



**VIDYABHARTI TRUST COLLEGE OF
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(Affiliated with Veer Narmad South Gujarat University, Surat)

**Department of Computer Application
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Contents

DATA ANALYST VS DATA ENGINEER VS DATA SCIENTIST	3
Data Analyst	3
Data Engineer.....	3
Data Scientist.....	4
GPT-5 (ChatGPT-5)	5
Overview	5
Major Improvements over GPT-4	5
GPT-5 Variants	6
Key New Features	6
Interface and Usability Updates	7
Privacy and Security.....	7
Comparison: GPT-4 vs GPT-5	7
Developer / API Updates	8
Release Timeline	8
Impact and Future Outlook.....	8

DATA ANALYS VS DATA ENGINEER VS DATA SCIENTIST

Data Analyst

Key Skills:

Proficiency in SQL, Excel, and BI tools (like Power BI or Tableau).
Strong analytical and problem-solving abilities.

Tasks:

Data cleaning, exploratory data analysis, creating dashboards, and reporting findings to stakeholders.

Goal:

To translate data into actionable insights and facilitate data-driven decision-making. Data analysts aim to provide clear, accurate, and insightful reports that help stakeholders understand business performance and trends.

Data Engineer

Key Skills:

Expertise in database systems, ETL (Extract, Transform, Load) processes, cloud platforms like AWS, Azure, and GCP, programming languages (Python, Java, Scala). Familiarity with big data technologies (like Hadoop, Spark).

Tasks:

Designing and implementing data pipelines, optimizing data storage solutions, and managing data integration from various sources.

Goal:

To design, build, and maintain robust data infrastructure that ensures reliable data flow and accessibility. Data engineers focus on creating efficient data pipelines and managing large-scale data systems, enabling smooth data processing and integration.

Data Scientist**Key Skills:**

Strong knowledge in statistical analysis, machine learning, programming (Python, R), and data visualization. Experience with data manipulation and modeling.

Tasks:

Building predictive models, performing complex data analysis, and developing algorithms to solve business problems.

Goal:

To develop predictive models and uncover insights that drive strategic business decisions and innovation. Data scientists use advanced statistical and machine learning techniques to generate actionable forecasts and solve complex problems.

- PROF. AMIT PATEL

GPT-5 (ChatGPT-5)

Overview

Full Name: Generative Pre-trained Transformer 5 (GPT-5)

Developer: OpenAI

Official Release: July 2025 (public rollout completed August 2025)

Model Type: Large Multimodal Transformer Model

Purpose: Natural language understanding, reasoning, creativity, and automation through text, image, and code.

Successor to: GPT-4 and GPT-4-Turbo

Major Improvements over GPT-4

- Better Reasoning Accuracy – 40–50% fewer hallucinations; improved multi-step logic, math, and coding.
- Larger Context Window – Up to 1 million tokens for enterprise edition (vs 128k in GPT-4-Turbo).
- Advanced Multimodality – Handles text, images, audio, and code in one chat.
- Better Personalization – Learns user preferences; customizable personalities and tones.
- Agent-Style Automation – Can browse the web, analyze files, and perform tasks with permission.
- Improved Coding and App Building – Visual Canvas mode with code preview and debugging.

GPT-5 Variants

Variant Name	Purpose / Target Use	Key Features
GPT-5 (Base)	General ChatGPT Free/Plus users	Fast, reasoning-oriented, multimodal (text + image).
GPT-5-Mini	Lightweight model	Quick responses, low latency, mobile friendly.
GPT-5-Nano	Developers / API automation	Low-cost model for backend integration.
GPT-5-Pro	ChatGPT Pro users	High reasoning depth, 1M token context, multimodal.
GPT-5-Enterprise	Businesses / Research	Custom memory, advanced security, API integration.

Key New Features

- ChatGPT Agent – Executes complex tasks like filling forms, managing files, and data analysis.
- Project Workspaces – Organize chats, files, and context under 'Projects'.
- File & App Integrations – Connects with Google Drive, Gmail, Slack, GitHub, Notion, Excel.
- Improved Voice and Vision – Real-time interaction, image understanding, handwriting reading.
- Developer Enhancements – Code Interpreter 2.0, new API parameters, auto-debugging.

Interface and Usability Updates

Custom Instructions 2.0 – Persistent user goals.

Themes and Colors – Interface personalization.

Canvas Mode – Visual editor for coding/design.

Offline Drafts – Save and sync projects.

Privacy and Security

- All automation tasks require confirmation.
- End-to-end encryption for enterprise users.
- Local memory can be paused or deleted anytime.
- GDPR and ISO 27001 compliant.

Comparison: GPT-4 vs GPT-5

Feature	GPT-4 / 4-Turbo	GPT-5
Release Year	2023–2024	2025
Context Limit	128K tokens	Up to 1M tokens
Modalities	Text, Image	Text, Image, Voice, Audio
Reasoning Depth	Medium	Advanced
Code Execution	Limited	Full Canvas + Debug
Web Access	Add-on	Built-in
Personalization	Manual	Dynamic / Memory-based
Speed	Moderate	2–3× faster
Accuracy	~75% factual	~90% factual

Developer / API Updates

- New dashboard with usage insights.
- Multiple model endpoints (Pro, Mini, Nano).
- Supports tool chaining.
- Improved rate limits for Pro/Enterprise users.

Release Timeline

Event	Date	Details
Internal Testing	March 2025	OpenAI Alpha testing phase.
Developer Preview	May 2025	Limited API rollout.
Public Launch	July 2025	ChatGPT and API integration.
Enterprise Rollout	August 2025	Full GPT-5 Agents availability.

Impact and Future Outlook

- GPT-5 bridges the gap between assistant and autonomous agent.
- Integrates with OpenAI Operator for workflow automation.
- GPT-6 (expected 2026) to add video reasoning and deeper consistency.

- PROF. NIDHI PATEL

VARIANT	WHAT IT IS	BEST FOR	PRICING (API, PER 1M TOKENS)
GPT-5	Flagship reasoning model	General use; strong coding, math, analysis, writing	\$1.25 input, \$10.00 output
GPT-5 Thinking	ChatGPT mode that forces deeper reasoning	Hard problems where careful step-by-step analysis help	\$1.25 input, \$10.00 output
GPT-5 Mini	Smaller, faster reasoning model	High-throughput tasks, tight budgets, well-defined prompts	\$0.25 input, \$2.00 output
GPT-5 Nano	Smallest, fastest reasoning model	Massive scale, lowest latency/cost needs	\$0.05 input, \$0.40 output
GPT-5 Pro	ChatGPT extended-reasoning variant (successor to o3-pro)	Most demanding, complex tasks; maximum completeness	subscription feature

