

Career Essentials in Generative AI by Microsoft and LinkedIn

What Is Generative AI?

- The vision, the idea, and the purpose.
- It's the complete paradigm shift for the future of jobs.

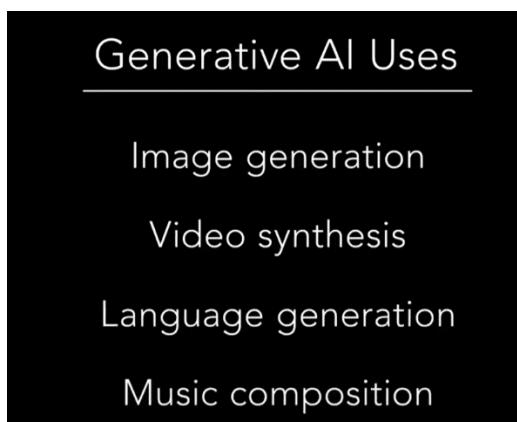
The importance of Gen AI

- Concise Information
- Generated text
- Custom Products
- Music
- Speech
- Visual effects
- 3D assets
- Sound effects

How Gen AI is different than other types of AI

- Gen AI means Generate new content.
- Predictive AI – focuses on classifying or identifying content that is based on preexisting data.

Gen AI Use Cases:



Predictive AI use case

- Reactive Machine (Self driving cars)
- Limited memory (Weather forecast)
- Theory of mind (Chatbots)
- Narrow AI (Product for e-commerce sites)
- Supervised learning (identify objects from images and video)
- Unsupervised learning (it can detect fraudulent bank transactions)
- Reinforcement learning (How to play a game)

Gen AI Definition:

- Designed to generate new content as **its primary output**.

How Gen AI works

AI 101

- Salt shaker example
- Feed with thousands, millions, trillions of contents and teach you an certain algorithm to generate outputs and solution as result

Gen AI 101

- As different cars have different engines, Gen AI has different models to perform a task.
- For e.g. companies and universities Open AI, NVIDIA, Google, Meta, UC Berkely, LMU Munich
- Gen Models can be private (OpenAI, Google) or public (Open Source)
- Different personas
 1. Business Leader

Product idea with Gen AI.

Open Source

Tasks 1 Libraries Datasets Languages Licenses
Other

Filter Tasks by name Reset Tasks

Multimodal

- Feature Extraction Text-to-Image
- Image-to-Text Visual Question Answering
- Document Question Answering
- Graph Machine Learning

Computer Vision

- Depth Estimation Image Classification
- Object Detection Image Segmentation
- Image-to-Image

Models 2,365 Filter new Full-text search Sort

CompVis/stable-diffusion-v1-4
Updated about 6 hours ago · 4.45M · 4.56k

runwayml/stable-diffusion-v1-5
Updated Jan 27 · 1.87M · 5.35k

prompthero/openjourney
Updated 19 days ago · 484k · 1.61k

stabilityai/stable-diffusion-2-1-base
Updated Dec 20, 2022 · 435k · 172

stabilityai/stable-diffusion-2-1 LinkedIn Learning

Open Source huggingface.com

Or with colab.research.google.com

2. Creative person

Appetite for adventure.

3. Common man

No Technical knowledge

Create your own content

- A **model** is set of algorithms that have been **trained on a specific dataset**.
- A **notebook** is tool for writing and running code.
- An **application** is an example of how a model can be used.
- An **outcome** is what the end user produces using Gen AI or a notebook that houses a model.

Quiz

1. What is an AI model?

Question 1 of 5

What is an AI model?

a model is an example of how a generative AI application can be used

a model is a set of algorithms that have been trained on a specific dataset
Correct

a model is a tool for writing and running code

[Next question](#)

2. What is a key benefit of using generative AI for repetitive or computational tasks?

Question 2 of 5

What is a key benefit of using generative AI for repetitive or computational tasks?

It increases the flexibility and adaptability of the inputs.

It allows humans to focus on more creative and strategic activities.
Correct

It reduces the risk of errors and biases.

It improves the quality and efficiency of the outputs.

[Next question](#)

3. What is the difference between generative AI and other types of AI that generate content?

Question 3 of 5

What is the difference between generative AI and other types of AI that generate content?

Generative AI is a subset of reactive machines that generate content in response to stimuli.

Generative AI's primary function is to create content.
Correct

Generative AI uses unsupervised learning to generate content without preexisting data.

Generative AI can generate content in any domain or format.

[Next question](#)

4. Do you need to have a technical AI background in order to start a generative AI venture?

Question 4 of 5

Do you need to have a technical AI background in order to start a generative AI venture?

Yes, because it is hyper complex. Several generative AI models and papers come out every day and in order to work in generative AI, you need to be able to write generative AI algorithms and you need to be able to train your own datasets.

No. Generative AI is so advanced that the code is writing itself. You almost do not need to hire anyone, you can do everything, including programming to product development on your own.
Incorrect

No. As a business leader with no technical background, you can either make partnerships with generative AI research institutions, or you can use open-source models in your next business endeavor. And as a hobbyist, a maker, or a creative, you can make use of a generative AI services that are free or are accessible with a modest fee.
Correct

[Next question](#)

5. What does the term open source mean in the context of generative AI models?

Question 5 of 5

What does the term open source mean in the context of generative AI models?

It means that the models are transparent and explainable to human users.

It means that the models are generated by crowdsourcing data from online users.

It means that the models are funded by the public sector and non-profit organizations.

It means that the models are publicly available for anyone to use and modify.
Correct

[Next](#)

Main Models

1. Generative Pre-trained Transformer (GPT)

- A natural language model developed by OpenAI
- It's a language model
- GPT is notable due to

Large scale.

Transformer architecture

Human-like text generation

Use cases

GitHub Copilot

Bing Chat

Time to 1M Users

Time to 1M Users

GPT-3 less than a week
Netflix - 49 months
Twitter - 24 months
Airbnb - 30 months
Facebook - 10 months
Instagram - 2.5 months

GPT-3 Limitations

- Lack of common sense
- Lack of creativity
- No understanding of generated text.
- Biased databases
- Danger of normalization of mediocrity with creative writing

Text to image applications

3 tools that does text Generation services

Midjourney – MacOS, Closed API, Art-Centric Approach

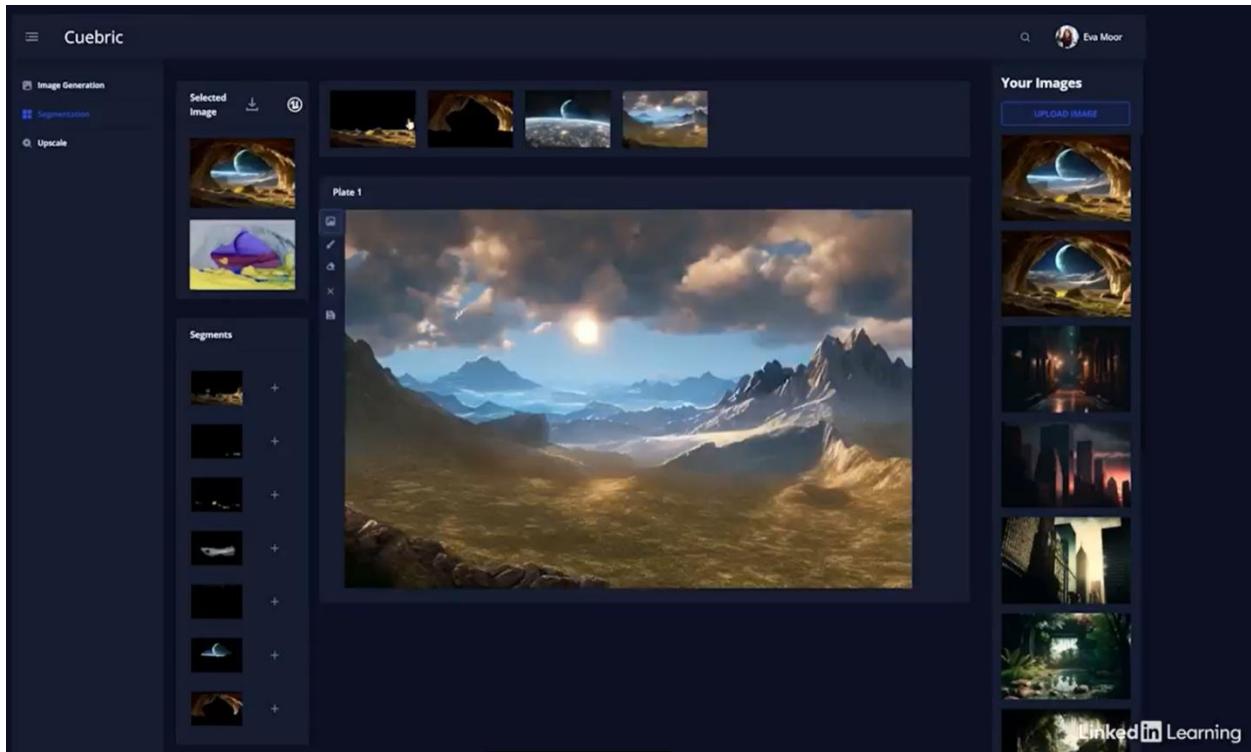
DALL-E – Windows, Open API, Released by corporation, Initially most superior machine learning algorithm

Stable Diffusion – Linux, Open Source, Continuous improvement from community

Industry Use Cases

Cuebrick

Hollywood's first gen ai tool created



Stitch fix

Is this your style?



Only some pieces?

Martini

2. Generative Adversarial Networks (GANs)

- GAN models work together to improve the generator's ability to create realistic data.

Industry use case

1. Audi – Wheel design
2. Beko – European -based appliance brand.

3. VAE and anomaly detection

- Variation Autoencoders (VAE) use anomaly detection.

VAE use cases

1. Financial Fraud
2. Manufacturing flaws

3. Network security breaches

Quiz

1. How can Variational Autoencoders (VAEs) be used in anomaly detection?

Question 1 of 8

How can Variational Autoencoders (VAEs) be used in anomaly detection?

- The natural language processing of VAEs help them compute complex information. With their large scale transformer architecture, they can quickly process language-based information.
- VAEs are trained with large datasets and they have the capability to future predict anomalies by analyzing the behaviors of a production systems.
- VAEs can be trained on a dataset of normal data, and later on be used to identify instances that deviate from the normal data.
Correct

Next question

2. What is one real-world application of Variational Autoencoders (VAE) in anomaly detection?

Question 2 of 8

What is one real-world application of Variational Autoencoders (VAE) in anomaly detection?

- Creating realistic audio samples for use in music production.
- Identifying patterns in social media activity to predict consumer behavior.
- Detecting defects in industrial quality control by identifying images of products that deviate from a dataset of normal products.
Correct
- Generating synthetic fraudulent transactions to train financial fraud detection models.

Next question

3. What is the most notable functionality of Natural Language models like Chat GPT?

Question 3 of 8

What is the most notable functionality of Natural Language models like Chat GPT?

- its capability to write hyper creative text for a variety of contents such as books, slogans, and scripts
Incorrect
- Its large scale capability to generate human-like text
Correct
- its ability to understand the meaning of the text it generates
- its capability to influence people to make decisions for them

4. What is GPT and why has it become notable in the field of natural language processing?

Question 4 of 8

What is GPT and why has it become notable in the field of natural language processing?

- GPT is a language model developed by OpenAI that can take in a prompt and generate text based on it, making it useful for a multitude of tasks.

Correct

- GPT is a language model developed by OpenAI that uses a transformer architecture to generate human-like texts.

Incorrect

- GPT is a language model developed by Google that uses a pre-training technique to improve its performance on task-specific datasets.

- GPT is a language model developed by Microsoft that suggests code and entire functions in real-time to its users.

5. What are Midjourney, DALL-E, and Stable Diffusion, and which industries are their early adopters?

Question 5 of 8

What are Midjourney, DALL-E, and Stable Diffusion, and which industries are their early adopters?

- They are large language models models. Chatbots, search engines, and customer service are the primary industry adopters.

- They are 3D asset generation companies. Their generated outcomes are used to design clothes, objects, CGI VFX, and are helping filmmakers quickly generate 3D environments.

- They are primary text-to-image generation services and models. Art, filmmaking, fashion, and marketing are the first industries to widely adopt their use.

Correct

6. Why might marketers use text-to-image models in the creative process?

Question 6 of 8

Why might marketers use text-to-image models in the creative process?

- They can efficiently suggest garments for customers based on their fashion style.

- They can be more efficient to use and provide a unique look and feel.

Correct

- They have the ability to generate 3D worlds for films more efficiently.

7. How does a GAN network improve its ability to generate better content?

Question 7 of 8

How does a GAN network improve its ability to generate better content?

The generator and discriminator parts of the network work together in harmony to challenge and trick the user in identifying which outcomes are "real" and which are "synthetic".
Incorrect

The generator and discriminator parts of the network work together in a competition to improve the generator's ability to create realistic data.
Correct

The user writes text to generate content and the networks learns to improve itself each time it is being used.

8. What is the purpose of the discriminator in a GAN model?

Question 8 of 8

What is the purpose of the discriminator in a GAN model?

to input one type of data and output the same type of data

to create realistic data for training models

to generate synthetic versions of fraudulent transactions for financial fraud detection

to evaluate the data created by the generator and give feedback on how to improve the next iteration
Correct

Next

The Future of AI

CG and Animation

CG and Animation – More realistic and believable characters, particularly in 3D modeling

Natural Language

Improved understanding in virtual assistants and chatbots

Energy

- Optimized consumption and production predicted demand
- Management of renewable sources

- Efficient distribution networks

Transportation

- Optimized traffic flow
- Predicted vehicle maintenance

Some predictions

- GenAI will be used to automate repetitive tasks and improve efficiency in a wide variety of industries.
- Realistic and accurate simulations in architecture, urban planning and engineering
- New materials and products in manufacturing and textile design
- Natural language generation improvement in news articles, books, and movie scripts.
- Improved self-driving cars with realistic virtual scenarios for testing and training.
- Audio to asset generation.

The future of jobs

- Is anyone taking over us humans who are entering in a new golden age of creativity and production.
- Where will be shift in job market?
Yes, absolutely , as it has always been throughout history
- Whenever a new advanced technology is introduced, its normal for some jobs to disappear, while other new ones are introduced.
- For e.g.
 - Before alarm clocks, there were **knocker uppers**(people we hired to knock at door) to wake people up.
Later Cheaper alarm clocks were introduced and knocker uppers job disappeared.
 - Switchboard operator jobs disappeared due to automated telephone exchange systems.
 - Manual teller to ATM Jobs
- People have more human centric with
 - Creativity
 - Problem solving
 - Empathy
 - Leadership

- Humanity will transcend from a society of customers to creators.
- The ones that excel in the future of job markets will be those strengthen their **unique personal emotional skills and creative abilities** that no computer can ever mimic.
- My Advise would be to start investing in expanding your consciousness, start getting to know what makes you unique, and sharpen your interpersonal, emotional, and creative skills

Quiz

1. What will be the main benefit of generative AI in the next years?

Question 1 of 2

What will be the main benefit of generative AI in the next years?

<input checked="" type="radio"/> automate repetitive tasks and liberate humanity from dull, dirty, difficult, or dangerous jobs
<input type="radio"/> optimize supply chains for corporations to save excess spending
<input type="radio"/> increase security through Blockchain and distributed ledger technology

Submit

2. In considering the future implications of generative AI on the job market, what skill set is essential for individuals seeking to thrive in this evolving landscape?

Question 2 of 2

In considering the future implications of generative AI on the job market, what skill set is essential for individuals seeking to thrive in this evolving landscape?

<input type="radio"/> mastery of machine learning algorithms and programming languages used in generative AI
<input type="radio"/> specialized technical skills in operating and managing automated systems
<input checked="" type="radio"/> development of unique personal emotional, interpersonal, and creative abilities Correct
<input type="radio"/> proficiency in utilizing existing creative tools and software for content generation

Ethics and responsibility

Moral and executive skill set required to work with Gen AI

- Assess whether the generated results fits your quality and satisfaction parameters.

- We deepen our executive skills.
- Who is benefiting from our tools ?
- Our moral compass should always direct towards
 - Transparency,
 - Fairness,
 - Empathy and
 - Responsibility

Organizational Priorities on Gen AI

- Organize a board as an ethical foundation for the integration of Gen AI.
- Provide employees with guidance and education.
- Also how to overcome their fears, challenges and biases towards this new advanced tool.
- Ensure that humans remain the decision makers
- Goal is strike a beautiful balance between leveraging the power of Gen AI to enhance human creativity and imagination and optimizing production while also maintaining human control and oversight.

Caution when working with Gen AI

- The greatest bias in AI is not race, it's not ethnicity, nor gender. It is a human inferiority complex.
- We should always emphasize the crucial and essential role of human creativity & decision-making in the process.
- AI is designing, AI is coding, but lets remember, its human's who wrote the algorithms.
- Its human who conceptualize, curate, and oversee the algorithms to produce the desired outcomes.
- Focus on highlighting the role that human play in the creation and use of AI.

Quiz

1. What are the top moral and executive skill sets required when working with generative AI?



Up next
Next steps
2m 52s

Question 1 of 3

What are the top moral and executive skill sets required when working with generative AI?

Transparency, fairness, empathy and responsibility. Approach production and operations with caution, always asking, "Who is benefiting?" from our generative AI solution.

Lobbying and diplomacy.

A rich technical background, especially in machine learning and natural language processing, coupled with excellent leadership skills.

Submit

2. When considering the integration of generative AI tools in business operations, what is the primary emphasis regarding the role of executive leadership and organizational strategy?

encouraging blind reliance on AI-generated content without considering ethical implications or human oversight

prioritizing human-centered approaches, ethical considerations, and maintaining human control over AI-generated content
Correct

advocating for unrestricted reliance on generative AI outcomes to streamline decision-making processes

establishing rigid guidelines that prioritize algorithm-generated content over human decision-making

3. How should we think of the relationship between humans and generative AI?

Question 3 of 3

How should we think of the relationship between humans and generative AI?

Human input and creativity will work in conjunction with AI to produce meaningful progress.
Correct

AI is necessary to maintain objectivity and eliminate human bias.

AI will become singularly responsible for decision-making and creativity.

AI will likely devalue human contributions and creativity.

Next

AI is a tool in the service of humanity

Generative AI: The Evolution of Thoughtful Online Search

- Just not keywords, but now having conversations.
- Needs careful navigation
- Thoughtful questioning and clear context are essential.
- To achieve meaning and accurate results

How search engine works

Traditional search engine perform 3 main functions

1. Crawling
2. Indexing
3. Ranking

Crawling

- Web crawlers discover new or updates webpages
- Systemically, continuously browse internet
- Keeps search engine index up to date.

Indexing

- Stores and organize content in search massive index.
- Analyze factors for relevance and context.

Ranking

- Provides best, most relevant results for query.
- Ranks on relevance, popularity , authority, etc.

These ranked results are then presented to the user with the most relevant and authoritative results first.

For e.g.

The screenshot shows a Bing search results page. The search query is "parts of a grant proposal". Below the search bar, there are filters for "ALL", "CHAT", "WORK", "IMAGES", "VIDEOS", "MAPS", "NEWS", and "MORE". It displays approximately 26,600,000 results from any time period. The first result is titled "Components of a Grant Proposal" and lists several bullet points about the components of a grant proposal. To the right of this title is a thumbnail image of a document page showing a table or form. Below the list is a link to "35 Successful Grant Proposal Examples (How to Write)" with a URL "www.wordtemplatesonline.net/grant-proposal-examples/".

Effectiveness of search engines

- Easy, effective, free
- Comprehensive access
- Relevant results
- Saves time.
- Advanced search options such as filters, suggestions etc.,

How a reasoning engine works

- A reasoning engine is a system that uses logic and inference methods to
 - draw conclusions,
 - Makes decisions,

- Summarize information or solve problems based on available
- There are different type of reasoning engines,
- But we talk about Generative Ai models such as ChatGPT and Bing Chat,
- These system process and understand human language.
- When a user enters a query, the reasoning engine can provide relevant and information response using human-like speech.

Pertaining phase

- Pretrained on massive dataset of text and code from books, articles, webpages, Wikipedia and more.
- Model learns language patterns, grammar, syntax and facts.

Subsequent training phase

- Predicts the next words in response to an prompt.
- Initially, human supervisors oversee or guide the process.
- Gradually, model improves its understanding of prompts.
- Eventually, it begins to generate high-quality, human-like responses.

Comparing search engines with reasoning engine

Traditional Search Engines	Reasoning Engines
● Explore a subject further	● Understand and interpret human language
● Not optimized for deeper questions	● Provide direct relevant responses
● Don't truly understand a query. Its just matches keyword for your query.	● Maintain context and understand intent
● Traditional is linear	● Its related to the context.

Reasoning Engine are NOT always correct

- Always take a caution.
- They do Hallucinate.

Future of online search.

- Bing used both reasoning engine and related citation.

The screenshot shows a Bing search interface with a light purple header bar containing a checkmark icon and the text "Generating answers for you...". Below the header is a main content area with a red border. Inside the content area, there is a message: "Sure, I can help you with that. There are many creative ways you can repurpose the wood from your old fence. Here are some ideas:" followed by a bulleted list of 14 items. At the bottom of the content area, there is a message: "I hope these ideas inspire you to create something amazing with your old fence wood. 😊". Below the content area is a footer bar with the text "Learn more: 1. upgradedhome.com 2. youtube.com 3. thespruce.com 4. familyhandyman.com 5. upgradedhome.com ... see less" and a progress indicator "1 of 20".

Quiz

1. What is the goal of the continuous crawling process of a search engine?

Question 1 of 10

What is the goal of the continuous crawling process of a search engine?

to discover new or updated webpages

to keep the search engine's index up-to-date
Correct

to store and organize webpage information

2. When a user enters a query, what does the **reasoning engine** strive to provide?

Question 2 of 10

When a user enters a query, what does the reasoning engine strive to provide?



a relevant, informative text response using human-like speech

Correct

Because reasoning engines process and understand human language, they are able to provide a relevant, well-reasoned, informative response using human-like speech.



a brief bulleted list summarizing the main points of the query



a ranked list of webpage results

3. When might a search engine be a superior tool to a reasoning engine?

Question 3 of 10

When might a search engine be a superior tool to a reasoning engine?



when you'd like to read further about a subject across a collection of different sources—but not necessarily when you want to ask deeper questions



when you want to have an intelligent conversation with an AI chatbot



when you want a customized, well-reasoned answer generated with human-like speech

Submit

4. Which is **not** a main function of a search engine?

Question 4 of 10

Which is **not** a main function of a search engine?



transforming

Correct

The main functions of a search engine are crawling, indexing, and ranking.



crawling



indexing



ranking

5. What is the most important benefit that the synergy between modern search engines and reasoning engines provides, as far as confidence in the results?

Question 5 of 10

What is the most important benefit that the synergy between modern search engines and reasoning engines provides, as far as confidence in the results?

- avoiding time wasted on unrelated results
Incorrect
- being able to use both engines simultaneously on a single platform
Incorrect
- verifying and validating search results
This was the correct answer



Review this video

What is the future of online search?

2m 42s

[Next question](#)

6. How can a user **best combine a search engine and a reasoning engine** to find information about an **unknown topic**?

How can a user best combine a search engine and a reasoning engine to find information about an unknown topic?

- Use the reasoning engine to get a summary of the topic, and then use the search engine for more detailed information.
- Use one engine to find general information, and then use the other engine to find disputing information on that topic.
- Use the search engine to find basic information, and then use the reasoning engine for a deeper dive.
Correct

7. How does a reasoning engine's ability to understand and interpret language provide the greatest advantage over a search engine?

Question 7 of 10

How does a reasoning engine's ability to understand and interpret language provide the greatest advantage over a search engine?

- It can provide a collection of additional ranked results on the topic requested.
- It can have an actual conversation with the user.
Correct
- It can mediate conflicting information between different machine learning models.

[Next question](#)

8. How are reasoning engines an improvement over search engines when it comes to entering what you are looking for?

Question 8 of 10

How are reasoning engines an improvement over search engines when it comes to entering what you are looking for?

- They can understand your intent and not just the words you used.
Correct

- They can provide a direct, ranked answer to your request.
- They can suggest alternative search queries to use if they sense yours needs improvement

[Next question](#)

9. How do human supervisors assist in training a reasoning engine?

Question 9 of 10

How do human supervisors assist in training a reasoning engine?

- Human supervisors perform monthly audits on reasoning engine responses to ensure the AI is doing a suitable job.

- In early training phases, human supervisors oversee the process, guiding the model towards accurate responses and contributing to its knowledge development.
Correct

- Human supervisors monitor every user query to make sure the reasoning engine creates accurate responses.

[Next question](#)

10. True or False: Reasoning engines are an all-knowing source of truth and should be trusted implicitly.

Question 10 of 10

True or False: Reasoning engines are an all-knowing source of truth and should be trusted implicitly.

- FALSE
Correct

- TRUE

Harness the power of prompt engineering

Some resources

- OpenAI documentation
- ChatGPT Discord server
- Prompt Engineering Guide
- Learn Prompting
- PromptPapers
- PromptHub

Thoughtful search strategies and approaches

1. Be Specific
2. Provide Context such as an example.
3. Break things down.
4. Use clear language,
5. If industry specific, add clarity for business language for that industry.
6. Experiment

Additional tips

- Role – play scenario

Prompt:

Imagine you're the product manager for a brand-new smartphone company. What are ten potential innovative features that could be added within the next five years?

- Analogies

Prompt:

Explain quantum mechanics using a sports analogy.

- Debate Style questions

Prompt:

Present arguments for and against the implementation of universal basic income.

- Creative Exercises

Prompt:

I'm writing a story about traveling to a parallel universe. Help me brainstorm some unique laws of nature that this parallel universe might have.

Quiz

1. When a user enters a query, what does the reasoning engine strive to provide?

a relevant, informative text response using human-like speech
Correct
Because reasoning engines process and understand human language, they are able to provide a relevant, well-reasoned, informative response using human-like speech.

a brief bulleted list summarizing the main points of the query

a ranked list of webpage results

[Next question](#)

2. When might a search engine be a superior tool to a reasoning engine?

when you'd like to read further about a subject across a collection of different sources—but not necessarily when you want to ask deeper questions
Correct

when you want to have an intelligent conversation with an AI chatbot

when you want a customized, well-reasoned answer generated with human-like speech

3. If your reasoning engine response is problematic (i.e., inaccurate, discriminatory, limited in view, etc.) what should you do?

Question 3 of 9

If your reasoning engine response is problematic (i.e., inaccurate, discriminatory, limited in view etc.) what should you do?

- Report the problematic response to the FCC.
- Give up and seek other research methods; the reasoning engine is unlikely to produce a valid result.
- Continue iterating. Keep regenerating and refining the prompt to get a more accurate, better result.
Correct

4. In prompt engineering, what is one-shot or few-shot learning?

Question 4 of 9

In prompt engineering, what is one-shot or few-shot learning?

- It refers to the style of answer you want to target in your response.
- It refers to how many chances you give the reasoning engine to get the right answer.
- It refers to how much instruction you provide in order to guide the answer. This may involve including examples of what a "correct" answer may look like.
Correct

[Next question](#)

5. In most instances, how should you craft your prompts?

Question 5 of 9

In most instances, how should you craft your prompts?

- Use clear language with proper grammar.
Correct
- Use conversational and informal language.
- Use jargon common to the industry.

6. Why is the iteration process necessary when you use a reasoning engine?

Question 6 of 9

Why is the iteration process necessary when you use a reasoning engine?

- You want to use a combination of both keywords and regular language prompts.
- You want to keep honing your prompt to get more and better results.
Correct
- You want to avoid creating multiple prompts when one good prompt will suffice.

7. Riva considers herself a prompt engineer. What does this mean?

Question 7 of 9

Riva considers herself a prompt engineer. What does this mean?

She can use coding to create better prompts than the prompts she creates with regular language.

She can create a prompt with samples of her question and the answers that she would like to see.
Correct

She has created a number of prompts to the point where she is an expert on crafting prompts.

[Next question](#)

8. What is the following creative type of prompt known as: "Imagine you're the manager of a small boutique video editing company. What are 10 innovative marketing ideas that could attract new business?"

Question 8 of 9

What is the following creative type of prompt known as: "Imagine you're the manager of a small boutique video editing company. What are 10 innovative marketing ideas that could attract new business?"

Debate-style

Role play
Correct

Analogy

9. True or False: Reasoning engines are an all-knowing source of truth and should be trusted implicitly.

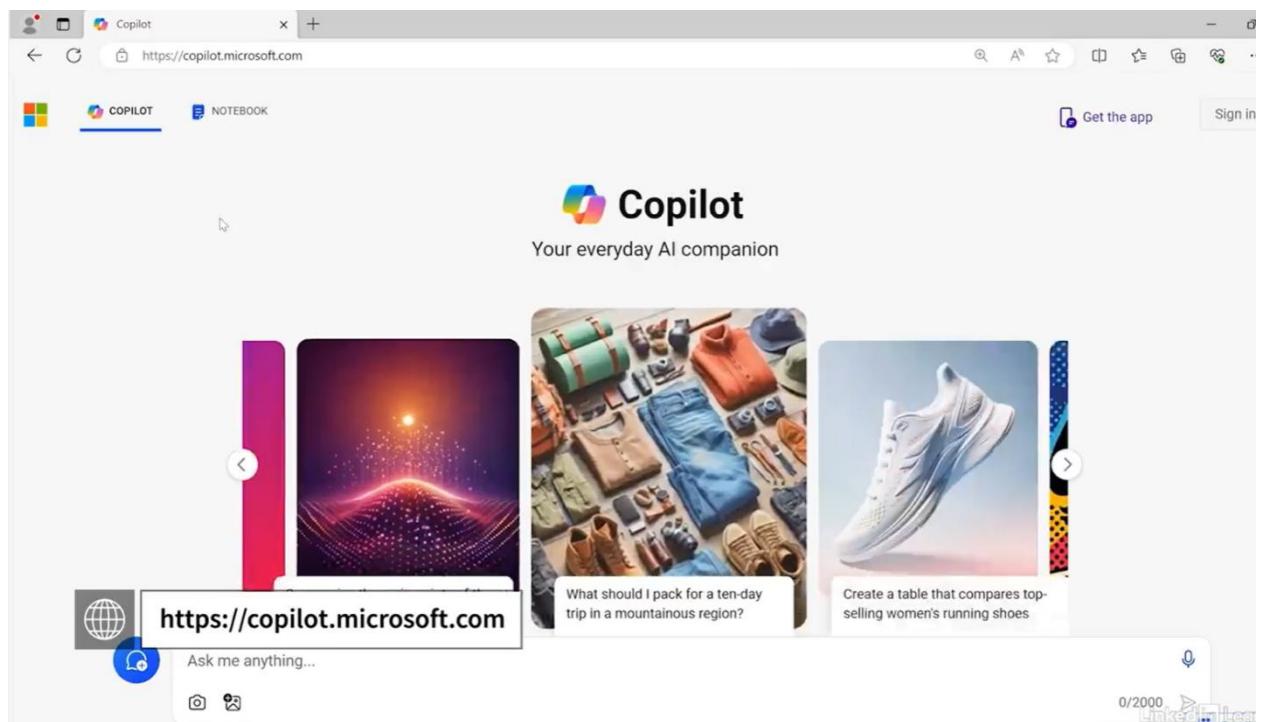
Question 9 of 9

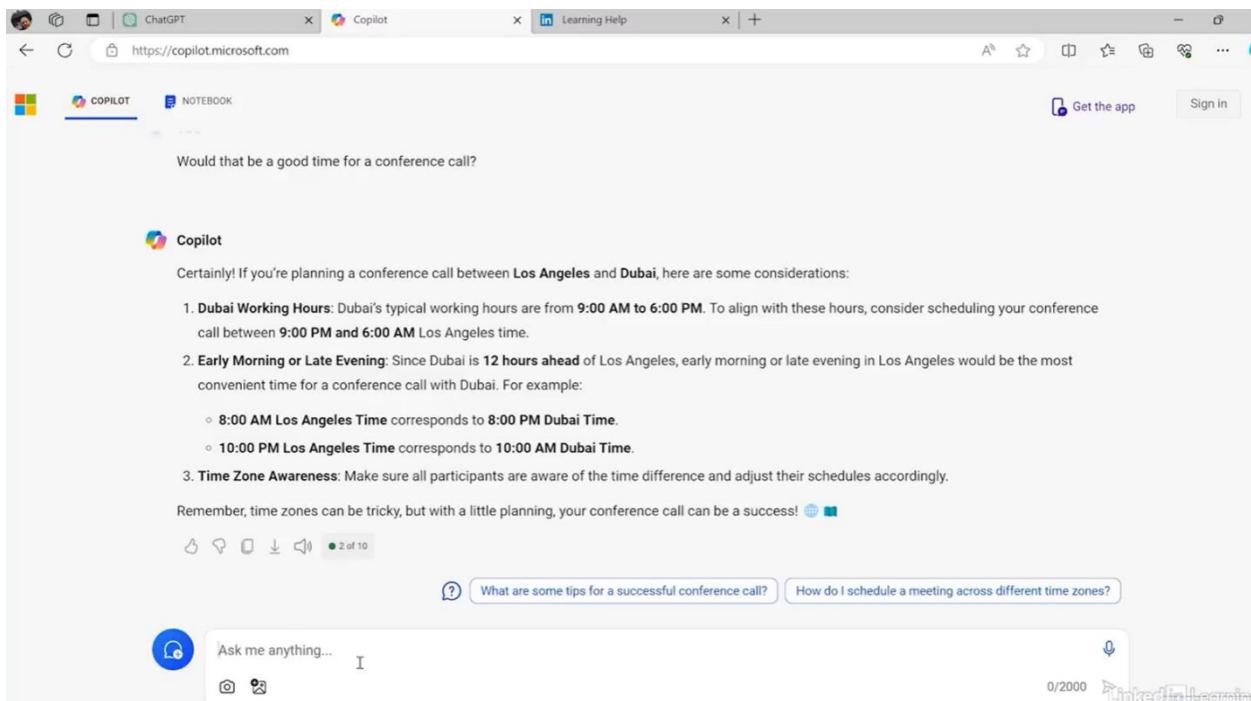
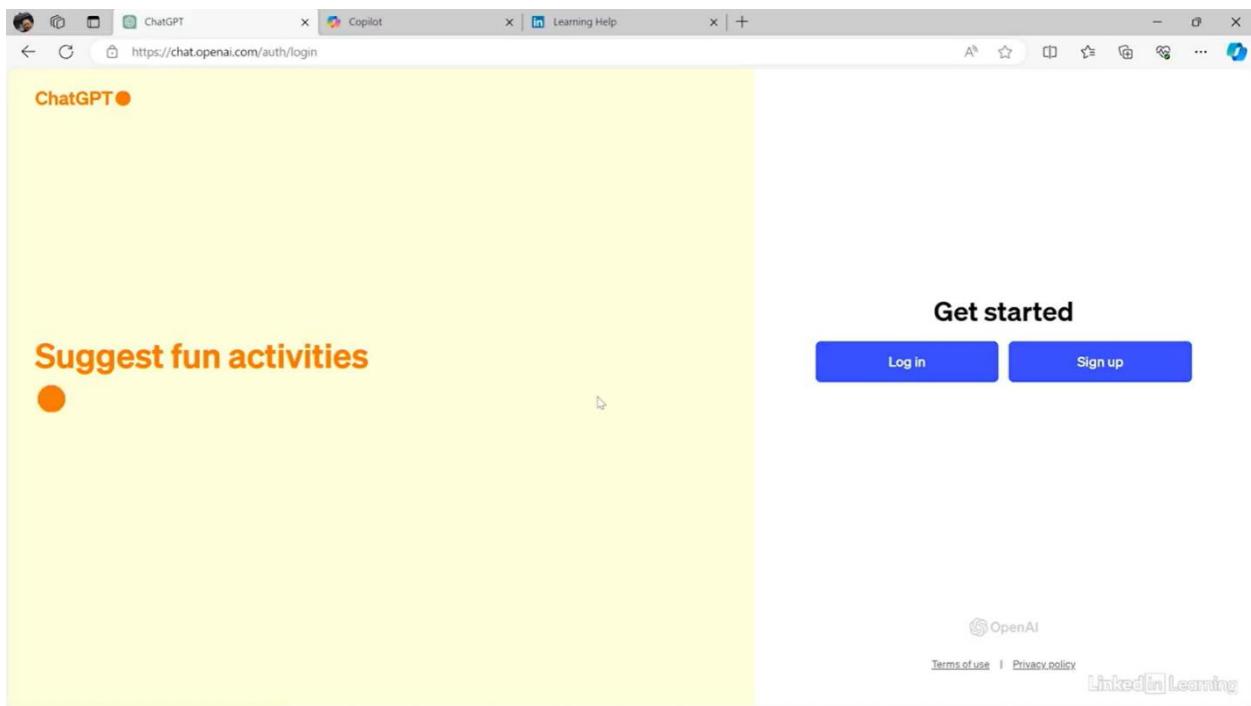
True or False: Reasoning engines are an all-knowing source of truth and should be trusted implicitly.

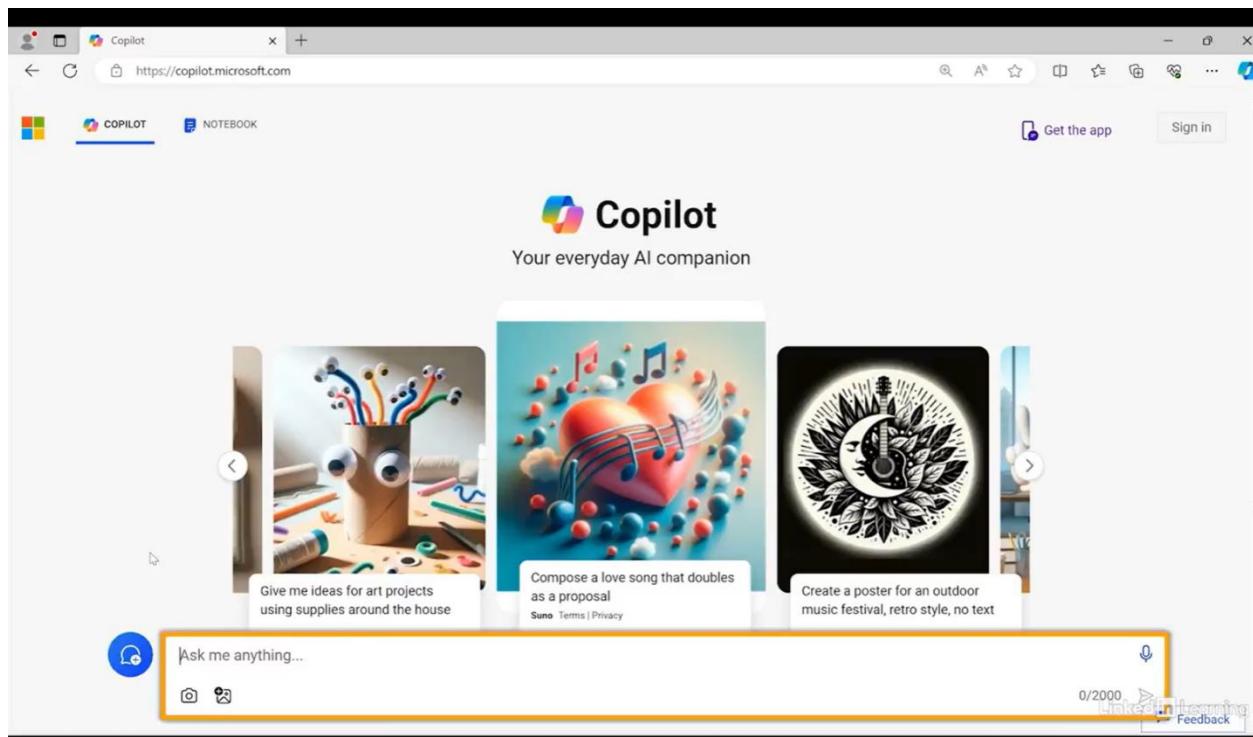
FALSE
Correct

TRUE

Streamlining Your Work with Microsoft Copilot







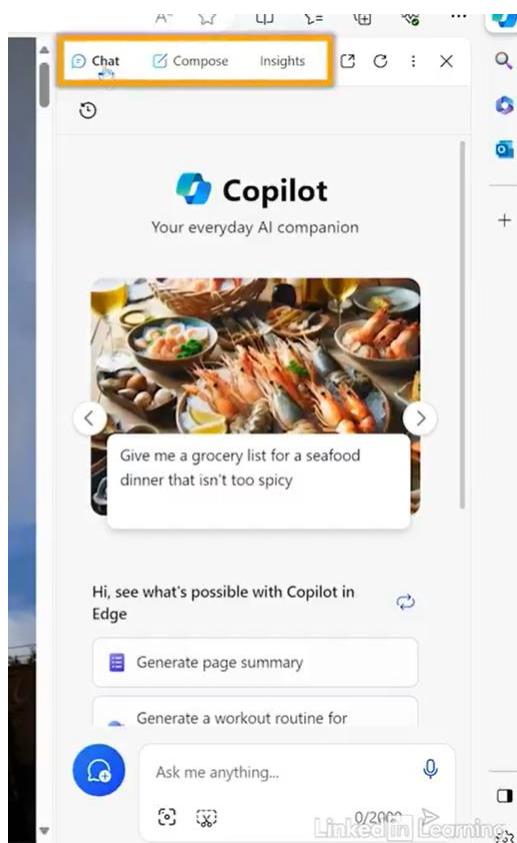
Accessing Copilot with Bing Browser



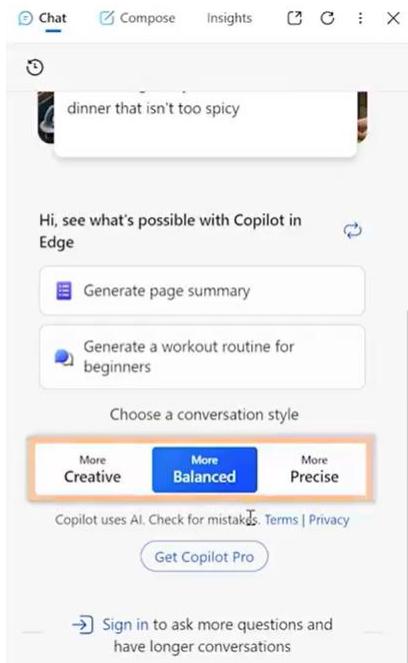
3 tabs



Chat

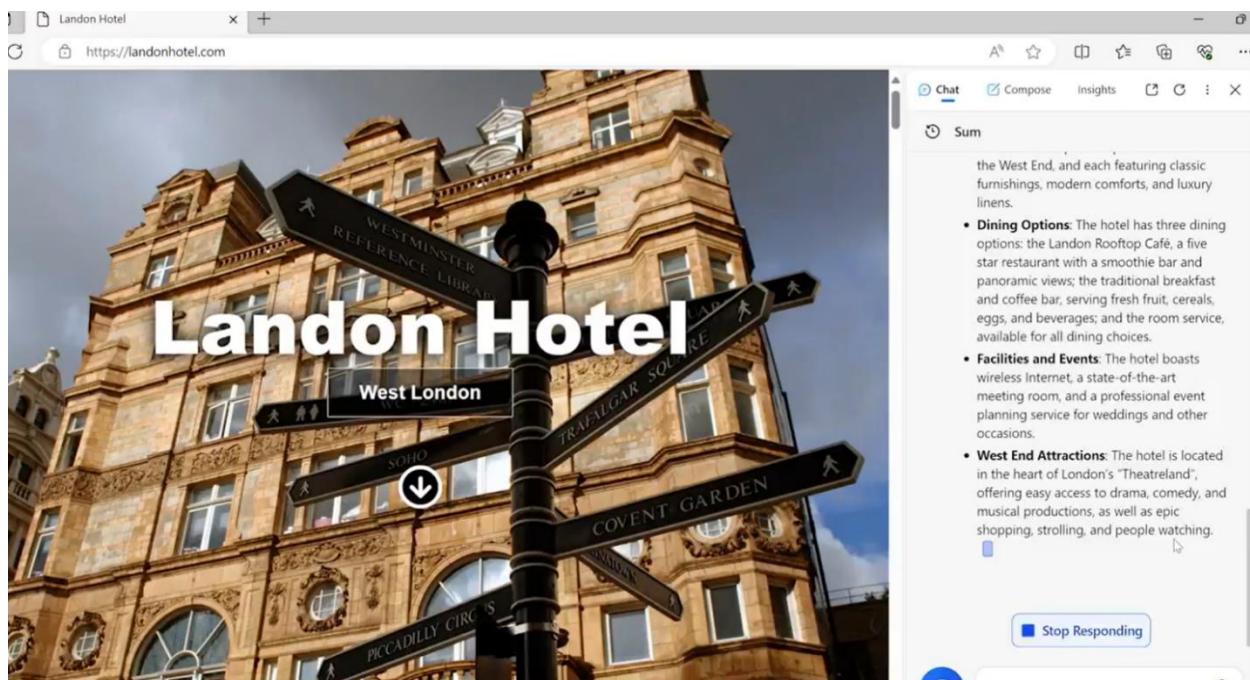


Change the conversation style



We can ask question on current web page.

A screenshot of the Microsoft Edge browser window. The main content area shows a large image of the Landon Hotel in London, featuring a prominent street signpost with directions to Westminster Reference Library, Trafalgar Square, Covent Garden, and Piccadilly Circus. The address bar at the top shows the URL 'https://landonhotel.com'. The Copilot sidebar is visible on the right, with a message from Copilot: 'Sign in to ask more questions and have longer conversations'. Below this, a user input field contains the text 'Summarize this page.' which is highlighted with a red box. The Copilot section shows a summary of the page: 'Great! You can always review your permissions in Settings.' and 'Notification and App Settings: Here is a summary of the web page: • The Landon Hotel - London: A 50-year-old hotel in the West'. At the bottom of the sidebar, there are buttons for 'Stop Responding' and 'Ask me anything...'.



Compose

The screenshot shows the LinkedIn AI Compose interface. At the top, there are tabs for Chat, Compose (which is selected), Insights, and a refresh icon. Below the tabs, a large input field contains the text: "tell my network I accepted a new job at Microsoft". Underneath this field is a date placeholder "0/2000".

Below the input field is a "Tone" section with five buttons: Professional (selected), Casual, Enthusiastic, Informational, Funny, and a plus sign for more options.

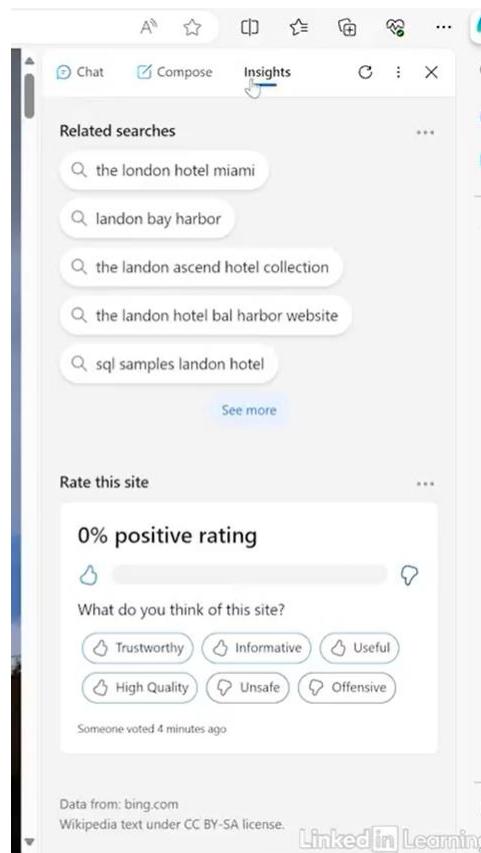
The "Format" section includes icons for Paragraph, Email, Ideas, and Blog post.

The "Length" section has three buttons: Short, Medium (selected), and Long.

A prominent blue button at the bottom center says "Generate draft".

The "Preview" section at the bottom states: "Your AI generated content will be shown here".

Insights

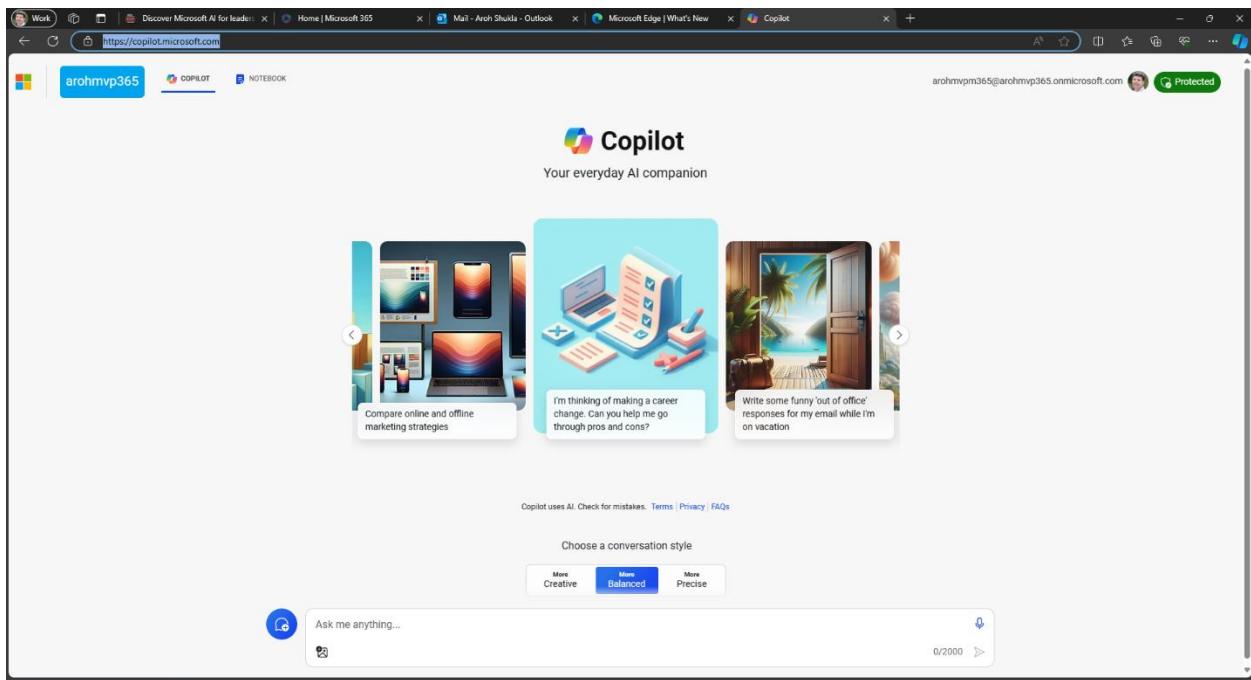


Copilot In Windows



Answer questions with Copilot

Copilot (microsoft.com)



New topic means, the current session will not have any context.

The screenshot shows the Microsoft Copilot AI interface. At the top, there's a navigation bar with icons for user profile, Copilot, Notebook, and a search bar with the URL https://copilot.microsoft.com. To the right are links for 'Get the app', 'Sign in', and a 'Chats' section listing 'Copilot GPTs' like Copilot, Designer, Vacation planner, Cooking assistant, and Fitness trainer.

The main content area has a heading 'Choose a conversation style' with three options: 'More Creative', 'More Balanced' (which is selected), and 'More Precise'. Below this is a message from 'Copilot': 'Alright, I'm ready! Thanks for the reset. What should we learn about?'. There are interaction icons for thumbs up, thumbs down, reply, and save.

A red box highlights the 'New topic' button in a blue rounded rectangle. Below it is a text input field 'Ask me anything...' and a microphone icon. To the right of the input field are buttons for 'Teach me a new word', 'Show me recipes', and 'Looking for a non-fiction'. At the bottom right is a LinkedIn share icon.

This screenshot continues the conversation with Copilot. The AI has provided a detailed response:

4. Advantages:

- **Accuracy:** Double entry ensures that errors are more easily detected.
- **Standardization:** It provides a consistent framework for recording transactions.
- **Financial Statements:** Accurate records lead to reliable financial statements.

5. Historical Context:

- Double-entry bookkeeping was developed during the **mercantile period** in Europe.
- It helped rationalize commercial transactions and make trade more efficient.
- The emergence of double entry has been linked to the birth of capitalism.

Below the text, a note says: 'Remember, in the double-entry system, **debits** and **credits** are essential, and the sum of all debits must equal the sum of all credits. This method ensures financial accuracy and transparency' with links to investopedia.com, accountingcoach.com, and thebalance.com.

At the bottom, there are interaction icons (thumbs up, thumbs down, reply, save) and a progress indicator '1 of 10' with a red box around it. Below these are two questions: 'What is the difference between a debit and credit?' and 'Can you give me an example of double-entry accounting?'. A 'New topic' button is also present.

1 of 10 mean I can have follow up questions and it will remember the context.

Summarize information with Copilot

- You can ask any questions that you are not aware of such as Printers, RAMS etc,
- If you want to summary of an long article,
 - select web page
 - Copilot Icon
 - Select Chat
 - Type “Summarize this Article”

The screenshot shows a Microsoft Edge browser window with a LinkedIn article titled "Mis/Disinformation is a big problem. The pros (and future pros) are on it." by Jess Stratton. The Copilot sidebar is visible on the right, with a red box highlighting the URL bar and the "summarize this article" input field. The Copilot interface displays a summary of the article and several AI-generated questions:

- **Keynote by Craig Silverman:** He shared insights on global disinformation, fake Facebook ads, and deceptive Amazon reviews.
- **Panels, Workshops, and Research Showcase:** Topics covered included communication, vaccine hesitancy, climate change denial, propaganda identification, and media literacy.
- **Takeaways and Recommendations:** Verify information, engage in person, and avoid online arguments to combat misinformation.

At the bottom of the Copilot sidebar, there are buttons for "Answer from this page instead", "What is the difference between misinformation ...", "Who are some other experts on online disinfor...", and "How can I improve my media literacy skills?".

Compose text with Copilot

- Write a Bio for speaker

The screenshot shows a Microsoft Edge browser window. The address bar at the top contains the URL <https://copilot.microsoft.com>. The main content area displays a generated bio for a speaker, with several sections highlighted by red boxes:

- A red box highlights the URL in the address bar.
- A large red box highlights the generated bio text, which includes:
 - Editorial Leadership: Having led editorial teams at some of the world's top tech firms, [Your Full Name] brings a unique blend of practical knowledge and strategic vision to their teaching approach.
 - Passion for Learning: [Your Full Name]'s unwavering passion lies in helping others learn and grow. Whether it's demystifying complex coding languages or simplifying cloud computing concepts, they thrive on making technology accessible to all.
- A red box highlights the footer links: Learn more, [1 linkedin.com](#), [2 bing.com](#), [3 lorraineklee.com](#), and [4 eatsleepwander.com](#).
- A red box highlights the bottom navigation bar with icons for like, dislike, share, download, and a progress indicator (1 of 10).
- A red box highlights the AI interface at the bottom, featuring a blue circular icon with a white speech bubble containing a plus sign, a text input field with placeholder "Ask me anything...", and a microphone icon with a "0/2000" character limit indicator.

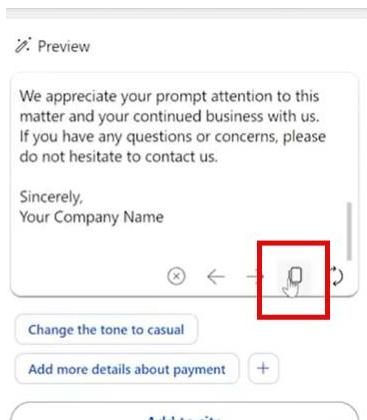
More options in Copilot icon at Edge:

The screenshot shows the Microsoft Copilot interface on a web browser. The top navigation bar includes 'Copilot', 'Red30 Tech employee giving pro', and a search bar. A red box highlights the 'Compose' button in the top right corner of the main content area. The main content area features a sidebar titled 'Copilot GPTs' with options like 'Copilot', 'Designer', 'Vacation planner', 'Cooking assistant', and 'Fitness trainer'. The main panel has sections for 'Write about', 'Tone', 'Format', and 'Length'. A large blue button at the bottom right says 'Generate draft'. A red box also highlights the 'Email' icon in the 'Format' section.

For e.g. You want to email to customer about late payment, tone Professional, Format email, length short and Generate draft.

This screenshot shows the Microsoft Copilot interface again, but with specific fields filled in. The 'Compose' tab is highlighted. In the 'Write about' field, the text 'A letter to a customer about a late payment' is entered. The 'Tone' section has 'Professional' selected. The 'Format' section has 'Email' selected. The 'Length' section has 'Short' selected. The 'Generate draft' button is highlighted with a red box and has a cursor pointing at it.

Review the draft and copy



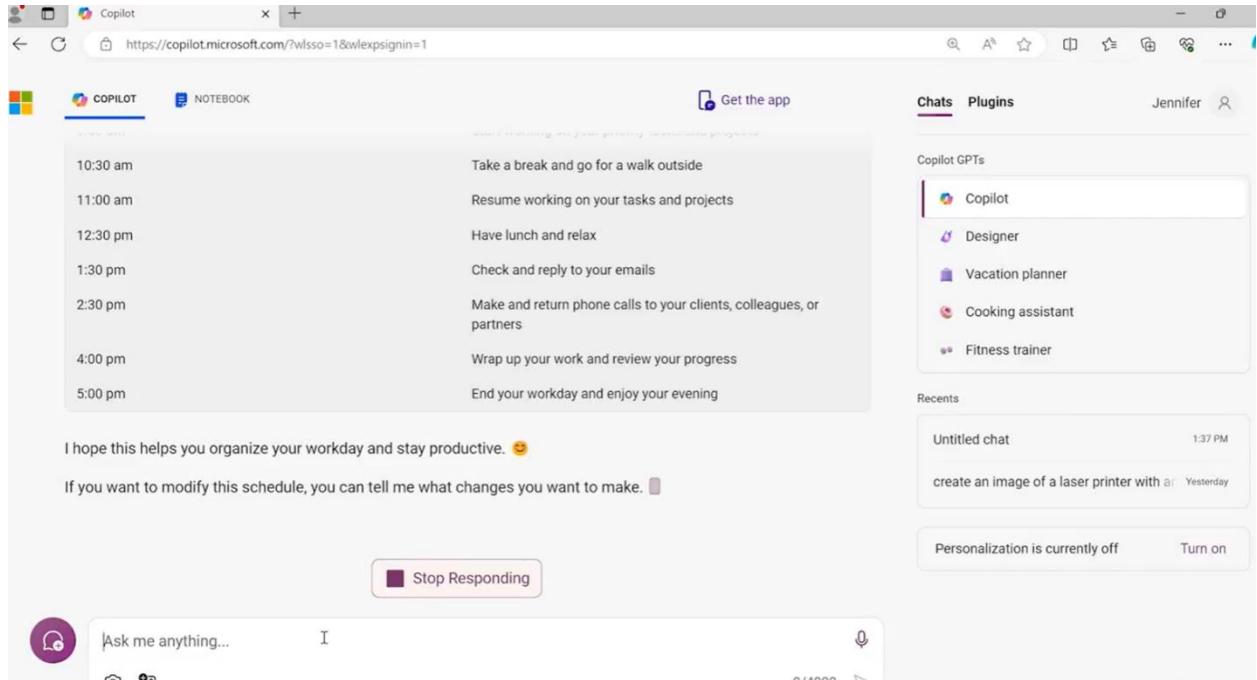
You can do similar for Google docs page and post it as social media under chat.

A screenshot of a Microsoft Edge browser window. The address bar shows the URL: "https://docs.google.com/document/d/1XKy0ctFTS_7OuAD9WFzaHhJWdhB9_b64/edit". The main content area displays a Google Docs document titled "Red30 Tech employee giving program blog article_LYND...". The document text discusses Red30 Tech's Give-a-Thon program. To the right of the document, the Microsoft Copilot sidebar is open. It includes a "Chat" section with a message "clothing brands?", a "Copilot" summary section, and a "Create a social media post about this" button, which is highlighted with a red box.

You use it the same way for LinkedIn

Solve problems with Copilot

- Make daily schedule with Copilot.

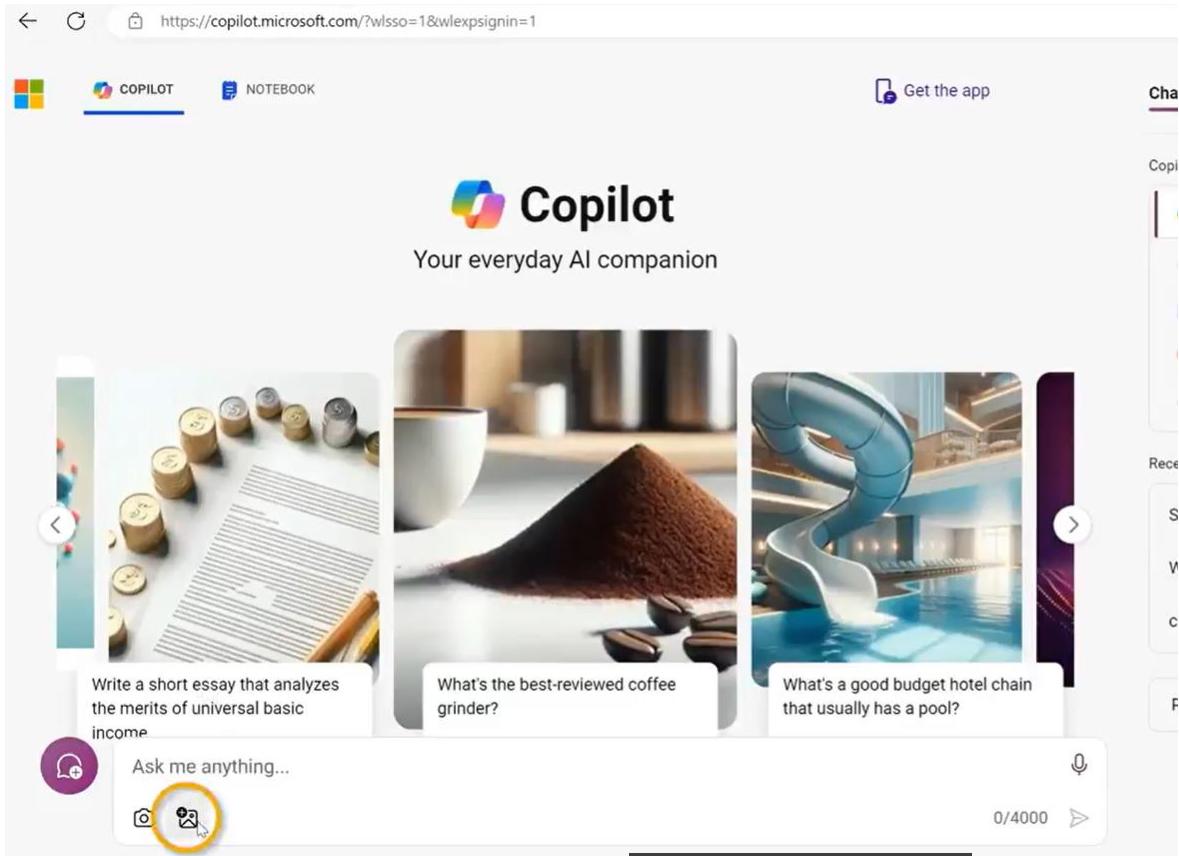


- Create webinar

- How much drinks for office party
- Can give a HR advice

Use Copilot to create and analyze images

- You upload and analysis what is in the image



- Copilot can give some suggestions within image.

Copilot

✓ Analyzing the image: Privacy blur hides faces from Copilot

This is an image of the **Tower Bridge** in **London, England**. It's a famous landmark that crosses the **River Thames**.

You can learn more about the history and architecture of the bridge by searching for "Tower Bridge" on the web. 😊

What is the history of London? Can you show me more pictures of famous landmarks in England?

- Copilot can generate new images with DALL-E model
- Some guidelines
 - You can not create images of public figures
 - Images hate speech, nudity or violence

Know where AI data is coming from

- Double check Copilot works with OpenAI

The screenshot shows a Microsoft Copilot browser window with the URL <https://copilot.microsoft.com/?wlssso=1&wlexpsigin=1>. The page displays a search result for a 15-year fixed-rate mortgage. It includes a summary statement, a note about rough estimates, and a call-to-action button labeled "Apply Now". Below the main content, there is a red box highlighting a social sharing bar with links to mortgagecalculatorplus.com, zillow.com, and zillow.com. At the bottom, there are buttons for "New topic", "Ask me anything...", and a microphone icon.

Disclose when using AI

- Need to verify local authorities if any policy that dicstates that AI has to be included.

The company provides devices such as laptops, tablets, smartphones and other equipment to employees for work-related purposes. Employees are expected to use these devices in a responsible, ethical and lawful manner, and to follow the guidelines below:

- Employees should only use company devices for authorized business activities and not for personal or recreational purposes, unless explicitly permitted by their manager or the IT department.
- Employees should protect their devices from theft, loss, damage or unauthorized access by using passwords, encryption, antivirus software and other security measures provided by the company.
- Employees should not install, download, copy or store any unauthorized or illegal software, files, data or content on their devices, or use them to access or transmit such material.
- Employees should not modify, alter, tamper with or repair their devices without the approval and assistance of the IT department.
- Employees should report any issues, problems, malfunctions or incidents involving their devices to the IT department as soon as possible.
- Employees should return their devices to the company when they leave their employment or when requested by the company.

The company reserves the right to monitor, inspect, audit and access any company device at any time, with or without notice, to ensure compliance with this policy and applicable laws and regulations. The company also reserves the right to revoke, suspend or limit the use of any company device by any employee who violates this policy or engages in any misconduct or inappropriate behavior.

By using a company device, employees acknowledge that they have read, understood and agreed to abide by this policy. Employees who fail to comply with this policy may face disciplinary action, up to and including termination of employment and legal action.

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By using a company device, employees acknowledge that they have read, understood and agreed to abide by this policy. Employees who fail to comply with this policy may face disciplinary action, up to and including termination of employment and legal action.

Rewrite the policy in German

Add more details to policy

Add to site LinkedIn

Use Copilot Pro for individual subscriber

- Copilot Pro

The screenshot shows a Microsoft Edge browser window displaying the Microsoft Copilot website. The URL in the address bar is <https://www.microsoft.com/en-us/store/b/copilotpro?ranMID=24542&ranEID=jZHTpnCvx8&ranSiteID=jZHTpnCvx8-e5fkEbHAEm7VKhWe...>. The page title is "Copilot Pro Plan & Pricing". The Microsoft logo is at the top left, followed by "Copilot Products Resources Sign in" and "All Microsoft". A large image on the right shows a 3D interface with various AI-related features like "Ask me anything...", "Power Automate", and "Generate a project kick off presentation based on the topics discussed in the file". Below this image, there's a callout box for "Copilot Pro" with the following text:

Copilot Pro

Supercharge your creativity and productivity with a premium Copilot experience. Gain priority access to GPT-4 and GPT-4 Turbo during peak times for accelerated performance to generate answers, content, and AI images even faster.

An upgrade subscription available to individual

Questions LinkedIn Learning

Choose the Copilot that suits you best

Copilot

For everyone who wants to find the right information, create unique content, and get things done faster. With your free Microsoft account, you can:

- Use Copilot on the web and in Windows, macOS, and iPadOS
- Access GPT-4 and GPT-4 Turbo during non-peak times
- Use text, voice, and images in conversational search
- Create and edit AI images with 15 boosts per day with Designer (formerly Bing Image Creator)
- Use plug-ins and GPTs

[Use free version of Copilot >](#)

Copilot Pro

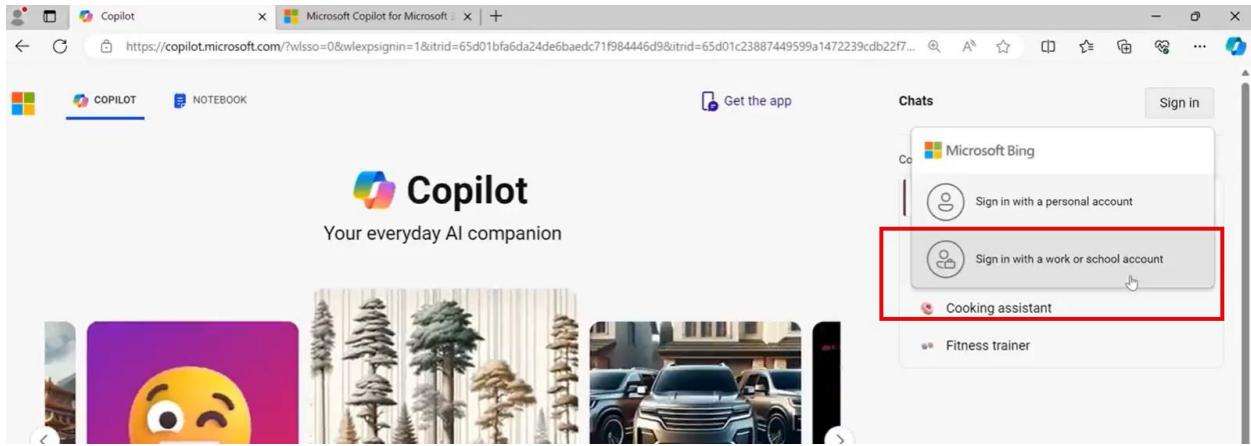
For those looking for accelerated performance and creativity capabilities, Copilot Pro supercharges your Copilot experience. This monthly subscription includes everything in Copilot, plus:

- Gain priority access to GPT-4 and GPT-4 Turbo including during peak times for accelerated performance to get things done faster
- Access Copilot in select Microsoft 365 apps¹ to draft documents, summarize emails, create presentations, and more
- Create, edit, and resize AI images even faster with 100 boosts per day with Designer (formerly Bing Image Creator)

[Get Copilot Pro](#)

[↑ Back to top](#)

Use Copilot data protections for business and enterprise



- Protected labels

A screenshot of the Microsoft Copilot interface. At the top, it shows the user is signed in as nbrazzi@kin... with a green "Protected" badge. Below the header, there are several AI-generated suggestions in cards: "Shop" (What's a good holiday gift for my team?), "Compare" (Is a SWOT analysis or a priority matrix best for my project?), "Code" (Write a Python script to perform Binary search), "Laugh" (What are some hilarious one-liners that will brighten up my day?), "Analyze" (What percentage of taxes should I withhold from my paycheck?), and "Manage" (Ask me for the information you need to help me manage stress). At the bottom, a message states "Your personal and company data are protected in this chat".

- Copilot for M365

The screenshot shows the Microsoft Copilot for Microsoft 365 landing page. At the top, there's a navigation bar with the Microsoft logo, 'Microsoft 365', and links for 'Products', 'Solutions', 'Plans and pricing', 'More', 'Contact Sales', and 'All Microsoft'. A search icon and a user profile icon are also present. A banner at the top says 'Now you can customize Copilot for Microsoft 365 with Copilot Studio. Learn more >'. Below the banner, the word 'ENTERPRISE' is displayed. The main heading is 'Copilot for Microsoft 365' with the subtext 'Thousands of skills. All your data. Infinite possibilities for enterprise.' A 'See pricing' button is visible. To the right, there's a screenshot of a Microsoft 365 interface showing Copilot suggestions. A callout box points to the text 'This subscription is called Copilot for Microsoft 365'. The bottom of the page includes a 'LinkedIn Learning' link and a URL 'https://www.microsoft.com/en-us/microsoft-365'.

- Copilot M365 Apps

The screenshot shows the 'Features' page for Copilot for Microsoft 365. The top navigation bar includes 'Overview', 'Features' (which is underlined), 'Pricing', 'Responsible AI', 'Resources', and 'FAQ'. Below the navigation is a section titled 'FEATURES' with the heading 'Work seamlessly'. A sub-section below it says 'See how Copilot for Microsoft 365 appears in many of the apps you and your organization use every day.' A horizontal menu bar lists 'Microsoft Teams', 'Word', 'Outlook', 'PowerPoint', and 'Excel'. Below this, a video player shows a person working on a laptop with Copilot features overlaid on the screen. A play button is visible in the video player.

The screenshot shows the Microsoft Copilot for Microsoft 365 web interface. At the top, there's a navigation bar with a user icon, 'Copilot' tab, and a search bar containing the URL. Below the header, the page title is 'Copilot for Microsoft 365'. It features a 'Copilot' logo and a sub-headline 'for Microsoft 365'. A note below says 'Copilot uses AI. Check for mistakes.' followed by links to 'Legal Terms', 'Privacy and Cookies', and 'FAQ'. On the left, there are six AI-powered tools: 'What's new' (What's the latest from person), 'Get key info' (List key points from file), 'Share meeting notes' (Generate meeting notes from meeting), 'What did they say?' (What did person say about), 'Where was I mentioned?' (Summarize emails where I was mentioned recently), and 'Draft an FAQ' (Create a FAQ based on file). On the right, a sidebar titled 'Recent activity' lists recent interactions with the AI, such as 'What was my last email from St' (Dec 13, 2023) and 'When is my next meeting?' (Dec 13, 2023). At the bottom, a prompt input field contains 'When was my last meeting with Stewart Mori?' and a character icon, with a progress bar showing '43/4000' and a blue send arrow button.

- Licensing Options

Business User Copilot with Entra ID
(Formerly “Bing Chat Enterprise”)



- Copilot for M365
Paid Subscription – Business

Business User

Copilot with Entra ID

(Formerly "Bing Chat Enterprise")

Use Copilot Chat Assistant for Free
With Enhanced Security

[Sign in with Microsoft 365 Business/Enterprise Account](#)

Copilot for Microsoft 365

Paid Subscription - Business

- Copilot tools in Microsoft 365 applications
- Faster responses and access to newer language models
- Interaction with your organization's Microsoft 365 data
(Formerly "Microsoft 365 Chat")

- Individual user

Individual User

Copilot with MSA

(Formerly "Bing Chat")

Use Copilot Chat Assistant for Free

[Sign in with a free personal account](#)

- Copilot Pro

Business User

Copilot with Entra ID

(Formerly "Bing Chat Enterprise")
Use Copilot Chat Assistant for Free
With Enhanced Security

Sign in with Microsoft 365 Business/Enterprise Account

Copilot for Microsoft 365

Paid Subscription - Business

- Copilot tools in Microsoft 365 applications
- Faster responses and access to newer language models
- Interaction with your organization's Microsoft 365 data
(Formerly "Microsoft 365 Chat")

Individual User

Copilot with MSA

(Formerly "Bing Chat")
Use Copilot Chat Assistant for Free

Sign in with a free personal account

Copilot Pro

Paid Subscription - Individual

- Copilot tools in Microsoft 365 applications for Individual Users
- Faster responses and access to newer language models

Stay up to date with what AI can do for you

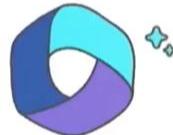
Use your AI assistant in Microsoft 365

- Copilot – A whole new way to work.
- Using Language model

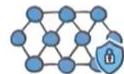
Microsoft 365 Apps



Microsoft 365 Copilot



Microsoft Graph



Large Language Model



Microsoft 365 Business Basic
\$6.00 user/month
(Annual subscription—auto renews)¹

Microsoft 365 Business Standard
\$12.50 user/month
(Annual subscription—auto renews)¹

Microsoft 365 Business Premium
\$22.00 user/month
(Annual subscription—auto renews)¹

Microsoft 365 Apps for business
\$8.25 user/month
(Annual subscription—auto renews)¹

Copilot in Word

Globe Bank International Brand and Website Copy

Slogan
Banking with us is like having the world in your hands.

About Us
There is a reason that we say that “banking with us is like having the world in your hands.” From the beginning, it’s been our goal to incorporate world-class services with an unmatched level of responsiveness and thoughtfulness, no matter what your level of banking need.

Globe Bank International (NYSE:GBI), founded in 1950, is one of the newer financial institutions widely active in the world financial market. Despite our youth, we have a history solidly built on hard work, common-sense business practices, empowering

Paragraph rewriting

About Us

There is a reason that we say that "banking with us is like having the world in your hands." From the beginning, it's been our goal to incorporate world-class services with an unmatched level of responsiveness and thoughtfulness, no matter what your level of banking need.

Rewrite with Copilot < 1 of 3 > AI-generated content may be incorrect ⌂ ⌂

We have a motto that "banking with us is like having the world in your hands." This reflects our vision to offer world-class services with an unparalleled degree of attentiveness and care, regardless of your banking requirement.

Replace Insert below ⌂ ⌂ ⌂ ⌂

About Us

There is a reason that we say that "banking with us is like having the world in your hands." From the beginning, it's been our goal to incorporate world-class services with an unmatched level of responsiveness and thoughtfulness, no matter what your level of banking need.

Rewrite with Copilot < 3 of 3 > AI-generated content may be incorrect ⌂ ⌂

We have a motto that "banking with us is like having the world in your hands." This reflects our vision to offer the best services possible with a high degree of attentiveness and care, regardless of your banking requirement.

Replace Insert below ⌂ ⌂ ⌂ ⌂ Adjust tone

AutoSave Off Document1 - Word No Label Search

File Home Insert Draw Design Layout References Mailings Review View Help

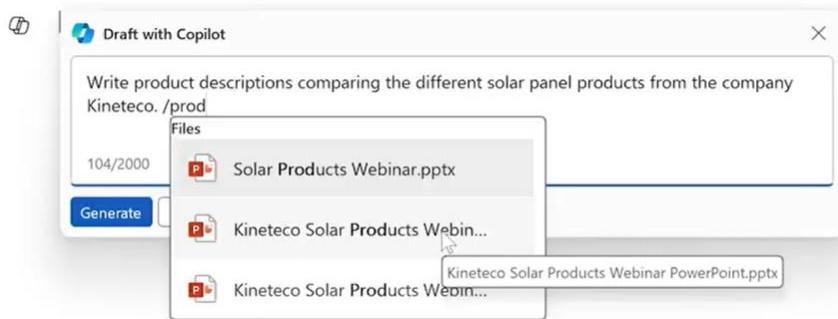
Clipboard Paste Calibri (Body) 11 B I U ab x² A² A Aa A² A² Font Paragraph Normal No Spacing Heading 1 Styles Editing

Draft with Copilot

Describe what you'd like to write, including notes or an outline, and Copilot can generate a draft to help you get started

0/2000

Generate Reference a file



Copilot in Excel

Category	Name	Package Quantity	SKU	Power (Watts)	Footprint (SQ FT)	Manufacturing Cost	Suggested Retail	Product
Solar panels	K-Eco 190		1 KE180	180	12.1	\$162.00	\$315.00	Economy
Solar panels	K-Eco 200		1 KE200	200	13.4	\$180.00	\$350.00	Economy
Solar panels	K-Eco 225		1 KE225	225	14.2	\$198.00	\$385.00	Economy
Solar panels	K-Eco 250		1 KE250	250	16	\$225.00	\$437.50	Economy
Solar panels	K-Eco 250X (same power, smaller footprint)		1 KE250X	250	10	\$480.00	\$650.00	Deluxe

Copilot require data in table format.

Category	Name	Package Quantity	SKU	Power (Watts)	Footprint (SQ FT)	Manufacturing Cost	Suggested Retail	Product
Solar panels	K-Eco 200		KE200	200	13.4	\$180.00	\$350.00	Economy
Solar panels	K-Eco 225		KE225	225	14.2	\$198.00	\$385.00	Economy
Solar panels	K-Eco 250		KE250	250	16	\$225.00	\$437.50	Economy
Solar panels	K-Eco 250x (same power, smaller footprint)		KE250X	250	10	\$480.00	\$650.00	Deluxe
Solar panels	K-Eco 275		KE275	275	18.3	\$247.50	\$481.25	Economy
Solar panels	K-Eco 300		KE300	300	20.2	\$270.00	\$525.00	Economy
Solar panels	K-Eco 325		KE325	325	22.2	\$292.50	\$568.75	Economy
Solar panels	K-Eco 325x (same power, smaller footprint)		KE325X	325	15.05	\$380.00	\$890.50	Deluxe
Solar panels	K-Eco 450		KE450	450	25.5	\$405.00	\$787.50	Economy
Solar panels	K-Eco 575		KE575	575	28.7	\$517.50	\$1,006.25	Economy

Copilot PREVIEW

with your data in Excel tables:

- + Add formula columns
- ✍ Highlight
- FilterWhere and sort
- >Analyze

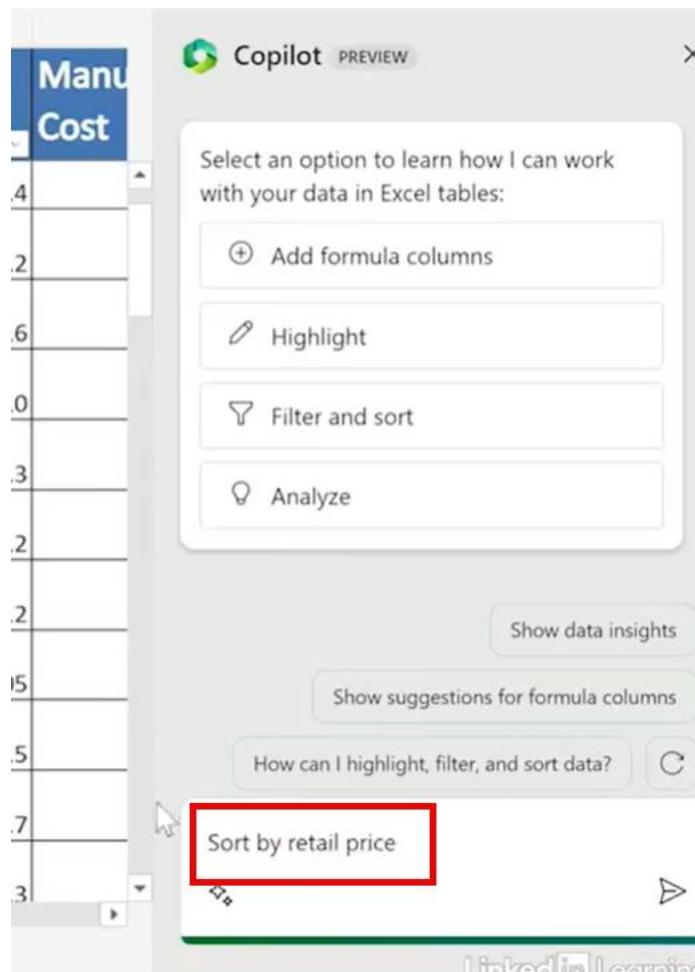
Show data insights

Show suggestions for formula columns

How can I highlight, filter, and sort data?

Watts	Footprint (SQ FT)	Cost
200	13.4	
225	14.2	
250	16	
250	10	
275	18.3	
300	20.2	
325	22.2	
325	15.05	

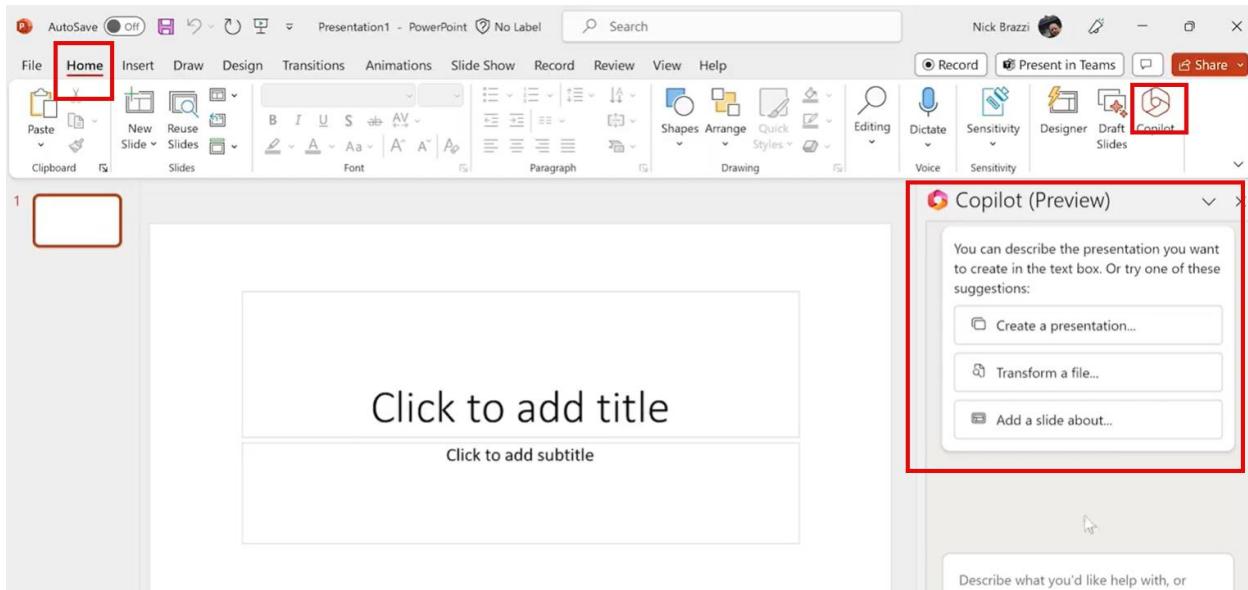
Sort by Retail price



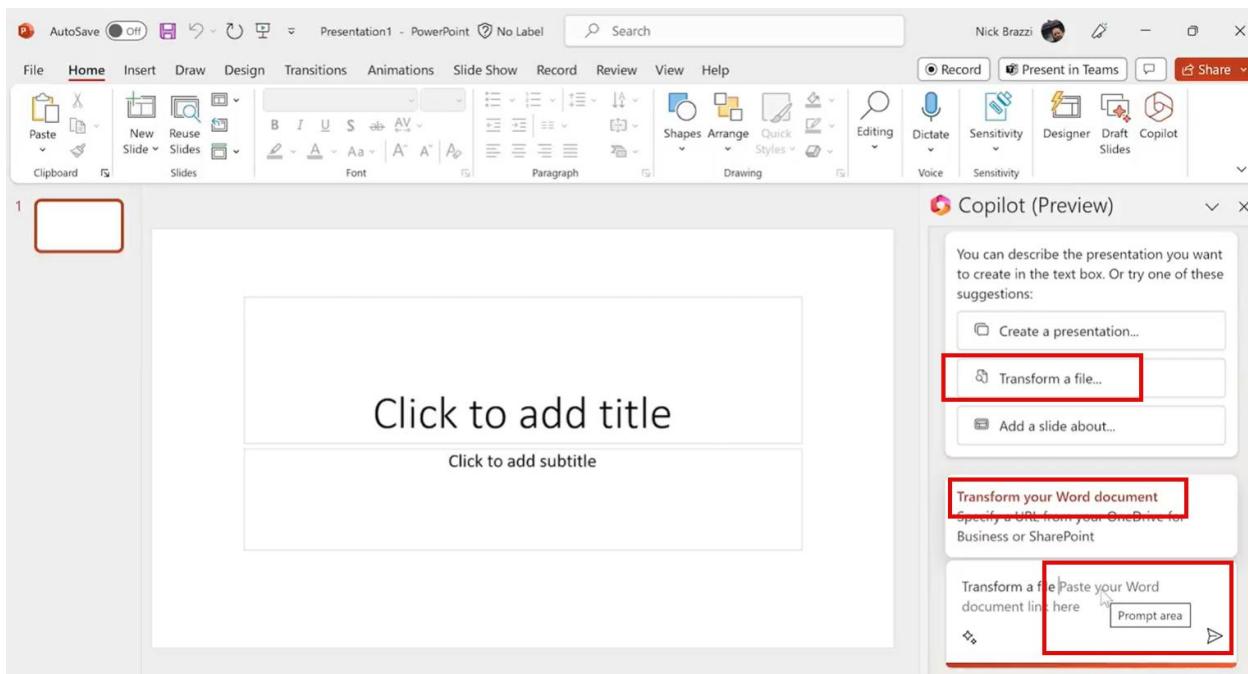
Make a column chart showing the package quantity by target consumer

- Works only Online Store, not on local system.

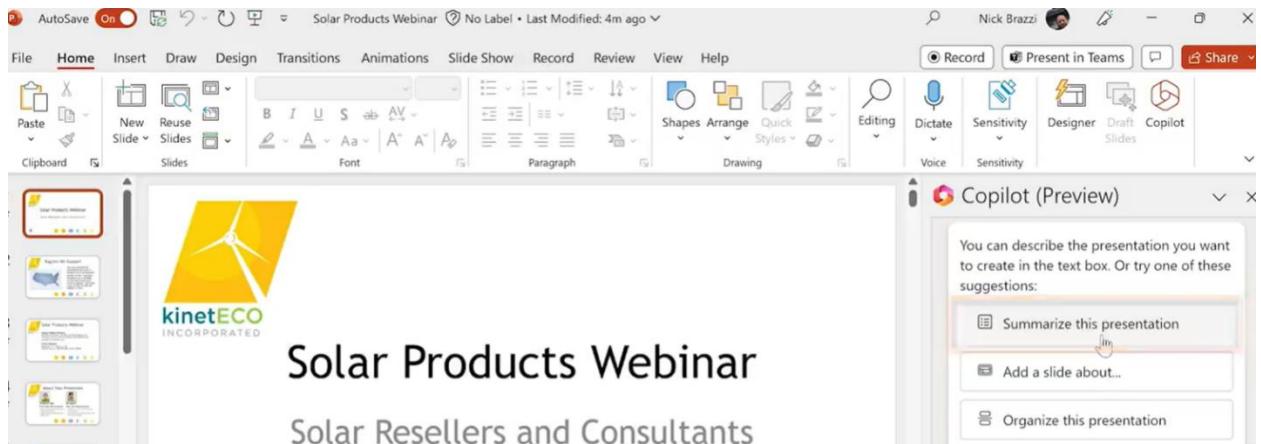
Copilot in Power Point



File should be Word file and Online version



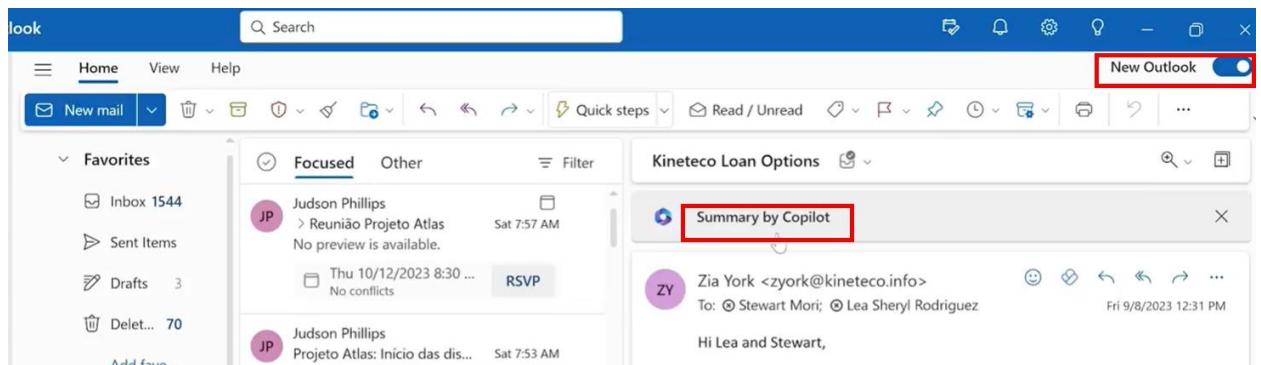
Modify existing PPT



Copilot in Outlook

- Works on latest Outlook
- No additional settings on Web

Summarize



Summary by Copilot Preview

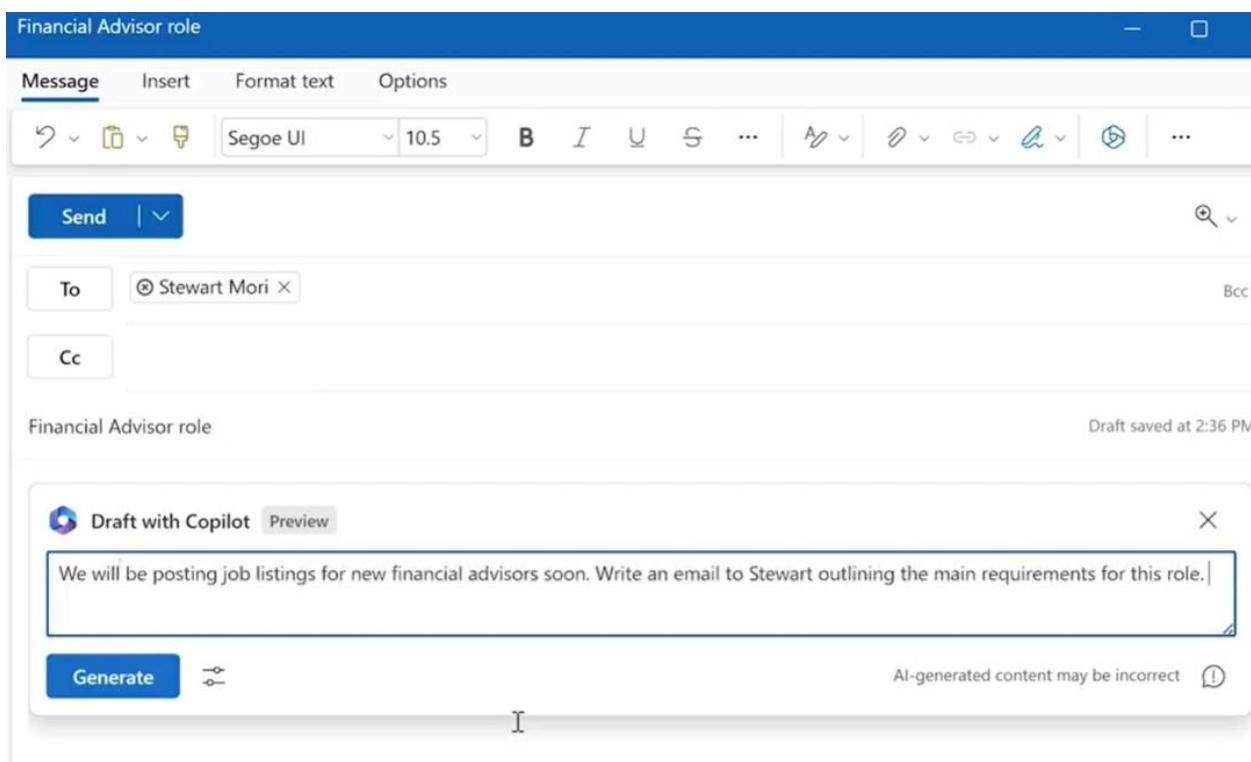
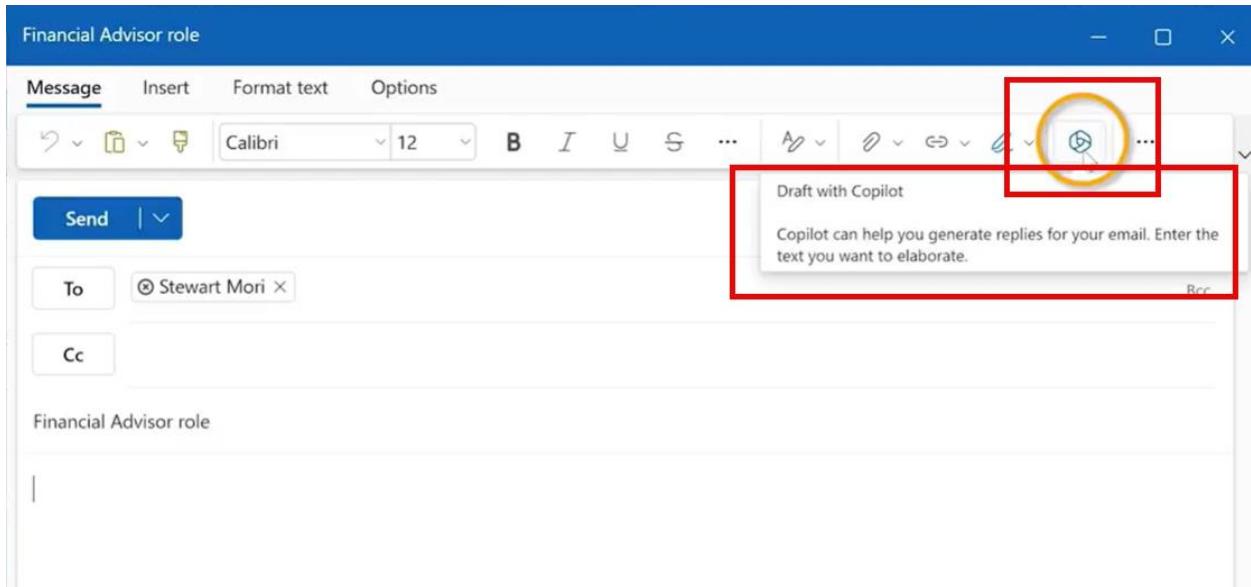


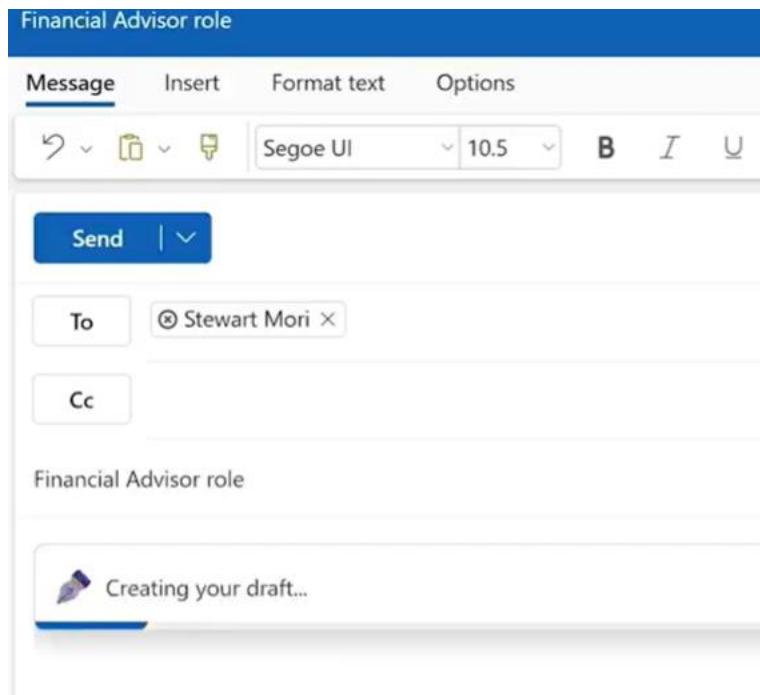
You thanked Zia York for meeting with you and asked about the total number of employees at Kineteco ①.

Stewart Mori mentioned that it would be helpful to have numbers for Europe specifically due to some regulations from the EU ②.

Zia York asked for more details on the interest rates, loan terms, and application process for the loan options and shared that Kineteco has about 13,000 employees worldwide, with 2,700 in Europe ③.

New Email

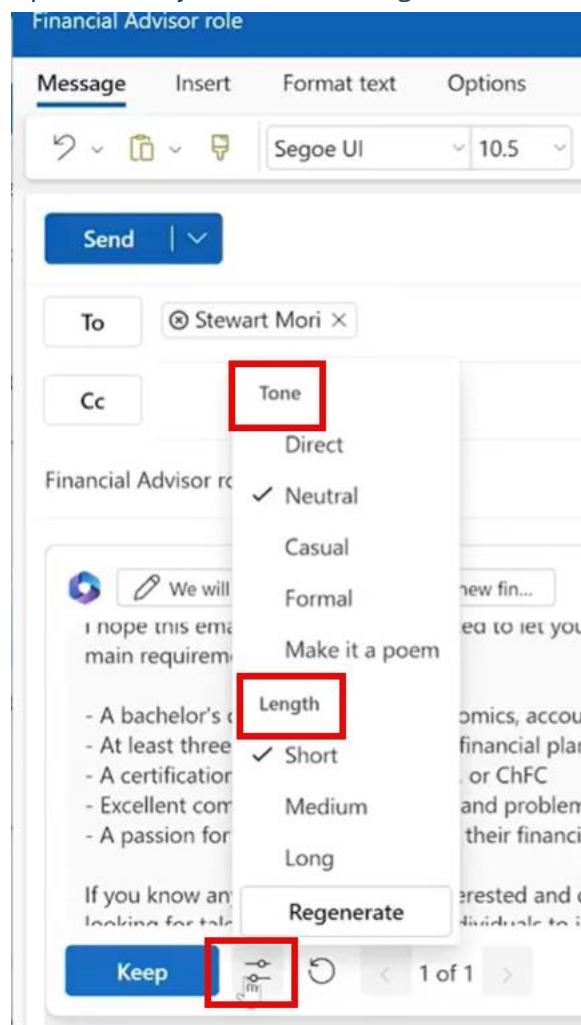




Options to Regenerate draft

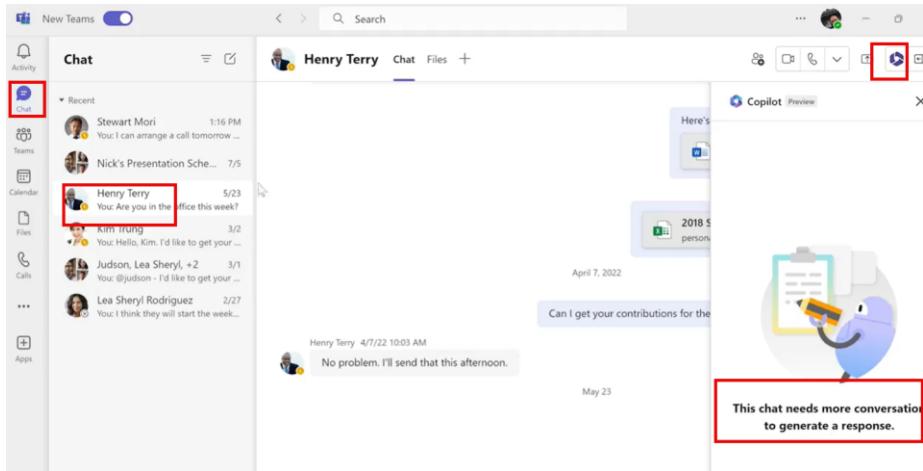
A screenshot of a Microsoft Word document window. The title bar says 'Financial Advisor role'. The menu bar includes 'Message', 'Insert', 'Format text', and 'Options'. Below the menu is a toolbar with icons for file, print, and font size (10.5). The main area shows a 'Send' button and recipient fields 'To: @ Stewart Mori' and 'Cc:'. The body of the document is titled 'Financial Advisor role' and contains the text 'Creating your draft...'. A progress bar is visible below the text. At the bottom, there is a message: 'We will be posting job listings for new fin' followed by 'I hope this email finds you well. I wanted to main requirements for this role are:' and a bulleted list of requirements. There is also a note: 'If you know anyone who might be interested looking for talented or motivated individu' and a 'Keep' button. A yellow circle highlights the circular arrow icon next to the 'Keep' button.

Options to adjust Tone and Length



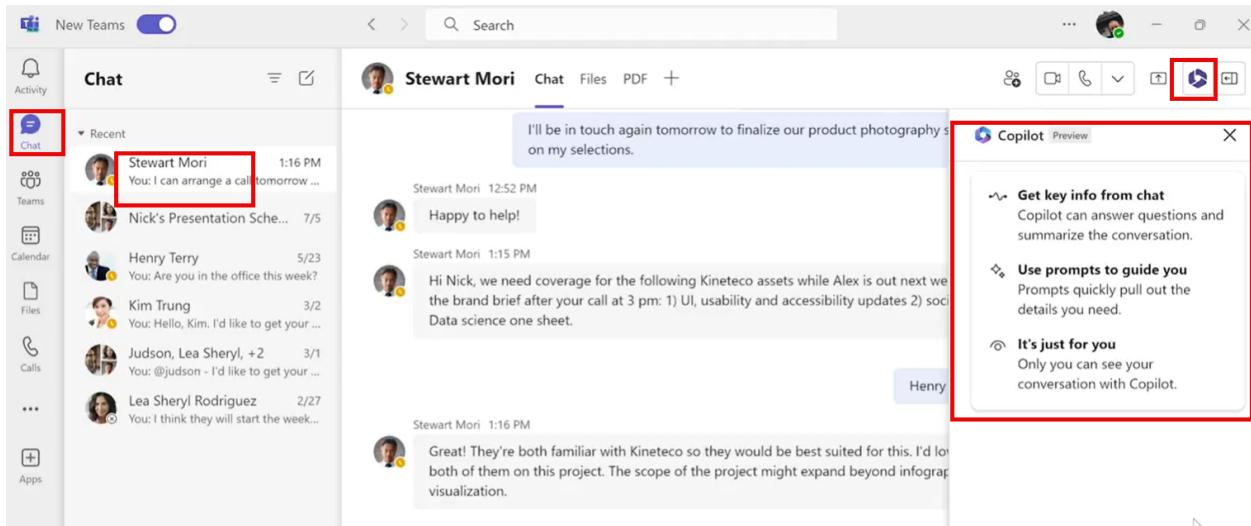
Copilot in Teams

Chat



As Henry has lesser conversations, Copilot cant give any response.

But with Stewart, we have a lot of conversation and copilot can give different



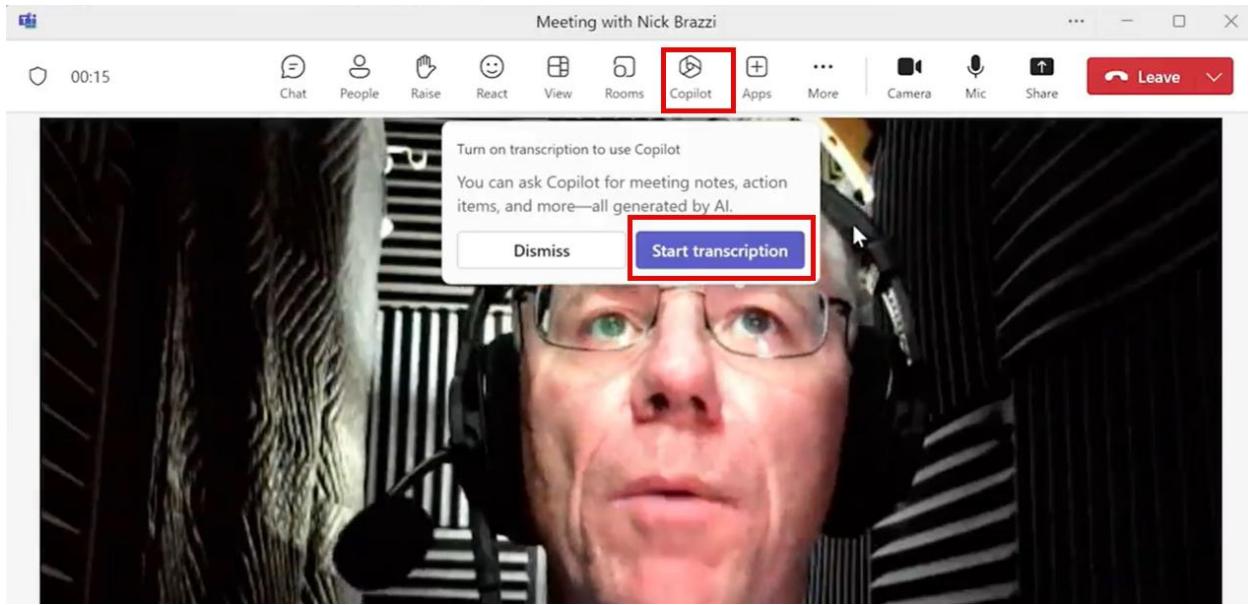
Type **Summarize** and get detailed summary

The screenshot shows a Microsoft Teams chat interface. At the top, there's a header with a profile picture, the name "Stewart Mori", and buttons for Chat, Files, PDF, and more. Below the header, a message from Stewart Mori says: "I'll be in touch again tomorrow to finalize our product photography selections on my selections." A response from Stewart Mori follows: "Happy to help!" Another message from Stewart Mori: "Hi Nick, we need coverage for the following Kineteco assets while Alex is out next week. We'll review the brand brief after your call at 3 pm: 1) UI, usability and accessibility updates 2) social media assets 3) Data science one sheet." A message from Henry (indicated by a blue box) says: "Great! They're both familiar with Kineteco so they would be best suited for this. I'd like to involve both of them on this project. The scope of the project might expand beyond infographics and visualization." A button labeled "I can arrange a call tomorrow" is visible. On the far right, there's a "Copilot" card with the heading "It's just for you" and the subtext "Only you can see your conversation with Copilot". A "Summarize" button is located above the Copilot card. The summary card itself contains a timestamp "8/23 12:51 PM - 8/23 1:16 PM" and a bulleted list of key points:

- Stewart Mori and Nick Brazzi discussed the digital catalog proofs and agreed that they are ready for print. [1] [2]
- The print request shows overnight priority and delivery is anticipated by EOD tomorrow. [3]
- Nick Brazzi will be in touch again tomorrow to finalize product photography selections. [4]
- Stewart Mori requested coverage for Kineteco assets while Alex is

A "Type a new message" input field is at the bottom left, and a "Ask a question about this chat" button is at the bottom right.

Meeting



Can ask question on ongoing meeting

Regional Check-in

Chat People Raise React View Notes Room Copilot Apps More Camera Mic Share Leave

Copilot Preview

❖ Let AI handle the busywork
Copilot can generate notes, list tasks, and much more—so you don't have to.

❖ Check the facts
A response could be inaccurate or incomplete. Share feedback to help Copilot improve.

❖ It's just for you
Only you can see your conversation with Copilot.

Ask me anything about this meeting

More prompts

Note:

1. Only if someone has already start the transcription
2. More than 5 mins have been passed.

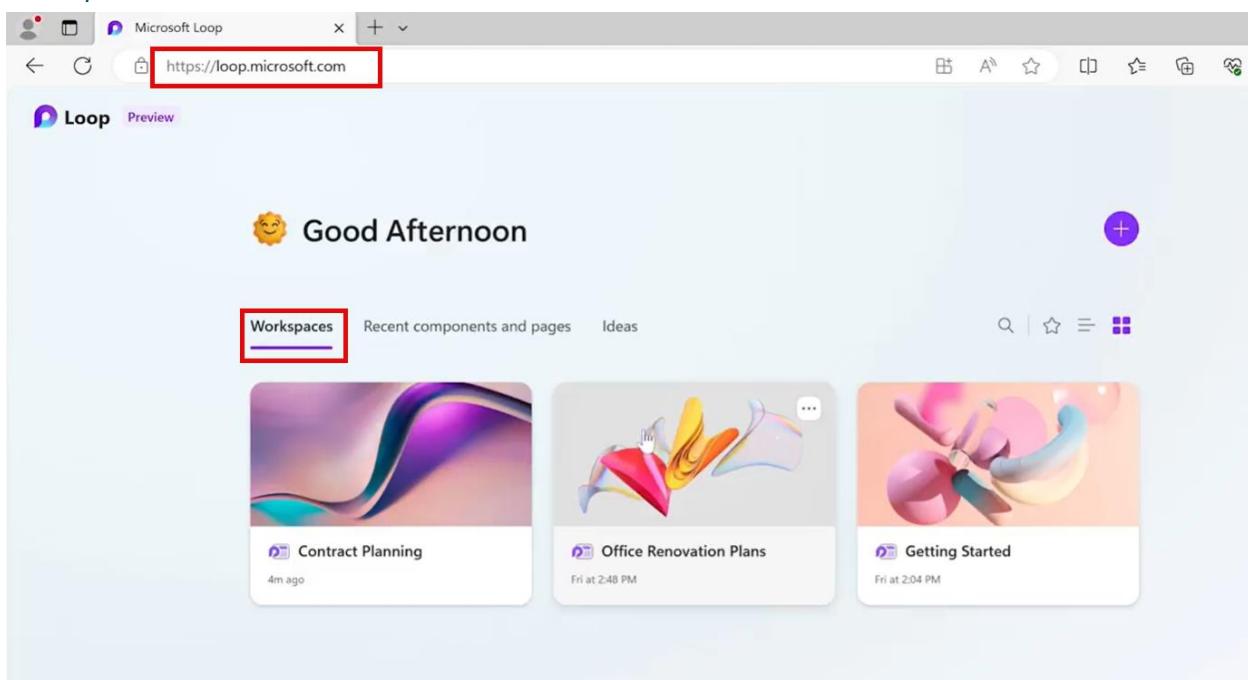
Can see AI notes under Recap

The screenshot shows the Microsoft Teams interface for a 'Regional Check-in' meeting. The 'Recap' tab is selected and highlighted with a red box. Below it, the 'AI notes' button is also highlighted with a red box. The page shows no shared files and includes tabs for Notes, AI notes, Mentions, and Transcript.

Copilot in Loop

- Web application for managing projects or organizing notes in a shared workspace

Workspace



The screenshot shows the Microsoft Loop workspace interface. At the top, there is a header bar with a user profile icon, a 'Microsoft Loop' tab, and a search bar containing the URL 'https://loop.microsoft.com'. Below the header is a navigation bar with icons for 'Loop' and 'Preview', and a purple circular button with a '+' sign.

The main area features a greeting 'Good Afternoon' with a smiling sun emoji. Below the greeting are three tabs: 'Workspaces' (which is highlighted with a red box), 'Recent components and pages', and 'Ideas'. To the right of these tabs are search and filter icons.

Three workspace cards are displayed:

- Contract Planning**: A card with a purple and blue abstract background image. It shows a document icon and the text 'Contract Planning'. Below it says '4m ago'.
- Office Renovation Plans**: A card with a white background featuring colorful abstract shapes. It shows a document icon and the text 'Office Renovation Plans'. Below it says 'Fri at 2:48 PM'.
- Getting Started**: A card with a pink and orange abstract background image. It shows a document icon and the text 'Getting Started'. Below it says 'Fri at 2:04 PM'.

The screenshot shows a Microsoft Loop workspace titled "Legal Requirements". The left sidebar lists sections: "Contract Planning" (with 3 Workspace members), "Project Planning", "Project Brief", "Contract Samples", "Project Planning", "Legal Requirements" (selected and highlighted with a red box), and "Untitled page". The main content area displays the title "Legal Requirements" and a bold statement: "This page contains all of the specific requirements decided by the Globe Bank legal team. November 2023." Below this, a "Draft page content" card is shown with options: "Summarize page", "General", "Table", "Checklist", and "Bulleted list". A large portion of the page content is visible but partially cut off.

This page contains all of the specific requirements decided by the Globe Bank legal team. November 2023.

Draft page content

Summarize page

General

Table

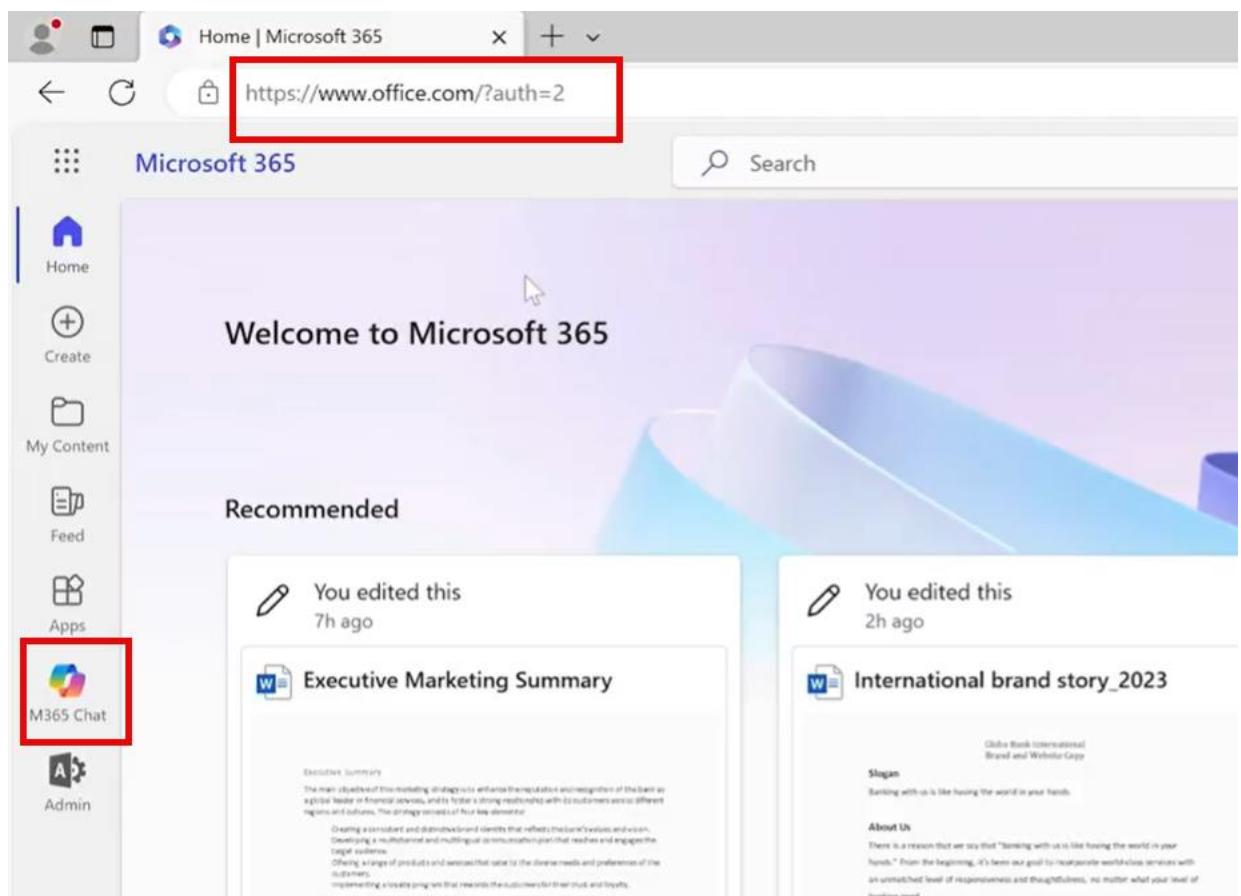
Checklist

Bulleted list

Using M365 Chat

App at M365 tenant

- App at M365 tenant or an app in Teams



- N

The screenshot shows the Microsoft 365 Chat interface at <https://www.office.com/chat?auth=2>. On the left is a vertical sidebar with icons for Home, Create, My Content, Feed, Apps, M365 Chat (which is selected), and Admin. The main area features the Microsoft 365 Chat logo and the text "Microsoft 365 Chat" and "Your copilot for work". Below this are six cards:

- What's new?**: What's the latest from [person], organized by emails, chats, and files?
- Get key info**: List key points from [file]
- Draft an FAQ**: Create an FAQ based on [file]
- Write an intro**: Propose a new introduction to [file]
- How to**: How do I write a request for proposal?
- Generate ideas**: List ideas for a fun remote team building event

At the bottom, there is a search bar with the placeholder "Which execu" and a "View prompts" button. A "dinkel" watermark is in the bottom right.

This screenshot shows the same Microsoft 365 Chat interface. The search bar now contains the completed query: "Which executives are mentioned in the International brand story_2023.docx". The file name is highlighted with a red box. The "View prompts" button is also highlighted with a red box. The rest of the interface is identical to the first screenshot.

The screenshot shows a Microsoft Teams interface. On the left, there's a sidebar with sections for 'What's organized?', 'Proposed file', and a search bar. The main area has a search bar at the top with tabs: 'All', 'People', 'Files' (which is selected), 'Meetings', and 'Emails'. Below the search bar is a list of files:

- International brand story_2023 (Word document, opened 2 hours ago)
- Executive Marketing Summary (Word document, opened 4 hours ago)
- Product inventory (Excel document, opened 5 hours ago)
- Going solar brochure (Word document, opened 6 hours ago)
- Solar Products Webinar (PDF document, opened 6 hours ago)

Below the file list is a search input field containing "Which executives are mentioned in the International brand story_2023.docx / Start typing to search". The search button in this field is highlighted with a red box.

App in Teams]]

The screenshot shows the Microsoft 365 App Store interface. On the left, there's a sidebar with icons for Activity, Chat, Calendar, Files, Calls, and Apps. The main area has a search bar at the top with the query "microsoft 365 chat". The search results are displayed under the heading "Search results for 'microsoft 365 chat'".

The results show 100 apps:

- M365 Chat** (Microsoft Corporation) - This app is highlighted with a red box. It's described as "Your copilot for work" and has a rating of 4.2 (28 ratings). An "Open" button is shown.
- Human Resources** (Microsoft Corporation) - Described as "Quickly view time-off balances and submit leave requests in Micr...". It has a rating of 5.0 (1 rating) and an "Add" button.
- Analytics 365** (Tollring) - Described as "Analytics 365: Teams Analytics and Reporting on Collaboration a...". It has a rating of 5.0 (2 ratings) and an "Add" button.
- Dynamics 365** (Microsoft Corporation) - Described as "Search, connect, and update Dynamic...". It has a rating of 3.3 (10 ratings) and categories "Customer support" and "Sales & marketing".
- Business Central** (Microsoft Corporation) - Described as "Share, view, and act on your business...". It has a rating of 3.5 (4 ratings) and categories "Communication" and "Customer & contact ma...".
- PlayQuiz - Learn & Play** (TeamsChamp) - Described as "PlayQuiz: an application to answer qu...". It has a rating of 5.0 (4 ratings).

Have a meeting with someone?

The screenshot shows the Microsoft Teams interface. On the left is a sidebar with icons for Activity, Chat, Teams, Calendar, Files, and Calls. The main area is titled 'M365 Chat' under 'Chat'. A message from 'M365 Chat' at 6:00 PM asks, 'When was the last time I had a meeting with Stewart Mori?'. Below it, a message from 'Daiana, Isabel, +2' at 11/10 says, 'According to my records, the last meeting you had with Stewart Mori was on Friday the 3rd. The subject of the meeting was "Strategy Session" and Isabel Ramos and Jennifer Vespes also attended the meeting.' There is a 'Copy' button and a note indicating 1 reference. At the bottom right, it says '5/30 AI-generated content may be incorrect'.

Quiz

1. Excel Copilot can only be used if

- you are working with Excel on Windows
- you are working with Excel on the web
- the file you are working on is stored on OneDrive, SharePoint, or Teams
Correct
Copilot can be used with files stored locally on your computer when working with Word or PowerPoint. But, when working with Excel, Copilot will only work for files stored on one of Microsoft's cloud storage tools.

Copilot can be used with files stored locally on your computer when working with **Word** or **PowerPoint**.

But, when working with **Excel**, Copilot will only work for files stored on one of **Microsoft's cloud storage tools**

2. Excel Copilot can only analyze data in a spreadsheet if

- the sheet contains 5 or more columns of data.
- any cells containing numbers are formatted as currency.
- You select the cells before opening the Copilot panel.
- the cells you want to analyze are formatted as a table.
Correct

3. If you join a Teams meeting that's already in progress, you can ask Copilot to summarize the topics that were discussed that you may have missed. This will only work if

- somebody in the meeting clicks the Copilot option and turns on the transcript feature
Correct

- each person in the meeting gives their permission
- there are 5 or more people in the meeting

4. PowerPoint Copilot can create a new presentation based on your written prompts or

Question 4 of 6

PowerPoint Copilot can create a new presentation based on your written prompts or ____.

- information in an email message.
- information in an existing document.
Correct
- information from a Teams meeting.

5. What is a common reason the summary option may not be available in Outlook?

- You are using Outlook on the web.
- The message you have selected is very short and does not have enough information to summarize.
Correct
- You are using Outlook on the mac.

6. If you want to ask Word Copilot to use information from a separate document, that referenced document must be:

You can use Copilot with documents stored locally on your computer's storage drive. But, if you want to **reference a separate file when making a Copilot request**, that referenced file must be stored on one of **Microsoft's cloud storage tools**.

 shared in Teams or stored on OneDrive, SharePoint

Correct

You can use Copilot with documents stored locally on your computer's storage drive. But, if you want to reference a separate file when making a Copilot request, that referenced file must be stored on one of Microsoft's cloud storage tools.

Generative AI and Ethics - the Urgency of Now

- Ethics are a human function,

Distinguishing responsible tech from human behavior

- In **banking sector**, AI and ML are helping identify who might have opportunities to be more financially secure
- So, save more, to increase retirement contributions
- In **Agriculture**, AO models predict large weather events.
- In **Corporates**, AI is transforming HR, better performance by team by their manager,
- We need to build these tools with Positive intention, with a grounding in ethical and responsible reasoning.
- In recent year, these apprehensions have emerged with a sharper edge,
- Some challenges
 - Deep fakes
 - Inaccurate chatbots
 - Legal confusion
 - Hiring biases

Understanding Vilas' ethical AI framework

3 parts

Responsible data practice

- What is the source of training data?
- What has been done to reduce bias in the data?
- How might the data we're using perpetuate historical basis?
- What opportunities exist to prevent biased decision-making?

Boundaries on safe and appropriate use

- Who is the target population for this tool?
- What are their main goals and incentives?
- What is the most responsible way to achieve these goals?

Robust transparency

- How did the tool arrive at its output?
- What other ways do we have of testing the fairness?
- Can decision makers easily understand the input-analysis- output process?
- Have you engaged with the broad range of stakeholders?

Applying Vilas' framework in a real world situation

AI Chatbot have inappropriate and offensive replied to customer

Steps to correct the situation

- Input-output checkpoints.
- Internal audit process
- Risk assessment

Ethical analysis needs to be intertwined with **initial design** and at every phase of deployment.

Quiz

1. What type of misused AI can give false advice, which is extremely dangerous in a situation such as providing medical advice?

<input type="radio"/>	legal confusion
<input type="radio"/>	deep fakes
<input checked="" type="radio"/>	inaccurate chatbots Correct

2. ABC Corp's management uses AI to provide advice on selecting options for its marketing strategy. How can robust transparency help the company.

Question 2 of 3

ABC Corp's management uses AI to provide advice on selecting options for its marketing strategy. How can robust transparency help the company?

<input checked="" type="checkbox"/>	It can assist in understanding the input-analysis-output process. Correct
<input type="radio"/>	It can identify the most responsible way to achieve goals.
<input type="radio"/>	It can uncover bias in the AI input training data.

Next question

3. Layla learns that her company's AI-driven chatbot has been giving inaccurate and sometimes rude responses to customers' questions. How should Layla deal with this issue?

<input type="radio"/>	Limit the number of employees who have access to the chatbot data set.
<input checked="" type="checkbox"/>	Limit the chatbot to customer service questions and no other purpose. Correct
<input type="radio"/>	Limit the number of customers who can use the chatbot at any one time.

Organizing data with ethics in mind

Ethical Data Organization

Prioritizing Privacy

- Conduct a privacy audit
- Create a training curriculum

Reducing Bias

- Be curious about who the data serves.
- Accessible to differently-abled people.
- Consider who interpreted the data

Prompting transparency

- Explain to all stakeholders, your customers, your employees, your suppliers, your regulator on How data is collected and used.
 - Might consider publishing a data governance framework

Preparing technology teams to make ethical decisions

Large Technology Orgs have different challenges

Possess specific skills and expertise

Work under tight deadlines.

Subject to specific regulatory requirements

Ethical decisions that technology teams might face

- How to ensure **security and privacy** of data collection, storage, use and reuse
- Deciding how to audit algorithms to ensure they **are free from bias**
- Deciding how to **reducing their environment impact**.

Creating a culture of ethical decision-making

- Foster ethical communication
- Establish ethical training

Preparing C-Suite in directing responsible AI

Responsible AI Policy and Governance framework

Responsible AI Policy and Governance Framework

Statement from the C-suite about how the organization should design and manage AI technologies, describing how to make ethical decisions, protect privacy, and eliminate or reduce bias



Provide mandate on responsible AI training

Building AI elements into all their technologies and conduct regular audits

Hire a Chief AI ethics officer.

Additional C-Suite Responsibilities

- Identify specific metrics
- Create regular reporting mechanisms on AI practices
- Hire a chief AI ethics officer

Preparing the Board of Directors to manage risk and opportunity in AI

C-Suite vs Board members

C-Suite	Board Members
<ul style="list-style-type: none">• Manages day-to-day operations• Makes real-time decisions about when and how to use new technologies	<ul style="list-style-type: none">• High-level organizational values• Regulatory requirements

Board of Directors in Ethical AI

- Ensure policies and procedures exist for ethical concerns.
- Ensure necessary resources and expertise.
- Ensure alignment with regulatory requirements.
- Dedicated AI committee is available to advise executives on significance decisions

Consulting your customers in building AI

Framework

LISA

Listen to users before you start.

Involve customers in decisions

Share Privacy policies

Audit your work

Communicating effectively organizationally and globally

ETHICS

E – Executives and board member

- Communication for ethical AI

T – Technologists

- Technologists. Engineers, developers

H – Human rights advocates

- Human rights advocates have a responsibility to ensure that systems that Technologists build respect human rights and dignity.

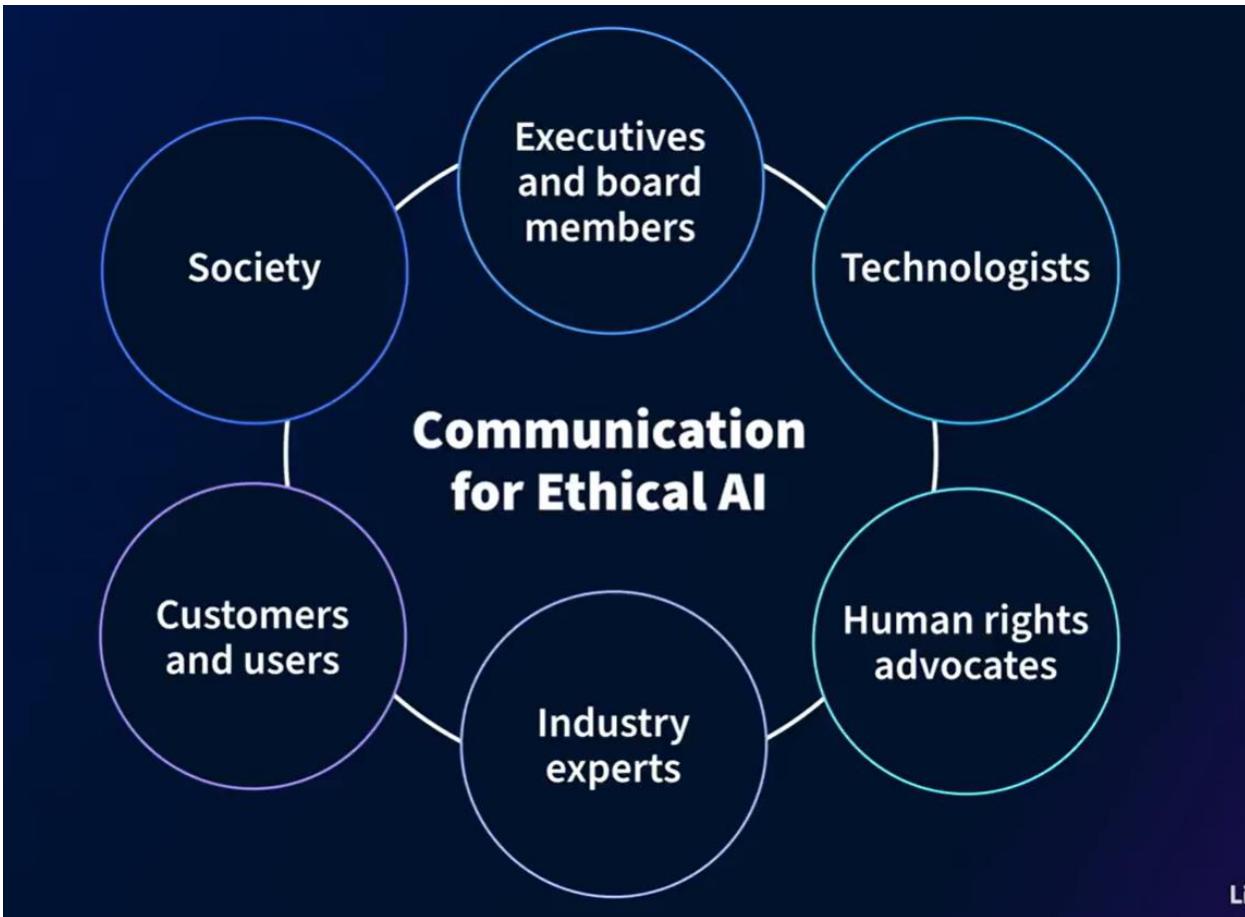
I - Industry experts

- Industry experts has a responsibility to share their knowledge and expertise on ethical implications.

C- Customers and users

- Have the responsibility to provide feedback and insights

S - Society



Some tips

Establishing Communication

- Establish various sessions between groups
- Develop training programs
- Create a cross-functional team
- Systematically collect and address user feedback
- Engage formally and informally with external stakeholders

Quiz

- Ahmad is creating a technology team for a new project. When should the team get together to discuss ethical considerations?

Question 1 of 5

Ahmad is creating a technology team for a new project. When should the team get together to discuss ethical considerations?

as ethical issues arise during the project

before starting the project
Correct

during the team member interview process

- Why is it a good practice for the C-suite to develop, and perhaps even mandate, an AI training and education program for all employees?

It democratizes decision-making around AI tools.
Correct

It increases employee engagement and retention.

It gives employees the responsibility for training on AI tools.

- In which situation are ethical considerations the responsibility of a board of directors?

when it involves compliance with a regulatory agency
Correct

when it involves day-to-day organizational activities

when it involves organizational hiring and training

- How can a company best build customer trust, which can translate to a loyal customer base?

QUESTION 1 OF 5

How can a company best build customer trust, which c.

- Listen to customers before developing a new product.
Incorrect

- Involve customers in decisions.

- Share a transparent privacy policy.
Correct

5. Why, more than any other reason, should a company perform a privacy audit?

- so it can develop a company-wide privacy policy
Correct

- so it can identify private customer information in its possession

- so it can establish guidelines for private information access

Summary

Becoming an Ethical Leader in AI

- 1 Incorporate communities into design.
- 2 Build skills beyond technology.
- 3 Become a steward of a **human-centered** future.



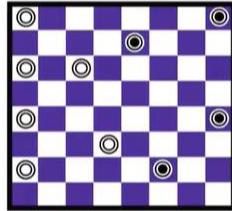
Introduction to Artificial Intelligence

Why you need to know about artificial intelligence

Define general intelligence

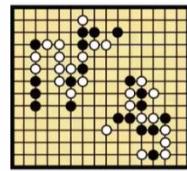
- There's no one standard for human intelligence
- Early systems outperform humans.

Early systems outperform humans.



- Systems start to seem more intelligent.

Systems start to seem more intelligent.



Definition of AI

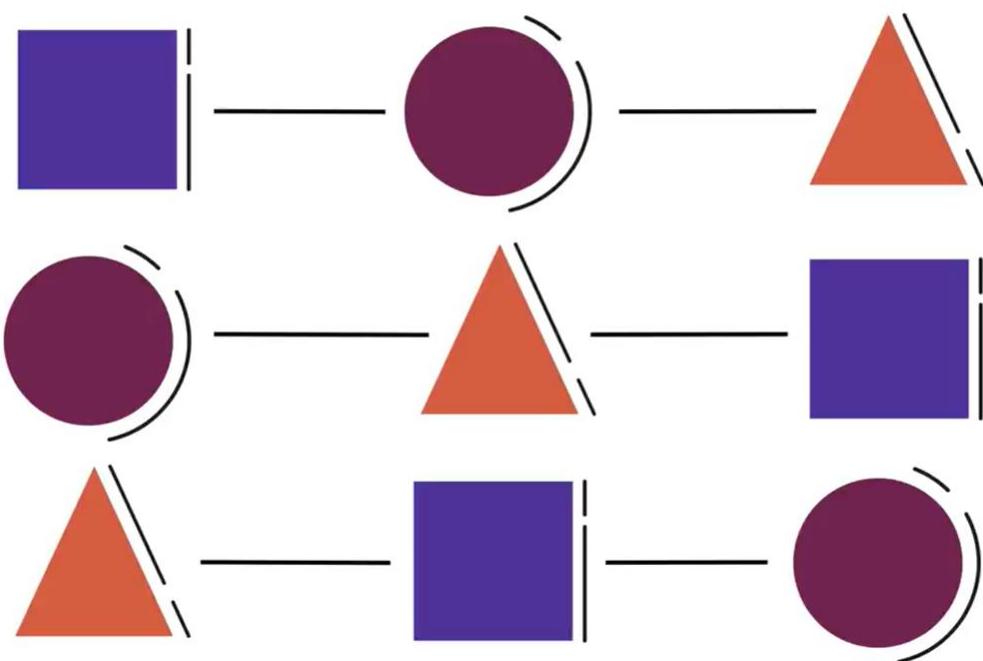
- A system that **shows behavior** that could be interpreted as **human intelligence**.
- In 2022, Google engineer was fired for claiming that their chatbot had a soul.

The general problem-solver

- Physical **symbol system** hypothesis

-

Physical symbol system hypothesis



-

- Chinese room argument

Strong vs. weak AI

Strong AI

- Machine displays all person-like behavior.

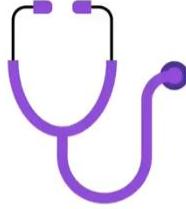
Weak AI

- AI that's confined to a very narrow task.
- E.g. Siri, Google Speaker

 Cough ...Temperature

 Cough+Temperature ...Dehydration

 Cough+Temperature+Dehydration ...Bronchitis



Quiz

1. Why did some of the earliest artificial intelligence systems focus on board games such as checkers and chess?

Correct

The first conference on artificial intelligence was in **1959**. Computers at that time didn't have the processing power to identify complex patterns. So early artificial intelligence systems needed to focus on **board games** and other tasks that had **simple rules and patterns**.

Why did some of the earliest artificial intelligence systems focus on board games such as checkers and chess?

It's easiest to make a computer system seem intelligent when it's working with set rules and patterns.

Correct

The first conference on artificial intelligence was in 1959. Computers at that time didn't have the processing power to identify complex patterns. So early artificial intelligence systems needed to focus on board games and other tasks that had simple rules and patterns.

Because early computer scientists didn't want the system to seem to sound too intelligent.

Board games gave computer systems access to huge amounts of data which allowed the machine to learn new things.

Board games were an easy way to have computers create neural pathways.

2. You're a product manager who's in charge of building a weak AI expert system that will give tax advice. You're working with dozens of accountants who go through thousands of different taxpayer scenarios. When a customer asks a question, then the expert system will ask a follow-up question. It will do this until it makes a recommendation. What's one of the biggest challenges with this system?

There will be too many tax combinations for the experts to cover with one system.

Question 2 of 3

You're a product manager who's in charge of building a weak AI expert system that will give tax advice. You're working with dozens of accountants who go through thousands of different taxpayer scenarios. When a customer asks a question, then the expert system will ask a follow-up question. It will do this until it makes a recommendation. What's one of the biggest challenges with this system?

- The system could evolve into strong AI and develop a personality.
- Many people will be uncomfortable trusting a computer system with their taxes.

-  There will be too many tax combinations for the experts to cover with one system.
Correct

One of the greatest challenges with symbolic expert systems is that every possibility needs to be programmed by an expert. When there are a lot of possibilities this can lead to an "combinatorial explosion." This is when there are so many different scenarios that the possibilities can't all be recorded by an expert.

- There aren't enough tax experts to help develop scenarios for the system.

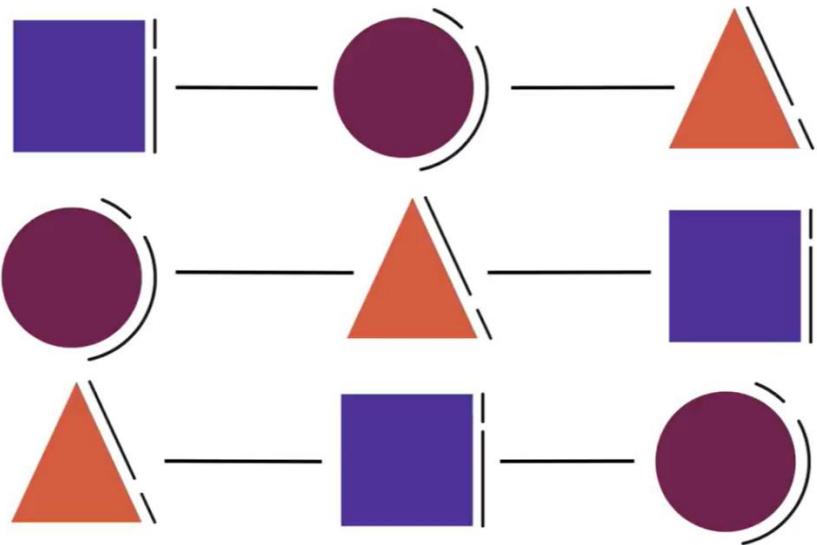
3. Luella seeks medical attention for chest pains. A nurse uses an artificial intelligence program to diagnose the cause. Why is this system likely not really intelligent?

- The program can only be intelligent if the patient provides a complete medical history.
-  The program only matches her symptoms to steps in a system an expert created.
Correct
This is an example of weak AI, unlike strong AI in which the system possesses some human traits.
- The program is only intelligent if a patient has been there before.

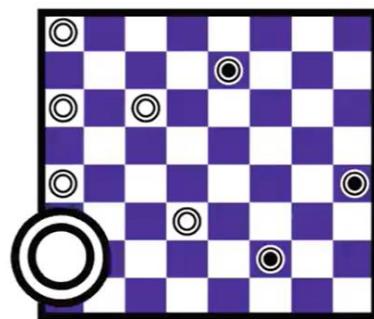
Machine learning

- Earlier AI systems used a symbolic approach that seem intelligent

Earlier AI systems used a symbolic approach.



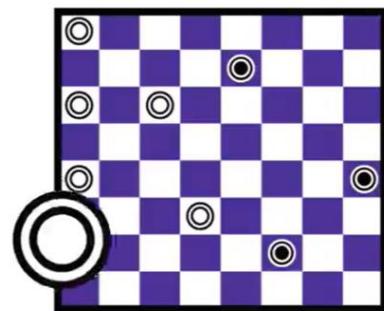
- Program a system to become intelligent through observation
- In 1959, a computer scientist named Arthur Samuel created a checkers program that could learn by playing against itself.



- The more machine played the more it saw patterns on how to win by observation.
- It learned through its own experience.

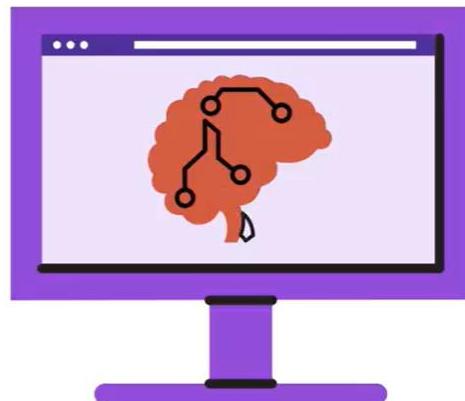
- Arthur called this idea **Machine Learning**

Machine learning



Not that much digital data in the 1950s

01101001
10101101
01101001
10101101
01011011



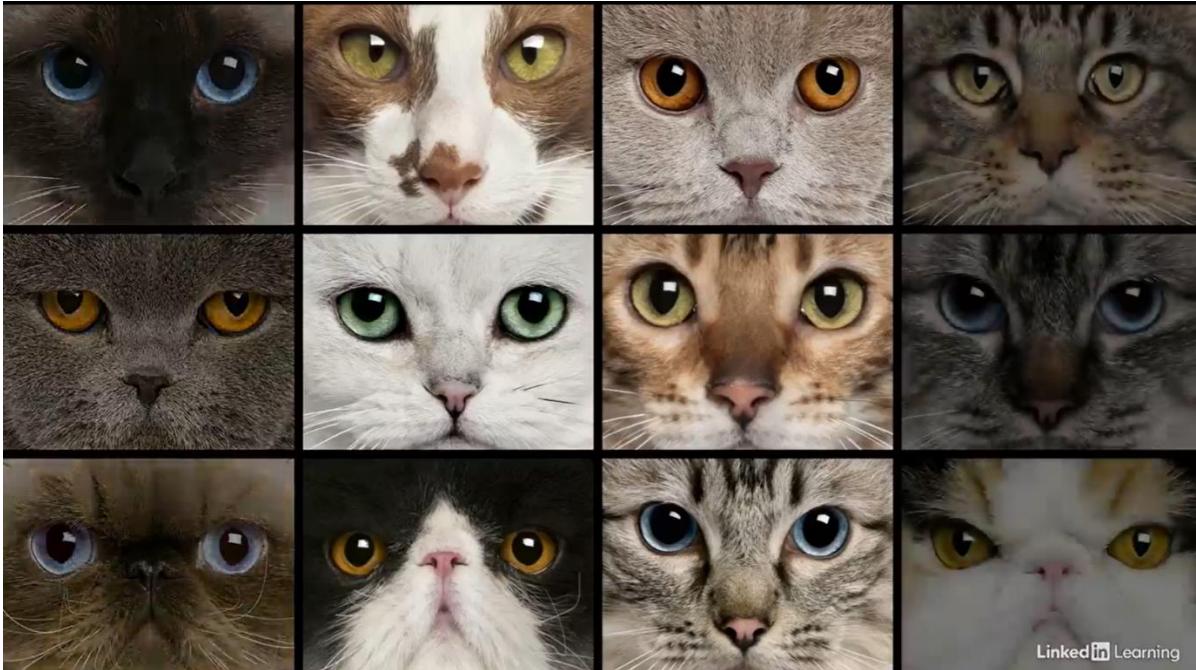
- Downsize: There was not much digital data.
- In 1990s, there was huge increase of digital data.

Huge increase in digital data in the 1990s

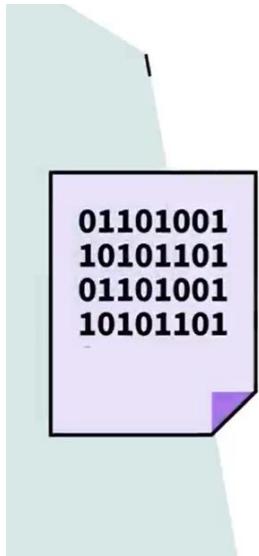


n 8

- If you millions of cats, you have access to this data.

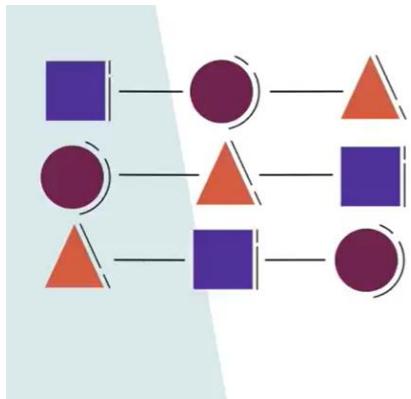


- Boom in terms of ML due to plenty of data and data scientists built new algorithms.



By learning through data, machines could continue to grow with more data.

- ML systems are just identifying patterns



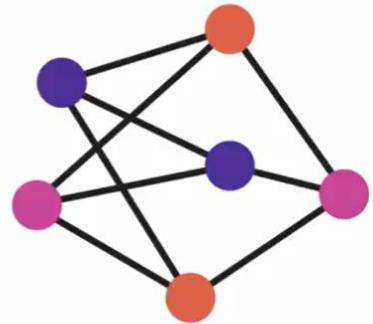
Machine learning systems are still just identifying patterns.

Artificial neural networks

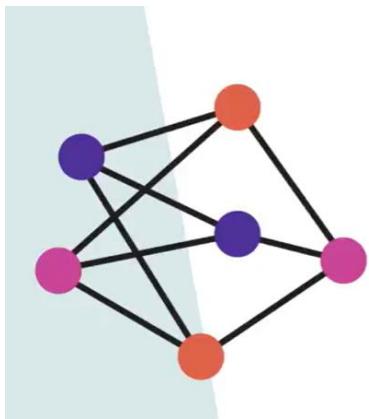
- Artificial neural network is an AI system that mimics the structure of the human brain.

Artificial Neural Network

AI system that mimics the structure of the human brain

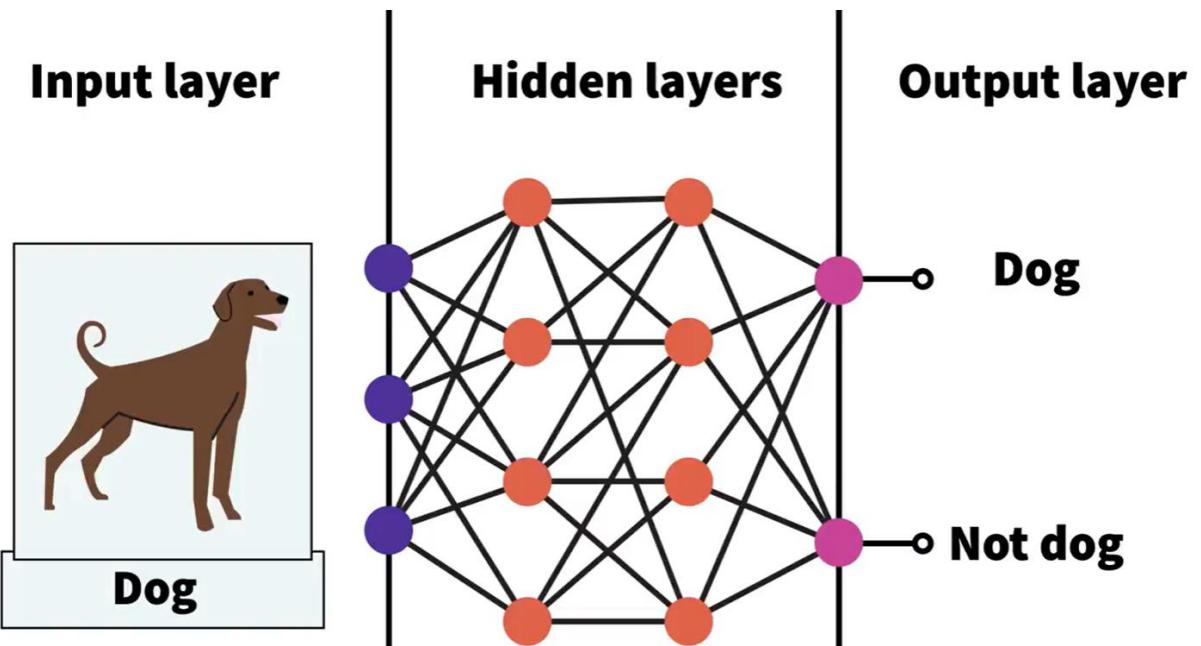


- The **artificial neural network used** hundreds (or millions) of numerical dials.



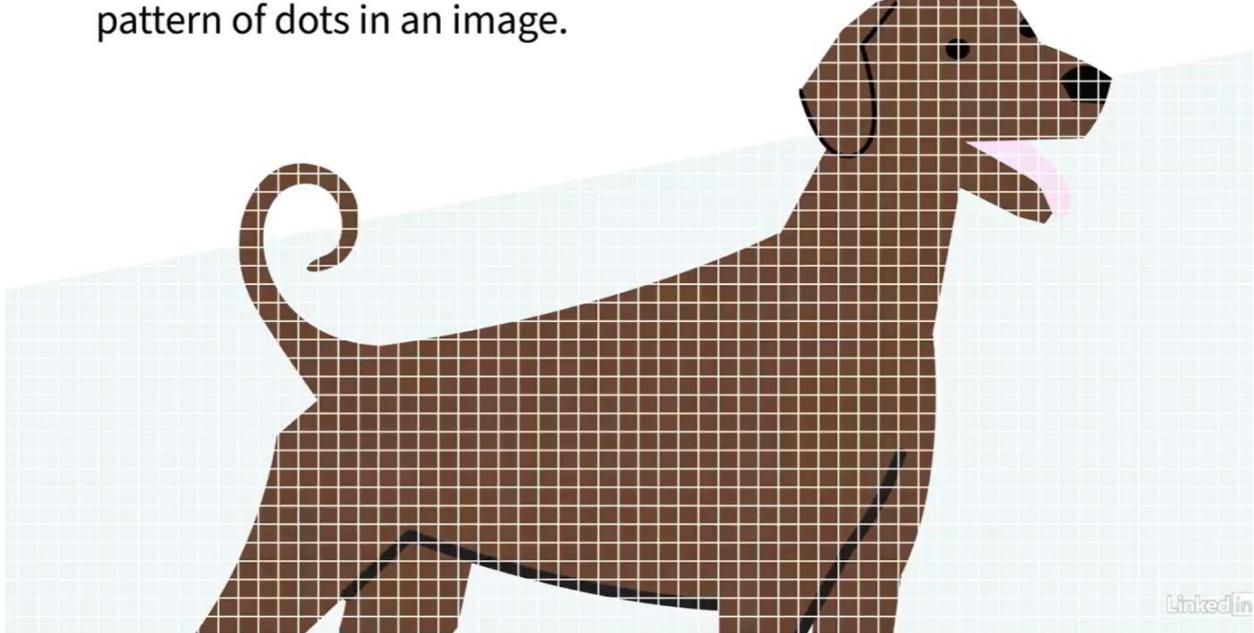
The artificial neural network uses hundreds (or millions) of numerical dials.

- It predicts better such as 64% chance of cat or 95% on rain.
- Input layer | Hidden layer | Output layer



- We label it as dog but neural network does not know.
- It's such scans pixel by pixel and predict if it's a dog or not.
- This is called training the neural network.
- The system sees the dog as a recognizable patterns of dots in an image.

The system sees the dog as a recognizable pattern of dots in an image.



LinkedIn

- Neural networks are machine learning systems.
- Network needs access to huge amounts of data.

Quiz

1. How does an artificial neural network learn?

It looks at the data and makes guesses, then it compares those guesses to the correct answer.

Much like a game you may have played in grade school, an artificial neural network makes guesses and then compares those guesses to the correct answer. These guesses are usually expressed as a percentage. So the network might be 60% sure that the image contains a dog.

How does an artificial neural network learn?

- A computer scientist programs each neuron to have the correct answer to any question.
- Only correct answers go into the input layer, so it learns what's correct from the output layer.
- The hidden layers hide the incorrect answers from the rest of the network.

It looks at the data and makes guesses, then it compares those guesses to the correct answer.
Correct

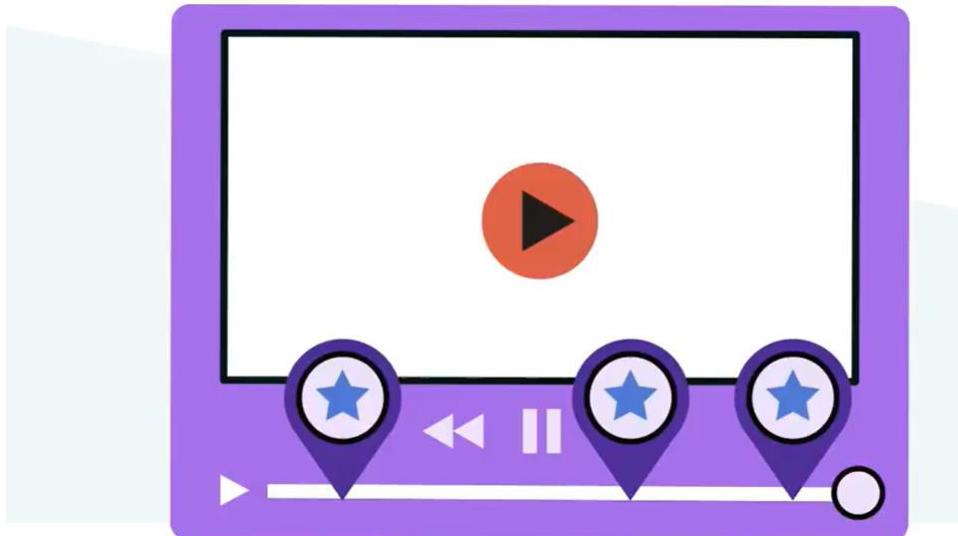
Much like a game you may have played in grade school, an artificial neural network makes guesses and then compares those guesses to the correct answer. These guesses are usually expressed as a percentage. So the network might be 60% sure that the image contains a dog.

Next

Common AI Systems

Searching for patterns in data

- ML systems feed on **data** to **learn** new things.
- Think of ML system of LinkedIn learning, how much you watched, when you stopped.
- With million of users, ML can easily find and rate which videos are highest rated.



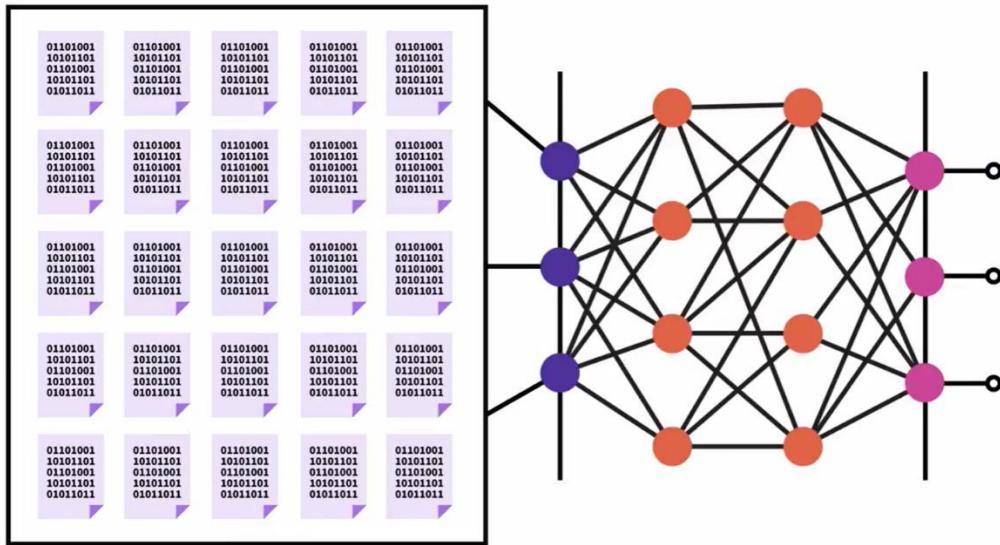
- With this new data you can find
 - Customer interests
 - Industry trends

- New products
- Improve features



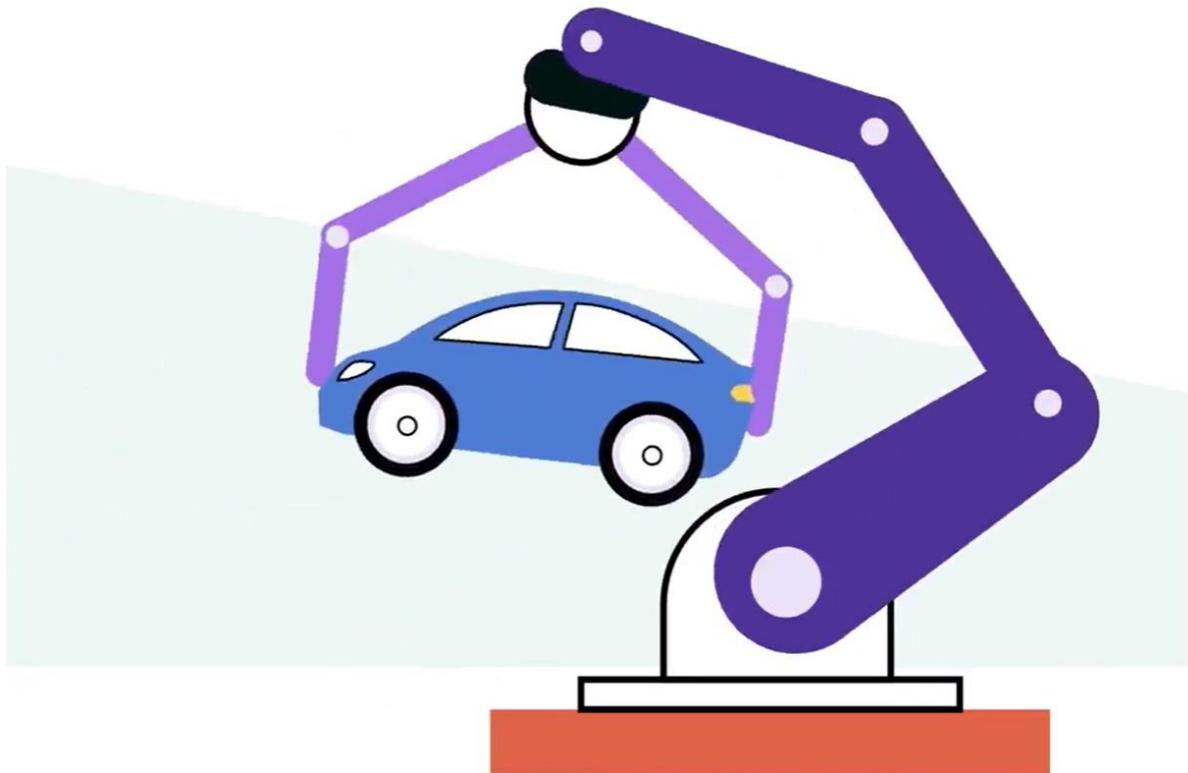
- ◆ Customer interests
- ◆ Industry trends
- ◆ New products
- ◆ Improve features

- Companies like **Google** and **Microsoft** are most enthusiastic about AI.
- Now, ML can have massive data



- You can think AI is black box.
- The network might be sensing things that humans are unable to perceive.
- This can be problem with industries such as insurance and healthcare.

Robotics



-
- Self driving cars



- Robots are impressive but limited what they limited unless they are programmed. They are worked BEST for repetitive tasks.
- Robotics combined with ML gives us many more options.
- Example is Self-Driving vehicles
 - You program to react to everything it might see on the road.
 - That's why the newest vehicles are using ML on artificial neural network.

Self-driving vehicles

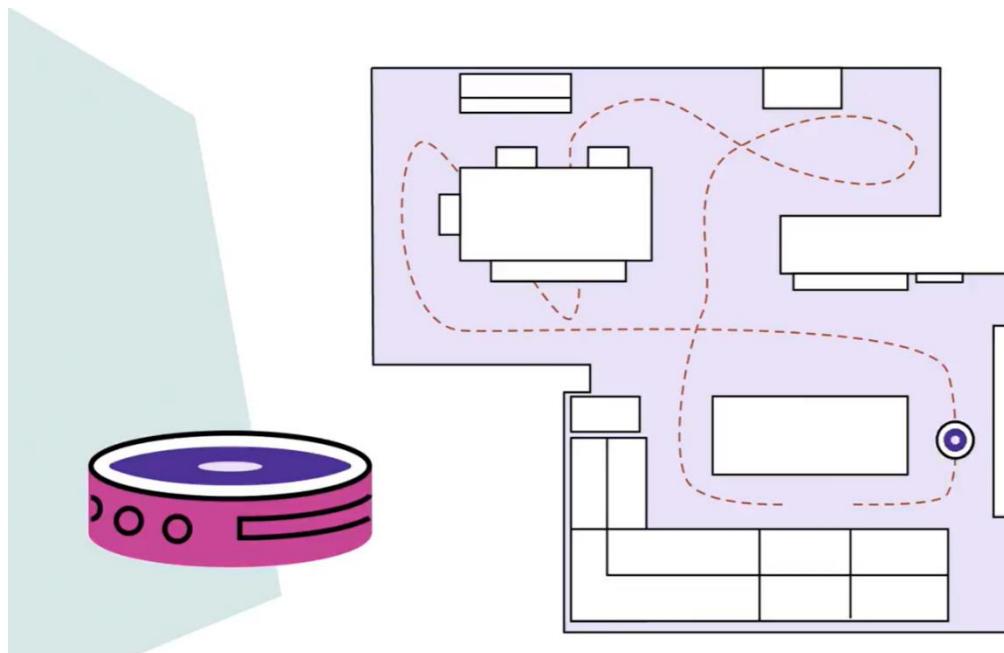


- These vehicles are outfitted with complex sensors that feed data into the network.

Self-driving vehicles

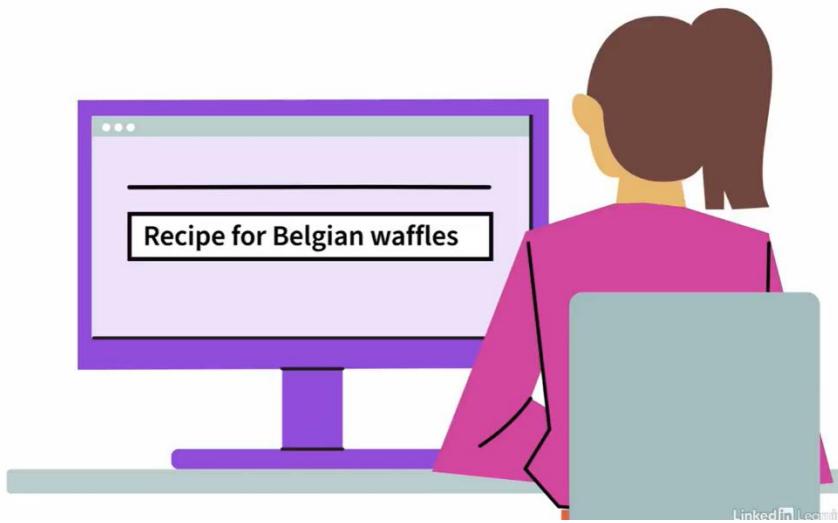


- It needs to be understood that all the roads.
- It also needs look are people animals, other vehicles
- Training the network.
- Other AI system does not complex ML systems such as self-driving cars and they could old fashioned systems such as **Roomba** (Vacuum cleaner) just programmed to avoid bumping into wall



Natural language processing

- Rather typing Recipe for Belgian waffles

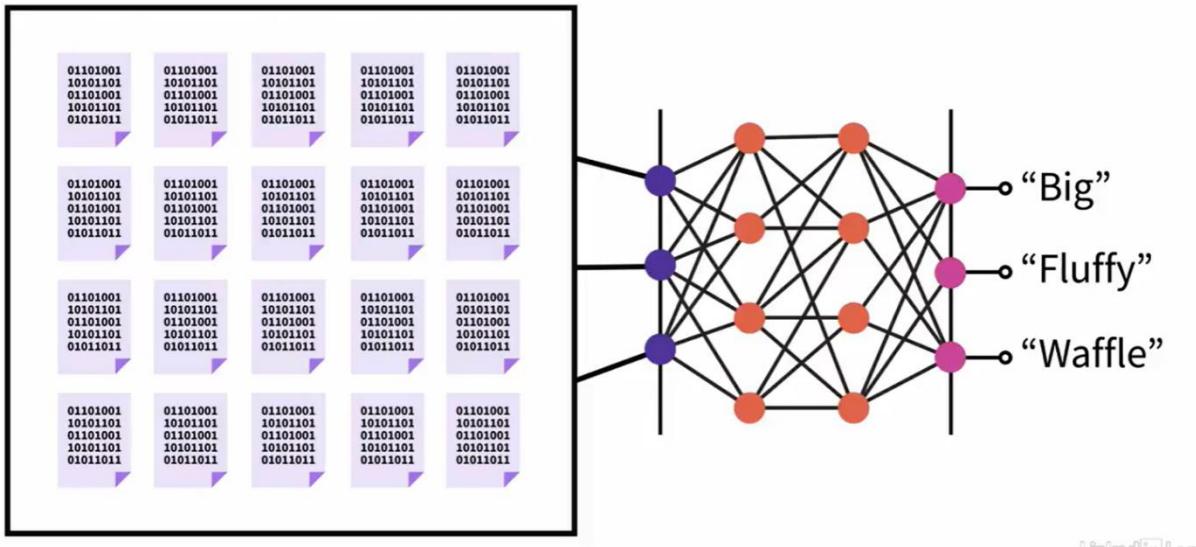


- We can use mobile and ask the same question with NLP



- NLP

Natural Language Processing



LinkedIn Learning

- NLP is not just understanding words but also the **context** and **meaning**.
- Famous Google search was **What is Love?**



- Now, google results are much better results.

Natural Language Processing



The Internet of Things

- IoT

IoT Devices



•

Quiz

1. The healthcare and medical insurance industries caution against using machine learning to search for patterns in data, and they do not want machines making decisions about a person's health. Why?

They may be decisions that **humans cannot understand**.

Although humans program machines, they do not understand exactly how machines identify patterns in large datasets, which can lead to errors.

Question 1 of 3

The healthcare and medical insurance industries caution against using machine learning to search for patterns in data, and they do not want machines making decisions about a person's health. Why?

They may be decisions that humans cannot understand.
Correct

Although humans program machines, they do not understand exactly how machines identify patterns in large datasets, which can lead to errors.

They may be decisions that humans are unable to make.

They may be decisions that will supplant office visits.

[Next question](#)

2. What type of impact does artificial intelligence have on robotics?

Question 2 of 3

What type of impact does artificial intelligence have on robotics?

AI systems can create robots that can more easily learn new tasks.

Correct

Early robotic systems needed to be explicitly programmed for each task. Newer AI systems can allow robots to learn through experience. They can try to mimic someone's behavior or even come up with new actions without being programmed.

AI systems will help robots do very precise work.

Newer robots won't be able to do anything without artificial intelligence.

AI systems can help robots do simple repetitive work.

3. What impact will the Internet of Things (IoT) have on artificial intelligence?

Question 3 of 3

What impact will the Internet of Things (IoT) have on artificial intelligence?

IoT devices will keep artificial intelligence agents from becoming strong AI.

These devices can act as experts to help program expert systems.

These devices will be a great new source of "real world" data.

Correct

Internet of Things or IoT devices can be a wealth of new data for artificial intelligence systems. They attempt to connect the digital world to the physical world. This will allow artificial intelligence systems to make predictions about where people go or how they interact with their devices.

IoT devices can form neurons to help create artificial neural networks.

Next

Labeled and unlabeled data

- Teaching how to play chess

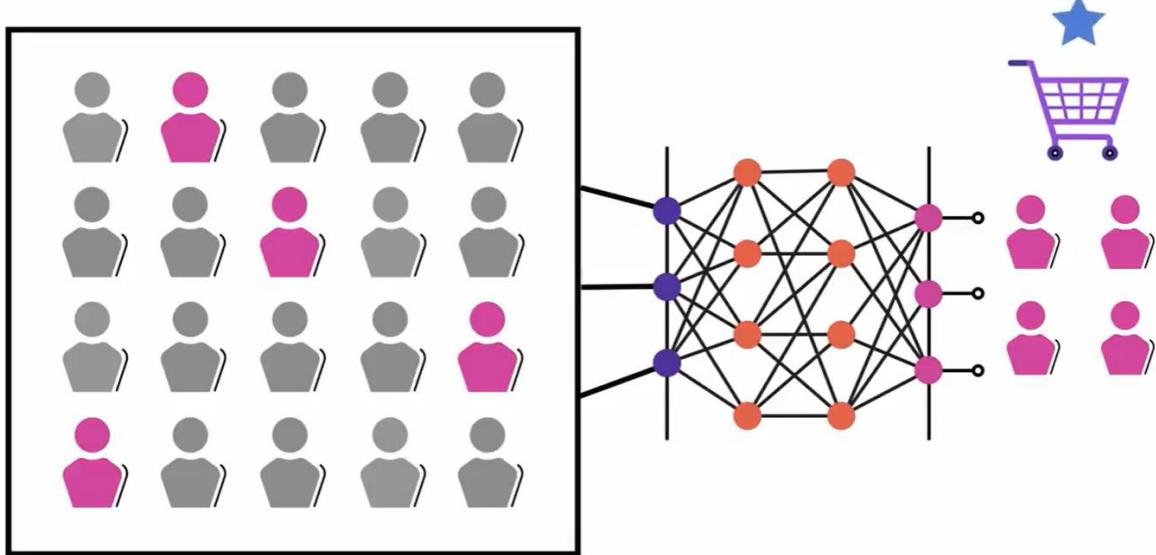
Teaching how to play chess



Supervised learning

- Data scientists acts like a tutor or a child for the machine for the machine.
- Amazon find regular shoppers who always buys

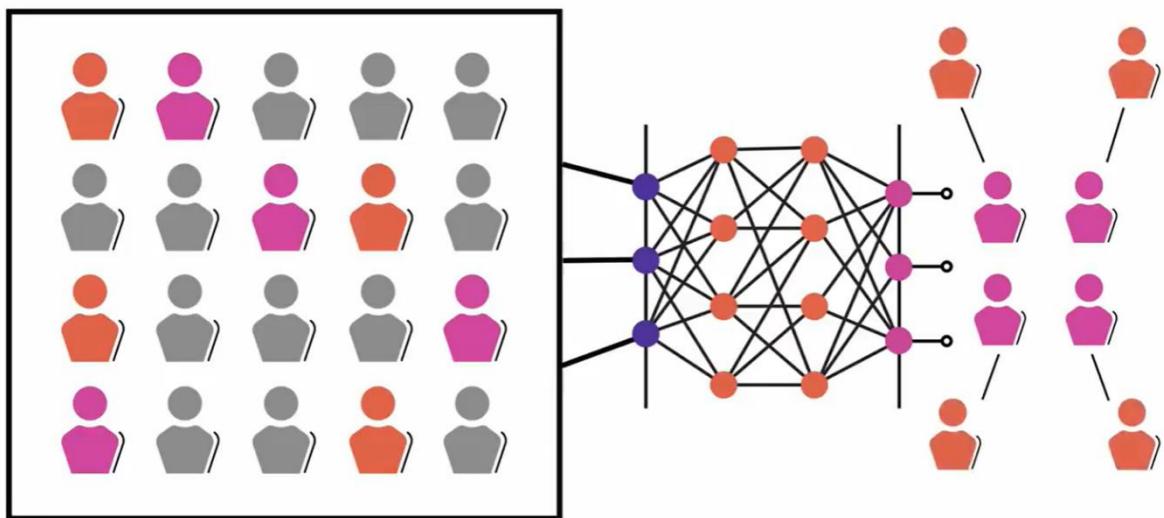
Supervised learning



Unsupervised learning

- Machines make all the observations its own.
- All Amazon to all customer data and system may find its own patterns.

Unsupervised learning



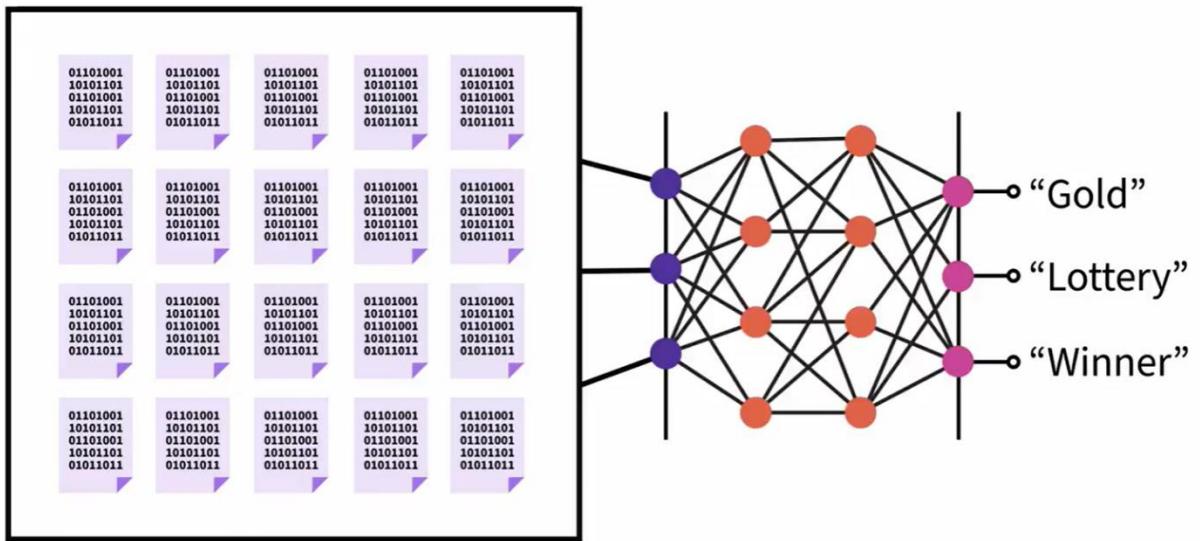
Massive datasets

- Example of Spam filter with programmed instructions



"Gold"
"Lottery"
"Winner"

- ML uses data and not programmed instructions. Use patterns.



Supervised ML

- Training data set

A smaller chunk of data that used machine uses to learn and these algorithms rely on

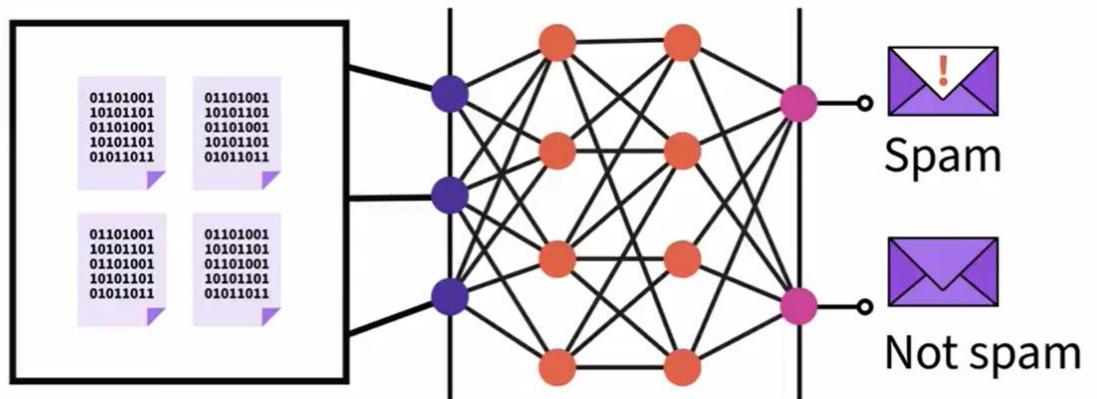
statistics.

Training Data Set

A smaller chunk of data that the machine uses to learn

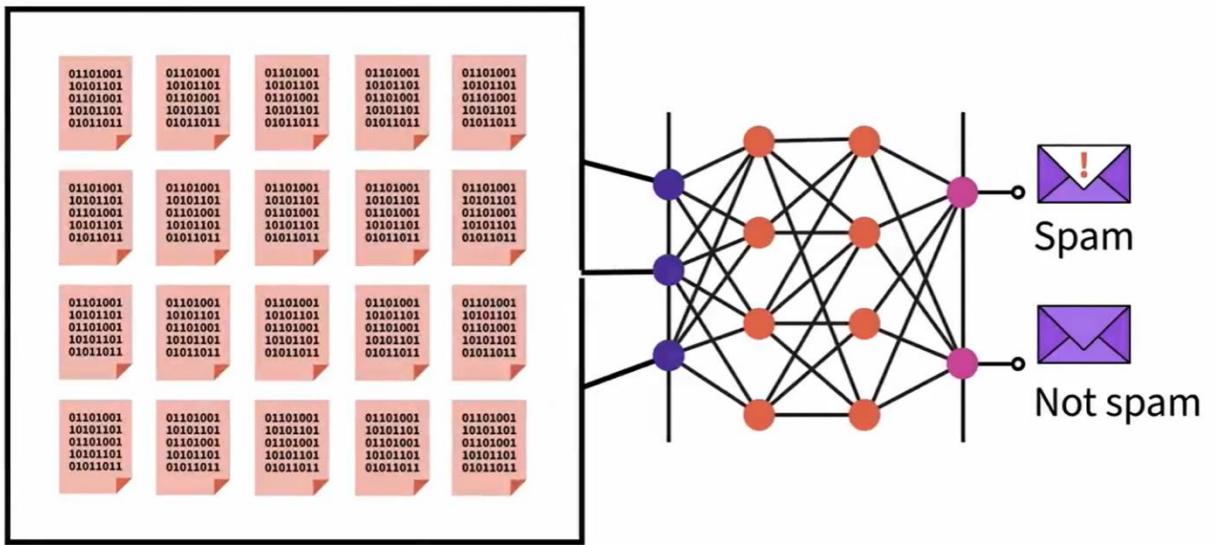
- Machine uses an algorithm help the machine find relationship within the data.

Training data set



- Test set. (**Larger dataset**)

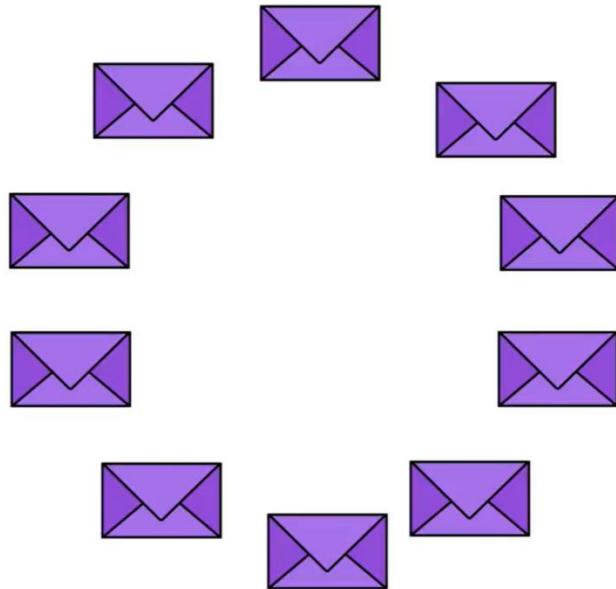
Test data set



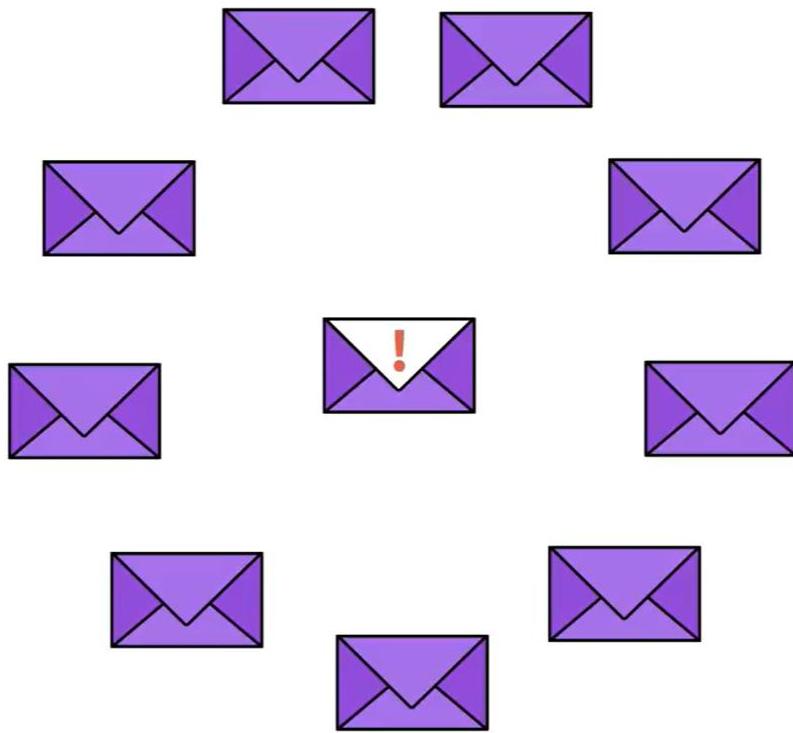
Navigation icons: back, forward, search, etc.

Example of spam filter

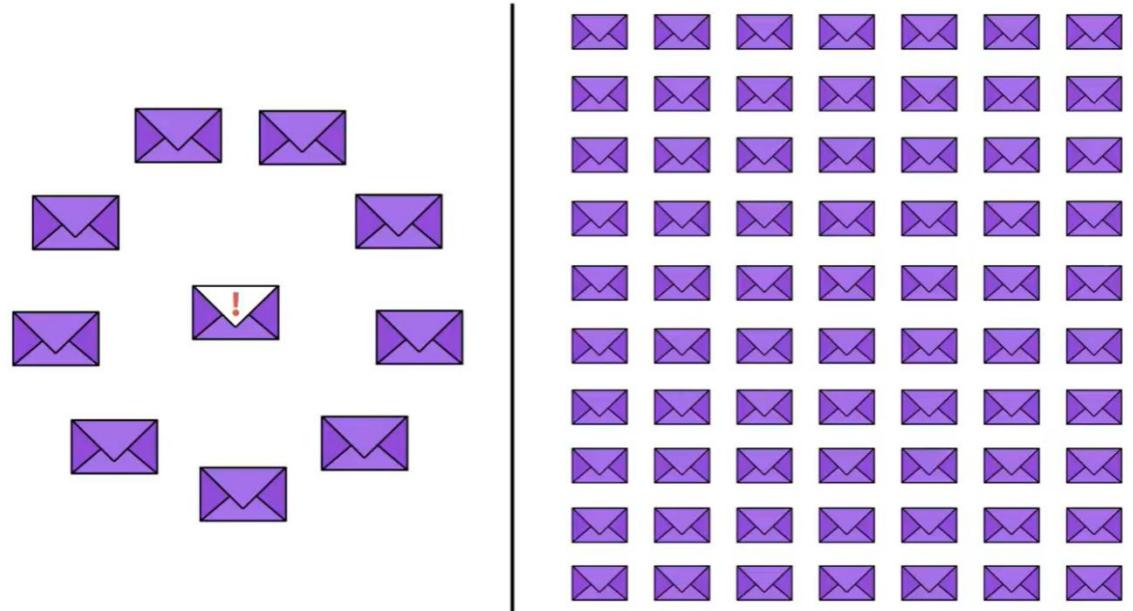
- 10,000 of email messages for our training dataset.



- We build our model.
- Training data has 9,000 regular messages and 1000 labelled as SPAM



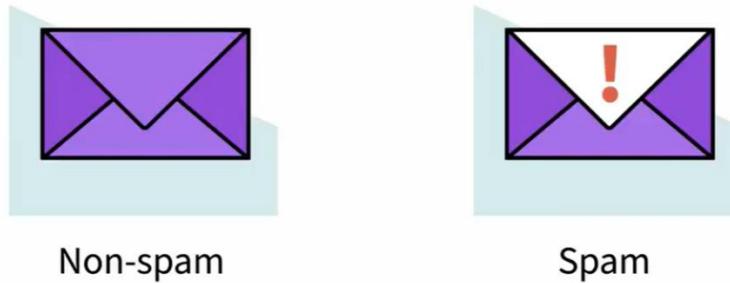
- We **test** data of 1 million records



-

- Test data is unlabeled.
- This model has only 2 options
- Called binary Classification Challenge.

Binary Classification Challenge



-

Quiz

1. A new online camping goods store wants to find connections between products customers buy and other products they might buy. Why would the company use unsupervised learning?

It does not yet have enough customers to make supervised learning meaningful.

If the store had a large number of established customers, it could use supervised learning effectively.

Question 1 of 2

A new online camping goods store wants to find connections between products customers buy and other products they might buy. Why would the company use unsupervised learning?

- Supervised learning is unable to identify connections between unrelated products.
- Connections can be found with any input required by the user.
- It does not yet have enough customers to make supervised learning meaningful.
Correct
If the store had a large number of established customers, it could use supervised learning effectively.

[Next question](#)

2. You're a preschool worker and you want to teach your class the letters in the alphabet. So you draw the letter "B" on the board. Then you ask the two-year-old students to find a block with that same letter. Some of the students correctly find the blocks with the letter "B", but some of the students confuse the letter "B" with the letter "D." So the incorrect students compare their block to the letter "B" on the board, recognize the error and then decide to get another block. What type of learning is this?

supervised learning

Supervised learning relies on labeled data. In this case the two-year-old students would use the letter written on the board as labeled data. Then they would try to classify the unknown data (the blocks) by matching the label. If the student sees that they made a mistake, they adjust and take another guess.

- machine learning
- reinforcement learning
- supervised learning
Correct
Supervised learning relies on labeled data. In this case the two-year-old students would use the letter written on the board as labeled data. Then they would try to classify the unknown data (the blocks) by matching the label. If the student sees that they made a mistake, they adjust and take another guess.
- unsupervised learning

[Next](#)

Classify data

- Like we organizing folders in our computer,
We have to classify our data.

-

Classifying Data



- Airlines companies want to classify their customers.
- Retailers want to classify their highest spenders.
- Search engines want to classify likelihood you will buy something online.

Binary classification

- One of the most popular supervised machine learning challenges.
- Because its simple and powerful.
- All binary classification uses supervised learning.
- Supervised learning requires labelled data.
- You need to first create a training data set.
- Examples

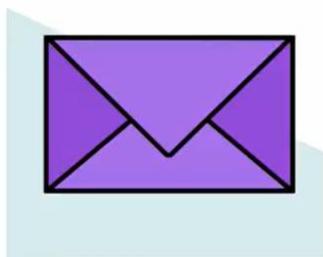
Credit Card Fraud

Binary Classification



Email providers

Binary Classification Challenge



Not spam



Spam

Booking data

- ◆ Booking data
- ◆ Fraudulent transactions
- ◆ Spam

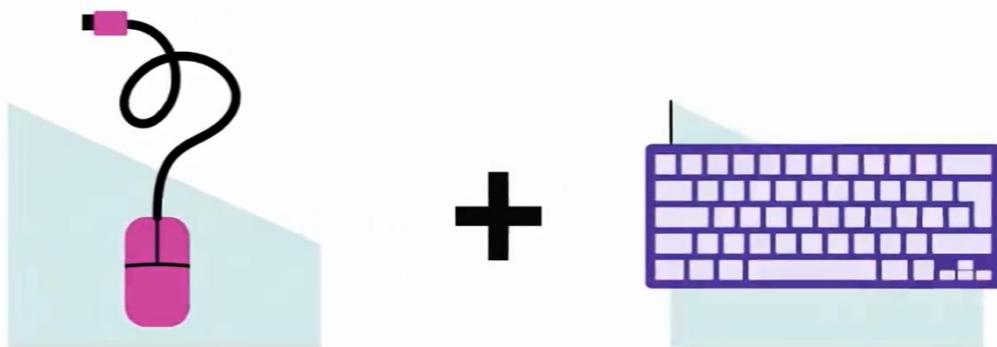


Cluster data

- Classifying your data does not fit every challenge.
- Systems may have massive amount of labelled data.

Data Clusters

- AI System's use of unsupervised learning to create its own **groups of data**.
- Frequent buying in common sites such as mouse and keyboards together



- Supervised learning = Classifying
- Unsupervised learning = Clustering
- Biggest advantage of **clustering** is there is a lot more unlabeled data

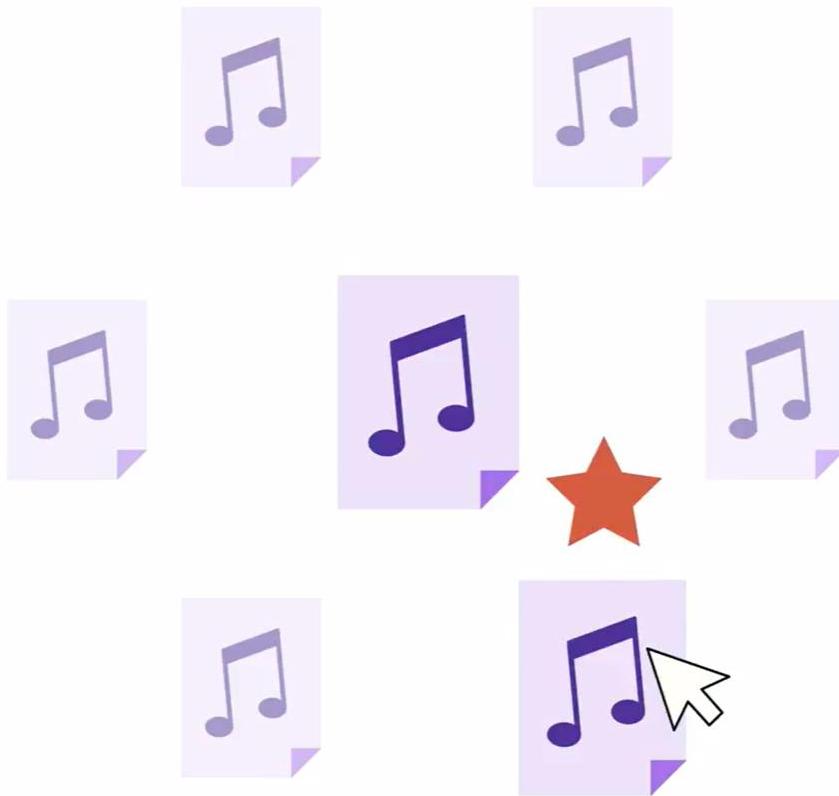
Reinforcement learning

- ML Algorithms that use rewards as a way to give the system incentive to new patterns.

Spotify



- Spotify **Discover** weekly compares **your favorite songs with bunch of related songs**.
- **ML Algorithms** tracks every time you click and play a song.
- It also keep track of how long you listen.
- Data scientists design the algorithm so that every time you click a related song, it get a **tiny digital reward**.
- Its almost like money for ML system.
- When you click on recommended song.



Q-learning

- Reinforcement learning that will find the best course of action, given the current state of the agent.
- It starts with **Q to 0**.



- Then you would have machine learn the actions that improve the conditions.



- The state of Q would go up each time you clicked a song.



- Think **Q** is **bank account** It can earn and then see balance grow.



- Once you select some songs, it will show as **Discover Weekly**

Quiz

- Why might you want to use reinforcement learning instead of unsupervised learning?

Reinforcement learning allows the machine to make predictions and create strategies instead of just clustering the data.

- Reinforcement learning can **create strategies** to better **find patterns in the data**.
- Unsupervised learning just tries to **create clusters based** on what it already sees in the data. So, if you were developing an **AI system to buy related items**, an unsupervised system would create a cluster of items frequently bought together by other customers. A reinforcement system might invent a strategy to encourage customers to purchase something new.

Why might you want to use reinforcement learning instead of unsupervised learning?

Reinforcement learning doesn't require training and test data in the same way as unsupervised learning.

Reinforcement learning allows the machine to make predictions and create strategies instead of just clustering the data.

Correct

Reinforcement learning can create strategies to better find patterns in the data. Unsupervised learning just tries to create clusters based on what it already sees in the data. So if you were developing an AI system to buy related items, an unsupervised system would create a cluster of items frequently bought together by other customers. A reinforcement system might invent a strategy to encourage customers to purchase something new.

Reinforcement learning is a great way to cluster data based on items that are frequently bought together.

Reinforcement learning allows the machine to create binary classifications based on labeled data.

2. What is one of the greatest challenges with supervised learning binary classification?

You need a lot of pre-classified or labeled data for the training set.

Supervised machine learning relies on labeled data for the training set. That means if you wanted to create a system that looked for dogs in images you needed to have tens of thousands of images known to contain dogs. Sometimes it's difficult to find that much labeled data.

Question 2 of 2

What is one of the greatest challenges with supervised learning binary classification?

You need a lot of pre-classified or labeled data for the training set.
Correct

Supervised machine learning relies on labeled data for the training set. That means if you wanted to create a system that looked for dogs in images you needed to have tens of thousands of images known to contain dogs. Sometimes it's difficult to find that much labeled data.

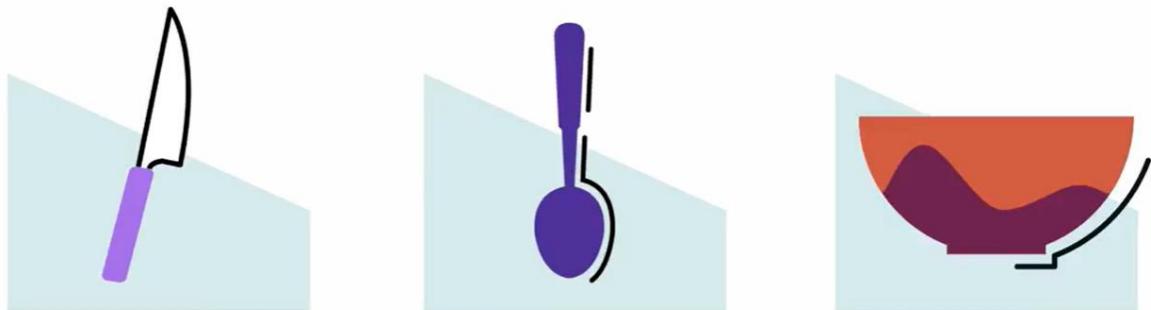
These systems are complex and inherently unreliable.

You have to come up with multiple classifications.

You have to let the machine come up with its own classification labels.

Common algorithms

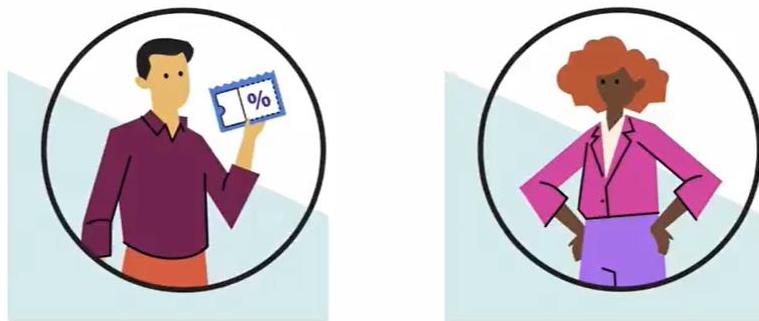
- Most of ML Algorithm borrowed from statistics.
- Each of these ML algorithms are like a chef's kitchen tool.



Examples

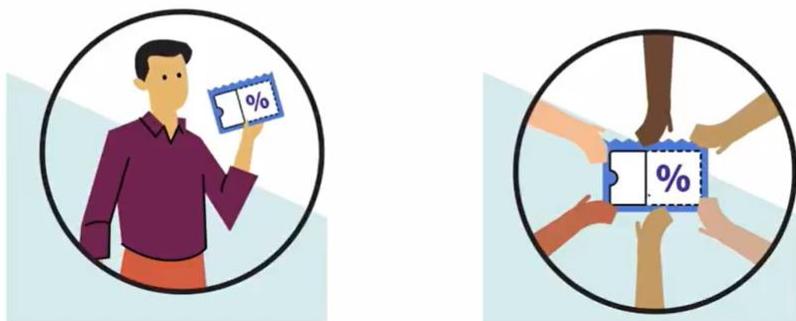
- Credit card company uses promotion and start with Binary classification

Binary classification



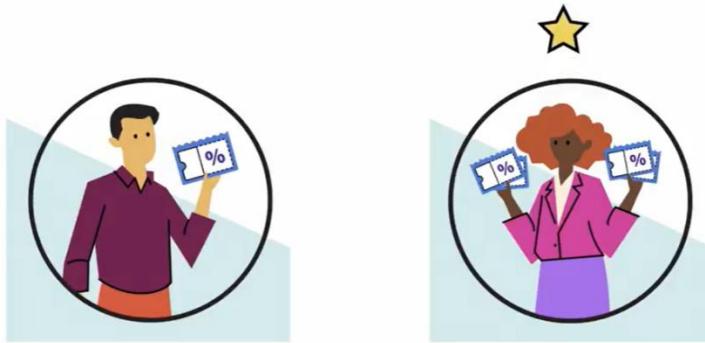
- Then they used binary classification to unsupervised learning

Binary classification to unsupervised learning



- Some users ALWAYS use promotion, “**Super Users**”

"Super Users"



- Find right **algorithm** for each **task**.

K-nearest neighbor

- Multi class classification is called as K nearest neighbor.

K-nearest neighbor (KNN)

- An algorithm that plots new data and compare it existing to existing data.

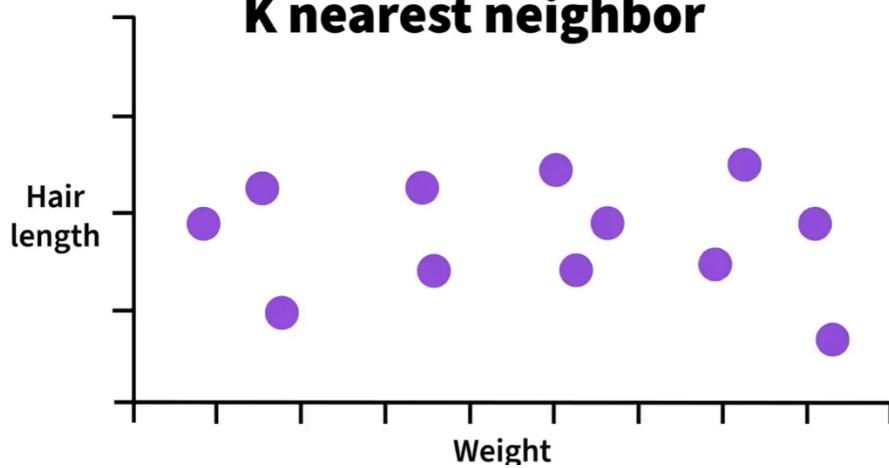
Euclidean Distance

- A mathematical formula that can see the distance between data points.
- Classification predictors
 - To start out, you might want to create two key features.
 - This will help you classify the dogs that share the same breed.

K-nearest neighbor Plot explanation

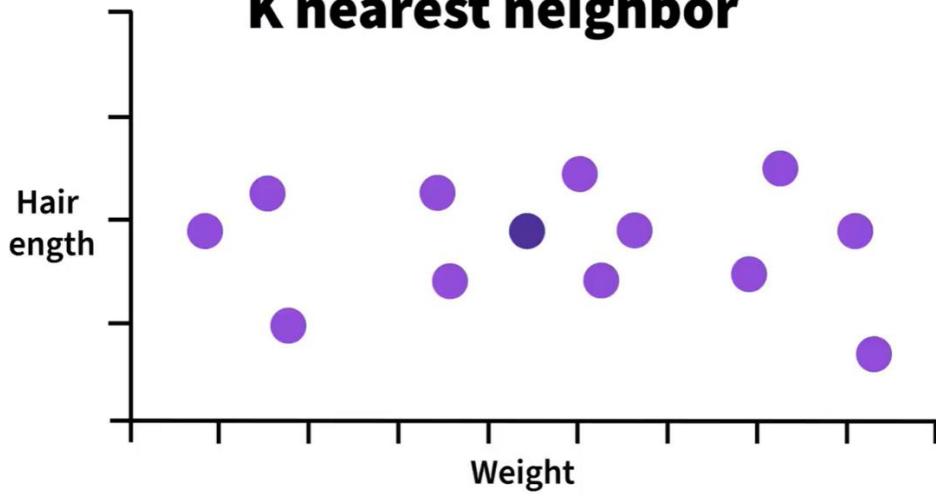
- X Y Diagram
- Y – Hair length
- X – Weight
- 1000 labeled dogs for training set.

K nearest neighbor

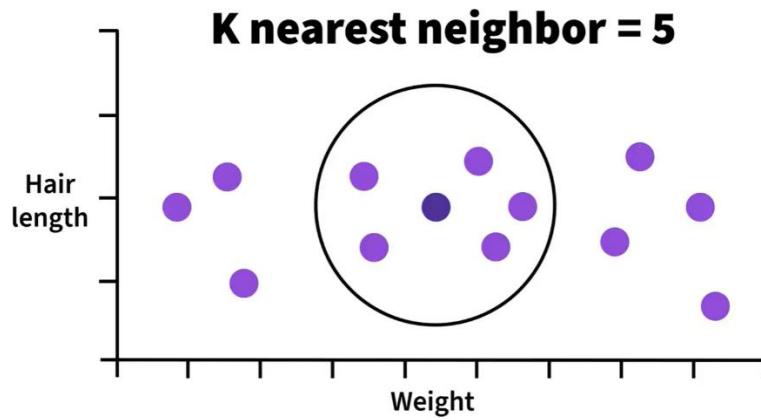


- Put unknown dog in the chart

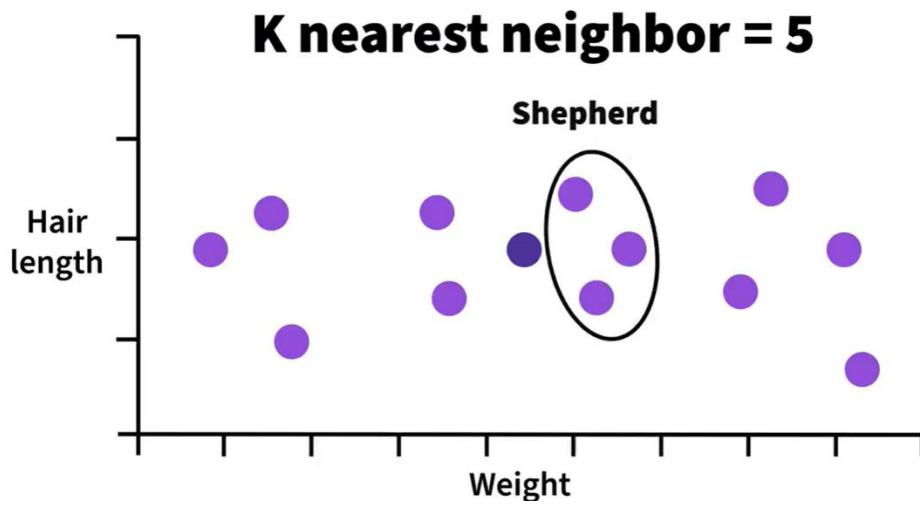
K nearest neighbor



- Now, we take K of 5

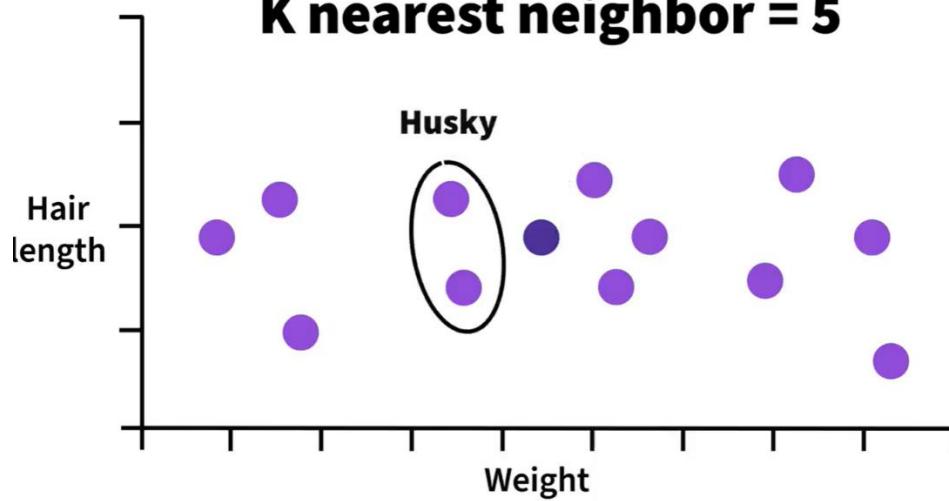


- 3 of them are Shepherd



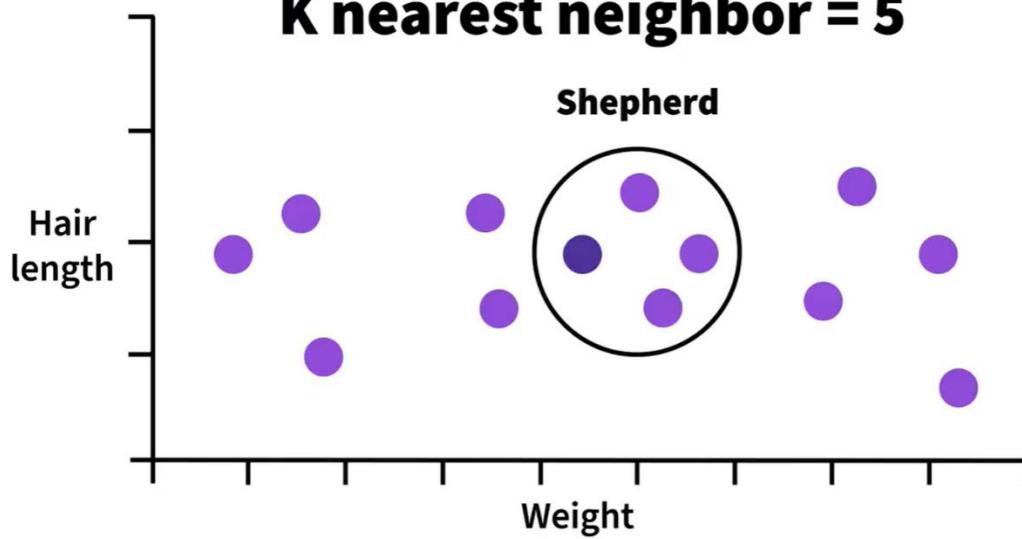
- And other 2 are Husky

K nearest neighbor = 5



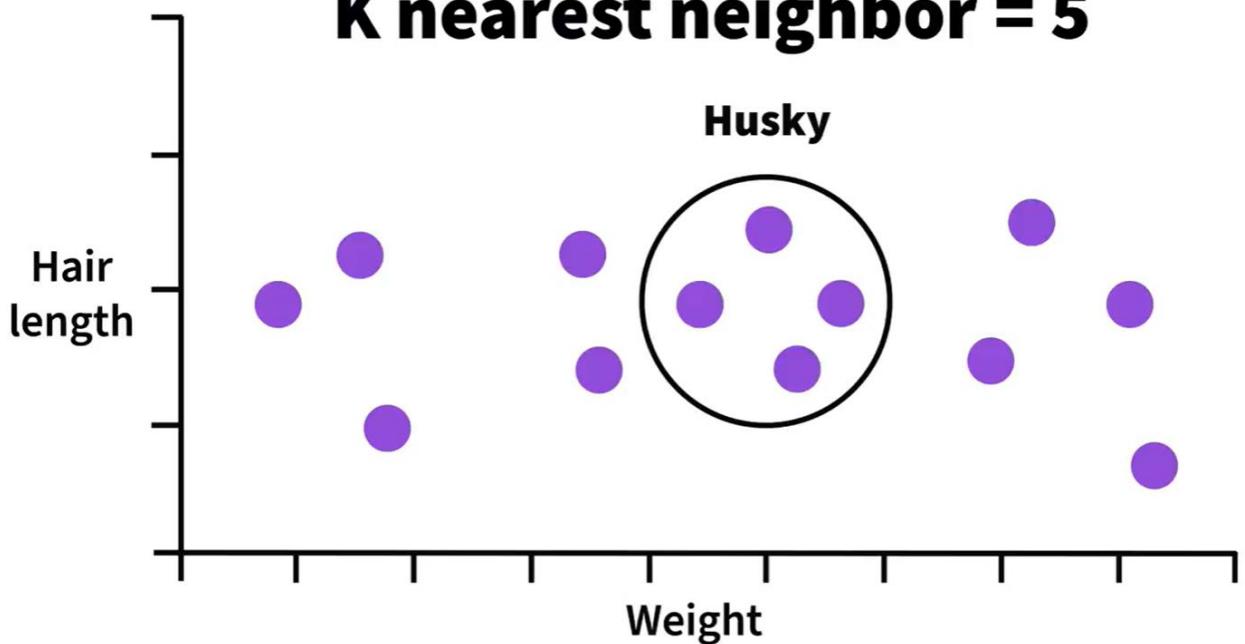
- Unknown dog should be Shepherd

K nearest neighbor = 5



- And reasonable to be Husky

K nearest neighbor = 5



© DeepLearning.AI

- Common used in Finance for best stocks.

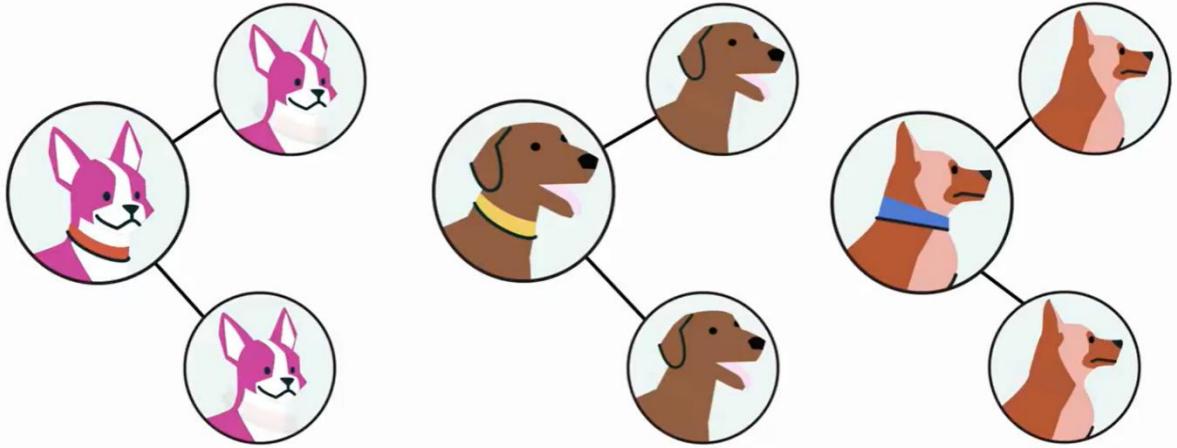
K-means clustering

- It is an unsupervised ML algorithm.
- Its used to create clusters based on what the machine sees in the data.
- Dogs play together in a shelter
- Groups are 3 in number

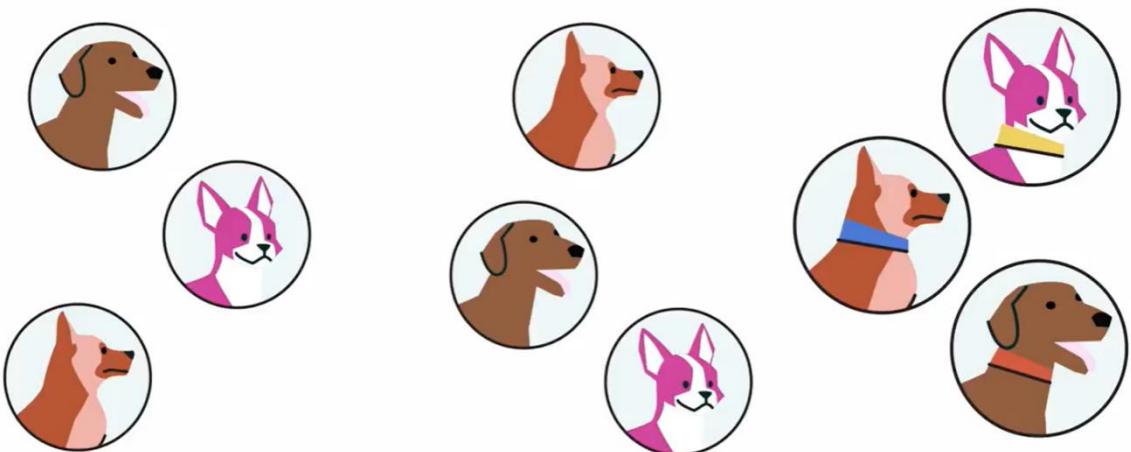
"Centroid" dogs



"Centroid" dogs



"Centroid" dogs



Actual use case

- Retailer cluster into 3 categories
- Loyal Customer
- Regular customers
- Low Prices shoppers.

- ◆ Loyal customers
- ◆ Regular customers
- ◆ Low priced shoppers



Regression

Regression Analysis

- A **supervised** ML algorithm that looks at **predictors and the outcome**.
- **Outcome** and
- **Predictor**

- Once you have training data, you can make a prediction

Example

- People buy convertibles in summer and SUV in winters.
- Months as predictor and they mapped that against the sales of certain vehicles

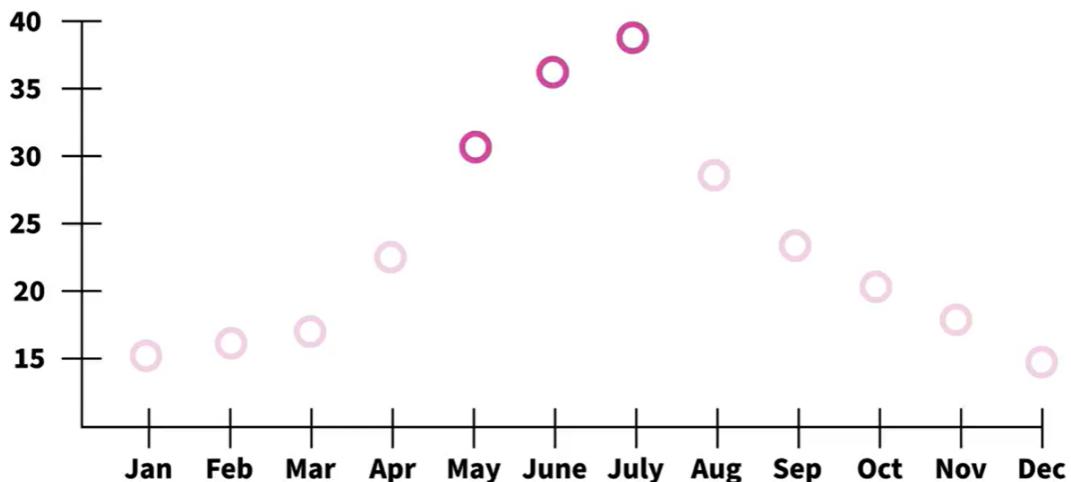
X Y Diagram

- Y- Months as predictor
- X – Sales by vehicle type
- Then they looked at the trend line.

Convertibles sales high in month on May, June, and July

○ Convertibles

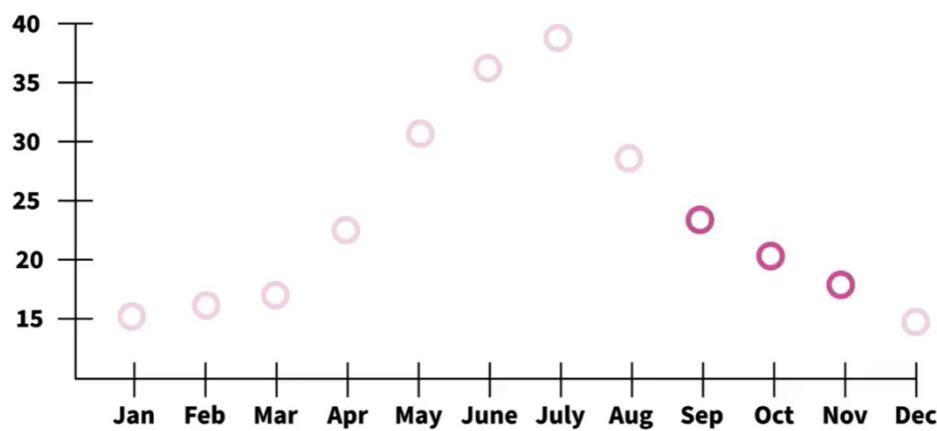
Predicted Buying Trends Regression



Sales will go down in Oct, Nov, Dec

○ Convertibles

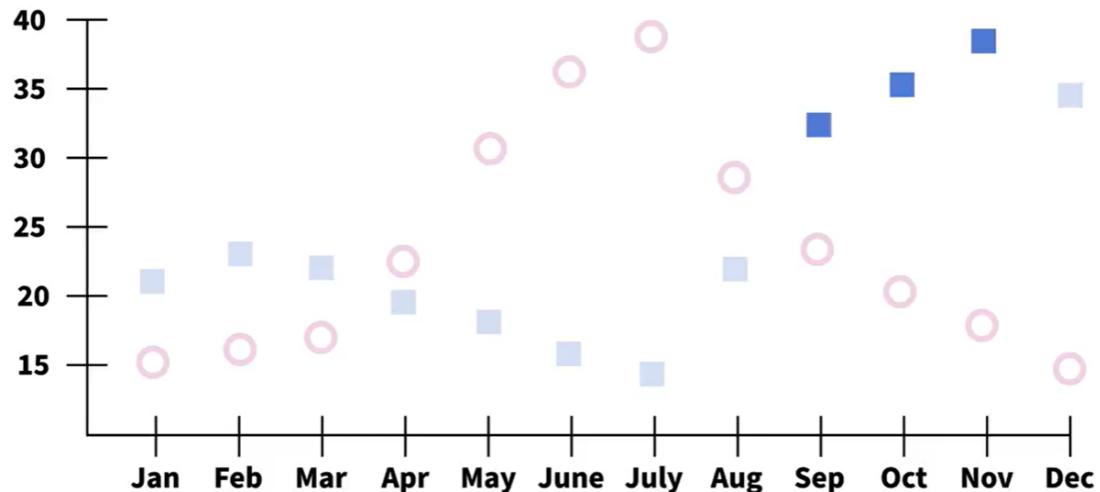
Predicted Buying Trends Regression



For SUVs and Trucks its opposite



Predicted Buying Trends Regression

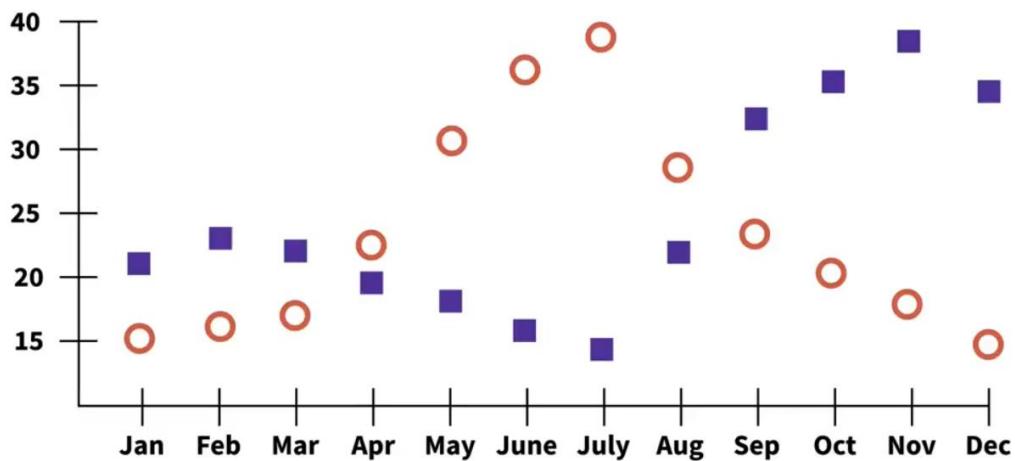


For e.g.

Walmart changes items depending on people taste.



Predicted Buying Trends Regression



•

Naive Bayes

- Sometime you want to classify items based on many features in the data.
- Naive Bayes Algorithm
Assumes that all the predictors are **independent** from **one another**.
- Example of Breeds using Naïve Bayes

Example

- 3 Breeds

Breeds



Terriers



Hounds



Sport dogs

- Predictors (features)
 - Hair length
 - Height
 - Weight

Class Predictor probability

- Find unknown dog category



Terrier

Hound

Sport

Hair	0.4	0.1	0.5
Height	0.2	0.1	0.7
Weight	0.1	0.05	0.85

o

Use Case

- o Detecting Fraud
- o Cybersecurity

Quiz

1. You work for a company that's selling electric cars to consumers. The company wants to get the maximum amount of value from its **advertising dollars**. So it wants to ramp up advertising when it thinks that customers would be most interested in purchasing an electric car. Your data science team wants to create a regression analysis based **on fuel prices**. How might this look on an XY diagram?

Create a trendline with fuel prices along the X axis and electric car sales on the Y axis

To do a regression analysis, data science teams will typically plot their data on an XY diagram. Then they will see if there are any trends in the data by creating a line in the center of the largest data point groupings. This is typically called a trendline. If the data has a clear trendline then it will be easier to predict relationships between the two variables. In this case, there might be a clear trend where when fuel prices rise, people are more likely to buy electric cars.

You work for a company that's selling electric cars to consumers. The company wants to get the maximum amount of value from its advertising dollars. So it wants to ramp up advertising when it thinks that customers would be most interested in purchasing an electric car. Your data science team wants to create a regression analysis based on fuel prices. How might this look on an XY diagram?

- Put electric car sales on both the X and Y axis.
- You don't need to put anything on the Y axis; just put fuel prices on the X axis and the trendline.

Create a trendline with fuel prices along the X axis and electric car sales on the Y axis.

Correct

To do a regression analysis, data science teams will typically plot their data on an XY diagram. Then they will see if there are any trends in the data by creating a line in the center of the largest data point groupings. This is typically called a trendline. If the data has a clear trendline then it will be easier to predict relationships between the two variables. In this case, there might be a clear trend where when fuel prices rise, people are more likely to buy electric cars.

- Put fuel prices in dollars on the X axis and fuel prices in rupees on the Y axis.

[Next question](#)

2. How is K Nearest Neighbor like the old saying, “birds of a feather flock together?”

Classify unknown data against the closest data that you do know.

This old saying is one of the best ways to remember the key strength of K Nearest Neighbor. This machine learning algorithm is a quick way to classify data that's similar and might “flock together.”

Question 2 of 2

How is K Nearest Neighbor like the old saying, “birds of a feather flock together?”

Multiclass classification is like a flock of birds that needs to be classified.

Incorrect

K-nearest neighbor is a way to classify versus the specific data that you are trying to classify.

Classify unknown data against the closest data that you do know.

Correct

This old saying is one of the best ways to remember the key strength of K Nearest Neighbor. This machine learning algorithm is a quick way to classify data that's similar and might “flock together.”

You want to fly through the data as quickly as possible.

Make sure you know everything about the data before you try to classify.

Select the best algorithm

Type of Algorithms

Supervised Learning and Classifying

- ◆ K nearest neighbor
 - ◆ Regression analysis
 - ◆ Naive bayes
 - ◆ K means clustering
-
- K nearest neighbor
 - Regression analysis
 - Naïve bayes
 - K mean clustering – Unsupervised

Ensemble modelling

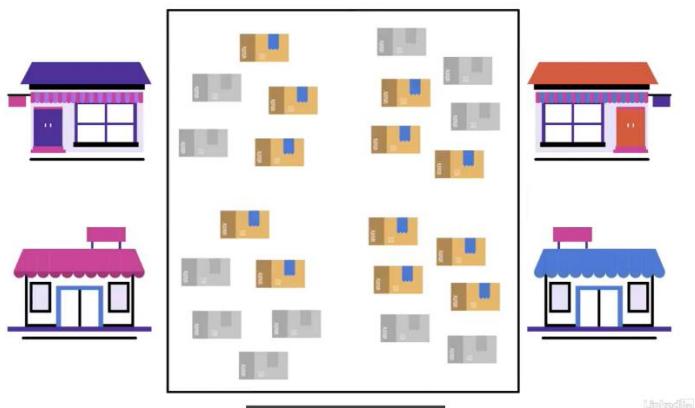
- Bagging
 - When you use several versions of **same** ml algorithm
- Stacking
 - When you use several **different** ml algorithm.

Example

- Retail shop chain, items just before check out.



- Used enable of ML algorithm
- Used K near algorithm and Navie bayes



Follow the data

- Bias and Variance

Bias

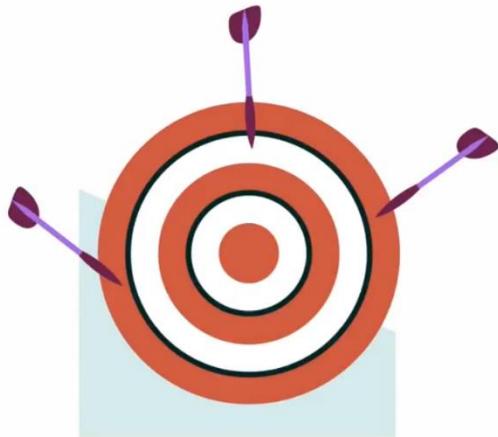
- The gap between the predicted value and actual outcome.

Example



High bias and low variance

- High bias and low variance



High bias and high variance

- High bias and low variance



Low bias and low variance

- Low bias and low variance

Overfitting and underfitting

- An AI system can create simple rules in its training data that don't work well with the larger test data

Underfitting

- Underfitting the data to the model.

Overfitting

- Overfitting the data model to the model.

Example

- Estimate the value of home
- You could use Naïve Bayes algorithm.

Predictors

- Square footage
- Location
- Number of bathrooms
- Number of bedrooms.

Predictors

- ◆ Square footage
- ◆ Location
- ◆ Number of bathrooms
- ◆ Number of bedrooms



- Add more predictors

Quality of view

Modern appliance

Flooring

Walkability

Add More Predictors

- ◆ Square footage
- ◆ Location
- ◆ Number of bathrooms
- ◆ Number of bedrooms

- ◆ **Quality of view**
- ◆ **Modern appliances**
- ◆ **Flooring**
- ◆ **Walkability**



Another example (ChatGPT)

Underfitting:

Suppose we have a dataset of students' **exam scores** (feature) and **corresponding hours of study** (target). If we fit a **linear regression model** to this data and the resulting line is **almost flat or has a very low slope**, it indicates **underfitting**. This means the model is **too simple to capture the underlying relationship between hours of study and exam scores**. It fails to generalize well to the data and performs poorly on both the training and test datasets.

Overfitting:

Continuing with the same dataset, if we fit a higher-degree polynomial regression model (e.g., degree 10) to the data and the resulting curve fits the training data extremely well, including all the noise and fluctuations, but **performs poorly on the test data**, it indicates overfitting. In this case, the model has learned the training data too well, capturing even the noise, but fails to generalize to new, unseen data. As a result, it performs well on the training data but poorly on the test data, showing high variance.

Quiz

1. What is ensemble modeling?

This is when you use a mix of different machine learning algorithms or data to improve the outcome.

Ensemble modeling is when you use **several machine learning algorithms to make better predictions**. Two of the most popular techniques are **bagging** and **stacking**.

- a) Bagging uses the **same machine learning algorithm with different data sets** to improve the prediction power.
- b) Stacking can use **several different machine learning algorithms “stacked”** on top of each other to improve the predictions.

Question 1 of 3
What is ensemble modeling?

This is when you use a mix of different machine learning algorithms or data to improve the outcome Correct
Ensemble modeling is when you use several machine learning algorithms to make better predictions. Two of the most popular techniques are bagging and stacking. Bagging uses the same machine learning algorithm with different data sets to improve the prediction power. Stacking can use several different machine learning algorithms “stacked” on top of each other to improve the predictions.

This is when you use machine learning to perform music composition.

This is when you mix the training data with the test data to improve the machine learning algorithm.

This is when you use supervised and unsupervised machine learning together to make better predictions. Incorrect
Ensemble modeling pertains to algorithms, not the type of machine learning.

2. You work for a credit card company that's trying to do a better job identifying fraudulent transactions. So your team uses unsupervised learning to create clusters of transactions that are likely to be fraudulent. The machine identified that when customers are buying electronics it's much more likely to be a fraudulent transaction. So you use this model for your new fraud detection system. Then customers started to complain that they couldn't use their credit cards to purchase any electronics. What is the challenge with your model?

You underfit the model to the data, the simple rule made too many inaccurate

predictions.

When you create a model, you need to be careful not to underfit or overfit the data. Sometimes you can identify patterns **that work with a small set of data but that doesn't fit when you start to look at larger datasets**. This is called **underfitting the data**.

Other times you can add more variables. This can create a lot of complexity and you might miss data outliers (data that is close but doesn't quite fit the model). This is called **overfitting the data**.

You used too much data to train the algorithm how to make predictions.

You used unsupervised learning when you should have used supervised learning.

You overfit the model to the data, the added complexity made it difficult to manage the system.
Incorrect
Overfitting would not result in the error in the scenario.

You underfit the model to the data, the simple rule made too many inaccurate predictions.
Correct
When you create a model, you need to be careful not to underfit or overfit the data. Sometimes you can identify patterns that work with a small set of data but that doesn't fit when you start to look at larger datasets. This is called underfitting the data. Other times you can add more variables. This can create a lot of complexity and you might miss data outliers (data that is close but doesn't quite fit the model). This is called overfitting the data.

Next question

3. How does the bias-variance trade-off affect machine learning?

If the machine makes a change to one, it must consider how the other is affected.

For example, correcting high bias could lead to higher variance, which would make the data less reliable.

Question 3 of 3
How does the bias-variance trade-off affect machine learning?

If the machine makes a change to one, it must consider how the other is affected.
Correct
For example, correcting high bias could lead to higher variance, which would make the data less reliable.

The machine will adjust both until there is low bias and low variance.

The machine will get either bias or variance low, which will then bring the other to low.

Next

Build a neural network

- We might have too much data.
- Orgs use Artificial Neural Networks

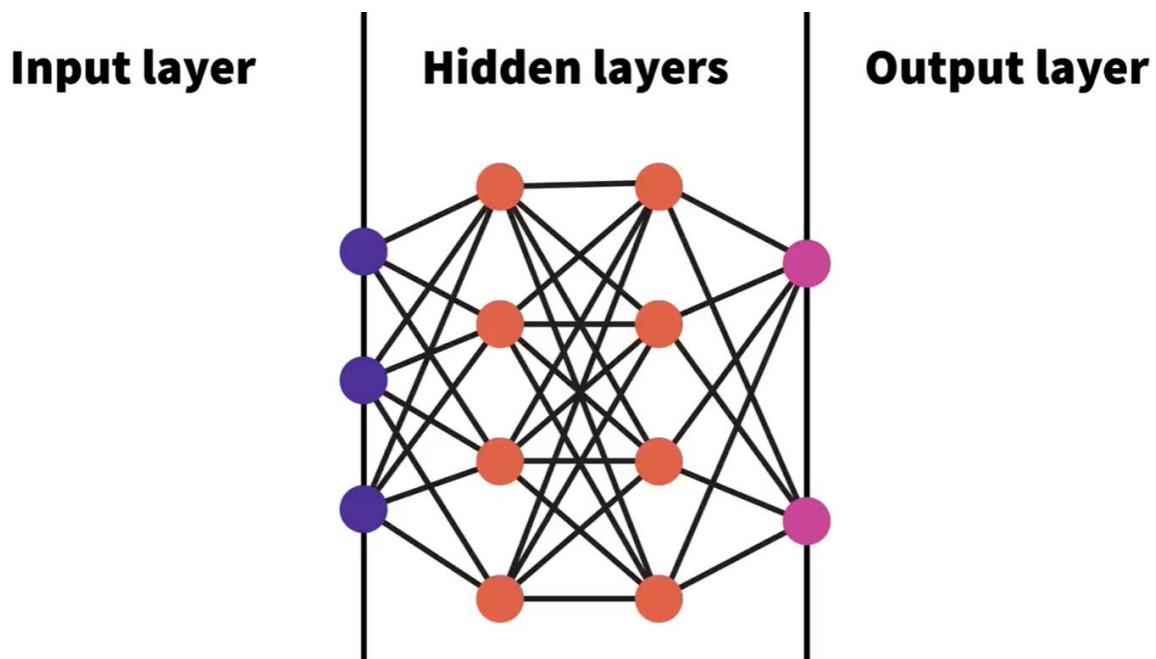
Artificial Neural Networks

- A type of ML that uses a structure like the human brain to break down massive datasets.
- It breaks down into much smaller pieces.

Architecture of Artificial Neural Networks

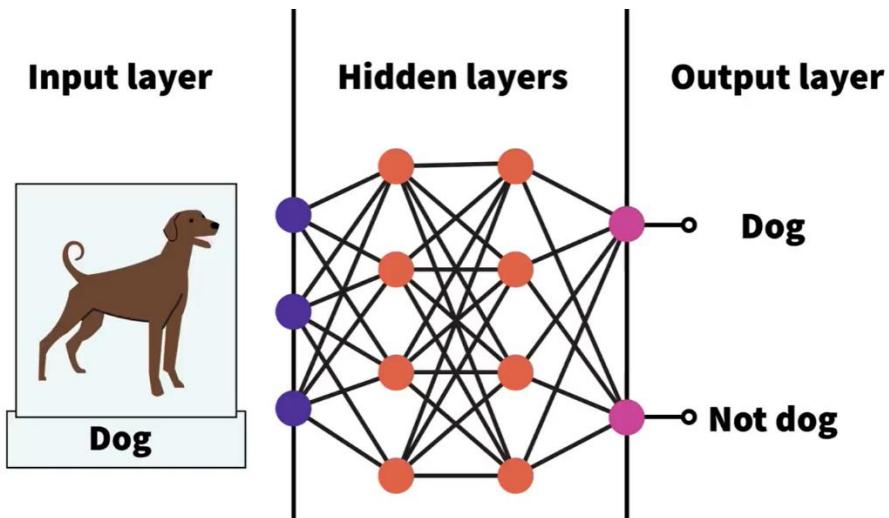
- Input layer
- Hidden layer
- Output layer

If network has a lot of hidden layer, then it called as **deep learning** artificial neural network.

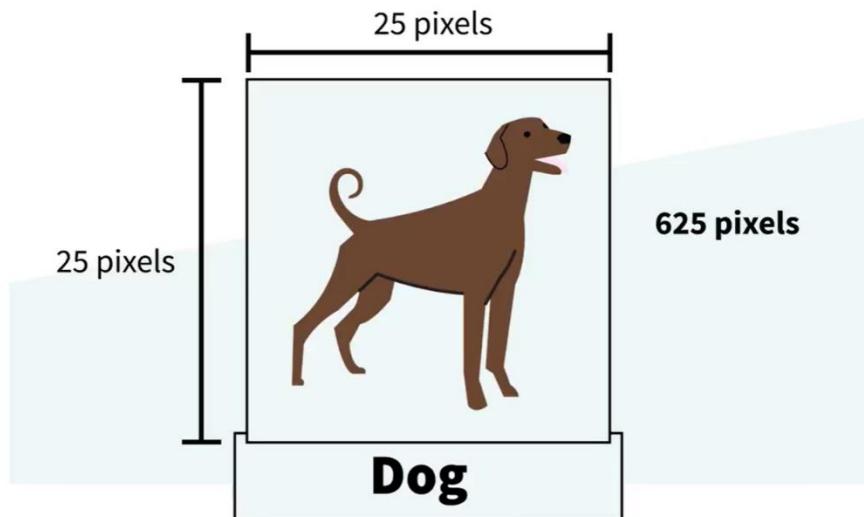


Example

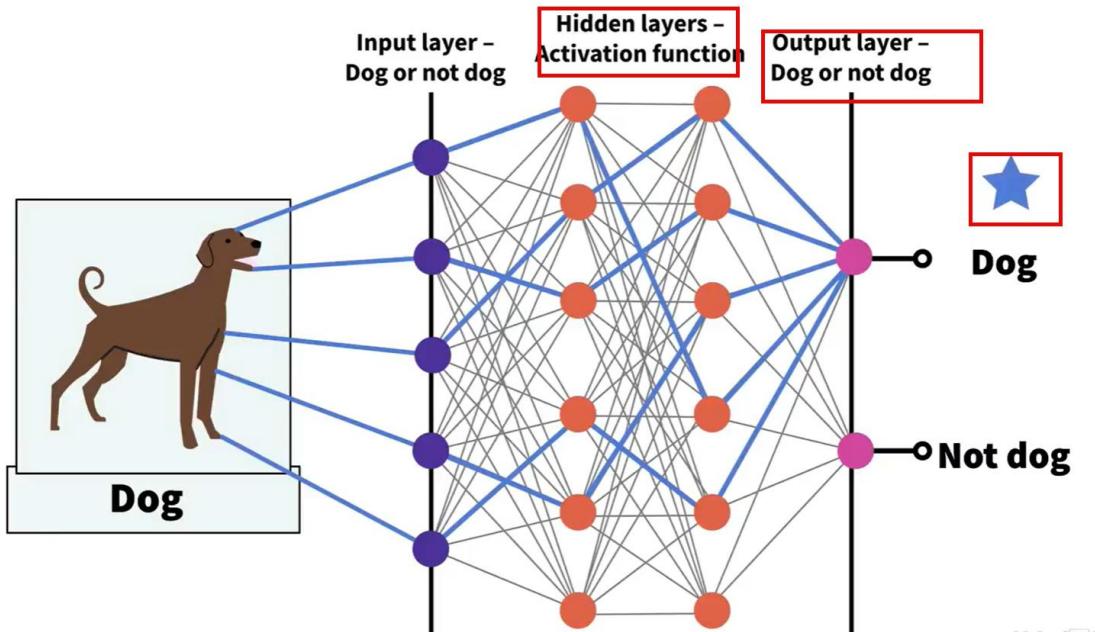
- Binary classification of dog or not dog



- Images is just a collection of pixels with different brightness and contrast.



- This inputs is fed to hidden layer
- Hidden layers – has **Activation function**.
- An Activation function is like a tiny gateway. It lets the neuron decide whether it wants to send the data to the next hidden layer in the network.
- Each hidden layer feeds the pixel data forward to next hidden layer.



- Since the pixel data moves through the layers from **left to right** is called as **Feedforward Neural network**.
- Advantage of Artificial neural network is that they are self-tuning. Similar as musical instruments.
- Each of the two neurons in the **output layer will have a probability score**.
- **Artificial neural network** is most often used **in supervised learning**.

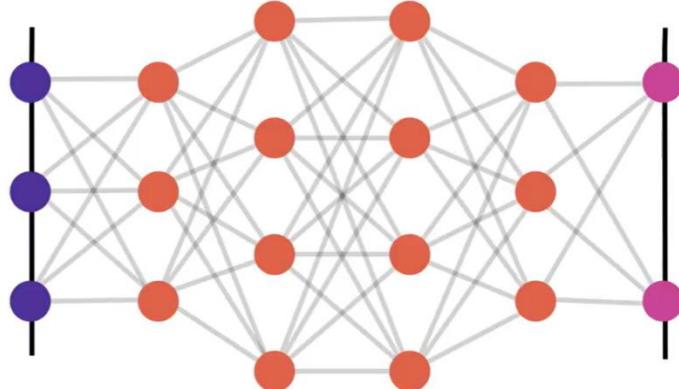
Weighing the connections

- An artificial neural network is structured in a way that so that they can better tune itself to understand your data.
- It just a self-tuning musical instrument.

Add weights to the connection

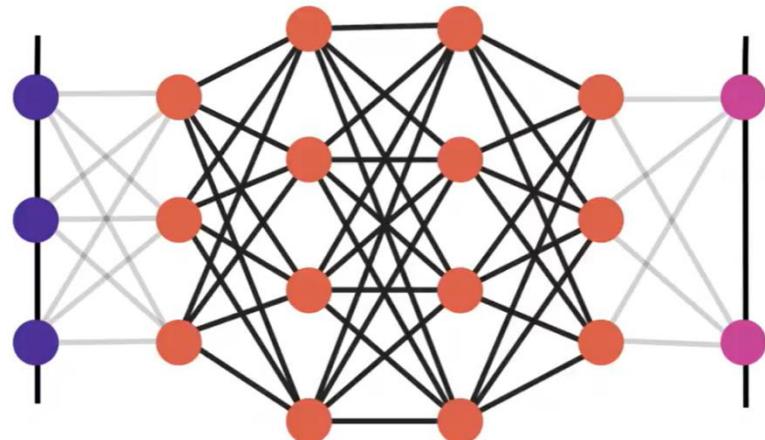
- With artificial neural network you add weights to the connection.

Add weights to the connections



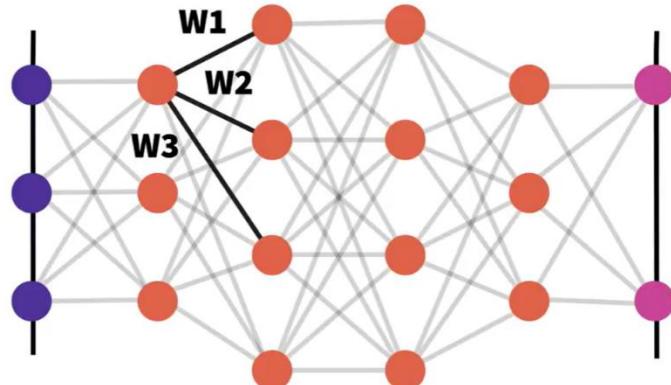
-
- Each neuron in the hidden layer feeds forward into every other neuron in the next layer.

Add weights to the connections



- If there are 100 neurons in every hidden layer, each neuron in that layer will have 100 connections going out.
- Each neuron has a weight as W_1, W_2, W_3 till 100.

Add weights to the connections

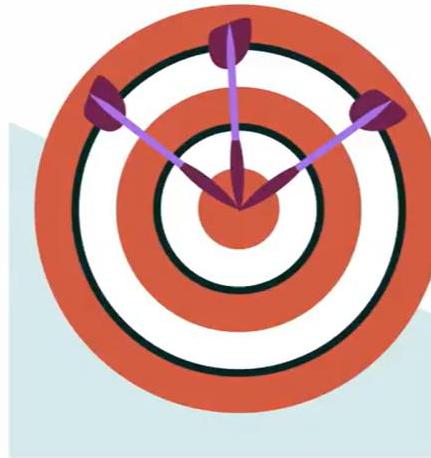


Weights in the neural network

1. Initialize the neural network
2. Feed the training data
3. Let the system adjust weights based on outputs.

The activation bias

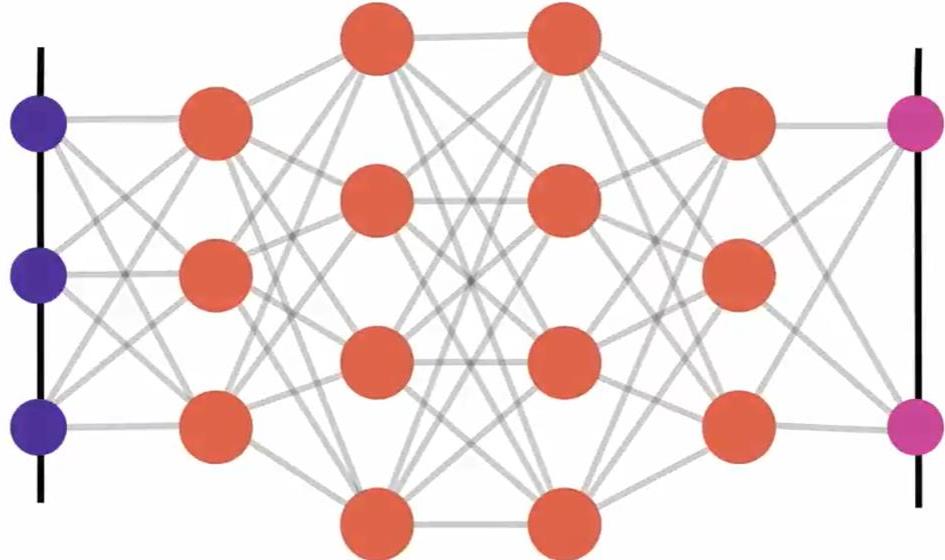
- neural network is still a form of ML.
- uses the same tools and techniques.
- Adding weights to neurons just add variance
- Low bias and low variance.



Low bias and low variance

- When you making a prediction, you need to balance the bias and variance in the data.
- Its called as bias variance trade off.
- So adjusting the variance will impact on the bias.
- In an artificial neural network, the **bias** is the number as the system assigns to each neuron.
- This bias number will shift the data, in a different direction to make it more accurate.
- artificial neural network tend to overfit the data.
- Remembering **overfitting** is when the **system adds a lot of complexity** when its training.
- Bias is on neuron, not connection.

Bias is on the neuron, not the connection.



Quiz

- Kira is building a neural network to identify customer returns using binary classifications of defective or unsatisfied. In which layer of this neural network will Kira have a **probability score**?

the output layer

The **output layer has probability scores** for the two binary classifications that help determine whether the network properly tunes itself.

the hidden layers

the input layer

the output layer

Correct

The output layer has probability scores for the two binary classifications that help determine whether the network properly tunes itself.

- You work for a security firm that wants to use an artificial neural network to create a video facial recognition system. So you create a training set with hundreds of images of people that are found in your video footage. You initialize the artificial neural network with random weights assigned to all its connections. When you feed through the first few images the

system does a terrible job identifying whether those people are included in the video. What would the artificial neural network now do to try and improve?

It will adjust the weights of the connections to see if it does a better job making a prediction.

- a) A **supervised learning** **artificial neural network** is **self-tuning**. That means it makes a prediction and then checks that prediction against the labeled data.
 - b) The network tunes itself by adjusting the weights of the connections and the bias on the neurons.
 - c)
3. Then it sees if these adjustments improve the outcome.

<input checked="" type="radio"/> It will reinitialize and add random weights to all the connections. Incorrect The neural network will actually change the weights from random to weights that are based on outputs.
<input checked="" type="radio"/> It will adjust the weights of the connections to see if it does a better job making a prediction. Correct A supervised learning artificial neural network is self-tuning. That means it makes a prediction and then checks that prediction against the labeled data. The network tunes itself by adjusting the weights of the connections and the bias on the neurons. Then it sees if these adjustments improve the outcome.
<input type="radio"/> It will add weight to the data to do a better job identifying the image in the network.
<input type="radio"/> It will add more layers to the output layer to see if it does a better job making a prediction.

Learning from mistakes

- For neural network 95% right is much different from 97% right.

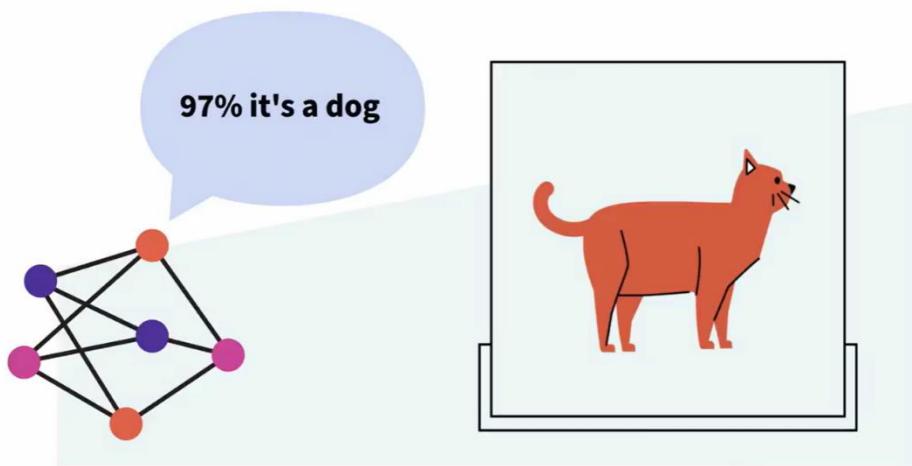
Cost function

- A number that the system uses to measure its answer against correct answer.

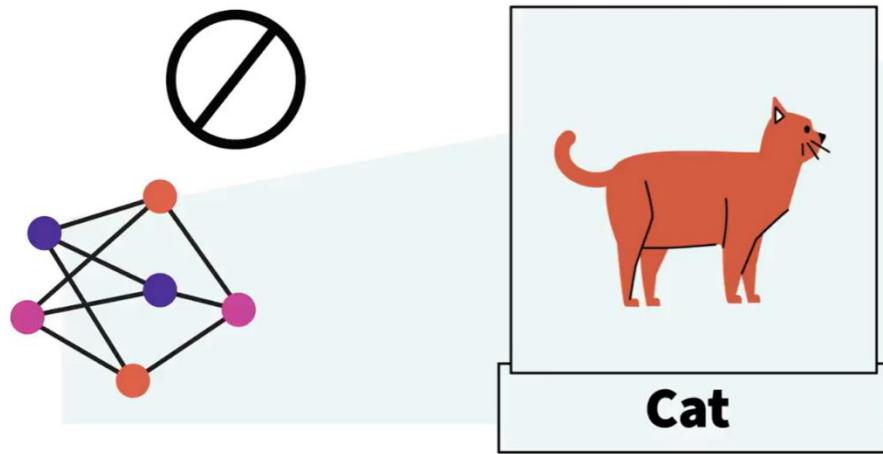
But it was cat photo

Example

- If an image contains dog,
- Network says its **97% chance** that its dog photo.



- But it was cat photo

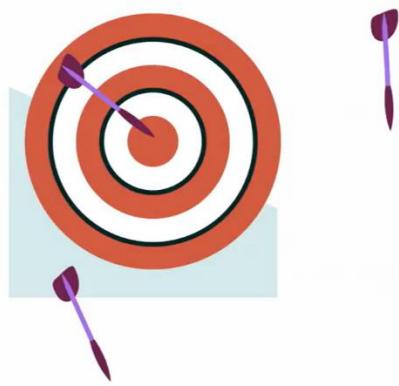


- That **wrongness** will have a slight cost.
- Network says its 99% chance of it's a dog photo.
- But it's a photo of a snow-covered mountain
- This wrongness has a much higher cost.
- Because here network was very very wrong.

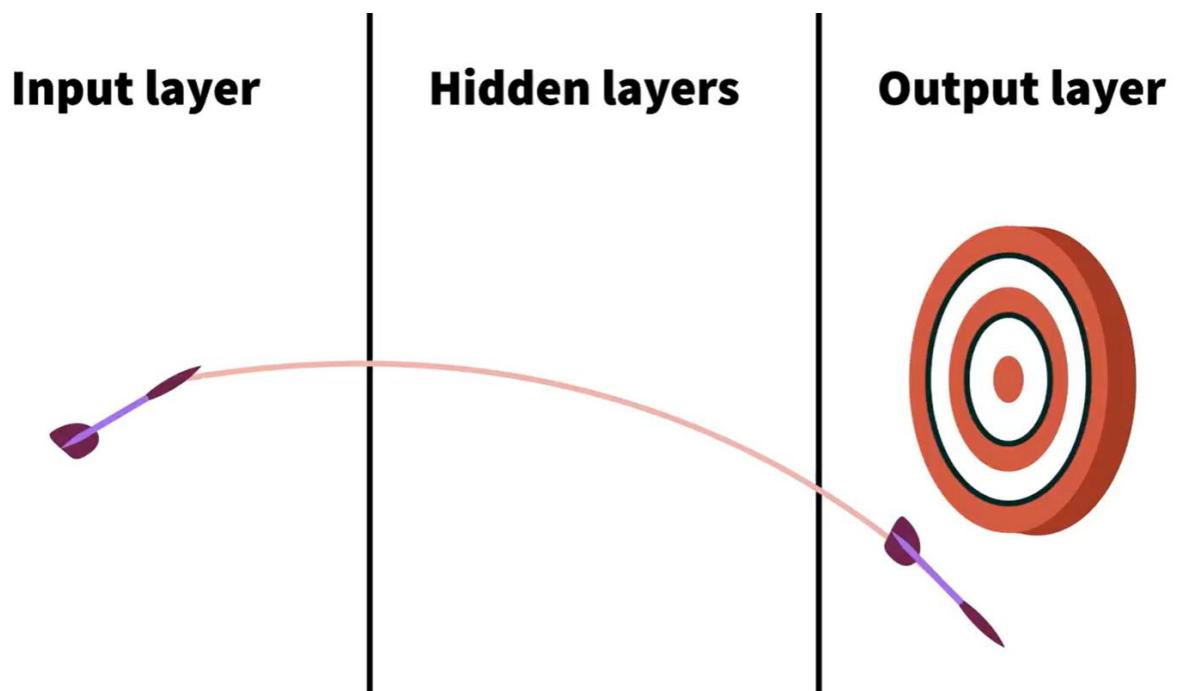
Gradient descent

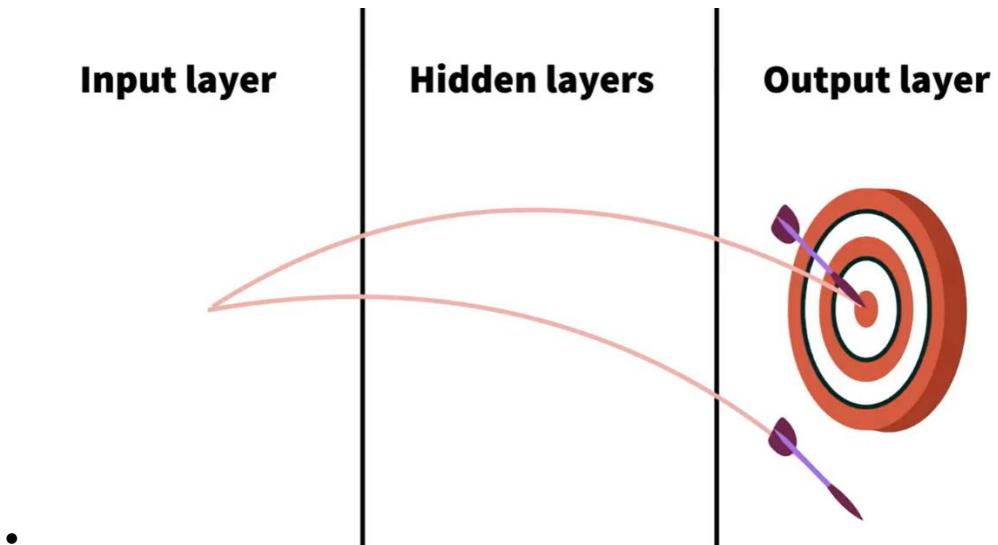
- Gradient means steepness and descent means going down.

- Network is playing darts again



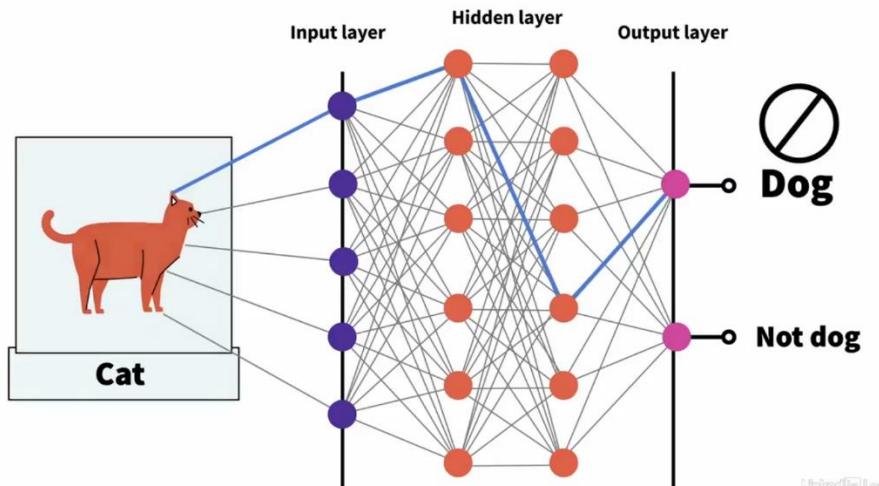
- Input layer | Hidden layers | Output layer



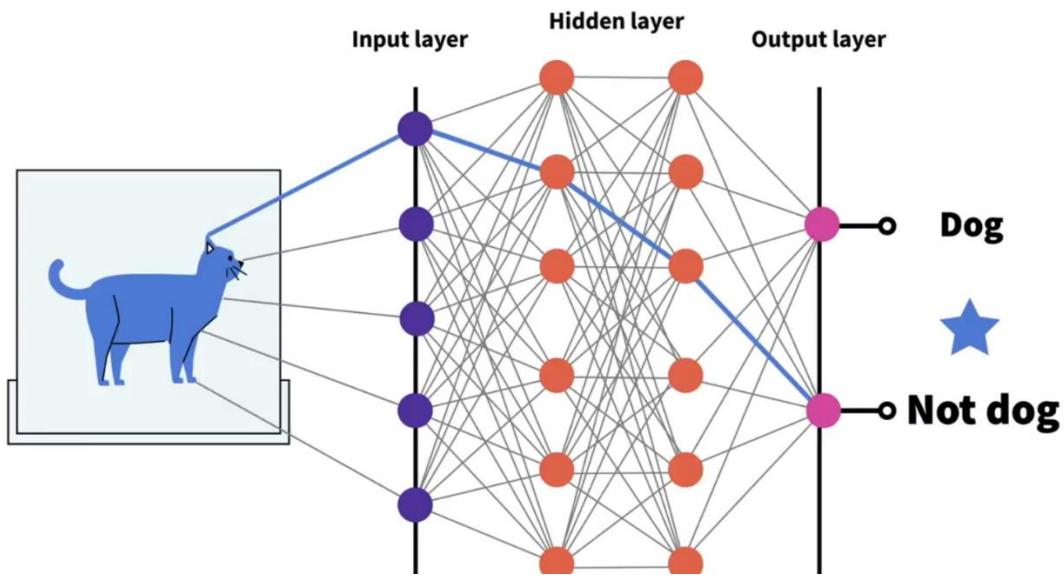


Backpropagation of errors (Backprop)

- Example
If network makes mistake, it has to go back



- It needs a gradient descent then it will use backprop to adjust weights.



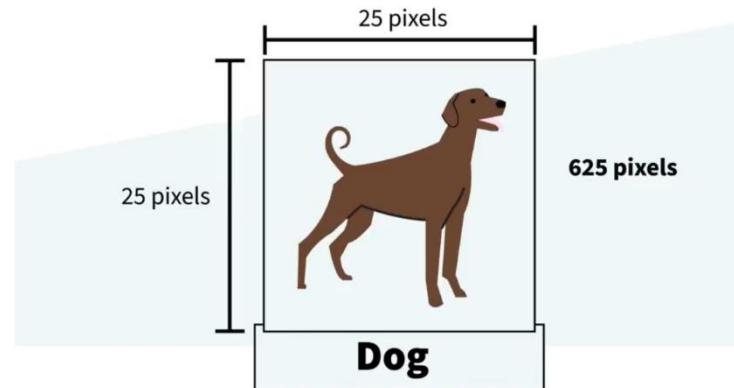
Step through the network

Building an AI system

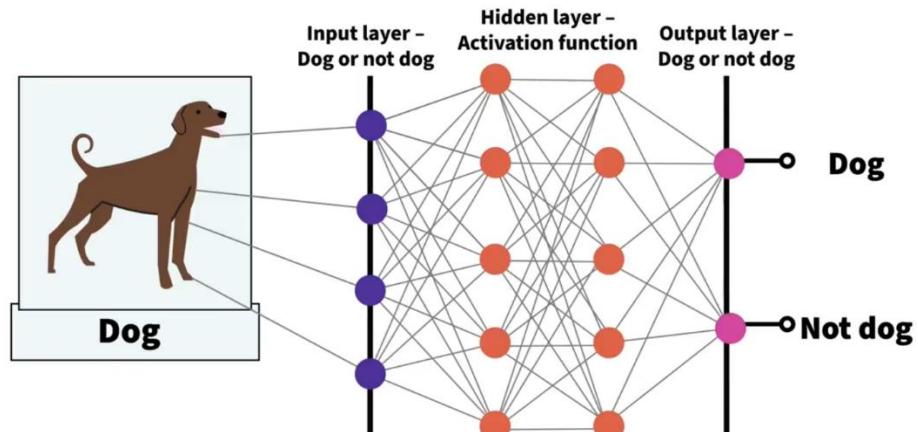
1. Figure out what you want from the data. Classify the data. Typically Binary classification challenge. Supervised training with labeled data
2. Determine the type of ML models you need, **standard ML algorithms** or **artificial neural networks**.
 - a. K nearest neighbor
 - b. Naïve Bayes

artificial neural networks used pixels

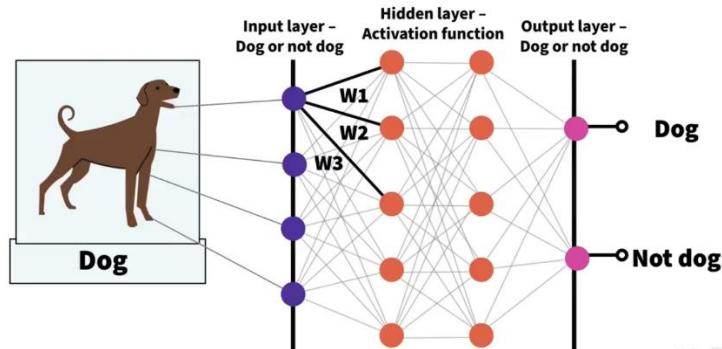
Artificial Neural Network



Artificial Neural Network



Artificial Neural Network



Artificial Neural network

a) Feed training set

- b) Determine how much the change the weights
 - c) Use the backpropagation to adjust the weights to lower the cost function.
 - d) Add data from test set (will NOT be labeled, it could be thousands of data)
 - e) Sometimes network work very well with training data (lesser content) but not with test data (far more data)
- This is called as **overfitting** the data

Quiz

1. With an artificial neural network what is the point of having a cost function?

It helps the network determine the cost of the error so they can make larger or smaller adjustments to its guesses.

Artificial neural networks need a measurement of “wrongness.” That way it knows how much to adjust its weights and biases. This is typically done through a calculation of the gradient descent which will increase or decrease the cost function. If it's very wrong, it will make big changes to the weights and biases. If it's slightly wrong, it will make much smaller changes.

It helps the network determine the cost of the error so they can make larger or smaller adjustments to its guesses.
Correct
Artificial neural networks need a measurement of “wrongness.” That way it knows how much to adjust its weights and biases. This is typically done through a calculation of the gradient descent which will increase or decrease the cost function. If it's very wrong, it will make big changes to the weights and biases. If it's slightly wrong, it will make much smaller changes.

It helps the network determine whether there should be many more hidden layers in the network.

It shows that the network should make the same level of adjustment whether it's 67% right or 99% right.

It shows that at some point the processing power cost will be too great for the neural network to make accurate predictions.

[Next question](#)

2. How can you best describe the cost function as it applies to neural networks?

a number the system uses to measure its answer against the correct answer

Cost function is a measure of wrongness, which in turn determines how much adjustment to weights and biases is needed.

a measure of how accurate a machine learning estimate is

the amount of money spent to develop a neural network

a number the system uses to measure its answer against the correct answer
Correct
Cost function is a measure of wrongness, which in turn determines how much adjustment to weights and biases is needed.

Next

Using AI systems

- Are only good as the data they're given.
- Learn by trying different things.
- Can do things that humans can't.
- GPT 3.

Applying AI to solve problems

- Consider the ethical challenges behind AI.

Consider the **ethical challenges** behind AI.



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Reference:

1. Career Essentials in Generative AI by Microsoft and LinkedIn
<https://www.linkedin.com/learning/patterns/career-essentials-in-generative-ai-by-microsoft-and-linkedin?u=109812938>

2. <https://copilot.microsoft.com>
3. Take Exam
<https://www.linkedin.com/learning/paths/career-essentials-in-generative-ai-by-microsoft-and-linkedin?u=109812938>

Actual Exam