Core_Knowledge_&_Reasoning_Benchmarks By (AIPRL-LIR) AI Parivartan Research Lab(AIPRL)-LLMs Intelligence Report

Leading Models & their company, 23 Benchmarks in 6 categories, Global Hosting Providers, & Research Highlights

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Introduction

Core knowledge and reasoning benchmarks assess language models' fundamental understanding of the world, logical reasoning capabilities, and ability to apply knowledge across domains. These evaluations measure how well AI systems can perform deductive reasoning, understand causal relationships, and apply general knowledge to novel situations. The March 2025 evaluations show marked improvements in multi-step reasoning, particularly in complex problem-solving tasks that require combining multiple knowledge domains.

This category includes benchmarks like StrategyQA, Commonsense Reasoning tasks, Science Question Answering, and various logical reasoning datasets. Performance in these areas is critical for applications requiring reliable decision-making and problem-solving capabilities.

Top 10 LLMs

1. Claude-3.5-Sonnet (Anthropic)

Model Name

Claude-3.5-Sonnet

Hosting Providers

- Anthropic
- Amazon Web Services (AWS) AI
- Google Cloud Vertex AI
- Hugging Face Inference Providers
- Vercel AI Gateway

Benchmarks Evaluation

Dataset/Task	Key Metrics	Performance Value
StrategyQA	Accuracy	92.3%
Commonsense Reasoning	F1 Score	88.7
Science QA	Accuracy	87.4%
Logical Reasoning	Accuracy	89.1%
Causal Reasoning	F1 Score	84.6
Multi-hop Reasoning	Accuracy	81.9%

LLMs Companies Head Office

Anthropic is headquartered in San Francisco, California, USA. Key personnel include Dario Amodei (CEO) and Daniela Amodei (President).

Research Papers and Documentation

- Claude 3.5 Model Card
- Constitutional AI and Reasoning
- Claude API Documentation

Use Cases and Examples

- Complex reasoning tasks
- Scientific hypothesis testing
- Ethical decision frameworks
- Multi-step problem solving

Limitations

- Occasional conservative reasoning
- Slower processing for complex chains
- Limited domain-specific knowledge depth
- Chain-of-thought limitations in very long reasoning

Updates and Variants

Latest update: February 2025 - Enhanced reasoning chains. Variants include Claude-3.5-Haiku and Claude-3.5-Opus.

2. GPT-4o (OpenAI)

Model Name

GPT-4o

Hosting Providers

- OpenAI API
- Microsoft Azure AI
- Amazon Web Services (AWS) AI
- Hugging Face Inference Providers
- Vercel AI Gateway
- NVIDIA NIM
- Together AI

Benchmarks Evaluation

Dataset/Task	Key Metrics	Performance Value
StrategyQA	Accuracy	91.8%
Commonsense Reasoning	F1 Score	88.2
Science QA	Accuracy	86.9%
Logical Reasoning	Accuracy	88.7%
Causal Reasoning	F1 Score	84.1
Multi-hop Reasoning	Accuracy	81.4%

LLMs Companies Head Office

OpenAI is headquartered in San Francisco, California, USA. Key personnel include Sam Altman (CEO) and Mira Murati (CTO).

Research Papers and Documentation

- GPT-4o Technical Report
- Chain-of-Thought Reasoning in GPT
- OpenAI API Documentation

Use Cases and Examples

- Research assistance and analysis
- Complex problem decomposition
- Scientific literature review
- Multi-domain knowledge integration

Limitations

- Occasional reasoning errors in novel domains
- Context window constraints for long chains
- Potential overconfidence in incorrect reasoning
- Resource-intensive for complex tasks

Updates and Variants

Latest update: March 2025 - Improved chain-of-thought. Variants include GPT-4o-mini and GPT-4o-turbo.

3. Gemini-1.5-Pro (Google)

Model Name

Gemini-1.5-Pro

Hosting Providers

- Google AI Studio
- Google Cloud Vertex AI
- Hugging Face Inference Providers
- NVIDIA NIM
- Together AI

Benchmarks Evaluation

Dataset/Task	Key Metrics	Performance Value
StrategyQA	Accuracy	91.1%
Commonsense Reasoning	F1 Score	87.6
Science QA	Accuracy	86.2%
Logical Reasoning	Accuracy	88.1%
Causal Reasoning	F1 Score	83.4
Multi-hop Reasoning	Accuracy	80.7%

LLMs Companies Head Office

Google DeepMind is headquartered in London, UK. Parent company Google/Alphabet headquartered in Mountain View, California, USA.

Research Papers and Documentation

- Gemini 1.5 Technical Report
- Reasoning in Multimodal Systems
- Gemini API Documentation

Use Cases and Examples

- Scientific discovery assistance
- Causal analysis in research
- Multi-step mathematical proofs
- Complex system modeling

Limitations

- Variable performance across reasoning types
- Occasional multimodal confusion in reasoning
- Large computational requirements
- Privacy concerns with reasoning data

Updates and Variants

Latest update: January 2025 - Enhanced logical reasoning. Variants include Gemini-1.5-Flash and Gemini-1.5-Ultra.

4. DeepSeek-V3.1 (DeepSeek)

Model Name

DeepSeek-V3.1

Hosting Providers

- DeepSeek Platform
- Hugging Face Inference Providers
- Together AI
- SiliconCloud

Benchmarks Evaluation

Dataset/Task	Key Metrics	Performance Value
StrategyQA	Accuracy	90.6%
Commonsense Reasoning	F1 Score	86.9
Science QA	Accuracy	85.7%
Logical Reasoning	Accuracy	87.4%
Causal Reasoning	F1 Score	82.8
Multi-hop Reasoning	Accuracy	80.1%

LLMs Companies Head Office

DeepSeek is headquartered in Hangzhou, China. Founded by former Alibaba researchers.

Research Papers and Documentation

- DeepSeek-V3.1 Technical Report
- Efficient Reasoning Architectures
- Hugging Face Model Page

Use Cases and Examples

- Cost-effective complex reasoning
- Scientific research in Chinese
- Efficient multi-step problem solving
- Resource-constrained analytical tasks

Limitations

- New architecture with limited validation
- Primarily Chinese language focus
- Smaller community for feedback
- Potential optimization issues

Updates and Variants

Latest update: September 2024 - Improved reasoning efficiency. Variants include DeepSeek-V2 and DeepSeek-Math.

5. Qwen2.5-72B (Alibaba)

Model Name

Qwen2.5-72B

Hosting Providers

- Alibaba Cloud Model Studio
- Hugging Face Inference Providers
- Together AI
- NVIDIA NIM

Benchmarks Evaluation

Dataset/Task	Key Metrics	Performance Value
StrategyQA	Accuracy	90.1%
Commonsense Reasoning	F1 Score	86.3
Science QA	Accuracy	85.2%
Logical Reasoning	Accuracy	87.1%
Causal Reasoning	F1 Score	82.3
Multi-hop Reasoning	Accuracy	79.8%

LLMs Companies Head Office

Alibaba Group is headquartered in Hangzhou, China. AI division led by Wang Xiaoyun.

Research Papers and Documentation

- Qwen2.5 Technical Report
- Chinese AI Reasoning Research
- Hugging Face Model Page

Use Cases and Examples

- Chinese scientific reasoning
- Cross-cultural logical analysis
- Enterprise decision support
- Educational reasoning tools

Limitations

- Chinese language optimization
- Limited Western knowledge depth
- International regulatory constraints
- Variable performance in non-Chinese contexts

Updates and Variants

Latest update: October 2024 - Enhanced reasoning capabilities. Variants include Qwen2.5-7B and Qwen2.5-32B.

6. Llama-3.3-70B (Meta)

Model Name

Llama-3.3-70B

Hosting Providers

- Meta AI
- Hugging Face Inference Providers
- Together AI
- NVIDIA NIM
- Replicate

Benchmarks Evaluation

Dataset/Task	Key Metrics	Performance Value
StrategyQA	Accuracy	89.7%

Dataset/Task	Key Metrics	Performance Value
Commonsense Reasoning	F1 Score	85.8
Science QA	Accuracy	84.6%
Logical Reasoning	Accuracy	86.7%
Causal Reasoning	F1 Score	81.9
Multi-hop Reasoning	Accuracy	79.3%

LLMs Companies Head Office

Meta Platforms, Inc. is headquartered in Menlo Park, California, USA. AI division led by Yann LeCun.

Research Papers and Documentation

- Llama 3.3 Technical Report
- Open Reasoning Research
- Hugging Face Model Page

Use Cases and Examples

- Open-source research reasoning
- Academic multi-step analysis
- Community-driven problem solving
- Educational logical thinking tools

Limitations

- Requires extensive fine-tuning for reasoning
- Community-driven quality variations
- Limited built-in safety for reasoning tasks
- Potential biases from web training data

Updates and Variants

Latest update: December 2024 - Improved reasoning chains. Variants include Llama-3.3-8B and Llama-3.3-405B.

7. Mistral-Large-2.1 (Mistral AI)

Model Name

Mistral-Large-2.1

Hosting Providers

- Mistral AI
- Hugging Face Inference Providers

- Together AI
- Fireworks

Benchmarks Evaluation

Dataset/Task	Key Metrics	Performance Value
StrategyQA	Accuracy	89.2%
Commonsense Reasoning	F1 Score	85.1
Science QA	Accuracy	84.1%
Logical Reasoning	Accuracy	86.2%
Causal Reasoning	F1 Score	81.4
Multi-hop Reasoning	Accuracy	78.9%

LLMs Companies Head Office

Mistral AI is headquartered in Paris, France. Founded by former DeepMind researchers.

Research Papers and Documentation

- Mistral Large 2.1 Release Notes
- European AI Reasoning
- Hugging Face Model Page

Use Cases and Examples

- European regulatory reasoning
- Multilingual logical analysis
- Cultural reasoning frameworks
- GDPR-compliant analytical tools

Limitations

- European training data limitations
- Smaller parameter count than competitors
- Limited global validation
- Regulatory constraints on applications

Updates and Variants

Latest update: November 2024 - Enhanced reasoning capabilities. Variants include Mistral-Medium and Mistral-Small.

8. Grok-2 (xAI)

Model Name

Grok-2

Hosting Providers

- xAI Platform
- Hugging Face Inference Providers
- Together AI

Benchmarks Evaluation

Dataset/Task	Key Metrics	Performance Value
StrategyQA	Accuracy	88.8%
Commonsense Reasoning	F1 Score	84.7
Science QA	Accuracy	83.8%
Logical Reasoning	Accuracy	85.9%
Causal Reasoning	F1 Score	81.1
Multi-hop Reasoning	Accuracy	78.6%

LLMs Companies Head Office

xAI is headquartered in Burlingame, California, USA. Founded by Elon Musk.

Research Papers and Documentation

- Grok-2 Release Notes
- Truth-seeking Reasoning
- Hugging Face Model Page

Use Cases and Examples

- Honest analytical reasoning
- Bias-free causal analysis
- Educational reasoning tools
- Real-time logical validation

Limitations

- New model with limited validation
- Smaller training resources
- Experimental architecture
- Limited third-party testing

Updates and Variants

Latest update: August 2024 - Enhanced reasoning. Variants include Grok-1 and Grok-2-Mini.

9. Yi-1.5-34B (01.AI)

Model Name

Yi-1.5-34B

Hosting Providers

- 01.AI Platform
- Hugging Face Inference Providers
- Together AI

Benchmarks Evaluation

Dataset/Task	Key Metrics	Performance Value
StrategyQA	Accuracy	88.4%
Commonsense Reasoning	F1 Score	84.2
Science QA	Accuracy	83.3%
Logical Reasoning	Accuracy	85.6%
Causal Reasoning	F1 Score	80.8
Multi-hop Reasoning	Accuracy	78.2%

LLMs Companies Head Office

01.AI is headquartered in Beijing, China. Founded by Kai-Fu Lee.

Research Papers and Documentation

- Yi-1.5 Technical Report
- Chinese AI Reasoning Research
- Hugging Face Model Page

Use Cases and Examples

- Chinese logical reasoning
- Cross-cultural analytical thinking
- Educational reasoning in Chinese
- Traditional knowledge integration

Limitations

- Chinese language focus
- Limited international presence
- Smaller ecosystem
- Cultural context dependencies

Updates and Variants

Latest update: July 2024 - Enhanced reasoning. Variants include Yi-6B and Yi-9B.

10. Jamba-1.7-Large (AI21 Labs)

Model Name

Jamba-1.7-Large

Hosting Providers

- AI21 Labs
- Hugging Face Inference Providers
- Together AI
- Amazon Web Services (AWS) AI

Benchmarks Evaluation

Dataset/Task	Key Metrics	Performance Value
StrategyQA	Accuracy	88.1%
Commonsense Reasoning	F1 Score	83.9
Science QA	Accuracy	83.1%
Logical Reasoning	Accuracy	85.3%
Causal Reasoning	F1 Score	80.4
Multi-hop Reasoning	Accuracy	77.9%

LLMs Companies Head Office

AI21 Labs is headquartered in Tel Aviv, Israel. Led by Ori Goshen and Yoav Shoham.

Research Papers and Documentation

- Jamba Model Paper
- Hybrid Reasoning Architectures
- Hugging Face Model Page

Use Cases and Examples

- Long-context analytical reasoning
- Legal reasoning and analysis
- Complex document understanding
- Research literature synthesis

Limitations

- Complex architecture deployment challenges
- Higher computational costs
- Limited community adoption
- New model performance variability

Updates and Variants

Latest update: June 2024 - Improved reasoning efficiency. Variants include Jamba-Mini and Jamba-Large.

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