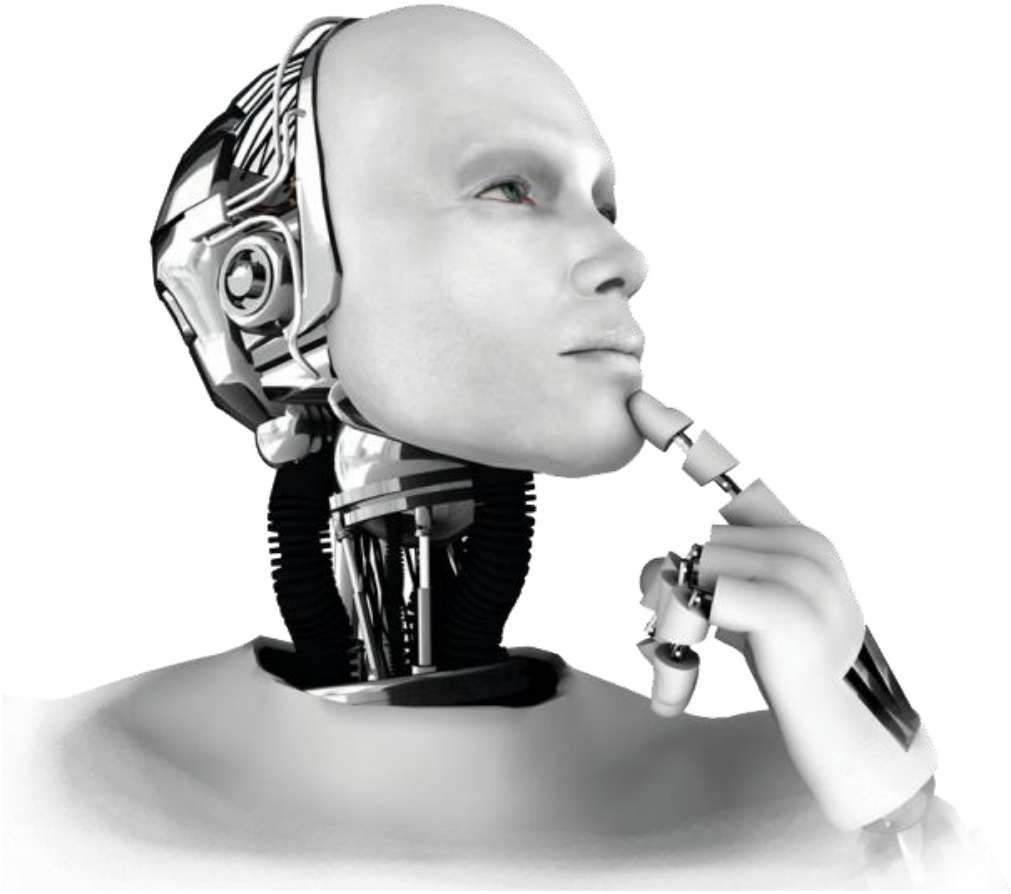


ARTIFICIAL INTELLIGENCE

FOR EVERYONE QUESTION & ANSWER

BY- **(A.MOIZ.SIDDIQUI)**

1) What's artificial intelligence (AI)?

Ans— (AI) mean's machine learning is also called (AI).

2) How many types of AI?

Ans— there are two types of AI: (1) ANI (2)AGI…

ANI: artificial narrow intelligence… AGI: artificial general intelligence.

3) Prograss are working this types?

Ans— AGI: almost no progress…. ANI: lots of progress…

4) Achieving AGI Will Take Time?

Ans-- AGI is an exciting goal for researchers to work on, but it requires many technological breakthroughs before we get there and it may be decades or hundreds of years or even thousands of years away.

5) what's Supervised Learning?

Ans— simple meaning input---output=result …

<A>Audio(input)….<B>Text(output)…. <Result> Application speech recognition..

This set of AI called supervised learning, just learns input to output, or A to B mappings. On one hand, input to output, A to B it seems quite limiting. But when you find a right application scenario, this can be incredibly valuable

6) Acquiring data?

Ans— correct data is called acquiring data :


cat


not cat


cat


not cat

Process of sampling signals that measure real world physical conditions and converting the resulting samples into digital numeric values that can be manipulated by a computer.

7) Data misuse ?

Ans-- **Data misuse** is the inappropriate use of **data** as defined when the **data** was initially collected. **Misuse** of information typically can be governed by laws and corporate cyber security policy. However, even with laws and policies in place, the potential for **data misuse** is growing

8) Data is Messy?

Ans— incorrect data is simply called data messy..

If you have bad data, then the AI will learn inaccurate things.

Data problems:

- Incorrect labels
- Missing values

Multiple types of data

- Unstructured Data: Images, audio, text

9) Machine learning vs data science?

Ans-- Machine learning is a subset of AI that focuses on a narrow range of activities. ... Data science isn't exactly a subset of machine learning but it uses ML to analyze data and make predictions about the future. It combines machine learning with other disciplines like big data analytics and cloud computing...

10) Running AI System?

Ans-- A software that which automatically returns output B for input A.

If you have an AI system running, serving dozens or hundreds of thousands or millions of users, that's usually a machine-learning system….

11) Formal definition of Data science?

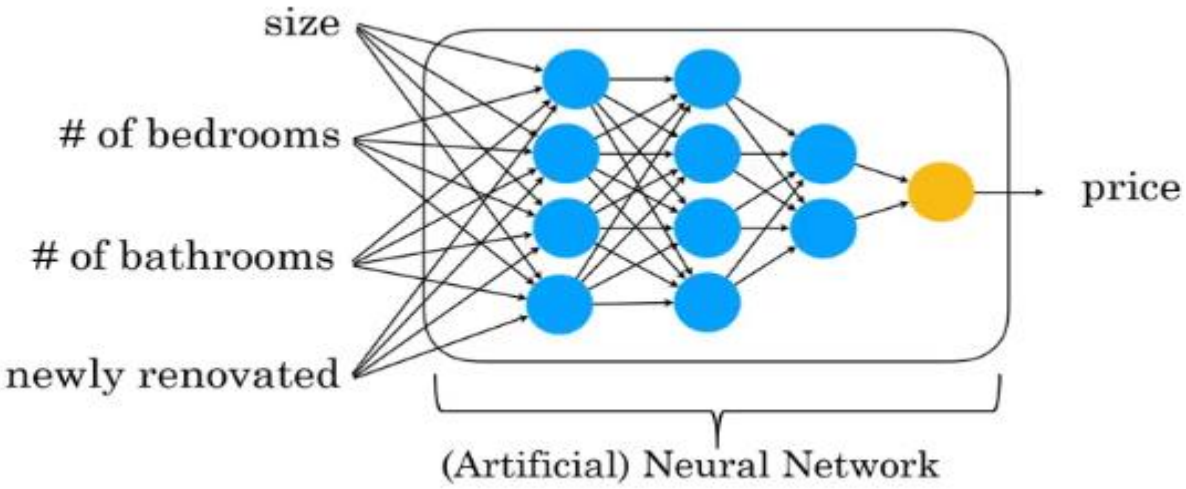
Ans-- Data science is the science of extracting knowledge and insights from data.

12) Machine Learning?

Ans-- Machine learning is the scientific study of algorithms and statistical models that computer systems use to perform a specific task without using explicit…

13) Deep Learning?

Ans-- Deep learning is a subset of machine learning in artificial intelligence (AI) that has networks capable of learning unsupervised from data that is unstructured or unlabeled. Also known as deep neural learning or deep neural network..



14) AI and related disciplines?

Ans--⇩

- Machine Learning
- Data Science
- Deep Learning / Neural Network
- Supervised Learning
- Un supervised learning
- Reinforcement Learning….

15) What makes a company AI company?

- Ans-- Strategic data acquisition
- Unified data ware house
- Pervasive automation
- New roles such as MLE

16) what's AI Transformation?

Ans—

1. Execute pilot projects to gain momentum
2. Build an in-house AI team
3. Provide broad AI training
4. Develop an AI strategy
5. Develop internal and external communications …

17) what's Technical diligence rules?

Ans—

- You are learning a simple concept
- Do you have large training data..
- Self driving car
    - Input is from sensors, camera
    - Output where are the other cars
- Recognizing gesture of traffic police, construction work, people– not possible
    - Critical application requires good accuracy..

X-ray diagnosis:

Diagnosing a disease after reading a book.

Diagnosing a disease from X-ray images– possible

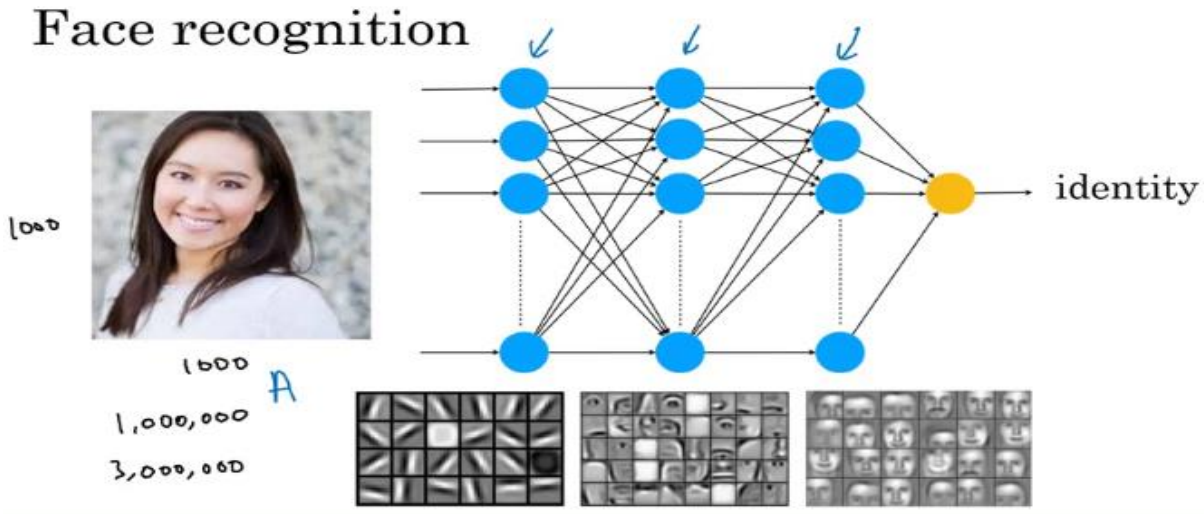
18) what's Strengths and weakness of ML?

- Ans-- Works when,
    - Learning a simple concept
    - Lots of data available
- Doesn't work when,
    - Learning a complex concept
    - Asked to work on new type of data such as X-ray images in different conditions and angles..

19) Face recognition?

Ans— A facial recognition system is a technology capable of identifying or verifying a person from a digital image or a video frame from a video source

- Pictures comprise pixels
    - Color images and channels
- A neural network corresponds to pixels
- Earlier layers will detect edges, then lobes and then objects..



20) what's Speech Recognition?

Ans-- Speech recognition is the ability of a machine or program to identify words and phrases in spoken language and convert them to a machine-readable format. Rudimentary speech recognition software has a limited vocabulary of words and phrases, and it may only identify these if they are spoken very clearly.

Amazon
Echo / Alexa

Google
Home

Apple
Siri

Baidu
DuerOS

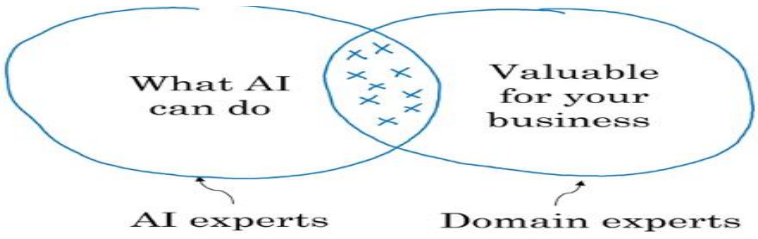
21) Key steps of Echo / Alexa ?

Ans—

- Collect data
  - Labelled voice
- Train model
  - Iterate many times
- Deploy the model
  - Get more data and update model

22) How to choose an AI project?

Ans—



23) Is it always necessary to have big data?

Ans—

- Having more data is good
- With small datasets you can make progress
- 10, 100 or 1000 data points can be a good start

24) Technical vs Business diligence?

Ans—

Technical diligence	Business diligence
• Can AI system meet desired performance • How much data is needed • Engineering timeline	• Lower costs • Increase revenue • Launch new product or business

Ethical diligence: make a society better ..

25) Build Vs Buy?

- Ans-- ML projects can be in housed or outsourced
- DS projects are generally in housed
- Buy industry standard, only build specialized products ..

26) How to work with AI team?

Ans— (Specify your acceptance criteria) -- (95% accuracy)-- (Training, validation and Test dataset).-- (Don't expect 100% accuracy)—

(Limitations of ML)—(Insufficient data)—(Mislabeled data)

(Ambiguous labels (human perception)….

27) Machine Learning frameworks names ?

Ans—

Machine learning frameworks:

- TensorFlow
- PyTorch
- Keras
- MXNet
- CNTK
- Caffe
- PaddlePaddle
- Scikit-learn
- R
- Weka

Research publications:

- Arxiv

Open source repositories

- GitHub

28) CPU Vs GPU ?

Ans—

CPU: Computer processor (Central Processing Unit)

GPU: Graphics Processing Unit

Cloud vs. On-premises

29) Steps or AI pipeline ?

Ans—

- Trigger word: Hey Device
- Speech Recognition: Tell me a joke
- Intent Recognition: joke, time, music, weather
    - Log of training instances, variation in text
- Execute joke….

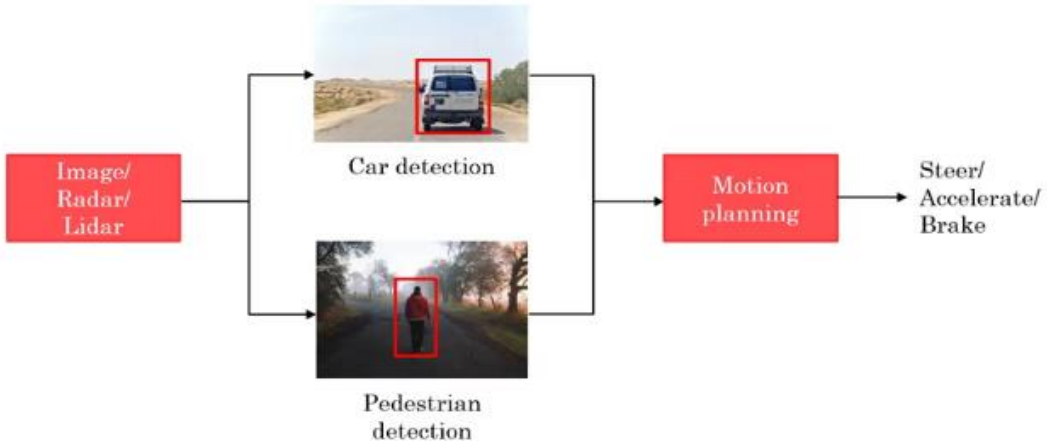
30) Smart speaker functions ?

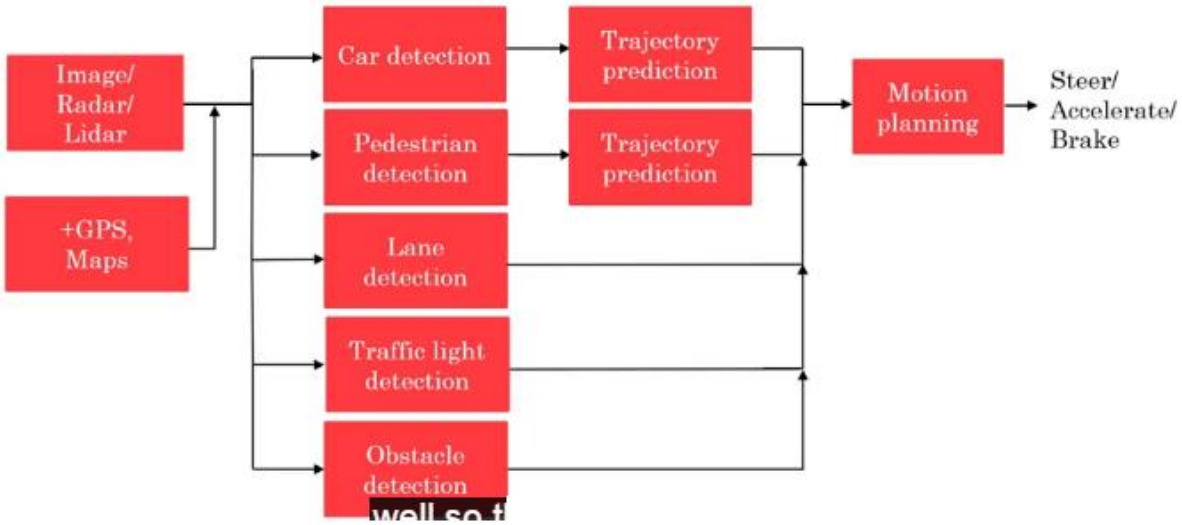
Ans—

- Play music
- Volume up/ down
- Make call
- Current time
- Units conversion
- Simple question
- These specialized execution routines are written by software engineer

31) Function of Self driving car?

Ans—





32) AI teams ?

Ans—

- AI team may have 100s of engineers
- A small team can have four or five members
- Example roles
    - Software Engineers
        - Execute joke, Set timer
    - Machine Learning Engineer
    - Machine Learning Researcher
        - Extend state-of-the-art
        - Applied ML scientist in between ML researcher and ML Engineer
    - Data Scientist
        - Provide insights
- Data Engineer
    - Organize data
    - Data is saved in cost effective way
    - We have lot of data, scalability is important
- AI Product Manager
    - What to build and feasible..

33) How Get started with a small team ?

- Ans-- 1 Software engineer
- 1 ML engineer / Data scientist
- No body but your self

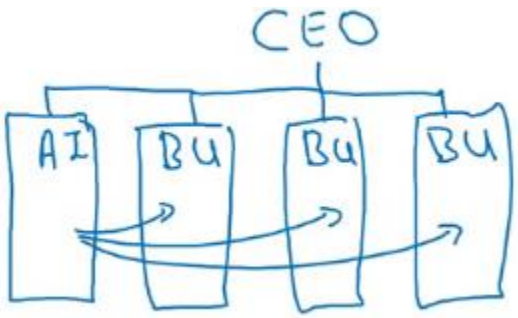
34) AI Transformation playbook ?

Ans—

- Execute a pilot project to gain momentum
- Build an in-house AI team
- Provide broad AI training
- Develop an AI strategy
- Develop internal and external communication

35) Build an in-house AI team ?

Ans—



- Develop tools that could be useful company wide
- Under CIO, CTO,CDO, CAIO..

36) Provide broad AI training ?

Ans—

Role	What they should learn
Executives and senior business leaders	• What AI can do for your enterprise • AI strategy • Resource allocation
Leaders of divisions working on AI projects	• Set project direction (technical and business diligence) • Resource allocation • Monitor progress
AI engineer trainees	• Build and ship AI software • Gather data • Execute on specific AI projects

37) what's Develop an AI strategy ?

Ans—

- Leverage AI to create an advantage specific to your company
- Design strategy that align with virtuous cycle of AI
- Blue River – precision agriculture

- AI needs to be specialized or verticalized to your industry sectory
- Don't compete with giants
- Creating a strategy
- Low cast strategy
- High value strategy
    - Strategic data acquisition
    - Unified data warehouse – Pull data into single repository, software can connect the dots
- Create network effect and platform advantages
    - Uber, Careem, Facebook …..

38) Develop internal and external communications ?

Ans—

Investor relation ----- Government relation ----Consumer / user education

Talent / recruitment

Internal communication…

39) Common pitfalls?

Ans---

Don't:	Do:
• Expect AI to solve everything	• Be realistic about what AI can and cannot do given limitations of technology, data, and engineering resources
• Hire 2-3 ML engineers and count solely on them to come up with use cases	• Pair engineering talent with business talent and work cross-functionally to find feasible and valuable projects

40) what's AI Application areas?

Ans—

- Computer Vision
  - Image Classification / Object recognition
    - Face recognition
  - Object detection
  - Image segmentation
  - Tracking

41) Ai Speech?

Ans—

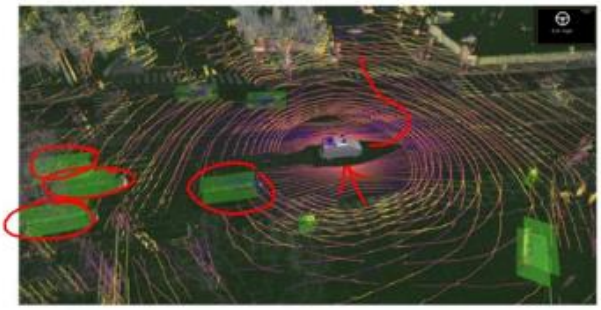
- Speech to text
- Trigger / wake word detection
- Speaker ID

Speech synthesis (text-to-speech / TTS)

42) Robotics ?

Ans—

- Perception: figuring out what's in the world around you
- Motion planning: finding a path for the robot to follow
- Control: sending commands to the motors to follow a path



43) General machine learning?

Ans—

- Unstructured data (images, audio, text)

 image  audio AIは、新たな電気だ AI is the new electricity text

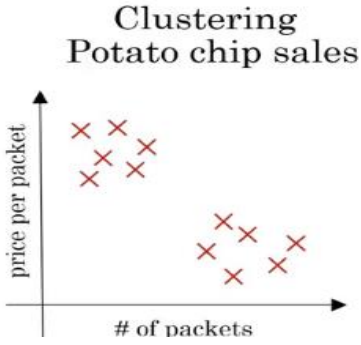
- Structured data

House size (square feet)	# of bedrooms	Price (1000$)
523	1	100
645	1	150
708	2	200

Clay batch #	Supplier	Mixing time (minutes)
001	ClayCo	35
034	GooClay	22
109	BrownStuff	28

44) Unsupervised learning?

Ans--- **Unsupervised learning** is a type of **machine learning** algorithm used to draw inferences from datasets consisting of input data without labeled responses..

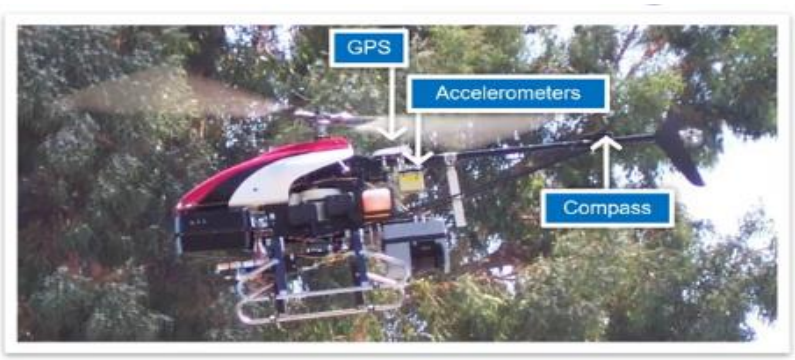


45) Transfer learning?

Ans—

46) Reinforcement learning?

Ans—



Use a "reward signal" to tell the AI when it is doing well or poorly. It automatically learns to maximize its rewards.

- Also useful in Games
- Not as much as economic value as supervised learning

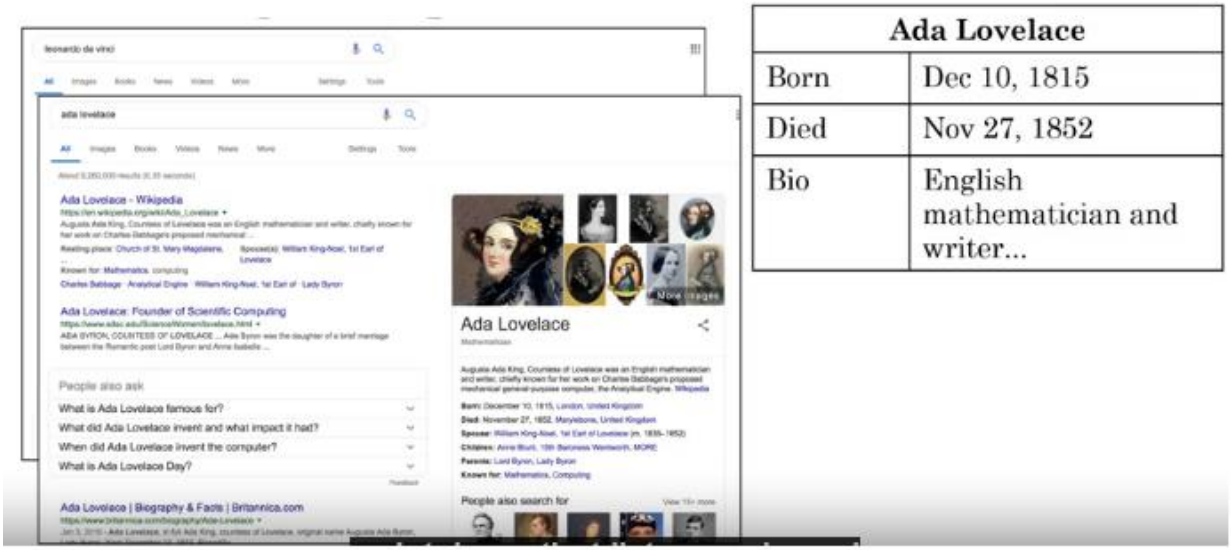
47) Generative Adversarial Network (GAN)?

Ans—

- Synthesize new images from scratch
- Entertainment industry, film, animation

47-b) Generative Adversarial Network (GAN)?

Ans---Knowledge graph..



Ada Lovelace	
Born	Dec 10, 1815
Died	Nov 27, 1852
Bio	English mathematician and writer...

48) AI & Society?

Ans—

- AI is super power
- Gold lock rule
    - Neither too optimistic nor pessimistic
- Don’t over spend on unnecessary danger
- AI winter
- AI can’t do every thing, but will transform industries..

49) Limitations of AI?

Ans—

Performance limitations --With small amount of data---

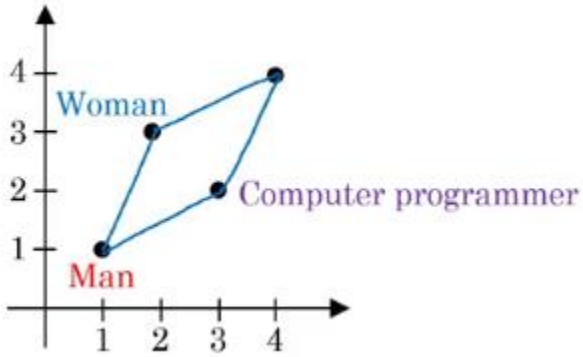
Explain ability is hard (sometimes doable): How should we trust --- Humans are also not good at explaining--Barrier to acceptance—Biased through biased data-----Adversarial attacks….

50) AI can learn unhealthy stereotype?

Ans—

Learn from internet

- Man: Woman as Father: **Mother**
- Man: Woman as King: **Queen**
- Man : Computer programmer as women: **Home maker**
- Man and woman can equally become programmer



51) Why bias matters?

Ans---

- Hiring tool that discriminates against woman
- Facial recognition working better for specific ethnicity
- Bank loan approvals'
- Toxic effect of reinforcing unhealthy stereotypes…

52) Combating bias?

Ans—Technical solution---

Zero out bias---

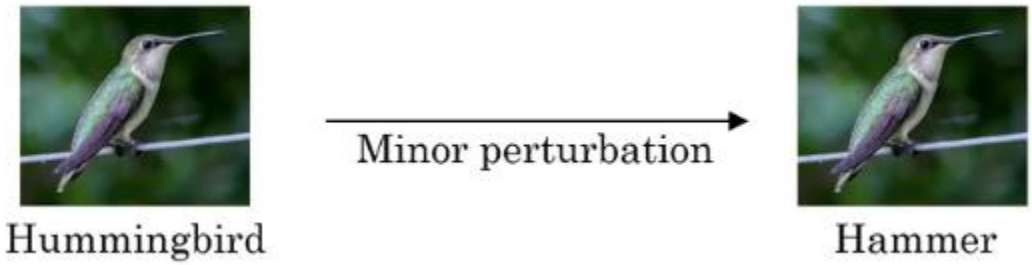
Use less biased or more inclusive data---

Transparency or auditing process-----

Diverse workforce --- Creates less biased applications…

53) Adversarial attacks?

Ans—



- Spam Filters
- Hate speech filter..

54) Adversarial defenses?

Ans---

- Cost to defend
- Slow speed
- May not be any incentive to attack, so should we invest in defense?
- Zero-sum against adversaries

55) Adverse uses of AI?

Ans—

- Deep Fakes
    - Synthesizing videos
    - Video of Obama
  - Undermining of democracy and privacy
    - Oppressive surveillance
  - Generating fake comments
  - Spam Vs anti-spam, Fraud Vs anti-fraud

56) AI & Developing economy?

Ans—

- Developing economies gradually moved up the ladder
- Lower end ladder are susceptible to automation such as agriculture
- Trampoline to move higher rungs
    - Leapfrog
    - Example of mobile phone
    - Mobile payments

      Online education

57) How developing economies can build AI?

Ans—

- US and China leading
- But AI communities are still immature
- Focus on AI to strengthen country's vertical industries
- Instead of focusing on AI in general, use AI where you are already good at
- Public private partnership
- Invest in education

……**END**……..