ASSOCIATION OF SOUTHEAST ASIAN NATIONS (ASEAN)

- It is an **intergovernmental organization of ten Southeast Asian countries.**

    - It was established on 8 August **1967 in Bangkok**, Thailand, with the **signing of the ASEAN Declaration (Bangkok Declaration).**
    - It aims to **promote economic and security cooperation** among its ten members.

- **Members:**
    - **Founding members** of ASEAN: **Indonesia, Malaysia, Philippines, Singapore,** and **Thailand**.
    - **Brunei** joined in 1984, **Vietnam** in 1995, **Laos** and **Myanmar** in 1997, and **Cambodia** in 1999.

- **Secretariat: Jakarta, Indonesia.**

- **Fundamental principles** of ASEAN are:
    - **Mutual respect** for the independence, sovereignty, equality, territorial integrity**,** and national identity of all nations.
    - The right of every state to lead its national existence **free from external interference,** subversion, or coercion.
    - **Non-interference in the internal affairs** of one another.
    - **Settlement of differences** or disputes in a **peaceful manner.**
    - **Renunciation of the threat** or use of force.
    - Effective cooperation among themselves.

    - **ASEAN Regional Forum (ARF):** It is a platform for dialogue and cooperation on political and security issues among ASEAN member countries and their partners.
    - **Decision Making**: It is done through consultation and consensus.

WHAT IS MACHINE LEARNING (ML)?

The 2024 Nobel Prize in physics has been awarded to John Hopfield and Geoffrey Hinton for foundational discoveries and inventions that enable machine learning with artificial neural networks.

Machine Learning (ML) is a **branch of Artificial Intelligence (AI)** focused on **building computer systems that learn from data.**

- ML allows computer systems to continuously adjust and enhance themselves as they accrue more "experiences."
- **ML algorithms are trained to find relationships and patterns in data.**
- **Using historical data as input**, these algorithms can **make predictions**, **classify information,** cluster data points, reduce dimensionality and even **generate new content.**
  - Examples of the latter, known as **generative AI,** include **OpenAI's ChatGPT,** Anthropic's Claude and GitHub Copilot.
- Training ML algorithms often **demands large amounts of high-quality data** to produce accurate results.
- **Applications:**
  - ML is widely applicable across many industries. For example, e-commerce, social media and news organizations use **recommendation engines** to suggest content based on a customer's past behavior.
  - **In self-driving cars**, ML algorithms and computer vision play a critical role in **safe road navigation.**
  - In healthcare, ML can **aid in diagnosis** and **suggest treatment plans.**
  - Other common ML use cases include **fraud detection, spam filtering**, **malware threat detection,** predictive maintenance, and business process automation.

What is Deep Learning?

- It is a method in AI that **teaches computers to process data in a way** that is inspired by the **human brain.**
- It is a **subset of ML** which **simulates the complex decision-making power of the human brain.**
- Deep learning models can **recognize complex patterns** in pictures, text, sounds, and other data **to produce accurate insights and predictions.**
- Deep learning methods are used to automate tasks that typically require human intelligence, such as describing images or transcribing a sound file into text.

WHAT IS CENTRAL CONSUMER PROTECTION AUTHORITY (CCPA)?

- The **Consumer Protection Act, 2019** was notified on August 9, 2019 and came into force on July 20, 2020.
- It replaced the Consumer Protection Act, 1986.
- **Under the** provisions of the **Act, the CCPA was established** in July 2020.
- CCPA aims to protect the rights of consumers by **cracking down on unfair trade practices and false and misleading advertisements** that are detrimental to the interests of the public and consumers.
- **Nodal Ministry: Ministry of Consumer Affairs, Food & Public Distribution**.
  - **CCPA is empowered to:**
  - Protect, promote, and **enforce the rights of consumers as a class**, and prevent violation of consumers rights under this Act.
  - **Prevent unfair trade practices** and ensure that no person engages himself in unfair trade practices.
  - **Ensure** that **no false or misleading advertisement is made** of any goods or services which contravenes the provisions of this Act or the rules or regulations made thereunder.

- Ensure that no person takes part in the publication of any advertisement which is false or misleading.

Composition:

- It will have a **Chief Commissioner** as head, and only **two other commissioners** as members — one of whom will deal with matters relating to goods while the other will look into cases relating to services.

Powers:

- The CCPA **can make interventions** when necessary **to prevent consumer detriment** arising from unfair trade practices and to initiate class action, including enforcing recall, refund and return of products.

- The CCPA **has an investigation wing**, headed by a director-general, which may conduct inquiries or investigations into consumer law violations.

- The CCPA has been granted wide **powers to take suo-moto actions, recall products**, **order reimbursement** of the price of goods/services, **cancel licenses,** and **file class action suits** if a consumer complaint affects more than one individual.

- The CCPA has **powers to pass orders of discontinuation of practices** that are unfair and prejudicial to consumers' interests **and impose penalties** in cases of false or misleading advertisements.

EXERCISE MALABAR

Exercise Malabar was started in **1992** as a **bilateral naval exercise** between **India and the US Navy.**

- The first Malabar Exercise in the Bay of Bengal took place in 2007.
- It was expanded into a **trilateral format** with the inclusion of **Japan in 2015.**
- In **2020**, the **Australian Navy** joined the Malabar Exercise, making it a **quadrilateral naval exercise.**

- It **takes place annually** in the **Indian Ocean** and **Pacific Oceans alternatively**.

- The exercise aims to **strengthen cooperation** and security in the Indo-Pacific region.

- Malabar 2024 will focus on a broad range of activities designed to enhance cooperation and operational capabilities, including discussions on special operations, surface, air, and anti-submarine warfare through a **Subject Matter Expert Exchange (SMEE).**

- Complex maritime operations such as **anti-submarine warfare**, surface warfare, and air defense exercises will be conducted at sea, with an emphasis on improving situational awareness in the maritime domain.

- The exercise will feature participation of various Indian naval platforms, including **guided missile destroyers,** multi-purpose frigates, submarines, fighter aircraft and helicopters.

MACE OBSERVATORY

- The **Major Atmospheric Cherenkov Experiment** (MACE) Observatory is the largest imaging Cherenkov telescope in Asia.

- **Location:** It is located at an altitude of ~4,300 m, **at Hanle, Ladakh.**

- It is Asia's Largest and World's Highest Imaging Cherenkov Observatory.

- The MACE project aims to **foster international collaborations**, advancing India's contributions to space research and bolstering India's position in the global scientific community.

- It is indigenously **built by Bhabha Atomic Research Centre** (**BARC**) with support from the **Electronics Corporation of India** (**ECIL**), Hyderabad, and other Indian industry partners.

- It will help the scientific community enhance its understanding in the fields of **astrophysics, fundamental physics**, and **particle acceleration mechanisms**.

- The MACE telescope will **observe high-energy gamma rays**, contributing to global efforts to understand the most energetic phenomena in the universe, such as supernovae, black holes, and gamma-ray bursts.
- It plays a significant role not only in advancing scientific research but also in supporting the **socio-economic development** of Ladakh.

GIG ECONOMY IN INDIA

What is Gig Economy?

- A gig economy is a free market system in which organisations hire or contract workers for a short span of time.
- Simply put, the positions are temporary to meet the company's requirements by having short-term engagements.
- Startups like Ola, Uber, Zomato, and Swiggy have established themselves as the main source of the gig economy in India.

Who is a Gig Worker?

- According to the Code on Social Security, 2020 (India), "A gig worker is a person who performs work or participates in work arrangements and earns from such activities, outside of the traditional employer-employee relationship."
- They are independent contractors, online platform workers, contract firm workers, on-call workers and temporary workers.
- Studies estimate that in 2020-21, **77 lakh workers were engaged in the gig economy**.
- The gig workforce is expected to **expand to 2.35 crore workers by 2029-30**.

What is the Average Age/Income of Gig Workers in India?

- The **median age of Indian gig workers is 27 and their average monthly income is Rs 18,000**.
- Of these, about 71 per cent are the sole breadwinners of their families. Additionally, gig workers operate with an average household size of 4.4.

Challenges Faced by Gig Workers:

- While platform companies have created avenues of employment, it has often been marred by **low wages**, **unequal gender participation**, and a **lack of possibility for upward mobility** within an organisation.
- This has triggered protests from workers at companies like Swiggy, Zomato, Ola, Uber, and Urban Company, among others.
- Gig workers are typically **hired by companies on a contractual basis** and are not considered their employees.
- As a result, they do not receive some of the benefits that an on-roll employee of the company may have.
  - This means they often do not receive benefits like paid sick and casual leaves, travel and housing allowances, and provident fund savings, among other things.

What Needs to be done in Order to Improve the Living Standards of these Gig Workers?

- **Fiscal Incentives**:
  - NITI Aayog in its report "India's Booming Gig and Platform Economy" has said that fiscal incentives such as tax-breaks or startup grants may be provided for businesses that provide livelihood opportunities where women constitute a substantial portion of their workers.

- **Retirement Benefits**:
  - The report also recommended firms adopt policies that offer old age or retirement plans and benefits, and other insurance cover for contingencies such as the Covid-19 Pandemic.
  - Businesses should consider providing income support to workers as it would be a "critical step in providing assured minimum earnings and social security from income loss in the wake of uncertainty or irregularity in work".
  - It also suggesting offering paid sick leave to workers apart from insurance cover.

NOBEL PRIZE IN PHYSICS HONORS PIONEERING ADVANCES IN AI AND MACHINE LEARNING

The 2024 Nobel Prize in Physics was awarded to **John Hopfield and Geoffrey Hinton** for their foundational contributions to AI, particularly in machine learning and artificial neural networks.

Their ground-breaking research in the 1980s laid the foundation for the AI revolution unfolding today.

NOBEL PRIZE IN PHYSICS
'FOR FOUNDATIONAL DISCOVERIES AND INVENTIONS THAT ENABLE MACHINE LEARNING WITH ARTIFICIAL NEURAL NETWORKS'

JOHN HOPFIELD, 91 — Professor at Princeton University, USA; PhD from Cornell University

GEOFFREY HINTON, 76 — Professor at the University of Toronto, Canada; PhD from The University of Edinburgh, UK

IN 2023: Awarded to Pierre Agostini, Ferenc Krausz and Anne L'Huillier for developing methods to produce attosecond pulses, allowing exploration of scientific processes at subatomic levels.

ON WEDNESDAY: NOBEL PRIZE IN CHEMISTRY

HOW ARTIFICIAL NEURAL NETWORKS WORK

Artificial neural networks (ANNs) are algorithms that allow computers to learn and remember while processing data. They essentially imitate the way human brains work. Neural networks comprise interconnected artificial neurons divided into an inner layer (or layers), hidden layer/s, and outer layer/s. The inner layer receives the data, hidden layer processes it, and outer layer transmits the result. The number of inner and hidden layers depends on the complexity of the problem.

Artificial Neural Network (ANN)

- o ANN is a mathematical model that uses a network of interconnected nodes to mimic the human brain's neurons and process data.
- o ANNs are a type of machine learning (ML) and deep learning that can learn from mistakes and improve over time.
- o They are used in artificial intelligence (AI) to solve complex problems, such as recognizing faces or summarizing documents.

- **Applications of Artificial Neural Networks:**
  - o Image and video recognition (e.g., facial recognition systems)
  - o Speech recognition (e.g., virtual assistants like Siri and Alexa)
  - o Natural language processing (e.g., language translation)
  - o Medical diagnostics (e.g., detecting diseases from medical images)
  - o Autonomous vehicles (e.g., self-driving car navigation)
- In essence, artificial neural networks mimic the brain's ability to learn from experience, adapt, and recognize complex patterns, making them foundational to modern AI and machine learning systems.
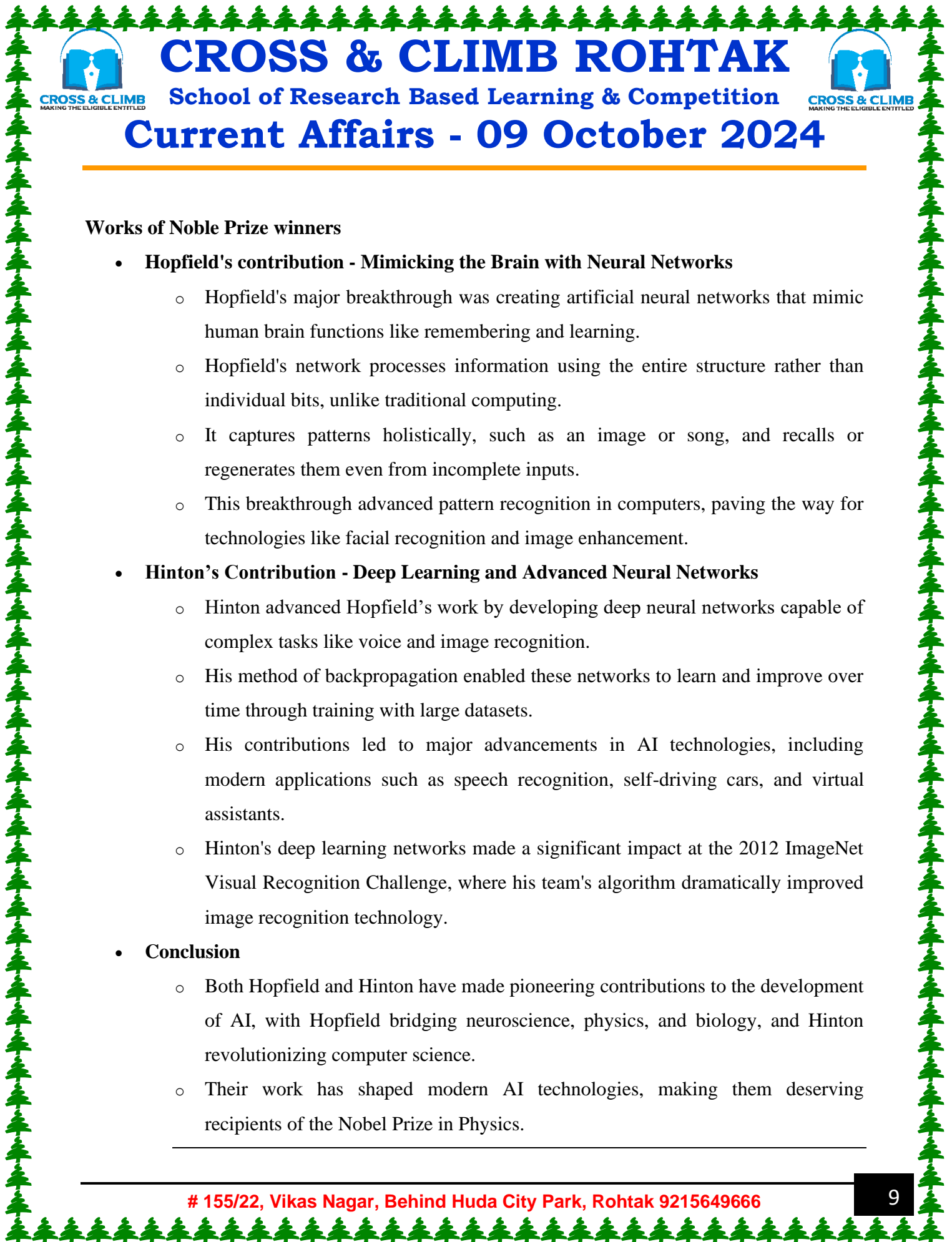
Works of Noble Prize winners

- **Hopfield's contribution - Mimicking the Brain with Neural Networks**
  - Hopfield's major breakthrough was creating artificial neural networks that mimic human brain functions like remembering and learning.
  - Hopfield's network processes information using the entire structure rather than individual bits, unlike traditional computing.
  - It captures patterns holistically, such as an image or song, and recalls or regenerates them even from incomplete inputs.
  - This breakthrough advanced pattern recognition in computers, paving the way for technologies like facial recognition and image enhancement.

- **Hinton's Contribution - Deep Learning and Advanced Neural Networks**
  - Hinton advanced Hopfield's work by developing deep neural networks capable of complex tasks like voice and image recognition.
  - His method of backpropagation enabled these networks to learn and improve over time through training with large datasets.
  - His contributions led to major advancements in AI technologies, including modern applications such as speech recognition, self-driving cars, and virtual assistants.
  - Hinton's deep learning networks made a significant impact at the 2012 ImageNet Visual Recognition Challenge, where his team's algorithm dramatically improved image recognition technology.

- **Conclusion**
  - Both Hopfield and Hinton have made pioneering contributions to the development of AI, with Hopfield bridging neuroscience, physics, and biology, and Hinton revolutionizing computer science.
  - Their work has shaped modern AI technologies, making them deserving recipients of the Nobel Prize in Physics.