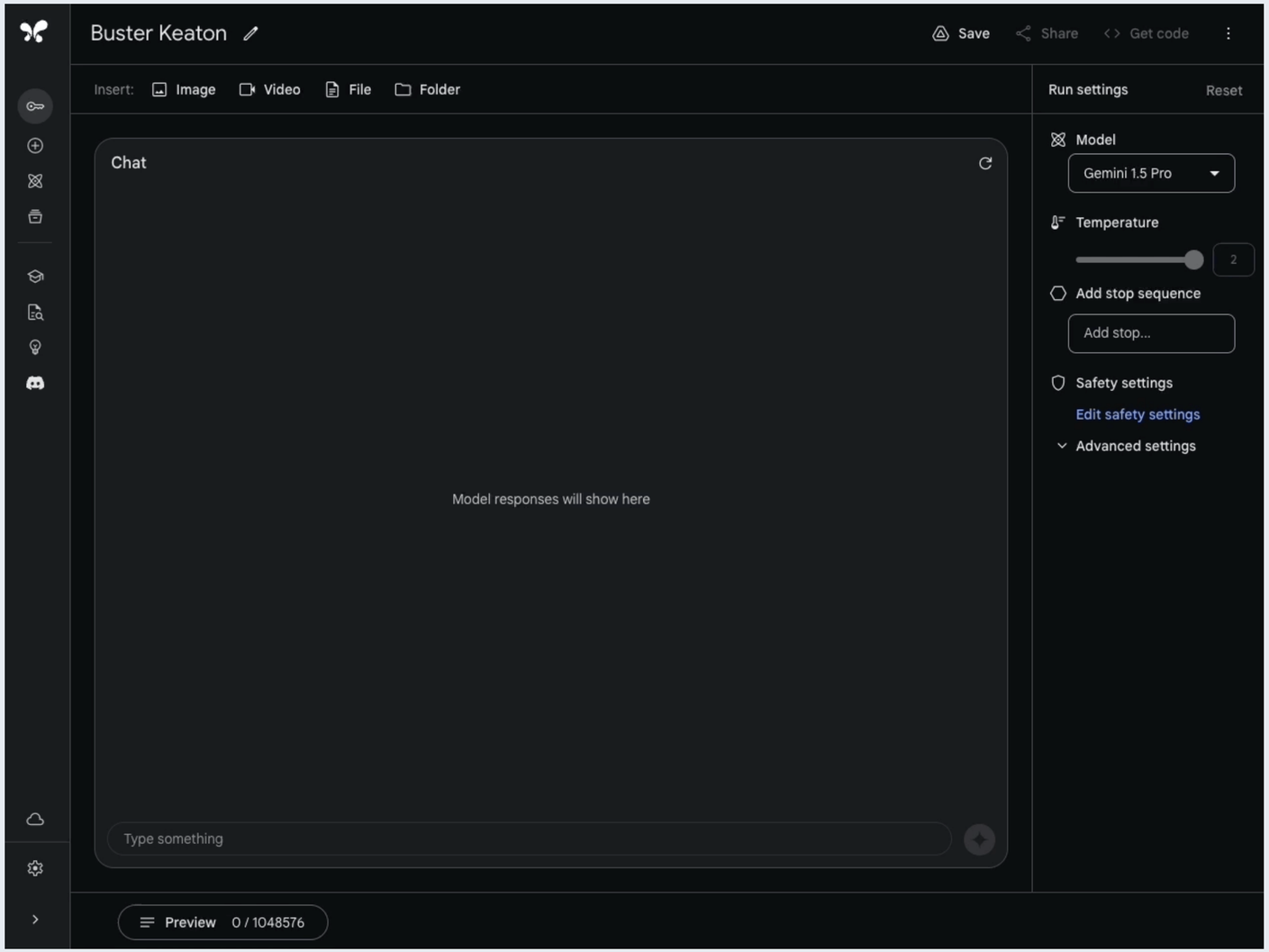
Gemini

https://gemini.google.com/

- 멀티모달 추론 기능을 갖춘 대화형 생성 인공지능

- 전문가 혼합(MoE, Mixture-of-Experts) 아키텍처를 통해 효율을 높임

- 70만 개 이상의 단어, 3만 줄의 코드, 1시간 분량의 동영상, 11시간 분량의 음성에 해당하는 방대한 양의 정보를 한 번에 처리



구글코리아 블로그

제미나이(Gemini) : https://blog.google/intl/ko-kr/products/explore-get-answers/google-gemini-next-generation-model-february-2024-kr/
젬마(Gemma) : https://blog.google/intl/ko-kr/products/explore-get-answers/-gemma-open-models-kr/

Gemini

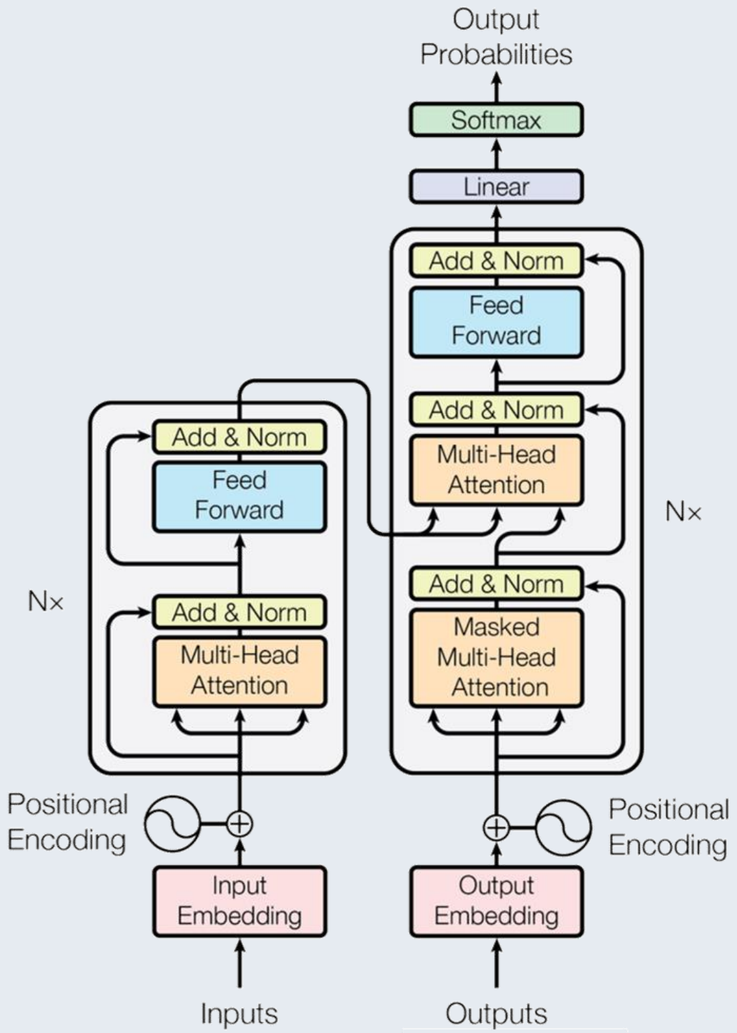
https://youtu.be/jV1vkHv4zq8?si=qllhHhciyAnJXoiw

LLM(Large Language Model)

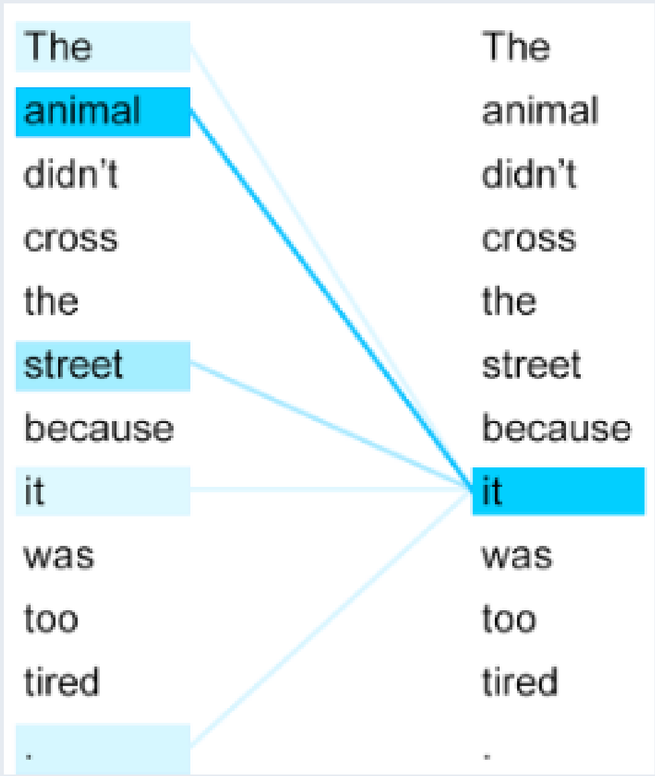
https://blogs.nvidia.co.kr/2023/01/30/what-are-large-language-models-used-for/

트랜스포머

Transformer 아키텍처

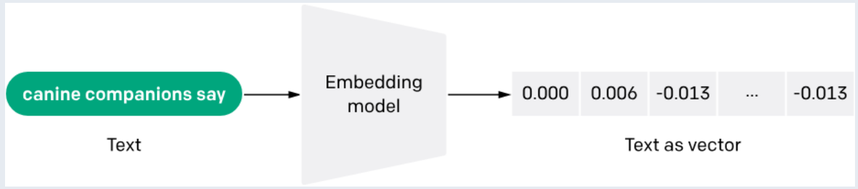


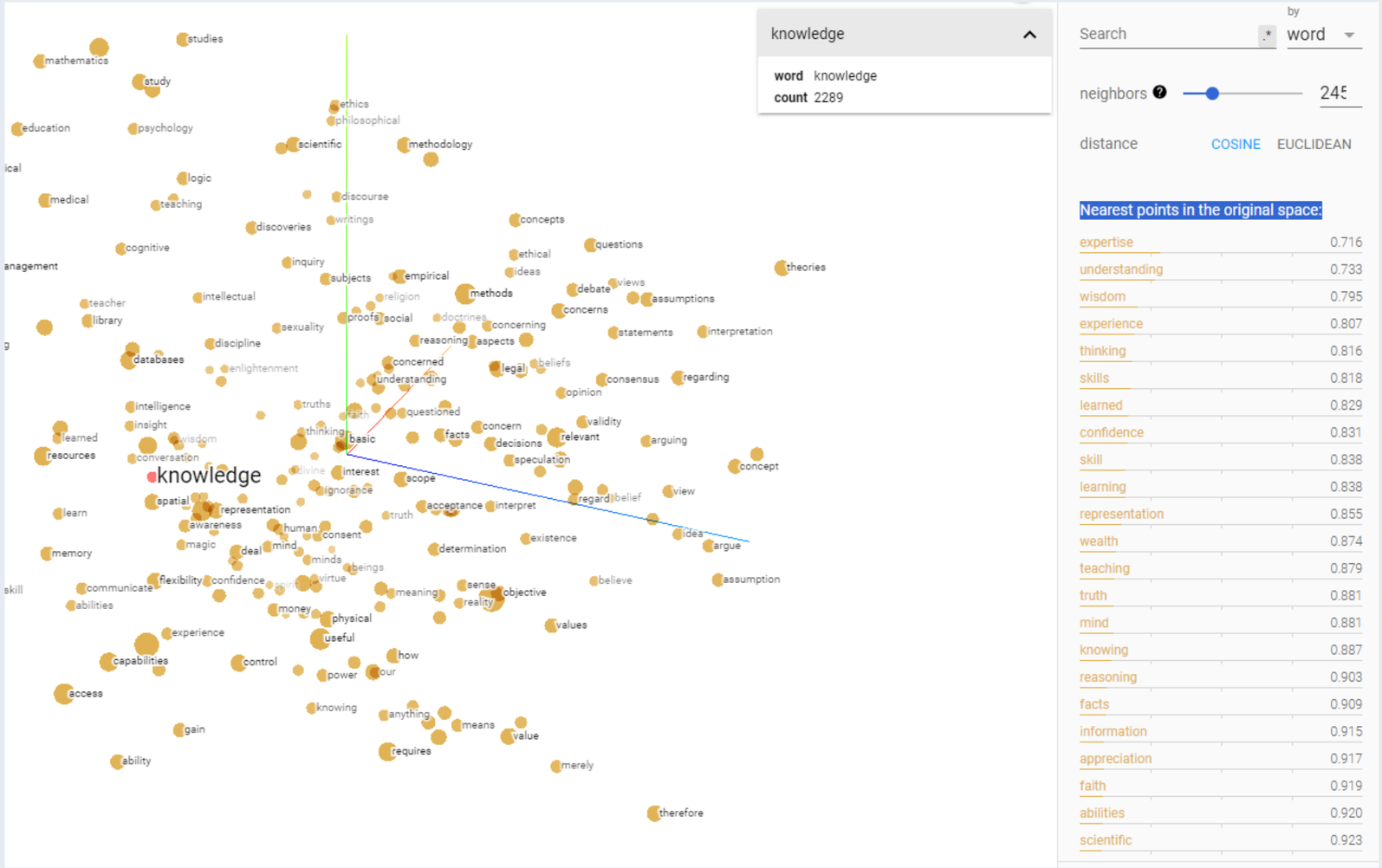
Self Attention



임베딩(Embedding)

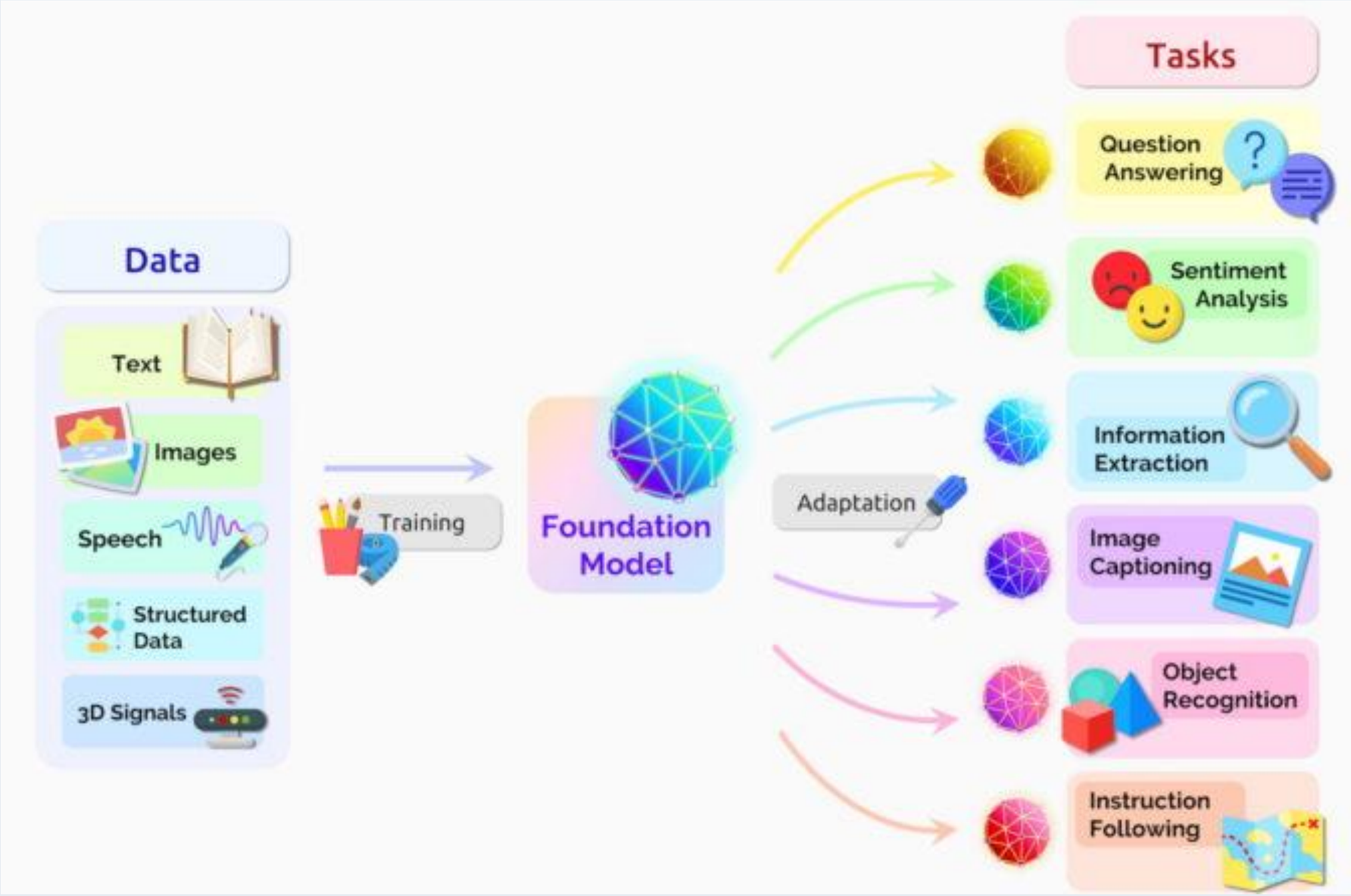
$$banking = \begin{pmatrix} 0.286 \\ 0.792 \\ -0.177 \\ -0.107 \\ 0.109 \\ -0.542 \\ 0.349 \\ 0.271 \end{pmatrix}$$





https://projector.tensorflow.org/

파운데이션 모델(FM, Foundation Model)



LLM Model

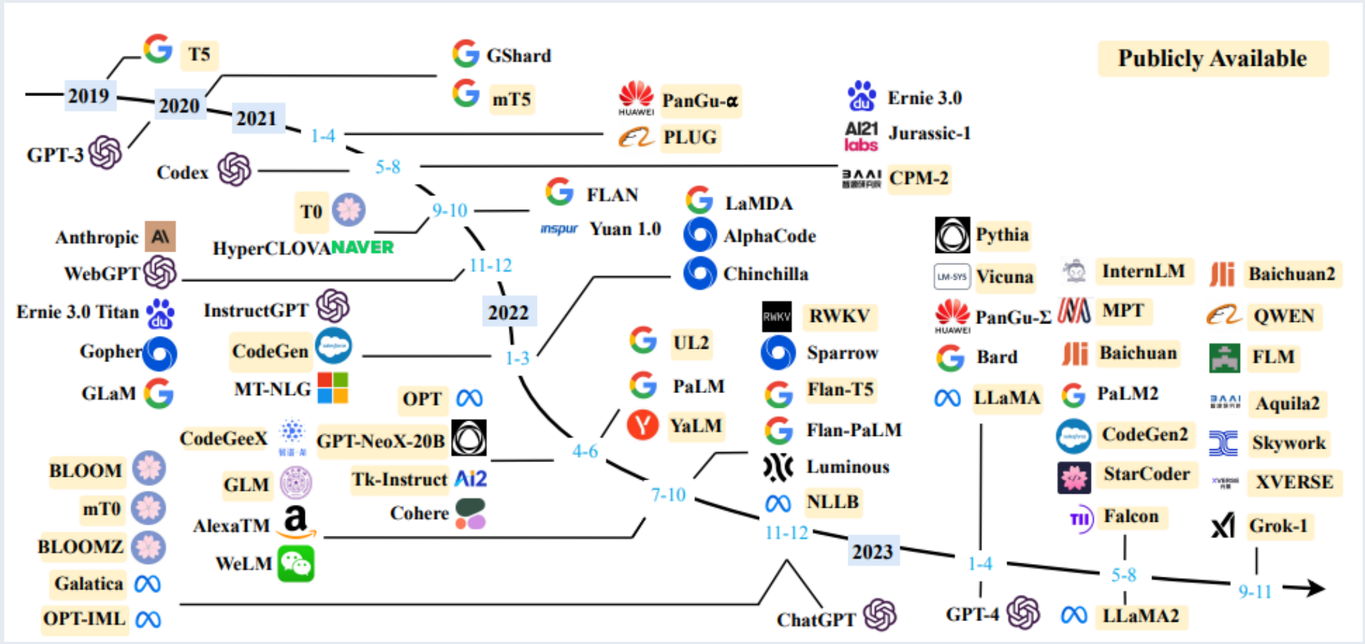
	Model	Release Time	Size (B)	Base Model	Adaptation IT	Adaptation RLHF	Pre-train Data Scale	Latest Data Timestamp	Hardware (GPUs / TPUs)	Training Time	Evaluation ICL	Evaluation CoT
Publicly Available	T5 [82]	Oct-2019	11	-	-	-	1T tokens	Apr-2019	1024 TPU v3	-	✓	-
	mT5 [83]	Oct-2020	13	-	-	-	1T tokens	-	-	-	✓	-
	PanGu-α [84]	Apr-2021	13*	-	-	-	1.1TB	-	2048 Ascend 910	-	✓	-
	CPM-2 [85]	Jun-2021	198	-	-	-	2.6TB	-	-	-	-	-
	T0 [28]	Oct-2021	11	T5	✓	-	-	-	512 TPU v3	27 h	✓	-
	CodeGen [86]	Mar-2022	16	-	-	-	577B tokens	-	-	-	✓	-
	GPT-NeoX-20B [87]	Apr-2022	20	-	-	-	825GB	-	96 40G A100	-	✓	-
	Tk-Instruct [88]	Apr-2022	11	T5	✓	-	-	-	256 TPU v3	4 h	✓	-
	UL2 [89]	May-2022	20	-	-	-	1T tokens	Apr-2019	512 TPU v4	-	✓	✓
	OPT [90]	May-2022	175	-	-	-	180B tokens	-	992 80G A100	-	✓	-
	NLLB [91]	Jul-2022	54.5	-	-	-	-	-	-	-	✓	-
	CodeGeeX [92]	Sep-2022	13	-	-	-	850B tokens	-	1536 Ascend 910	60 d	✓	-
	GLM [93]	Oct-2022	130	-	-	-	400B tokens	-	768 40G A100	60 d	✓	-
	Flan-T5 [69]	Oct-2022	11	T5	✓	-	-	-	-	-	✓	✓
	BLOOM [78]	Nov-2022	176	-	-	-	366B tokens	-	384 80G A100	105 d	✓	-
	mT0 [94]	Nov-2022	13	mT5	✓	-	-	-	-	-	✓	-
	Galactica [35]	Nov-2022	120	-	-	-	106B tokens	-	-	-	✓	✓
	BLOOMZ [94]	Nov-2022	176	BLOOM	✓	-	-	-	-	-	✓	-
	OPT-IML [95]	Dec-2022	175	OPT	✓	-	-	-	128 40G A100	-	✓	✓
	LLaMA [57]	Feb-2023	65	-	-	-	1.4T tokens	-	2048 80G A100	21 d	✓	-
	Pythia [96]	Apr-2023	12	-	-	-	300B tokens	-	256 40G A100	-	✓	-
	CodeGen2 [97]	May-2023	16	-	-	-	400B tokens	-	-	-	✓	-
	StarCoder [98]	May-2023	15.5	-	-	-	1T tokens	-	512 40G A100	-	✓	✓
	LLaMA2 [99]	Jul-2023	70	-	✓	✓	2T tokens	-	2000 80G A100	-	✓	-
	Baichuan2 [100]	Sep-2023	13	-	✓	✓	2.6T tokens	-	1024 A800	-	✓	-
	QWEN [101]	Sep-2023	14	-	✓	✓	3T tokens	-	-	-	✓	-
	FLM [102]	Sep-2023	101	-	✓	-	311B tokens	-	192 A800	22 d	✓	-
	Skywork [103]	Oct-2023	13	-	-	-	3.2T tokens	-	512 80G A800	-	✓	-

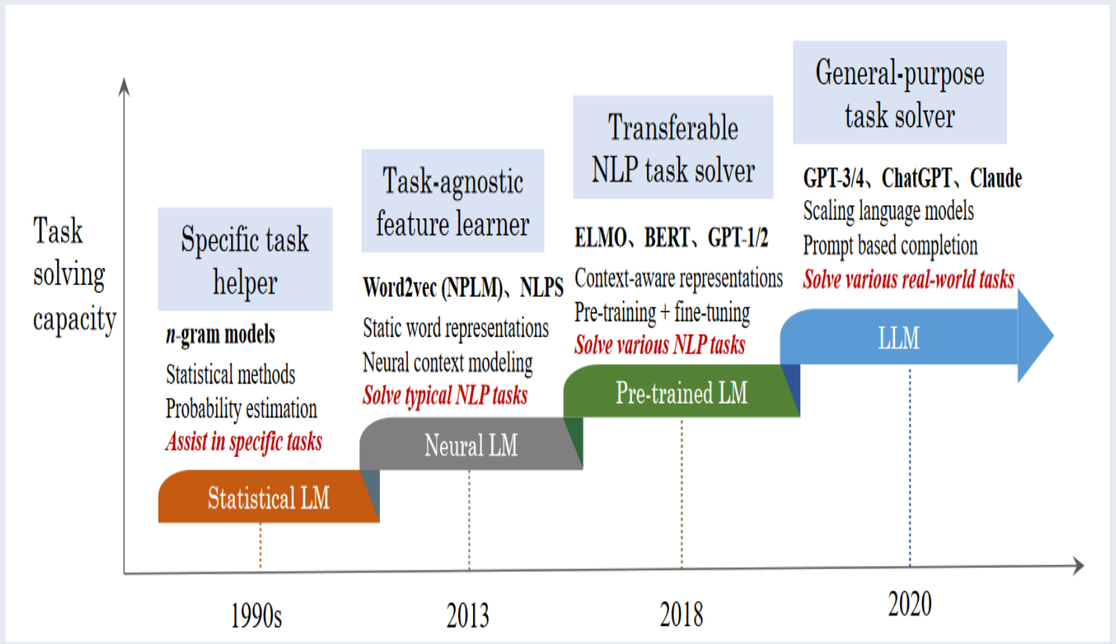
	Model	Release Time	Size (B)	Base Model	Adaptation IT	Adaptation RLHF	Pre-train Data Scale	Latest Data Timestamp	Hardware (GPUs / TPUs)	Training Time	Evaluation ICL	Evaluation CoT
Closed Source	GPT-3 [55]	May-2020	175	-	-	-	300B tokens	-	-	-	✓	-
	GShard [104]	Jun-2020	600	-	-	-	1T tokens	-	2048 TPU v3	4 d	-	-
	Codex [105]	Jul-2021	12	GPT-3	-	-	100B tokens	May-2020	-	-	✓	-
	ERNIE 3.0 [106]	Jul-2021	10	-	-	-	375B tokens	-	384 V100	-	✓	-
	Jurassic-1 [107]	Aug-2021	178	-	-	-	300B tokens	-	800 GPU	-	✓	-
	HyperCLOVA [108]	Sep-2021	82	-	-	-	300B tokens	-	1024 A100	13.4 d	✓	-
	FLAN [67]	Sep-2021	137	LaMDA-PT	✓	-	-	-	128 TPU v3	60 h	✓	-
	Yuan 1.0 [109]	Oct-2021	245	-	-	-	180B tokens	-	2128 GPU	-	✓	-
	Anthropic [110]	Dec-2021	52	-	-	-	400B tokens	-	-	-	✓	-
	WebGPT [81]	Dec-2021	175	GPT-3	-	✓	-	-	-	-	✓	-
	Gopher [64]	Dec-2021	280	-	-	-	300B tokens	-	4096 TPU v3	920 h	✓	-
	ERNIE 3.0 Titan [111]	Dec-2021	260	-	-	-	-	-	-	-	✓	-
	GLaM [112]	Dec-2021	1200	-	-	-	280B tokens	-	1024 TPU v4	574 h	✓	-
	LaMDA [68]	Jan-2022	137	-	-	-	768B tokens	-	1024 TPU v3	57.7 d	-	-
	MT-NLG [113]	Jan-2022	530	-	-	-	270B tokens	-	4480 80G A100	-	✓	-
	AlphaCode [114]	Feb-2022	41	-	-	-	967B tokens	Jul-2021	-	-	-	-
	InstructGPT [66]	Mar-2022	175	GPT-3	✓	✓	-	-	-	-	✓	-
	Chinchilla [34]	Mar-2022	70	-	-	-	1.4T tokens	-	-	-	✓	-
	PaLM [56]	Apr-2022	540	-	-	-	780B tokens	-	6144 TPU v4	-	✓	✓
	AlexaTM [115]	Aug-2022	20	-	-	-	1.3T tokens	-	128 A100	120 d	✓	✓
	Sparrow [116]	Sep-2022	70	-	-	✓	-	-	64 TPU v3	-	✓	-
	WeLM [117]	Sep-2022	10	-	-	-	300B tokens	-	128 A100 40G	24 d	✓	-
	U-PaLM [118]	Oct-2022	540	PaLM	-	-	-	-	512 TPU v4	5 d	✓	✓
	Flan-PaLM [69]	Oct-2022	540	PaLM	✓	-	-	-	512 TPU v4	37 h	✓	✓
	Flan-U-PaLM [69]	Oct-2022	540	U-PaLM	✓	-	-	-	-	-	✓	✓
	GPT-4 [46]	Mar-2023	-	-	✓	✓	-	-	-	-	✓	✓
	PanGu-Σ [119]	Mar-2023	1085	PanGu-α	-	-	329B tokens	-	512 Ascend 910	100 d	✓	-
	PaLM2 [120]	May-2023	16	-	✓	-	100B tokens	-	-	-	✓	✓

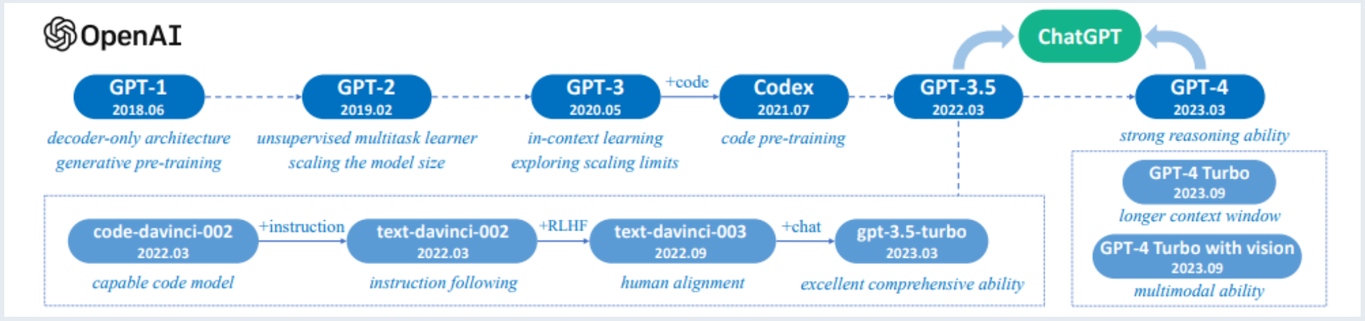
https://arxiv.org/pdf/2303.18223.pdf

LLM Model

A Survey of Large Language Models : https://arxiv.org/pdf/2303.18223.pdf , 번역자료 : https://wikidocs.net/222912







생성형 AI 유스케이스

Code Generation, Documentation, and Quality Assurance

- Code Snippets AI
- ChatGPT
- Google Gemini
- Tabnine

Project Management and Operations

- Wrike
- ClickUp
- monday.com
- Notion

Product Development and Management

- Viable Generative Analysis
- Stability AI
- AI21 Labs
- GPT-4

Graphic Design and Video Marketing

- Diagram
- Synthesia
- Lightricks
- Rephrase.ai

Blog and Social Media Content Writing

- Jasper
- Notion AI
- Phrasee
- HubSpot Content Assistant

Entertainment Media Generation

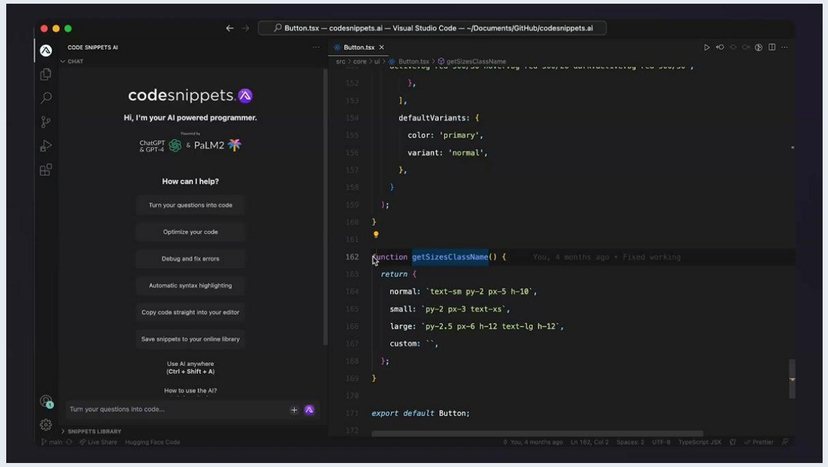
- Stability AI's Stable Diffusion
- Plask
- Charisma
- Latitude Unchained

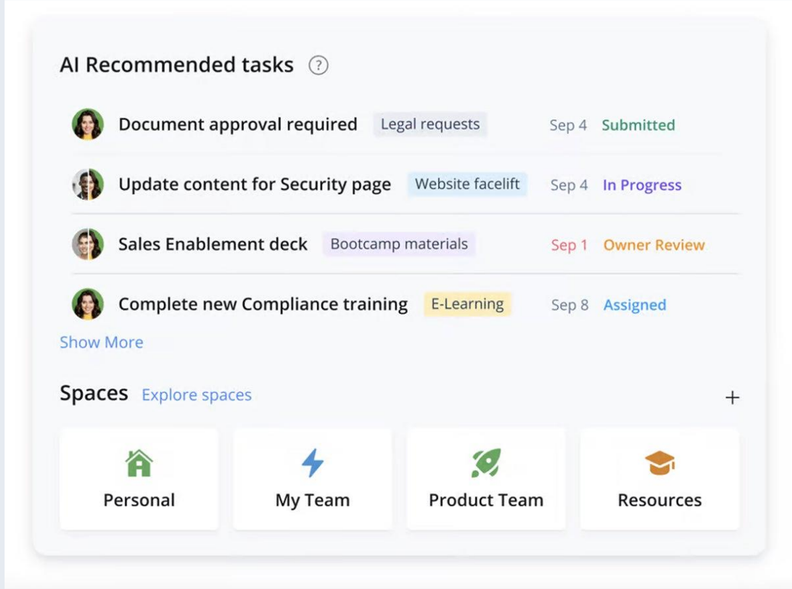
Inbound and Outbound Marketing and Sales

- Twain
- Salesforce Einstein GPT
- HubSpot AI

Performance Management and Coaching

- Anthropic Claude
- Gong
- CoachHub AIMY





https://www.eweek.com/artificial-intelligence/generative-ai-enterprise-use-cases/

생성형 AI 유스케이스

Business Performance Reporting and Data Analytics

- SparkBeyond Discovery
- Dremio
- Narrative BI
- Copilot for Power BI

Customer Support and Customer Service

- Gridspace
- IBM watsonx Assistant
- UltimateGPT
- Zendesk Advanced AI
- Forethought SupportGPT

Medical Diagnostics and Pharmaceutical Drug Discovery

- Paige.ai
- Google Med-PaLM 2
- Insilico Medicine
- Iambic Therapeutics

Consumer-Friendly Synthetic Data Generation

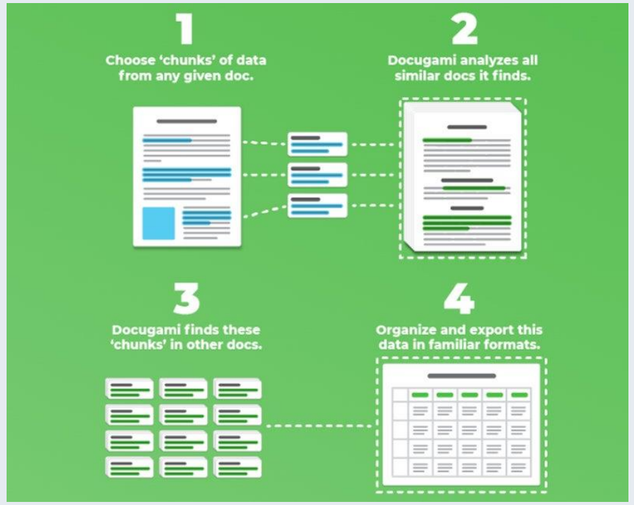
- Syntho Engine
- Synthesis AI
- MOSTLY AI
- Infinity AI

Smart Manufacturing and Predictive Maintenance

- Tulip Frontline Copilot
- Clarifai
- C3 Generative AI Product Suite

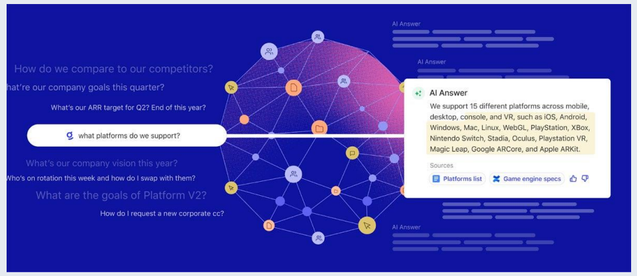
Fraud Detection and Risk Management

- Simplifai InsuranceGPT
- Docugami
- ChatGPT



Optimized Enterprise Search and Knowledge Base

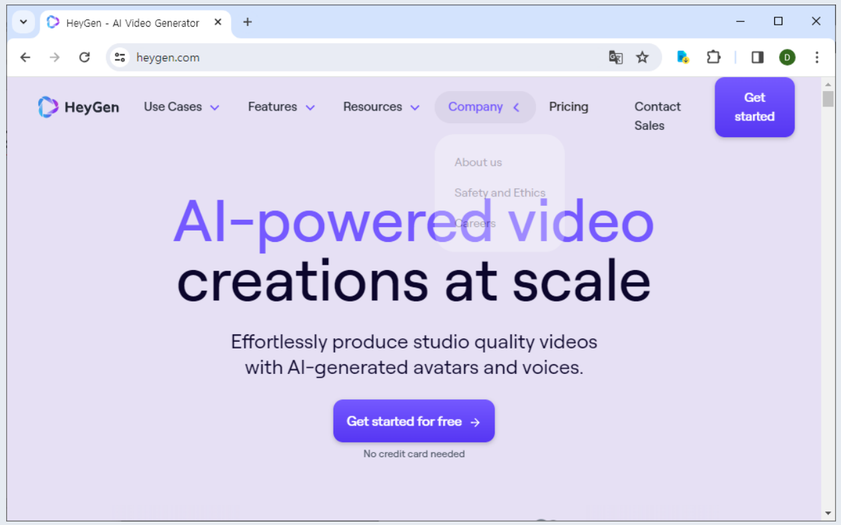
- Glean
- Coveo Relevance Generative Answering
- Elasticsearch Relevance Engine



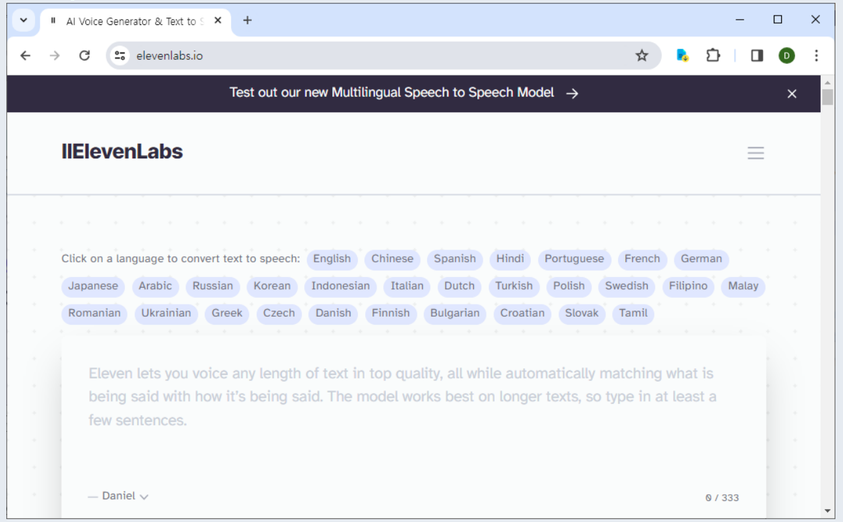
https://www.eweek.com/artificial-intelligence/generative-ai-enterprise-use-cases/

생성형 AI 유스케이스

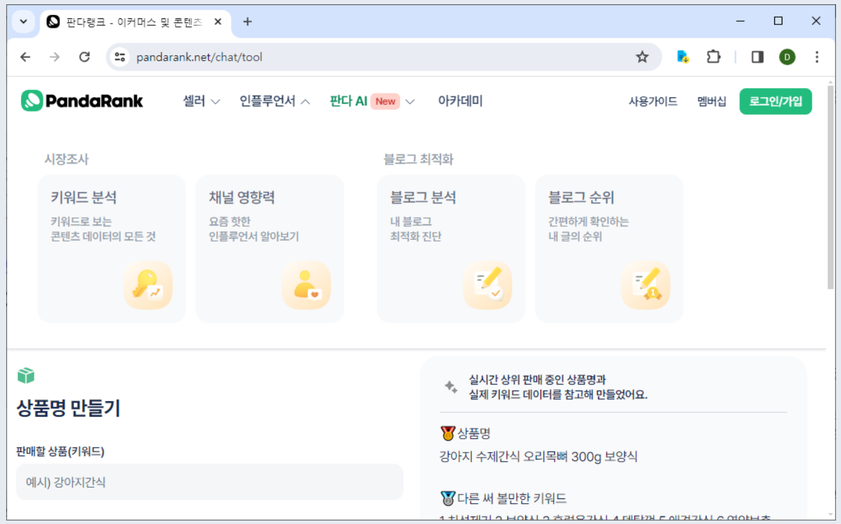
https://www.heygen.com/



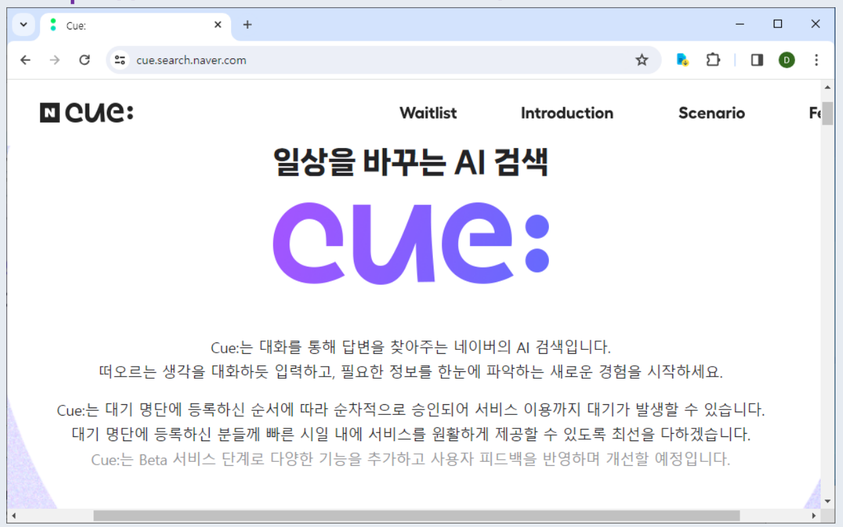
https://elevenlabs.io/



https://pandarank.net/chat/tool

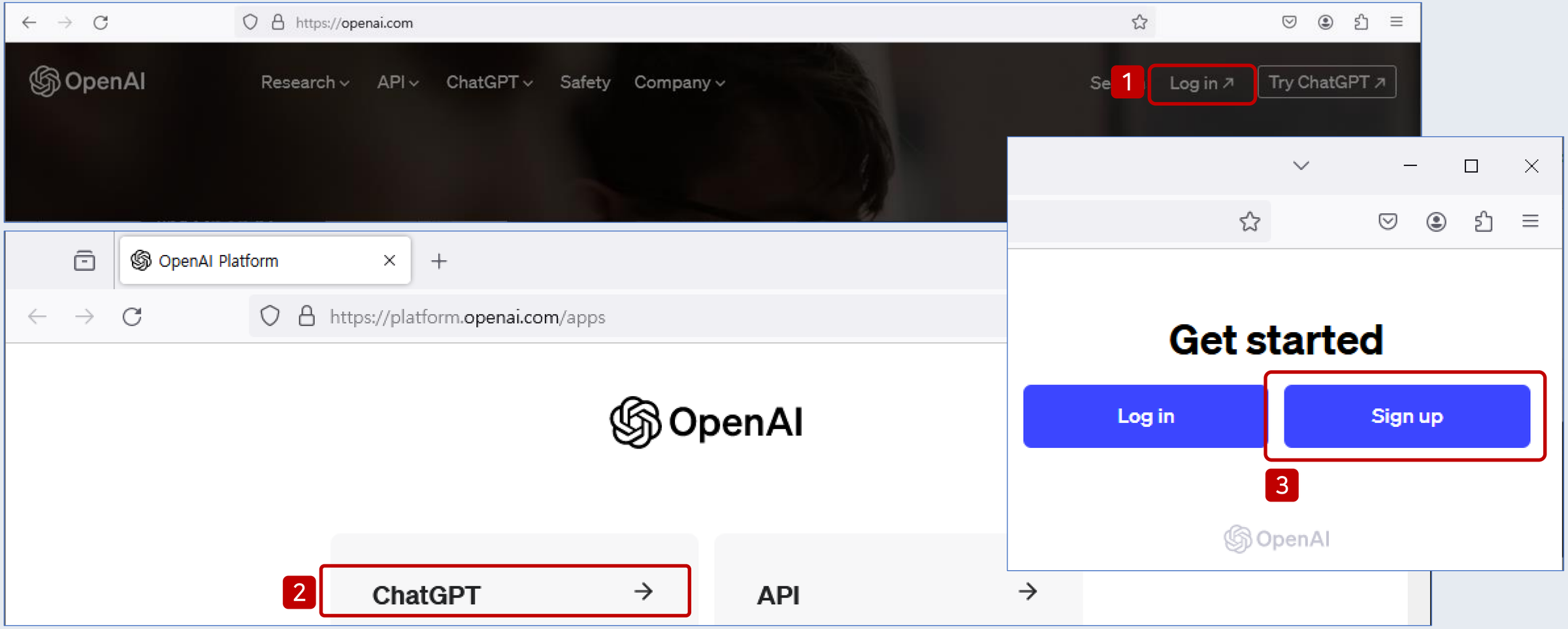


https://cue.search.naver.com/

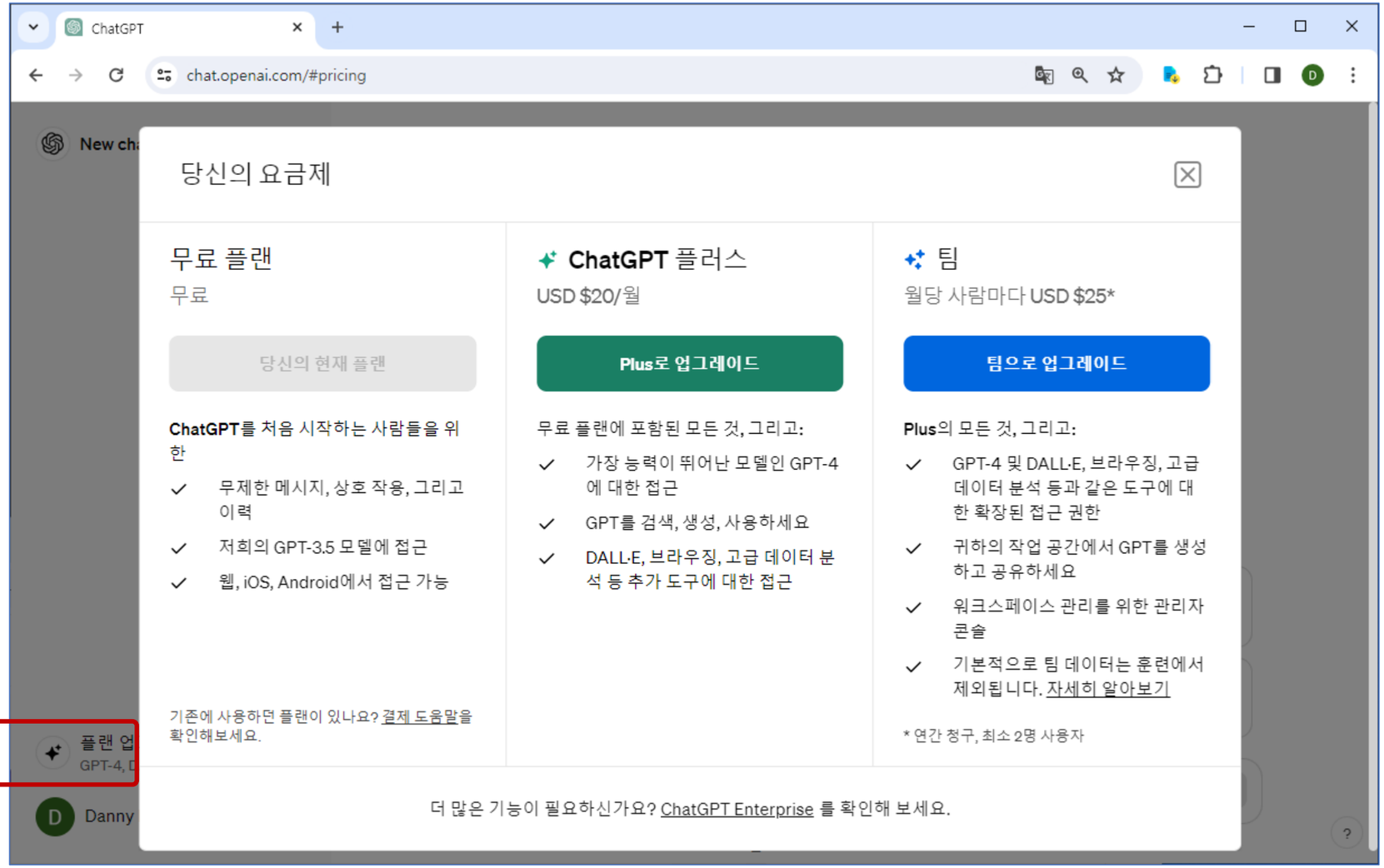


실습 - ChatGPT

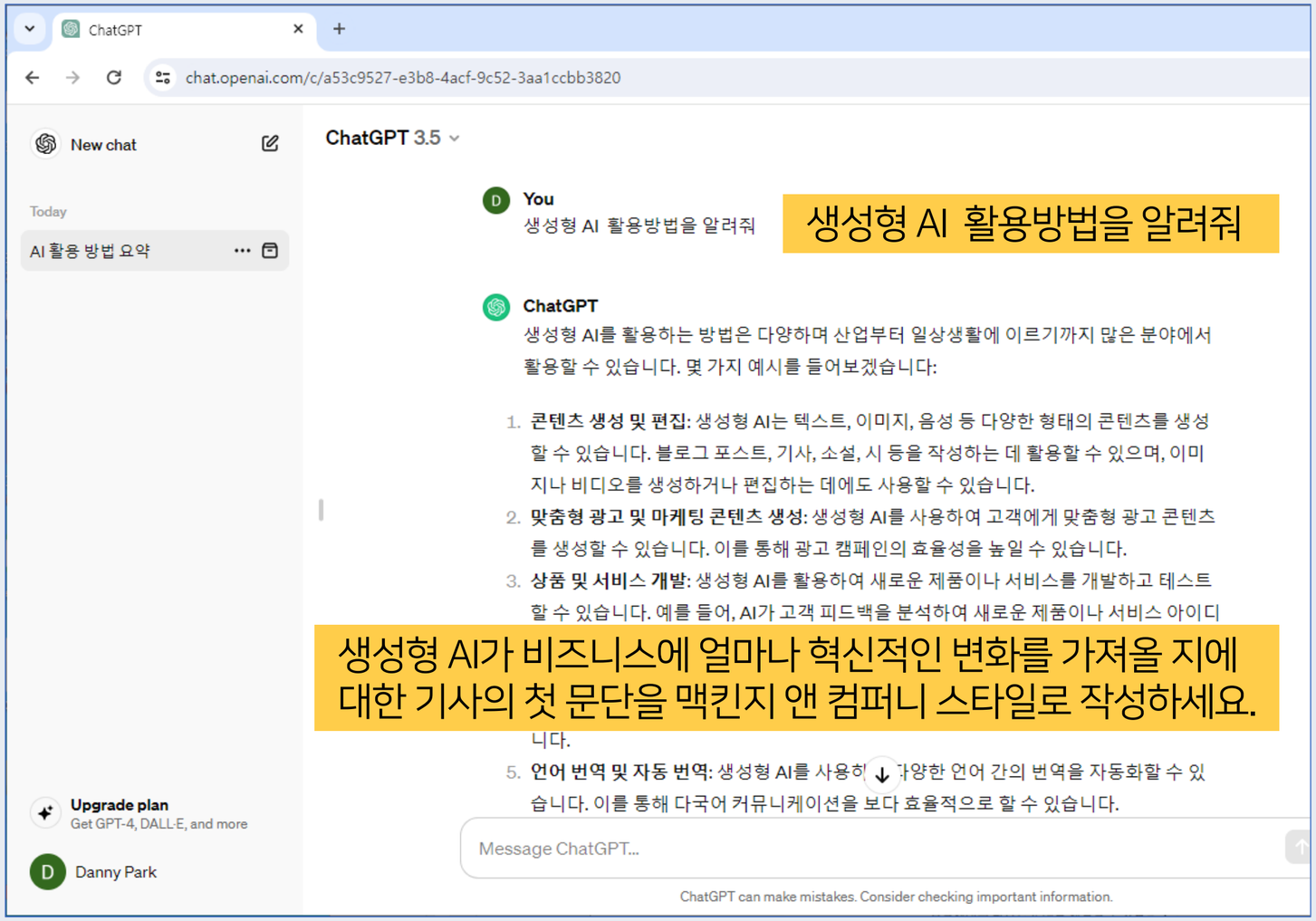
https://openai.com/



실습 - ChatGPT


ChatGPT
chat.openai.com/#pricing
당신의 요금제
무료 플랜
무료
당신의 현재 플랜
ChatGPT를 처음 시작하는 사람들을 위한
무제한 메시지, 상호 작용, 그리고 이력
저희의 GPT-3.5 모델에 접근
웹, iOS, Android에서 접근 가능
기존에 사용하던 플랜이 있나요? 결제 도움말을 확인해보세요.
ChatGPT 플러스
USD $20/월
Plus로 업그레이드
무료 플랜에 포함된 모든 것, 그리고:
가장 능력이 뛰어난 모델인 GPT-4에 대한 접근
GPT를 검색, 생성, 사용하세요
DALL·E, 브라우징, 고급 데이터 분석 등 추가 도구에 대한 접근
팀
월당 사람마다 USD $25*
팀으로 업그레이드
Plus의 모든 것, 그리고:
GPT-4 및 DALL·E, 브라우징, 고급 데이터 분석 등과 같은 도구에 대한 확장된 접근 권한
귀하의 작업 공간에서 GPT를 생성하고 공유하세요
워크스페이스 관리를 위한 관리자 콘솔
기본적으로 팀 데이터는 훈련에서 제외됩니다. 자세히 알아보기
* 연간 청구, 최소 2명 사용자
더 많은 기능이 필요하신가요? ChatGPT Enterprise 를 확인해 보세요.
Danny

실습 - ChatGPT

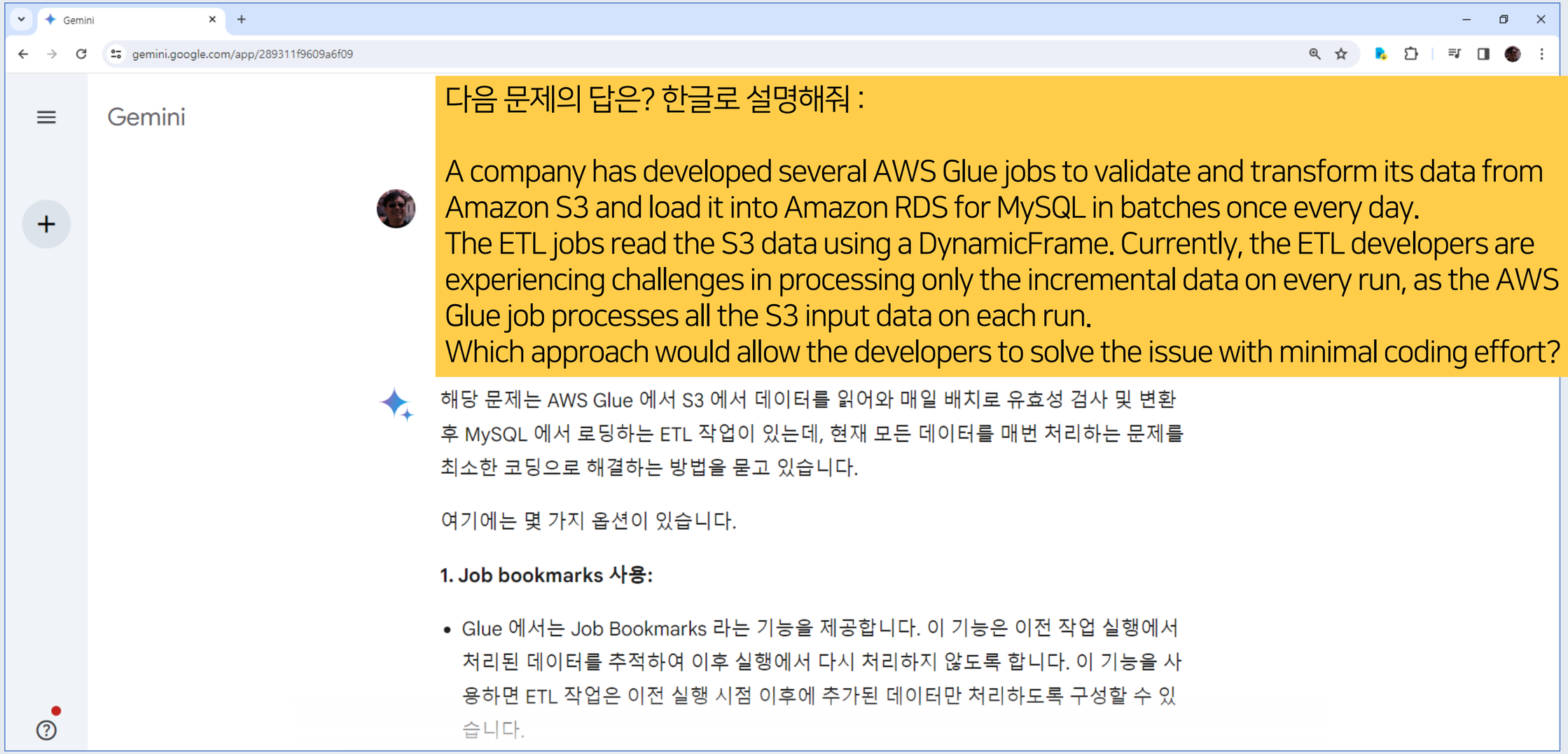


파이썬 라이브러리를 활용해서 'Gen AI' 키워드로 검색한 결과를 스크래핑 하는 코드를 작성해.

```python
import requests
from bs4 import BeautifulSoup

def scrape_gen_ai_results():
    # 검색할 키워드
    keyword = 'Gen AI'
    # 구글 검색 결과 페이지 URL (스크랩하고자 하는 검색 엔진에 맞게 변경)
    url = f'https://www.google.com/search?q={keyword}'

    # User-Agent 헤더를 설정하여 봇으로 인식되지 않도록 함
    headers = {
        'User-Agent': 'Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (

    # requests를 사용하여 URL에 GET 요청
    response = requests.get(url, headers=headers)

    # 응답 코드가 200(성공)이 아니면 에러를 발생시킴
    if response.status_code != 200:
        raise Exception(f"Failed to load page (status code: {response.status_code})")

    # BeautifulSoup을 사용하여 HTML 파싱
    soup = BeautifulSoup(response.text, 'html.parser')

    # 검색 결과 링크 가져오기
    search_results = soup.find_all('div', class_='tF2Cxc')

    # 결과 출력
    for result in search_results:
        link = result.find('a')['href']
```

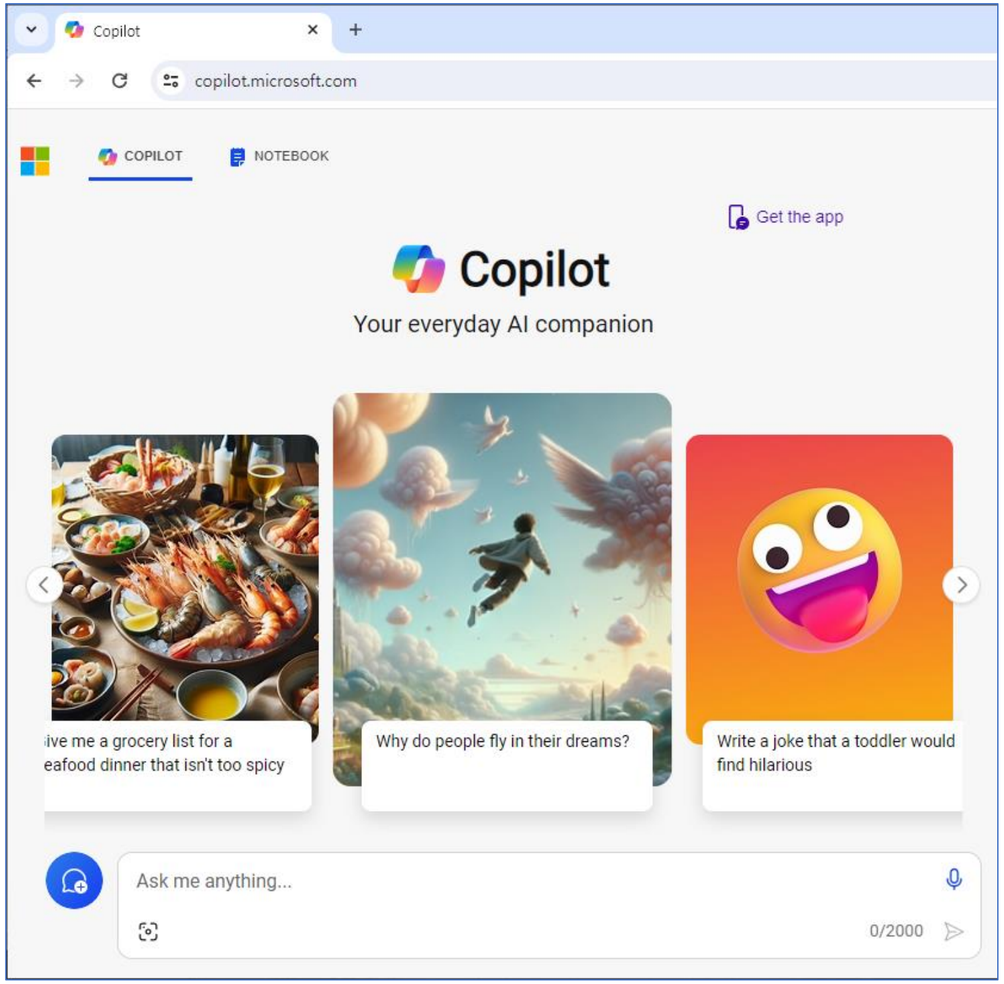
일상/업무 활용팁 https://sdf.seoul.kr/research-report/2077

실습 - Gemini https://gemini.google.com/

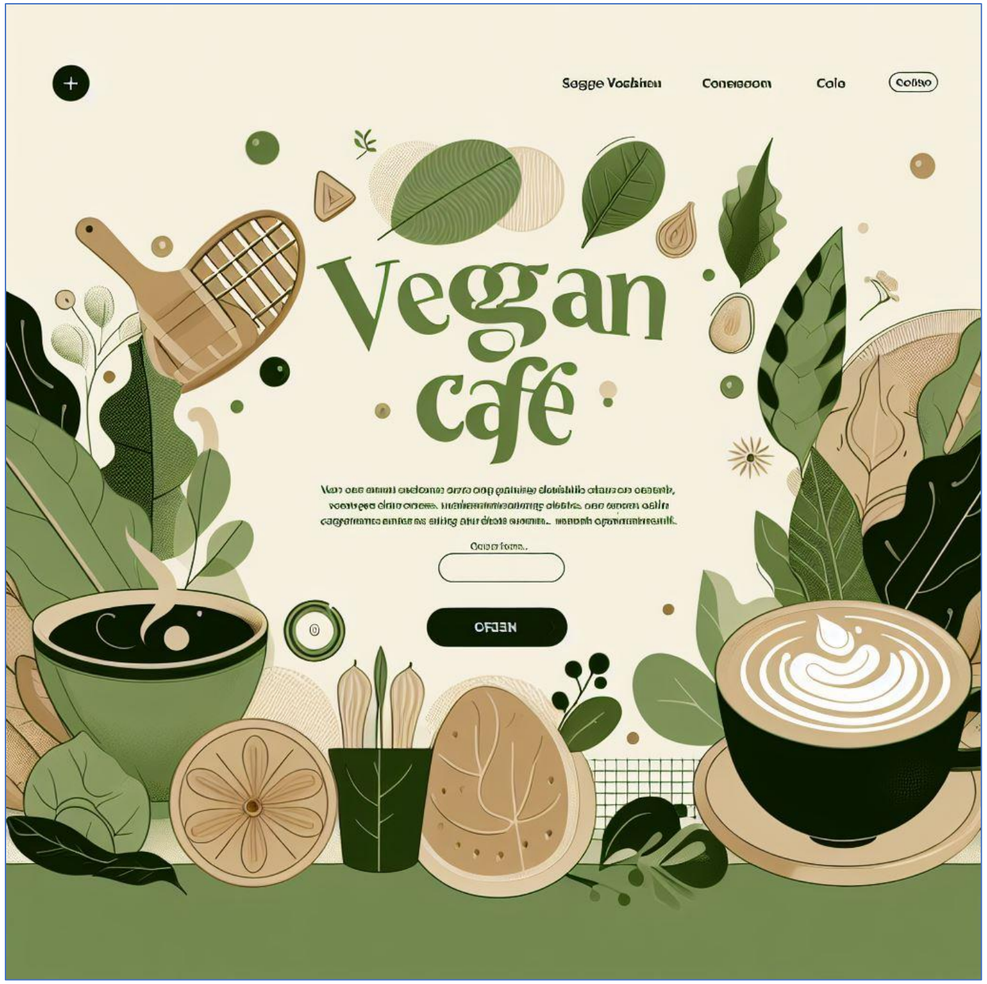


실습 - Copilot

https://copilot.microsoft.com/



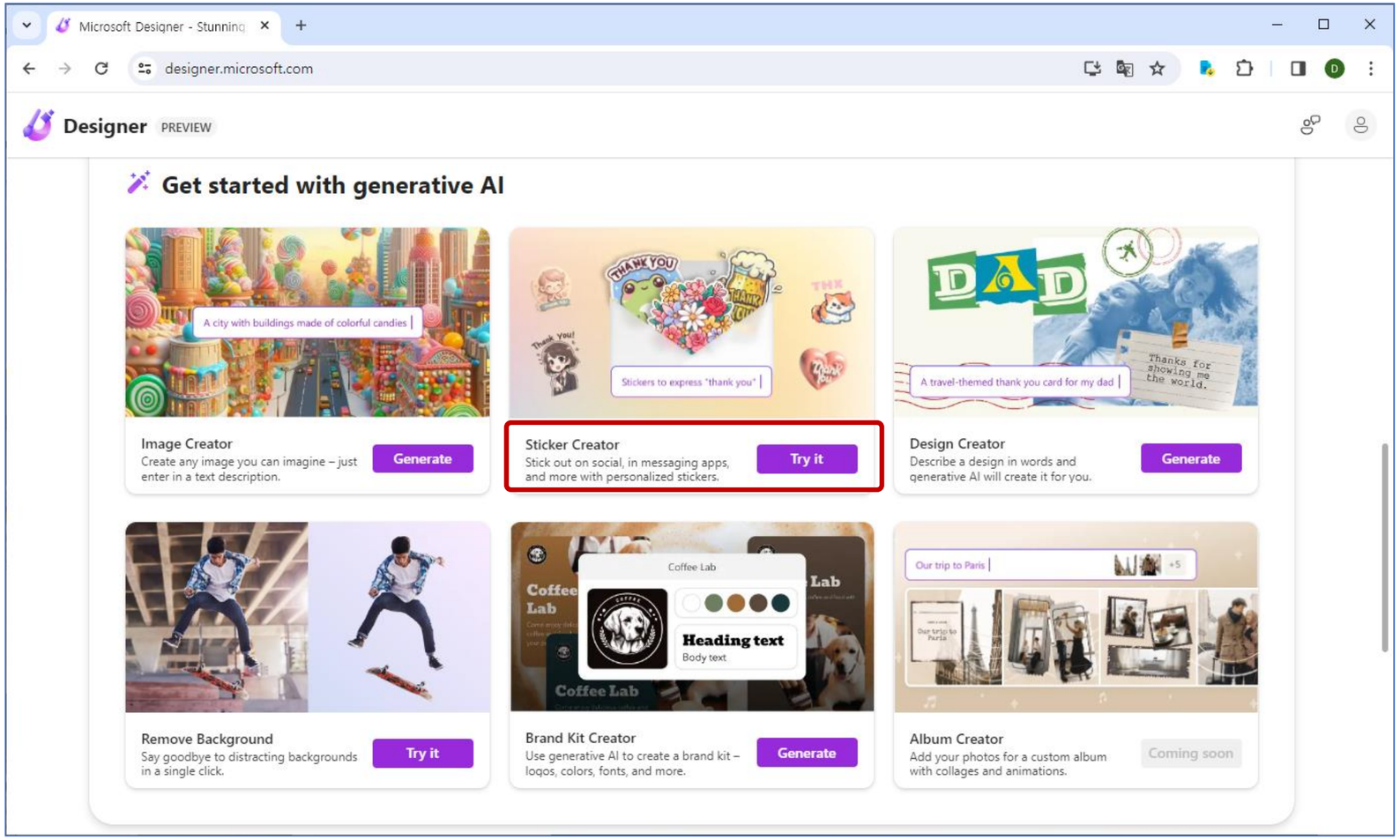
이미지 생성 프롬프트 참고 https://eopla.net/magazines/12062

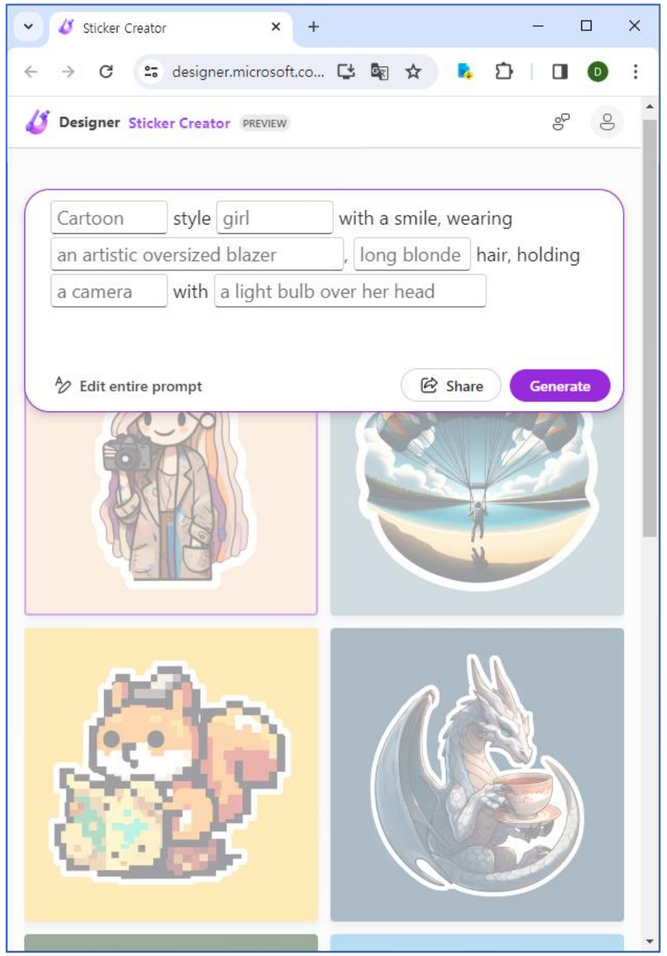


실습 - Designer

https://designer.microsoft.com/

Get started with generative AI





THANK YOU

kgpark88@gmail.com