



Gujarat

Judicial Services Exam

The High Court of Gujarat

Volume - 10

General Knowledge & Computer



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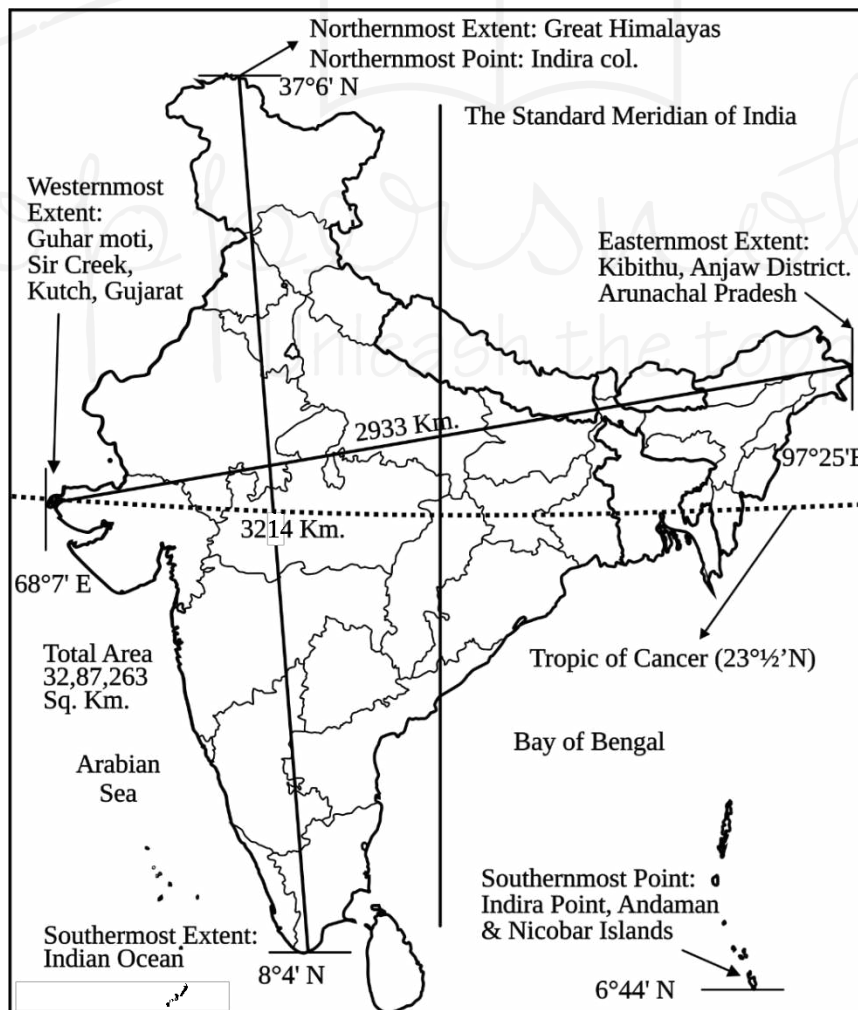
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CHAPTER

Indian Geography

INDIA - AT A GLANCE

Aspect	Details
Latitudinal Extent	8°4' N to 37°6' N
Longitudinal Extent	68°7' E to 97°25' E
Northernmost Point	Indira Col, Ladakh
Southernmost Point	Indira Point, Great Nicobar Island
Easternmost Point	Kibithu/Valang, Arunachal Pradesh
Westernmost Point	Gaurmukh, Gujarat
Area	3,287,263 sq km
World Ranking by Area	7th largest country
Percentage of World Area	2.4%
Countries Larger than India by Area	Russia, Canada, China, USA, Brazil, Australia
Latitudinal Distance (North–South)	3,214 km
Longitudinal Distance (East–West)	2,933 km
Population Ranking	Largest in the world



Coastline of India:

- On 29th April 2025, the Government of India recalculated the country's coastline. Including islands, the total coastline length is **11,098 km**. The coastline touches **9 states** and **66 districts**.
- **Western Coast States:** Gujarat, Maharashtra, Goa, Karnataka, Kerala
- **Eastern Coast States:** Tamil Nadu, Andhra Pradesh, Odisha, West Bengal
- **State-wise Highlights:**
 - ✓ **Longest coastline:** Gujarat (2,340 km)
 - ✓ **Shortest coastline:** Goa (193 km)
 - ✓ On the eastern coast, the **longest coastline** is Tamil Nadu (1,068 km)
- **Maritime Zones (as per International Maritime Organization):**
 - ✓ Territorial Sea
 - ✓ Contiguous Zone
 - ✓ Exclusive Economic Zone (EEZ)
- **Tropic of Cancer in India:**

- ✓ The Tropic of Cancer is located at **23°N latitude**, north of the Equator.
- ✓ It passes through **8 Indian states:** Gujarat, Rajasthan, Madhya Pradesh, Chhattisgarh, Jharkhand, West Bengal, Tripura, and Mizoram.
- ✓ The **Mahi River** crosses the Tropic of Cancer **twice**.

Standard Time

- The **Standard Time** in India is based on the **82.5° East longitude**, which is the **central meridian** passing through **Naini (Mirzapur), Uttar Pradesh**.
- India's standard time is **5 hours 30 minutes ahead of Greenwich Mean Time (GMT)**, meaning when it is **12:00 noon in England**, it is **5:30 PM in India**.
- The **standard meridian** passes through **five states:** Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Odisha, and Andhra Pradesh.

Bordering Countries

Country	Capital	Border Length with India	Bordering Indian States / Remarks
Afghanistan	Kabul	106 km	Ladakh (via Wakhan Corridor / PoK region)
Bangladesh	Dhaka	4096.7 km	West Bengal, Assam, Meghalaya, Tripura, Mizoram
Bhutan	Thimphu	699 km	West Bengal, Sikkim, Assam, Arunachal Pradesh
China	Beijing	3488 km	Ladakh, Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh
Myanmar	Naypyidaw	1643 km	Arunachal Pradesh, Nagaland, Manipur, Mizoram
Nepal	Kathmandu	1751 km	Bihar, Uttar Pradesh, Uttarakhand, West Bengal, Sikkim
Pakistan	Islamabad	3323 km	Jammu & Kashmir, Ladakh, Punjab, Rajasthan, Gujarat
Sri Lanka	Colombo (Commercial), Sri Jayawardenepura Kotte (Legislative)	Sea Border	Separated from India by the Gulf of Mannar
Maldives	Malé	Sea Border	Located southwest of India in the Indian Ocean , below Lakshadweep Islands

International Boundaries

Adjacent to India:

- **Radcliffe Line** – Between India and Pakistan
- **24th Parallel** – Between India and Pakistan
- **McMahon Line** – Between India and China

- **LAC (Line of Actual Control)** – Between India and China
- **Durand Line** – Between Afghanistan and Pakistan
- **Johnson Line (1865) & MacDonald Line (1893)** – Between China and India (Ladakh); currently considered illegal by China

International Disputed Areas Involving India:

- **Galwan Valley** – India and China
- **Siachen Dispute** – India and Pakistan
- **Katchatheevu Island** – India and Sri Lanka
- **Kalapani Dispute** – India and Nepal
- **Susta Area Dispute** – India and Nepal

Administrative Status

- **Administrative Structure:** India currently comprises **28 states** and **8 Union Territories**.
- **Districts:** In 2011, India had a total of **640 districts**, which increased to **780 districts** by 2025 (as of October 2025).

- **Villages:** In 2011, India had approximately **640,000 villages**.

Political Structure:

- **Lok Sabha Seats:** Maximum 550; currently 543.
- **Rajya Sabha Seats:** Maximum 250; currently 245.
- **Legislative Councils:** Present in six states: Uttar Pradesh (100), Maharashtra (78), Bihar (75), Karnataka (75), Andhra Pradesh (58) and Telangana (40)

India's Physical Landscape

Major Himalayan Ranges of India

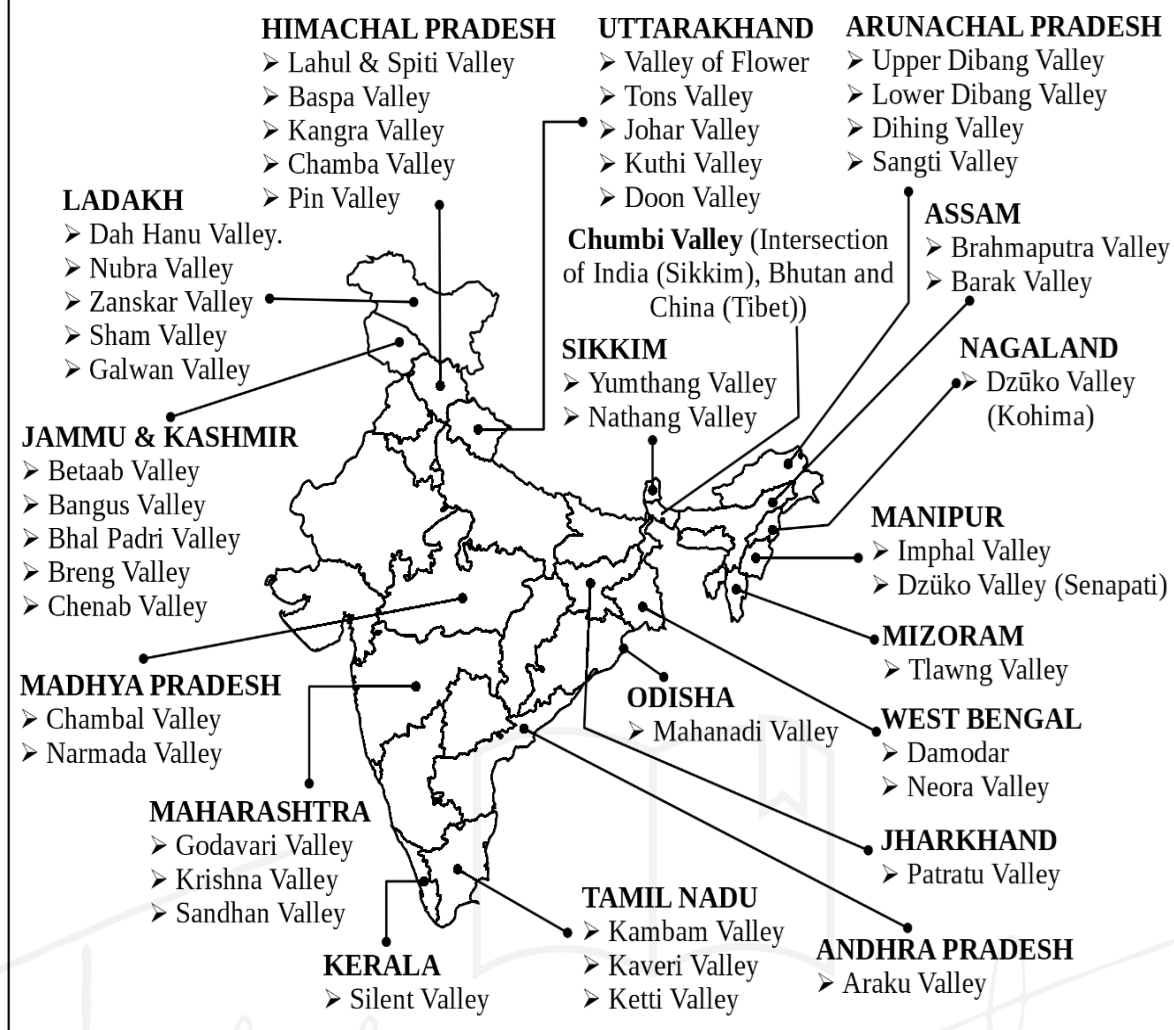
Mountain Range	Location / Extent	Key Notes (Description)	Highest Mountain Peak
Karakoram Range	Ladakh (India), China, Pakistan	One of the world's most rugged mountain systems; contains the greatest concentration of glaciers outside the polar regions (e.g., Siachen Glacier).	K2 (Mount Godwin-Austen) – 8,611 m
Ladakh Range	Ladakh (UT)	Lies between the Indus River and the Karakoram Range; cold desert climate; parallel to the Zaskar Range.	Lunpo Gangri – ~ 7,095m
Zaskar Range	Ladakh & Himachal Pradesh	Eastern extension of the Greater Himalayas; acts as a climatic barrier; Zaskar River cuts through it forming deep gorges.	Kamet Peak – ~7,756 m
Shiwalik (Siwalik) Range	Outer Himalayas (Punjab to Assam foothills)	Youngest, lowest & outermost Himalayan range; composed of unconsolidated sediments; prone to erosion and landslides.	Churdhar Peak – 3,647 m
Pir Panjal Range	Jammu & Kashmir, Himachal Pradesh	Largest range of the Lesser Himalayas; separates Kashmir Valley from Himachal Pradesh; famous for passes like Banihal.	Indrasan – 6,221 m
Dhauladhar Range	Himachal Pradesh	Southern branch of the Lesser Himalayas; rises sharply from Kangra Valley; known for steep slopes and snow peaks.	Hanuman Tibba – 5,860 m

Important valleys of India

- **Western Ghats' highest peak** - Anamudi (2695 m), Kerala
- **Eastern Ghats' highest peak** - Jindagarh (1690 m), Andhra Pradesh
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- **Andaman and Nicobar's highest peak** - Saddle Peak (732 m), North Andaman
- **Bihar's highest peak** - Someshwar (874 m)
- **Chhattisgarh's highest peak** - Gaurkata (Samripat, 1225 m)
- **Jharkhand's highest peak** - Parasnath (Giridih district)

Important Valleys Of India



Prominent Himalayan Glaciers

Glacier Name	Location	Important Features
Siachen	Karakoram ranges	Nubra Valley of Himalayas; 2nd longest glacier outside Polar region largest glacier of trans-Himalayas
Biafo	Karakoram	Flows into the Shigar River
Gangotri	Uttarakhand	Origin below Chaukhamba Peak; also known as 'Gomukh'
Hispar	Gilgit-Baltistan	World's longest glacial system
Zemu	Sikkim/Nepal	Largest glacier of Eastern Himalaya; feeds River Teesta
Sonapani	Lahaul & Spiti, HP	Longest glacier in the Pir Panjal range. A glacier stream is a tributary to the Chandra River, which later merges with the Bhaga River to form the Chenab.
Milam	Uttarakhand	Major source of River Gori Ganga (Saryu); biggest glacier in Kumaon Himalaya
Chong Kumdan	Karakoram, Ladakh	Feeds Shyok River due to potential blocking
Diamir	POK	Known as the 'King of Mountains'
Rupal	Kashmir	In Greater Himalayas; flows north eastward
Bhillans, Thajivas, and Prui	Jammu and Kashmir	

Prominent Himalayan Passes

Pass Name	State / UT	Location / Border	Importance
Zoji La	Jammu & Kashmir, Ladakh	Greater Himalayas	Connects Srinagar–Kargil & Leh; Lying in the middle of India and China
Banihal Pass	Jammu & Kashmir	Pir Panjal Range	Jawahar Tunnel passes beneath it ; Srinagar–Jammu route ; a pass connecting the rest of India to Kashmir .
Khardung La	Ladakh	Ladakh Range	Road to Siachen; one of highest motorable roads
Chang La	Ladakh	Ladakh Range	Connects Leh to Pangong Lake
Fotu La	Ladakh	Zaskar Range	Highest point on Srinagar–Leh highway
Namika La	Ladakh	Zaskar Range	On Kargil–Leh route
Baralacha La	Himachal Pradesh	Zaskar Range	On Leh–Manali highway
Shipki La	Himachal Pradesh	India–Tibet Border (Kinnaur)	Historic silk route for trade.
Mana Pass	Uttarakhand	Chamoli District	Road to Kailash–Mansarovar; Indo-China route
Niti Pass	Uttarakhand	Chamoli District	Old trade route to Tibet
Lipulekh Pass	Uttarakhand	Pithoragarh District	Kailash–Mansarovar Yatra route; India–Nepal–Tibet tri-junction
Muling La	Uttarakhand		connects Uttarakhand and Tibet and is situated in the north of Gangotri.
Nathu La	Sikkim	Indo–China Border	A border trade post with China; one of the highest motorable roads in the world connects Sikkim with the Tibet Autonomous Region of China.
Jelep La	Sikkim	Near Kalimpong	Trade route to Lhasa in historical times
Sella Pass	Arunachal Pradesh	Tawang District	Connects Tawang to rest of state; Sella tunnel world’s Longest twin lane tunnel above 13000 feet altitude.
Bum La	Arunachal Pradesh	Near Tawang	Indo–China sensitive military pass
Dipher Pass	Arunachal Pradesh	East Kameng	Eastern Himalayas, remote and strategic
Khunjerab Pass	(POK)	Gilgit–Baltistan (Pak-Occupied Kashmir)	On China–Pakistan border; on CPEC route
Lanak La	Ladakh (Disputed Border)	Aksai Chin region (Indo-China)	Disputed India–China border crossing

Lekhapani	Arunachal Pradesh	Eastern tip near Assam-Arunachal	Historic WW-II route via Stilwell Road; strategic for eastern sector
Rohtang Pass	Himachal Pradesh	Pir Panjal Range	Connects Kullu Valley to Lahaul and Spiti valleys ; separates Chenab and Beas basins a famous tourist attraction site
Debsa Pass	Himachal Pradesh	-	Located between Kullu and Spiti districts
Dihang Pass	Arunachal Pradesh	-	Connects Arunachal Pradesh to Myanmar Beyond this pass, the Himalayas bend sharply to the south and spread along the eastern boundary of India.
Khyber Pass	Pakistan–Afghanistan		Connects Peshawar (Pakistan) to Jalalabad (Afghanistan) ; part of the ancient Silk Road trade network
Muling La Pass & Mangsha Dhura Pass	Uttarakhand	Greater Himalayas	Connects Uttarakhand to Tibet

Geographical Division of Plains

Geographical Type	Location/Extent	Characteristics / Special Features
Bhabar Plains	From Punjab to Assam; located south of the Shivalik hills (foothill region)	Small rivers disappear underground in these plains.
Terai Plains	South of the Bhabar plains; marshy area	Rivers flow on the surface instead of going underground.
Bangar Plains	Doab regions situated between two rivers	Composed of gravel, stones, sand, and clay; formed by older alluvium. Also called Bhud, Reh, Dhaya, or Bet in some regions.
Khadar Plains	Formed by new alluvial soil	Highly fertile; located in flood-prone areas; formed by recent alluvium.

Doab Area

Doab Name	Rivers It Lies Between
Sind Sagar Doab	Indus & Jhelum
Jech Doab	Jhelum & Chenab
Rachna Doab	Ravi & Chenab
Bari Doab	Beas & Ravi
Bist Doab	Beas & Sutlej

Plateau

Plateau	Location	Special Features / Notes	Major Rivers / Highlights
Central India Plateau	Rajasthan, Madhya Pradesh, Uttar Pradesh	Known as the "Basket of Mustard" of Central India	Parvati, Chambal, Banas, Kuno, Seep

Malwa Plateau	Madhya Pradesh	Located between Aravalli and Vindhya ranges; famous for soybean production; rich in black soil; Chinese traveler Faxian called its climate one of the best in the world	–
Bundelkhand Plateau	Madhya Pradesh, Uttar Pradesh	Panna district produces the most diamonds in India; famous tourist sites include Khajuraho, Orchha, Chanderi, and Devgarh	–
Baghelkhand Plateau	Madhya Pradesh, Chhattisgarh	Red-yellow soil predominates; major rice-producing region; highest concentration of sal trees in India	–
Chota Nagpur Plateau	Bihar, Jharkhand, West Bengal	Rich in minerals; known as the "Ruhr of India"; largest mineral production in India	–
Kathiawar Plateau	Gujarat	Region has black soil; famous for peanut and cotton cultivation	–
Deccan Plateau	Maharashtra, Gujarat, Karnataka	Largest plateau in India; Kalsubai is its highest peak; formed by volcanic activity and basalt rocks	–
Dandakaranya Plateau	Odisha, Chhattisgarh, Andhra Pradesh	Famous for rice cultivation; one of the most Naxal-affected regions	Mahanadi, Tel, Ong
Rayalaseema Plateau	Andhra Pradesh, Telangana	Red-yellow soil predominates; famous for tobacco and maize cultivation	–

Important Facts

- Netarhat in Jharkhand is known as the "Queen of Chotanagpur Plateau."
- The highest peak of the Chotanagpur Plateau is Parasnath Hill.
- The Rashtrapati Bhavan in New Delhi, India, is located on Raisina Hill.

Indian Coast

West Coast (Western Coastal Plains)

Coastal Plain	Location / Extent	Special Features / Notes
Kathiawar Coast	Gujarat to Daman	Major ports: Pandit Deendayal (Kandla), Dahej, Mundra.
Konkan Coast	Daman to Goa	Major ports: Mumbai, Nhava Sheva (Jawaharlal Nehru).
Canara Coast	Goa to New Mangalore	Also called the Kannada Coast. Major ports: New Mangalore, Marmagao (Vasco da Gama).
Malabar Coast	New Mangalore to Kanyakumari	Major port: Kochi (Spice Port). Minerals: sand, thorium, monazite.

East Coast (Eastern Coastal Plains)

Coastal Plain	Location / Extent	Special Features / Notes
Northern Circars Coast	West Bengal to Mahanadi Delta	Major ports: Haldia, Kolkata.
Utkal Coast	Mahanadi to Krishna Delta	Major port: Paradip (Odisha).
Golconda Coast	Krishna River to Cauvery River	Major port: Vishakhapatnam (India's deepest port).
Coromandel Coast	Cauvery River to Kanyakumari	Highest rainfall due to retreating monsoon (Nov–Dec). Rice cultivation in Nov–Dec.

Major Island Groups of India

➤ **Andaman & Nicobar Islands (Bay of Bengal):**

- ✓ Volcanic islands known for pristine beaches, coral reefs, and rich biodiversity (Havelock, Neil, Ross).
- ✓ The Great Nicobar Island is the largest island in India
- ✓ 22 islands in Nicobar.
- ✓ It is believed that Andaman and Nicobar Islands are an elevated portion of submarine mountains.

➤ **Lakshadweep Islands (Arabian Sea):**

- ✓ Coral atolls famous for lagoons, marine life, and water sports.

Arabian Sea Islands

Island / Island Group	Location	Features / Special Notes
Aliya Wet	Gulf of Khambhat	Formed between the mouths of the Narmada and Tapi rivers; famous for petroleum production.
Khadiya Wet	Gulf of Khambhat	Island formed by the Narmada and Tapi rivers.
Piram Wet	Gulf of Khambhat	Located in Bhavnagar district; famous for salt production.
Bombay High	Maharashtra (near Mumbai)	India's largest petroleum source, located near Mumbai.
Basin Island	Maharashtra	A small petroleum source.
Elephanta Island	Maharashtra	Famous for the Elephanta Caves located on this island.
Jawahar Island	Maharashtra	Also known as Butcher Island.
Salsette Island	Maharashtra	Home to the major city of Thane.
Chorão Island	Goa	Location of the Salim Ali Bird Sanctuary.
Willingdon Island	Kerala	Located in Vembanad Lake, Kerala.
Lakshadweep Islands	Arabian Sea	Coral-built atoll islands consisting of 36 small islands.

Bay of Bengal Islands

Island Name	Location	Notes / Significance
New Moore Island	Bay of Bengal	Disputed between India and Bangladesh since 1981.
Kalash Island	Bay of Bengal	Famous island within Sundarbans National Park.
Ganga Sagar Island	West Bengal	Located at the mouth of the Hooghly River; also known as Sagar Island.
Abdul Kalam Island	Odisha	India's missile launching center; formerly called Wheeler Island. Nearby are two smaller islands: Chandipur and Balasore.
Sriharikota Island	Andhra Pradesh	Houses the Satish Dhawan Space Centre.
Pamban Island	Tamil Nadu	Located in the Gulf of Mannar.
Barren Island	Eastern Andaman	India's only active volcano. Last eruption occurred on 5 November 2020.
Andaman & Nicobar Islands	Bay of Bengal	India's largest island group.
Shaheed Dweep	Andaman & Nicobar	Formerly called Neil Island.
Subhash Chandra Bose Island	Andaman & Nicobar	Formerly called Ross Island.
Swaraj Dweep	Andaman & Nicobar	Formerly called Havelock Island.

River Islands

Island Name	River	Notable Facts / Description	Location / State
Majuli Island	Brahmaputra	World's largest river island; declared India's first river island district in 2017	Assam
Umanand Island	Brahmaputra	Famous for the Golden Langur	Assam
Srirangapatnam Island	Kaveri	Located on an island in Tamil Nadu	Tamil Nadu
Mandhata Island	Narmada	Historical/Geographical significance	Khargone/Khandeva, Madhya Pradesh

Rivers and Water Resources of India

Important River of India

Rivers	Description
Indus	➤ Origin: Near Mount Kailash in Tibet (China) ➤ Major Tributaries: Jhelum River, Chenab River, Ravi River, Beas River, Sutlej (Satluj) River, etc. ➤ Course: Enters India through Ladakh (UT of Ladakh) and flows northwest into Pakistan and finally drains into the Arabian Sea. ➤ According to the 1960 Indus Waters Treaty, the eastern rivers of the water system - Sutlej, Ravi and Chenab were to be with India ➤ North to South Sequence: Indus, Chenab, Ravi, Beas, Satluj
Ganga	➤ Origin: Gangotri Glacier near Gaumukh in Uttarakhand. ➤ Total length: 2,525 km (longest river in India). ➤ Empties into the Bay of Bengal through the Sunderbans Delta ➤ Major Tributaries: Yamuna, Son, Kosi, Ghaghara etc. ➤ Distributary: Bhagirathi-Hooghly (formed at Farakka) ➤ At Devprayag the Bhagirathi is Joined by Alaknanda.
Yamuna (1375 km)	➤ Source: Yamunotri Glacier in Uttarakhand. ➤ Role: Westernmost & longest tributary of the Ganga, joining it at Prayag (Allahabad). ➤ Right-bank tributaries: Chambal, Sind, Betwa (480 km), Ken. ➤ Left-bank tributaries: Hindan, Rind, Senger, Varuna, Tons (Longest tributary, its tributaries- Pabbar, Asan)
Son(780km)	➤ Origin: Amarkantak Plateau in Madhya Pradesh. ➤ Note: Large south bank tributary of the Ganga.
Chambal (1050km)	➤ Source: Near Mhow, Madhya Pradesh. ➤ Confluence: Joins Yamuna. ➤ Feature: Famous for ravines and badland topography. ➤ Tributaries: Banas, Kali Sindh, Parvati ➤ Border of Madhya Pradesh and Uttar Pradesh and Madhya Pradesh and Rajasthan
Kosi(730km)	➤ Type: Antecedent river. ➤ Source: Arun River from Everest region, merging to form Saptakoshi in Nepal. ➤ Nickname: "Sorrow of Bihar" due to flooding. ➤ Plain Elevation: 30 metres above sea level.
Narmada (1312km)	➤ Origin: Amarkantak Plateau ➤ Flow: Flows through fault valleys between the Satpura and Vindhya ranges; forms the boundary between North and South India ➤ Feature: Dhuandhar Waterfall; formation of an estuary ➤ Tributaries: Tawa, Sher, Shalkar

Tapti	➤ Origin: Multai, fault valley of the Satpura Range (Betul, Madhya Pradesh) ➤ Flow: Passes through Madhya Pradesh, Maharashtra, and Gujarat ➤ Feature: Flows parallel to the Narmada; about 80% of its basin lies in Maharashtra ➤ Tributaries: Waghur, Aner, Girna, Purna, Panzara and Bori.
Brahmaputra	➤ Origin: Chemayungdung Glacier, near Mount Kailash (Northern Himalayas) ➤ Total length: ~2,900 km (one of the longest rivers of Asia). ➤ Finally drains into the Bay of Bengal, forming the Ganga–Brahmaputra–Meghna Delta. ➤ Major Tributaries: Subansiri, Manas, Sankosh, Dihang, Lohit, Burhi dihing etc. ➤ It has the least storage capacity of usable water.
Mahanadi (858km)	➤ Origin → Sihawa range, Chhattisgarh ➤ States → Chhattisgarh, Odisha (The largest river here) ➤ Tributaries → Seonath, Hasdeo, Mand, Ib, Ong, Tel, Jonk
Godavari (1465km)	➤ Origin → Kasu bai hill, Nashik (MH - About 50 percent of the basin area is in this state, longest peninsular river. ➤ Tributaries → Pranhita, Indravati, Penganga, Manjra ➤ Peninsular India's longest river, the Old Ganga or Ganga of the South, the country's second largest basin.
Krishna (1400km)	➤ Origin: Mahabaleshwar, located in the Sahyadri Range (Maharashtra) ➤ Tributaries: Bhima, Tungabhadra, Koyna, Munsri, Malaprabha, Panchganga, Dudhaganga, Ghataprabha ➤ Feature: It has the largest drainage basin among the peninsular rivers. ➤ Note: The Krishna–Godavari water dispute is between Karnataka and Andhra Pradesh.
Cauvery / Kaveri (805km)	➤ Origin: Brahmagiri Hills (Karnataka); known as <i>Ponni</i> in Tamil Nadu; the fourth-largest river in South India ➤ States: Karnataka, Kerala, Tamil Nadu (The Cauvery water dispute is between Tamil Nadu and Karnataka) ➤ Feature: Shivanasamudra Waterfall (largest in terms of volume); total length – 800 km ➤ Tributaries: Kabini, Bhavani, Amaravati, Hemavati, Shimsha
Luni (450km)	➤ Origin: Aravalli Range ➤ Feature: Seasonal River; ends in the Rann of Kutch; ➤ major tributaries include Jojari, Sukri, and Jawai
Jhelum (725 km)	Origin: Verinag Spring → passes through Wular Lake → Joins chenab In the Vedas – Vitasta
Chenab (974 km)	Formed by confluence of Chandra + Bhaga rivers at Tandi (Himachal) → Largest tributary of Indus → Joins Sutlej before finally merging with Indus In the Vedas , it is referred to as Asikni .
Ravi (720 km)	Origin: Kullu Hills near Rohtang pass → drains area between Pir Panjal & Dhaola Dhar ranges
Beas (470 km)	Origin: Near Rohtang pass → Joins Sutlej River
Sutlej (1050km) (Sutudri)	Origin: Rakas's lake (Tibet) → enters Punjab via Shipki La pass → Antecedent River cutting through the Himalayas before uplift

Fact to Know:

- Nandi river flows through Tiruttani a famous pilgrimage place of South India.
- Berach River, a southern-side tributary of Banas River, originates from the hills in Udaipur, Rajasthan.
- The Galwan River is a strategic river in Ladakh, India, flowing from disputed Aksai Chin (controlled by China) to join the Shyok River, an Indus tributary.
- Pindar River is the tributary of Alaknanda.

Lakes In India

Lake	State/Union Territory	Main Features
Wular Lake	Jammu and Kashmir	India's largest and Asia's second-largest freshwater natural lake; formed due to tectonic activity; the Jhelum River flows through it.
Kodaikanal Lake	Tamil Nadu	Artificial freshwater lake.
Dal Lake	Jammu and Kashmir	Famous for houseboats and Shikaras; known as the "Jewel of Srinagar."
Pangong Tso	Ladakh	Salt Lake extending into China.
Tso Moriri, Tso Kar	Ladakh	High-altitude freshwater lakes.
Chilika Lake	Odisha (Mahanadi Delta)	Asia's largest brackish water lake; famous for flamingos; India's first Ramsar site.
Kanwar Lake	Bihar	Asia's largest freshwater oxbow lake.
Chandra Tal Lake	Himachal Pradesh	"Lake of the Moon"; Parashar Lake is also located in Himachal Pradesh.
Sasthamkotta Lake	Kerala	"Queen of Lakes"; the largest freshwater lake in Kerala.
Loktak Lake	Manipur	The largest freshwater lake in Northeast India; famous for <i>phumdis</i> ; home to the world's only floating national park.
Pookode Lake	Kerala	The smallest lake in India.
Bhojtal Lake	Madhya Pradesh	Asia's largest artificial lake.
Govind Ballabh Pant Sagar (Rihand Dam)	Uttar Pradesh	India's largest artificial lake.
Cholamu Lake	Sikkim	The highest-altitude lake in India.
Pulicat Lake	Andhra Pradesh and Tamil Nadu	India's second-largest brackish lagoon; shared by two states.
Vembanad Lake (Lagoon)	Kerala	The longest lake in India; the largest lake in Kerala.
Sambhar Lake	Rajasthan	India's largest inland Salt Lake.
Kolleru Lake	Andhra Pradesh	Seasonal freshwater lake located between the Krishna and Godavari rivers.
Nainital Lake	Uttarakhand	Crescent-shaped natural freshwater lake.
Naukuchia Tal	Nainital, UK	
Bhimtal Lake	Uttarakhand	Larger than Nainital Lake.
Renuka Lake	Himachal Pradesh	Named after Goddess Renuka.
Tsongmo (Changu) Lake	Sikkim	Glacial lake located near the Nathu La Pass.
Rudrasagar Lake	Tripura	Wetland designated under the Ramsar Convention.

Roopkund Lake	Uttarakhand	Glacial lake; known as the “Mystery Lake” due to hundreds of human skeletons found around it.
Jaisamand Lake	Rajasthan	Asia’s second-largest artificial freshwater lake; Pichola Lake is another prominent lake in Rajasthan.
Gurudongmar Lake	Sikkim	Mountain lake; a sacred pilgrimage site in Buddhism.
Keetham Lake	Uttar Pradesh	Also known as <i>Sur Sarovar</i> ; designated as a Ramsar site.
Lonar Lake (Crater Lake)	Maharashtra	India’s only lake formed by a meteor impact; the largest crater lake in the world.
Hussain Sagar Lake	Telangana	Artificial lake built on the Musi River; connects the twin cities of Hyderabad and Secunderabad.
Bhopal Lake	MP	one of the largest artificial lake of its time was built in 11 th C

Waterfalls in India

Waterfall	Location	Description
Nohkalikai Waterfall	Meghalaya	India’s highest plunge (vertical drop) waterfall.
Dudhsagar Waterfall	Goa	Four-tiered waterfall located on the Mandovi River.
Jog Waterfall	Karnataka	Situated on the Sharavathi River; also known as Gersoppa Falls.
Dhuandhar Waterfall	Madhya Pradesh	World-famous waterfall flowing through marble rocks; falls from the narrow stream of the Narmada River.
Rajrappa Waterfall	Jharkhand	Formed at the confluence with the Damodar River; known for its fascinating rock formations.
Hundru Waterfall	Jharkhand	Located in Ranchi district; surrounded by varied rock formations.
Kempty Waterfall	Uttarakhand	Situated in Tehri Garhwal district.
Shivanasamudra Waterfall	Karnataka	Located on the banks of the Cauvery River; the second-largest waterfall in India.
Kapildhara Waterfall	Madhya Pradesh	Formed at the confluence of the Kapila and Erandi rivers with the Narmada River.
Kunchikal Waterfall	Karnataka	The highest waterfall in India; formed by the Varahi River.
Duduma Waterfall	Odisha	Located on the Machkund River.
Tirathgarh Waterfall	Chhattisgarh	The highest waterfall in Chhattisgarh, situated on the Kanger River.
Chitrakote Waterfall	Chhattisgarh	Known as the “Niagara Falls of India”; located on the Indravati River.
Gatha (Gatha Seha Waterfall)	Madhya Pradesh	Fed by the Ken River.
Magod Falls	Karnataka	A group of waterfalls where the Bedti River descends.
Thalaiyar Falls	Tamil Nadu	The tallest waterfall in Tamil Nadu; also known as Rat Tail Falls.
Athirappilly Waterfall	Kerala	The largest waterfall in Kerala.

Dams & Reservoirs

- A dam is a barrier across flowing water that obstructs, directs or retards the flow, often creating a reservoir, lake or impoundment.

Name of Dam	State	River	Main Feature
Nagarjuna Sagar Dam	Andhra Pradesh / Telangana	Krishna	The largest stone–masonry dam in Asia.
Srisailem Dam	Andhra Pradesh / Telangana	Krishna	Constructed in a deep gorge for hydroelectric power generation.
Sardar Sarovar Dam	Gujarat	Narmada	Part of the Narmada Valley Project; multipurpose dam.
Ukai Dam	Gujarat	Tapi	The second-largest water project in Gujarat.
Bhakra Dam	Himachal Pradesh / Punjab	Sutlej	The highest gravity dam in Asia; part of the Bhakra–Nangal Project.
Baglihar, Salal, Dulhasti Dams	Jammu & Kashmir	Chenab	Built for hydroelectric power generation.
Almatti Dam	Karnataka	Krishna	Major dam of Karnataka; disputed with Maharashtra and Andhra Pradesh; also known as Lal Bahadur Shastri Dam.
Tungabhadra Dam	Karnataka	Tungabhadra	Used for irrigation and hydroelectric power generation.
Krishnarajasagar Dam	Karnataka	Cauvery	Lifeline of the Mysore region.
Idukki Dam	Kerala	Periyar	The largest hydroelectric dam in Kerala.
Mullaperiyar Dam	Kerala / Tamil Nadu	Periyar	A disputed dam between Kerala and Tamil Nadu.
Banasura Sagar Dam	Kerala	Karamanasha Tributary	The largest earthen dam in India.
Indira Sagar Dam	Madhya Pradesh	Narmada	Largest reservoir in India by surface area.
Gandhi Sagar Dam	Madhya Pradesh / Rajasthan	Chambal	The first dam of the Chambal Valley Project.
Koyna Dam	Maharashtra	Koyna	The largest hydroelectric dam in Maharashtra.
Hirakud Dam	Odisha	Mahanadi	The longest earthen dam in Asia.
Ranjit Sagar Dam	Punjab	Ravi	Used for irrigation and power generation.
Rana Pratap Sagar Dam	Rajasthan	Chambal	Part of the Chambal Valley Project.
Bisalpur Dam	Rajasthan	Banas	Main source of drinking water for Jaipur.
Mettur Dam	Tamil Nadu	Cauvery	The oldest and most important dam in Tamil Nadu.
Rihand Dam	Uttar Pradesh	Rihand	The largest multipurpose dam in India.
Tehri Dam	Uttarakhand	Bhagirathi and Bhilangna	The highest dam in India (~260 meters).
Farakka Barrage	West Bengal	Ganga	Maintains water flow in the Kolkata port.

Maithon Dam	West Bengal / Jharkhand	Barakar	Part of the Damodar Valley Corporation project.
Panchet Dam	West Bengal / Jharkhand	Damodar	A component of the Damodar Valley Corporation project.
Tilaiya Dam	Jharkhand	Barakar	The first project under the Damodar Valley Corporation.
Kallanai (Grand Anicut) Dam	Tamil Nadu	Cauvery	The oldest dam in India, also known as the Grand Anicut.

Transportation in India

Road Transport

- **State with the highest number of roads:** Maharashtra
- **State with the lowest number of roads:** Sikkim
- **State with the highest number of paved roads:** Maharashtra
- **State with the highest number of unpaved roads:** Odisha
- **State with the highest road density:** Goa
- **State with the lowest road density:** Jammu & Kashmir
- **Longest road tunnel in India:** Dr. Shyama Prasad Mukherjee Tunnel, Jammu & Kashmir (9.2 km)

- **Longest road bridge in India:** Bhupen Hazarika Bridge, Assam (9.15 km)
- **Second longest National Highway in India:** NH-27, Porbandar (Gujarat) to Silchar (Assam), 3,507 km
- **State with the highest number of National Highways:** Maharashtra (102)
- **State with the lowest number of National Highways:** Meghalaya (5)
- **Shortest National Highway in India:** NH-327B, West Bengal (1.2 km)
- **Golden Quadrilateral cities:** Delhi, Mumbai, Chennai, Kolkata

National Highways

National Highway	Connects	Key Features
NH-44	Srinagar (Jammu & Kashmir) – Kanyakumari (Tamil Nadu)	India's longest National Highway; approximately 3,745 km; passes through 12 states and Union Territories (from Jammu & Kashmir to Kanyakumari (Tamil Nadu)) 7 NHs were merged to form National Highway 44 (NH 44)
NH-27	Silchar (Assam) – Porbandar (Gujarat)	India's second-longest highway; East–West corridor
NH-19 (formerly NH-2)	Delhi – Kolkata (via Jhansi, Prayagraj, Varanasi, Dhanbad)	Part of the Golden Quadrilateral; runs parallel to the Ganga
NH-48	Delhi – Mumbai – Bengaluru – Chennai	Major part of the Golden Quadrilateral
NH-16 (formerly NH-5)	Kolkata – Chennai (via Odisha and Andhra coasts)	Eastern Coastal Highway; main route for Andhra Pradesh and Odisha
NH-8 (now part of NH-48)	Delhi – Mumbai	Busiest industrial corridor
NH-1 (now part of NH-44)	Delhi – Amritsar (Wagah Border)	Key route in North India; historically significant / Sher Shah Suri Route

Fact to Know:

- **National Highways Authority of India (NHAI):** An autonomous body under the Ministry of Road Transport and Highways, established in 1995, maintains National Highways.
- At present, the Grand Trunk Road extends from Amritsar to Kolkata in India.
- Roads are classified in 6 categories in India.

Railway Transport:

- The first train in India ran on **16 April 1853** between **Mumbai and Thane**. This train was named "**Black Beauty**."
- **Founder of Railways in India: Lord Dalhousie** is considered the father of railways in India.

Metro Services in India:

- The first metro in India was inaugurated in **Kolkata (Calcutta Metro)**.
- In **2011**, **Namma Metro** in **Bengaluru** was launched with support from **Japan**.

Important facts related to Railways

- **Longest train route in India:** Vivek Express (Kanyakumari to Dibrugarh)
- **Fastest train in India:** Vande Bharat Express (Varanasi to Delhi)
- **Longest railway platform in India:** Hubli / Siddharudha Swami Railway Station, Karnataka (since 2020)
- **Largest railway station in India:** Howrah, West Bengal

- **India's first solar-powered railway station:** Guwahati (2018)
- **Railway services between India and Bangladesh:** Maitree Express and Bandhan Express
- **Railway services between India and Pakistan:** Thar Express and Samjhauta Express
- **Mountain railway services in India:** Kalka–Shimla (Himachal Pradesh), Darjeeling (West Bengal), and Nilgiri (Tamil Nadu)
- **India's first private railway station:** Rani Kamalapati Station, Habibganj, Madhya Pradesh
- **Proposed bullet train service in India:** Ahmedabad to Mumbai
- **Konkan Railway Service (1990):** Operates between Roha (Maharashtra) and Mangaluru (Karnataka) covering 760 km
- **Indian Railways in UNESCO World Heritage List:**
 - ✓ Darjeeling Himalayan Railway
 - ✓ Nilgiri Mountain Railway
 - ✓ Kalka–Shimla Railway
- **Konkan Railway:** Started in 1990; serves Maharashtra (Roha), Goa, and Karnataka (Mangaluru); 760 km long.

Fact to Know:

- The Indian Railways has integrated its helpline numbers into a single number, that is 139.

Railway Zone

Railway Zone	Headquarters	States/Regions Covered
Northern Railway	Delhi	Delhi, Haryana, Uttar Pradesh, Punjab, Rajasthan, Jammu & Kashmir
North Central Railway	Prayagraj (Allahabad)	Uttar Pradesh, Madhya Pradesh, Rajasthan
North Eastern Railway	Gorakhpur	Uttar Pradesh, Bihar, part of West Bengal
North East Frontier Railway	Maligaon, Guwahati	Assam, Arunachal Pradesh, Nagaland, part of West Bengal, Bihar, Meghalaya
North Western Railway	Jaipur	Rajasthan, Punjab, Haryana, part of Uttar Pradesh
Eastern Railway	Kolkata	West Bengal, Jharkhand, Bihar
East Central Railway	Hajipur	Bihar, Jharkhand, part of Uttar Pradesh

East Coast Railway	Bhubaneswar	Odisha, Andhra Pradesh, Chhattisgarh
Southern Railway	Chennai Central	Tamil Nadu, Kerala, Puducherry, parts of Andhra Pradesh and Karnataka
South Central Railway	Secunderabad	Telangana, Andhra Pradesh, Maharashtra, parts of Karnataka
South Coast Railway	Visakhapatnam	Coastal Andhra Pradesh (Visakhapatnam, Vijayawada divisions)
South Eastern Railway	Garden Reach, Kolkata	West Bengal, Jharkhand, Odisha
South East Central Railway	Bilaspur	Chhattisgarh, Odisha, Maharashtra, parts of Madhya Pradesh
South Western Railway	Hubli	Karnataka, Tamil Nadu, Andhra Pradesh, parts of Maharashtra
Western Railway	Mumbai	Maharashtra, Gujarat, parts of Rajasthan
West Central Railway	Jabalpur	Madhya Pradesh, Uttar Pradesh, parts of Rajasthan
Central Railway	Mumbai	Maharashtra, Madhya Pradesh, Karnataka, parts of Andhra Pradesh
Konkan Railway	Navi Mumbai	Konkan region of Maharashtra, Goa, Karnataka (started in 1998)
Metro Railway (Kolkata)	Kolkata	West Bengal (Kolkata Metropolitan Area; announced in 2010)

Railways Tunnel

Tunnel Name	Track Length (meters)	Location	Railway Division
Pir Panjal Railway Tunnel	11,215 m	Jammu & Kashmir	Northern Railway
Atal Tunnel (Rohtang passageway)	9,020 m	Himachal Pradesh	Northern Railway
Sangaldan Tunnel	8,000 m	Jammu & Kashmir	Northern Railway
Karbude Tunnel (T-35)	6,505 m	Maharashtra	Konkan Railway
Nathu Wadi Tunnel (T-6)	4,390 m	Maharashtra	Konkan Railway
Tike Tunnel (T-39)	4,078 m	Maharashtra	Konkan Railway
Barviewadi Tunnel (T-49)	4,000 m	Maharashtra	Konkan Railway
Savarde Tunnel (T-17)	3,429 m	Maharashtra	Konkan Railway
Barsem Tunnel (T-73)	3,343 m	Goa	Konkan Railway
Karwar Tunnel (T-80)	2,950 m	Karnataka	Konkan Railway

Waterways

- The **Inland Waterways Authority of India (IWAI)** was established in 1986 under the **Inland Waterways Authority of India Act, 1985** as an autonomous organization for the development, maintenance, and regulation of national waterways.
- Under the **National Waterways Act, 2016**, 111 inland waterways were declared as National Waterways.

Major National Waterways of India:

Serial No.	National Waterway (NW) No.	Name	Length (km)	Location (States)
1	NW-1	Ganga–Bhagirathi–Hooghly River System	1,620	Uttar Pradesh, Bihar, Jharkhand, West Bengal (Allahabad-Haldia stretch)
2	NW-2	Brahmaputra River	891	Assam

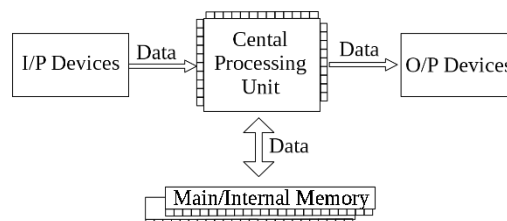
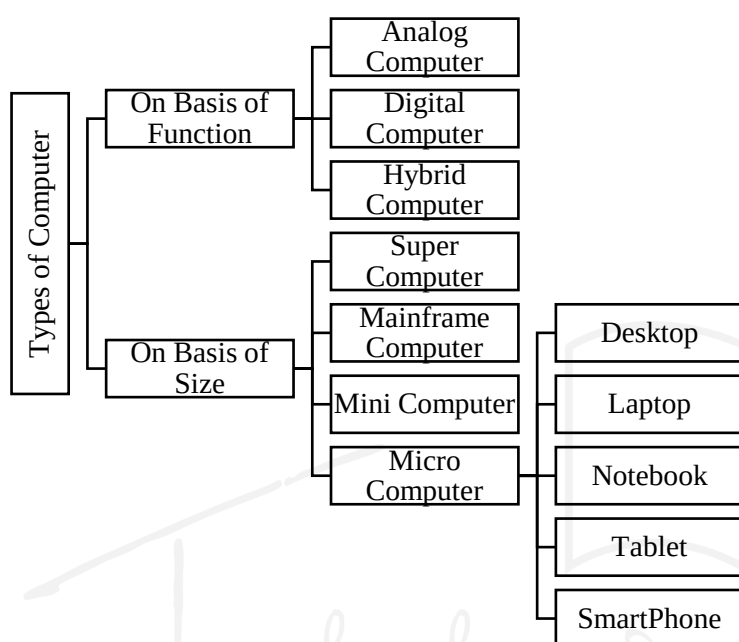
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CHAPTER

Basic of Computer

“A computer would deserve to be called intelligent if it could deceive a human into believing that it was human.” –**Alan Turing (father of modern computers)**.

A **computer** is an electronic device that can be programmed to **accept data (input)**, **process** it and **generate results (output)**. A computer along with additional hardware and software together is called a computer system.



Types of Computer: On Basis of Function:

- Analog Computer:** Analog computers process **continuous data** and work with **physical quantities** like voltage, temperature, speed, and pressure.
Ex: **Thermometer, Speedometer, Seismograph**
- Digital Computer:** Digital computers process **discrete (binary) data** using **0s and 1s**, performing calculations and logical operations.
Ex: Personal Computer (PC), Laptops, Supercomputers
- Hybrid Computer:** Hybrid computers combine **both analog and digital features**, processing continuous (analog) and discrete (digital) data.
Ex: ECG Machine (Electrocardiogram), Flight Simulators, Weather Prediction System

Types of Computers: On Basis of Size:

Mainframe Computer :

- Mainframes are a type of computer, which are made for **‘throughput’** as fast as possible. Throughput can be defined as **“the rate at which the data is processed”**.
- They are very large in size.
- They have greater processing power and memory as compared to minicomputers.
- Multiple users work at a time on these computers. They are expensive.
- They are generally used in railway reservations, insurance companies, research institutes and professional organizations.
- IBM 4300, IBM4381, UAX 8842 etc are examples of mainframe computers.

➤ **Historical Overview :**

- ✓ First Mainframe Computer: Harvard Mark I (1944).
- ✓ IBM 700 series (1950s-60s) revolutionized mainframes.
- ✓ **Gene Amdahl** is widely considered the "**father of the mainframe computer**" and played a key role in the design of IBM's mainframe computers, including the IBM 704.

Mini computer :

- A Minicomputer is a mid-sized computing device that is more powerful than a microcomputer but less powerful than a mainframe. It is designed for multi-user operations
- They have more processing power and storage capability. They have more than one CPU. More than one person can work upon them at a given time.
- They are generally used in big offices, banks etc.
- **Historical Overview :**
 - ✓ **First Minicomputer: PDP-8** (1965) by Digital Equipment Corporation (DEC).

- ✓ **1970s & 1980s:** Minicomputers became popular in **businesses, research institutions, and industry.**
- ✓ **Modern Minicomputers:** Still used in **networking, industrial automation, and cloud computing.**

Micro computer :

- A Microcomputer is the smallest and most commonly used type of computer designed for individual use.
- They are small in size and less costly.
- They are used at homes, in schools. A micro computer consists of a single CPU.
- They have comparatively less memory and working speed.
- A single person can work on it at a given time. They are also called personal computers.
- **Historical Overview :**
 - ✓ **First Microcomputer: Micral (1973)** – First commercially available microcomputer.
 - ✓ **Popularized by: Apple I (1976), IBM PC (1981).**
 - ✓ **Modern microcomputers:** Now include **desktops, laptops, notebooks, tablets, and smartphones.**

Types of Microcomputers		
Type	Description	Example
Desktop Computer	A stationary computer designed for office and home use, requiring an external monitor, keyboard, and mouse.	Dell OptiPlex, HP Pavilion, Apple iMac
Laptop	A portable computer with a built-in keyboard, display, and battery, used for personal and professional tasks.	MacBook Air, Lenovo ThinkPad, Dell XPS
Notebook	A thinner, lightweight version of a laptop with similar functionality but improved portability.	ASUS ZenBook, HP Spectre, Dell XPS 13
Tablet	A touchscreen-based, portable computing device that runs mobile operating systems.	Apple iPad, Samsung Galaxy Tab, Microsoft Surface
Smartphone	A mobile computing device with a touchscreen, calling features, and internet connectivity.	iPhone, Samsung Galaxy, Google Pixel
Personal Digital Assistant (PDA)	A small handheld device used for organizing personal information, now mostly replaced by smartphones.	Palm Pilot, BlackBerry PDA
Gaming Console	A microcomputer designed specifically for gaming and multimedia applications.	Sony PlayStation, Microsoft Xbox, Nintendo Switch
Embedded Computer	A specialized microcomputer embedded in electronic devices for a specific function.	Smart TVs, ATMs, Car GPS Systems

Supercomputer:

- Supercomputers are the largest in size. They are the most powerful in processing and memory.
- They process complex calculations with high accuracy.
- A Supercomputer is the most powerful and fastest type of computer, capable of performing trillions of calculations per second.
- It is used for complex computations in scientific research, artificial intelligence, and large-scale simulations.
- FLOPS [Floating Point Operation Per Second] is the unit of measurement for speed.
- **Historical Overview:**
 - ✓ **First Supercomputer: CDC 6600 (1964)**, developed by **Seymour Cray (Father of Super Computer)**.
 - ✓ **Cray-1 (1976)**: Introduced vector processing technology.
 - ✓ **Modern Supercomputers**: Use **parallel processing**, **AI**, and **quantum computing** to enhance speed.

Supercomputer in India:

India has developed several high-performance supercomputers for scientific research, weather forecasting, artificial intelligence, and space exploration. These systems are developed by organizations like C-DAC (Centre for Development of Advanced Computing), ISRO, and IITs.

Historical Overview:

- India launched its own supercomputing program in 1988, under the leadership of Dr. Vijay Bhatkar (Father of supercomputers in India).
- The Centre for Development of Advanced Computing (C-DAC) was established in 1988 to develop indigenous supercomputers.
- **PARAM 8000 – India's First Supercomputer (1991) :**
 - ✓ Developed by: C-DAC.
 - ✓ Processing Power: 1 GFLOP (Giga Floating Point Operations Per Second).
 - ✓ Significance: Marked India's entry into the global supercomputing race.
 - ✓ Impact: Led to technological self-reliance in high-performance computing.
- **National Supercomputing Mission (NSM) :**
 - ✓ Launched in 2015 to develop world-class supercomputing infrastructure in India.
 - ✓ **Objective:** Build indigenous supercomputers and deploy them in academic institutions for research.
 - ✓ **Implemented by:**
 - C-DAC (Centre for Development of Advanced Computing).
 - DST (Department of Science & Technology).
 - MeitY (Ministry of Electronics & Information Technology).
 - ✓ **Target:** Install **70+ supercomputers across India.**

List of Major Supercomputers in India			
Supercomputer Name	Institution	Processing Power	Application
PARAM Siddhi-AI (Top 100-150)	C-DAC (Pune)	5.267 PFLOPS	AI, Drug Discovery, Deep Learning
Pratyush	IITM Pune	4.0 PFLOPS	Weather & Climate Research
Mihir	NCMRWF, Noida	2.8 PFLOPS	Meteorological Simulations
EKA	CRL, Pune (Tata Group)	172 TFLOPS	AI & Scientific Computing
SAGA-220	ISRO	220 TFLOPS	Space Research & Aerospace Simulations
PARAM Yuva-II	C-DAC	500 TFLOPS	General Research & Data Analysis
PARAM Brahma	IISER Pune	850 TFLOPS	Scientific Research
PARAM Yukti	JNCASR (Bangalore)	450 TFLOPS	Molecular & Material Science
PARAM Shivay	IIT-BHU (Banaras Hindu University)	833 TFLOPS	Academic Research & Data Science

PARAM Sanganak	IIT Kanpur	1.6 PFLOPS	AI & Deep Learning
PARAM Pravega	IISc Bangalore	3.3 PFLOPS	Scientific Research & Cloud Computing
Flosolver MK6	NAL (National Aerospace Laboratories)	50 TFLOPS	Aerospace & Fluid Dynamics

Development of Computer

Year	Descriptions
1617 AD	Napier's Bones ➤ A manually operated calculating device. ➤ Invented by Scottish mathematician John Napier. ➤ Used for multiplication and division. ➤ A tool to simplify complex calculations, considered one of the most significant advancements in the study and practical applications of mathematics.
1642 AD	Pascaline ➤ Also known as the Adding Machine. ➤ Invented by Blaise Pascal. ➤ Used for addition and subtraction only. ➤ Operated based on the principles of a clock and odometer.
1694 AD	Leibniz Wheel ➤ Considered an improved version of Pascaline. ➤ Developed by Gottfried Wilhelm von Leibniz. ➤ Capable of performing basic mathematical operations (addition, subtraction, multiplication, and division).
1801–1805	Punch Cards ➤ Developed by Joseph Jacquard for use in mechanical looms. ➤ First mechanical loom that used punched cards to store weaving designs. ➤ Played a crucial role in the development of computers based on two key ideas: ✓ Information was coded using punch cards. ✓ Stored data and instructions on punch cards functioned as a program.
1822 AD	Difference Engine ➤ A gear, shaft, and steam-powered machine. ➤ Invented by Charles Babbage. ➤ The first error-free device for mathematical and statistical calculations. ➤ Used for creating mathematical tables and could perform 60 additions per minute. ➤ Had memory capability and operated based on programmed instructions.
1833 AD	Analytical Engine ➤ In 1833 AD, Charles Babbage developed an advanced version of the Difference Engine, known as the Analytical Engine. ➤ It was capable of operating based on instructions stored on punch cards. ➤ The punch cards were used not only to store instructions but also to record input and output data. ➤ A key feature of this machine was its ability to perform calculations up to the 50th decimal place. ➤ It could also compute the square root of whole numbers, and the results were automatically printed. ➤ Memory was used for data storage in this machine. ➤ It had separate devices for input and output operations.

1889–1890 AD	Hollerith Census Tabulator ➤ A punch card-based census machine. ➤ Developed by American mathematician Herman Hollerith. ➤ Introduced the concept of punch cards as a computing tool, pioneered by Herman Hollerith.
1939–1942	ABC Computer (Atanasoff-Berry Computer) ➤ Developed by: John Atanasoff and Clifford Berry. ➤ First fully automatic electronic digital computer. ➤ Work on this computer continued from 1939 to 1942, and in 1942, it was released in England by John Atanasoff and Clifford Berry.
1944 AD	MARK-I ➤ Inventors & Developers: Howard Aiken & IBM (International Business Machines). ➤ World's first fully automatic electro mechanical calculating machine. ➤ Used for performing complex mathematical calculations. ➤ Full name: Automatic Sequence Controlled Calculator (ASCC). ➤ Capabilities: ✓ Could perform multiplication in 6 seconds. ✓ Could perform division in 12 seconds.
1946 AD	ENIAC (Electronic Numerical Integrator and Computer) ➤ Developed by: A team of scientists at the University of Pennsylvania led by J. Presper Eckert and John William Mauchly. ➤ World's first fully electronic computer.
1947 AD	EDVAC (Electronic Discrete Variable Automatic Computer) ➤ Developed by: John von Neumann. ➤ Capable of storing data and instructions in binary form (0s and 1s). ➤ First stored-program digital computer.
Some Important Facts ➤ Lady Ada Augusta ✓ The first woman to program the Analytical Engine. ✓ She is known as the world's first programmer. ✓ She is also credited with the invention of the binary system. ➤ John von Neumann: ✓ Introduced the concept of logical design with stored programs. ✓ Credited with storing data and instructions in binary form. ✓ He is known as the Father of Modern Computers. The concept of stored program states that a program and memory can be stored in the same memory.	
1949 AD	EDSAC (Electronic Delay Storage Automatic Calculator) ➤ Developed by Professor Maurice Wilkes at Cambridge University. ➤ It was the first stored-program digital computer.
1951 AD	UNIVAC (Universal Automatic Computer) ➤ Developed by General Electric Corporation. ➤ Designed by John Mauchly and J. Presper Eckert. ➤ First commercial computer used for business and general-purpose applications.