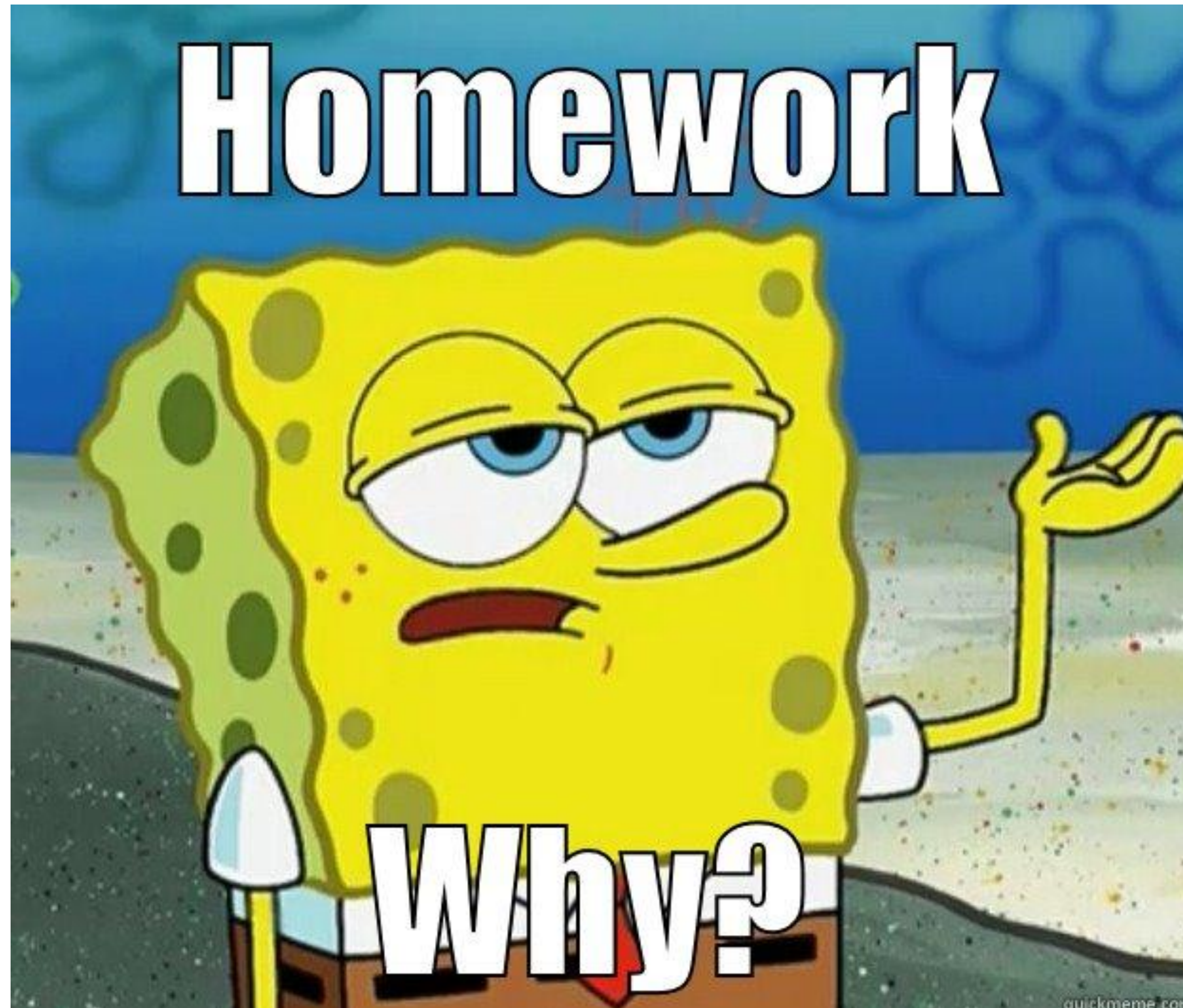# Career Exploration in Machine Learning

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Checking Homework (resume)

Introduction to today's lecture

Machine Learning is changing the world. It's not just about algorithms; it's about solving real-world problems, working with passionate teams, and making a difference.

Today, we'll explore the exciting career paths waiting for you in the world of ML!

What do you think a career in ML looks like?

Different ML Roles: A Team Effort

There are different kinds of ML specialists:

- Data Scientist

- ML Engineer

- ML Researcher

- Data Analyst

- Data Engineer

- ...

Data Scientist

- **The Detective of Data**: Data Scientists explore complex datasets to find hidden patterns and answer important questions. They use statistical analysis, data visualization, and machine learning algorithms to understand the story the data tells.

- **Key Responsibilities**:

  - Define business problems that can be solved with ML.

  - Collect, clean, and prepare large datasets.

  - Build, train, and evaluate ML models.

  - Communicate findings and insights to stakeholders, often through clear visualizations and reports.

- **Skills**: Python/R, SQL, machine learning algorithms, statistical modeling, data visualization, communication, problem-solving.

ML Engineers

- **The Architect**: ML Engineers are the bridge between models and real-world applications. They take the insights from Data Scientists and build robust, scalable systems that can handle real-time data and make predictions.

- **Key Responsibilities**:

  - Deploy and maintain ML models in production environments (cloud, web, mobile).

  - Optimize model performance for speed and efficiency.

  - Work with software engineers to integrate ML into larger systems.

  - Monitor model performance and troubleshoot issues.

- **Skills**: Python, software engineering, cloud computing (AWS, Azure, GCP), DevOps, machine learning algorithms, APIs, data pipelines.

ML Researcher

- **The Pioneer of Progress**: ML Researchers explore the cutting edge of artificial intelligence, developing new algorithms, models, and approaches to solve challenging problems. They often work in academia or at research-focused companies.

- **Key Responsibilities**:

  - Conduct research on new ML techniques.

  - Publish research papers in academic conferences and journals.

  - Develop and improve existing ML algorithms.

  - Collaborate with other researchers and engineers.

- **Skills**: Strong mathematical foundation (linear algebra, calculus, statistics), deep understanding of ML algorithms, programming skills, research experience, excellent writing and communication skills.

Data Analyst

- **The Storyteller of Data**: Data Analysts are the masters of extracting meaningful information from raw data. They use their analytical skills to identify trends, patterns, and anomalies, helping organizations make informed decisions.

- **Key Responsibilities**:

  - Collect, clean, and organize data from various sources.

  - Perform statistical analysis and data visualization to uncover insights.

  - Develop reports and dashboards to communicate findings to stakeholders.

  - Collaborate with Data Scientists and other teams to support data-driven decision-making.

- **Skills**: SQL, data visualization tools (Tableau, Power BI), spreadsheets (Excel, Google Sheets), statistical analysis, data cleaning, communication skills.

Data Engineer

- **The Data Maestro**: Data Engineers design, build, and maintain the complex data infrastructure that makes machine learning possible. They ensure data is accessible, reliable, and ready for analysis and model training.

- **Key Responsibilities**:

  - Design and build data pipelines to collect, process, and store large datasets.

  - Develop and manage data warehouses and data lakes.

  - Ensure data quality, consistency, and security.

  - Work with Data Scientists and ML Engineers to optimize data flow for ML models.

- **Skills**: Big data technologies (Hadoop, Spark), cloud platforms (AWS, Azure, GCP), SQL and NoSQL databases, data modeling.

Industry Trends: ML's Growing Impact

ML is Everywhere!

It transforms industries:

- **Healthcare**: Faster diagnoses, personalized treatments, drug discovery.

- **Finance**: Fraud detection, risk assessment, improved customer service.

- **Retail**: Personalized recommendations, optimized pricing, inventory management

- **Technology**: Self-driving cars, chatbots, image recognition, voice assistants

- ...
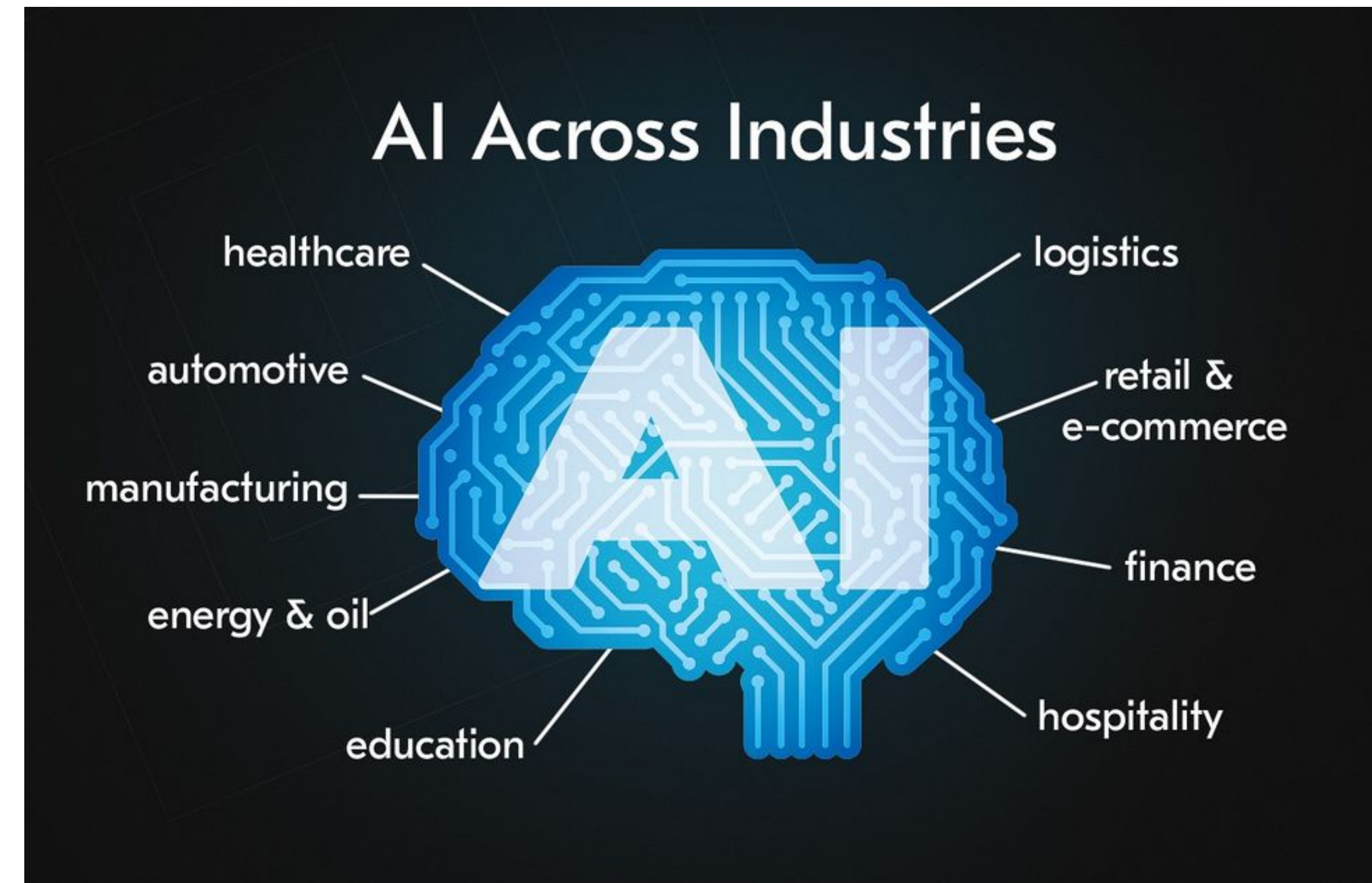
Hometask

Task: try to find yourself! Think about which of the above specialties might be a good fit for you. Explain why.

- **Ideas on how to make an assignment**:

  - check youtube

  - check job aggregators

  - talk to specialists you know

  - ...

Q&A

Thank you for your attention!