**Report**

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**Self-Assessment:**

**Positive Characteristics of the Current Submission**

* **Detailed Organization:** The project plan is clearly laid out with step-by-step details, ensuring all required items are addressed.
* **Effective Visualizations:** Clear bar charts and heat maps effectively represent the data trends, making the insights accessible.
* **Reproducible Code:** Included well-commented Python code for clear, reproducible visualizations ([Link](https://github.com/atharvaj0gtap/AI-Trend-Analysis.git)).
* **Integration of Feedback:** No feedback was given since Milestone 2.

**Areas for Improvement from Previous Submission**

* **N/A**

**Steps Taken to Address Feedback**

* **N/A**

**Topic:** Impact of AI on Jobs: Automation Risk and Trends Across Industries

**Motivation:**

This project examines the impact of artificial intelligence on employment trends worldwide, with a focus on automation risk and job growth/decline across industries and occupations. My motivation stems from my personal and academic interest in understanding how rapid technological advancements are reshaping the labor market.

Using the "AI-Powered Job Market Insights" dataset—which comprises 500 realistic job listings spanning various industries, company sizes, and levels of AI adoption. This analysis is driven by the growing need to understand job displacements, wage disparities, and the necessity for workforce reskilling, thereby providing insights that can inform strategic policymaking and business decisions.

**Data Analysis:**

**Data Overview and Preparation**

The dataset contains key variables, including:

* **Job\_Title, Industry, Company\_Size, Location**
* **AI\_Adoption\_Level (Low, Medium, High)**
* **Automation\_Risk (Low, Medium, High)**
* **Salary\_USD (numerical)**
* **Remote\_Friendly (Yes, No)**
* **Job\_Growth\_Projection (Decline, Stable, Growth)**

Data cleaning has been completed, so the analysis proceeded directly with exploratory data analysis (EDA) using Python (Pandas, Matplotlib, Seaborn).

**Exploratory Analysis**

1. **Job Listings by Industry:**  
   I first computed the frequency of job listings per industry. I discovered that sectors such as Manufacturing, Education, and Technology have the highest number of listings, while Transportation has the fewest. This indicates that some industries are experiencing robust hiring activity, whereas others might be facing contraction.
2. **Distribution of AI Adoption Levels and Automation Risk:**  
   I also examined how job growth projections vary in their adoption of AI. My visualizations revealed that a significant portion of job listings are associated with moderate to high AI adoption. This implies that many roles might be under pressure to adapt to technological changes, which could lead to either job displacement or the creation of new roles requiring advanced skills.

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**Visualizations:**

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**Figure 1:** A bar chart comparing the average salary (in USD) by the AI adoption level based on industry. Higher AI adoption can correlate with higher salaries in certain industries, but the effect is not uniform. Elements such as market demand and specific job responsibilities also contribute to salary levels.

**Figure 2:** A heatmap displaying the distribution of automation risk among industries. Routine task-based jobs in Transportation face higher automation risks.

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**Figure 3:** Two side by side bar charts showing the top skills in high-growth vs. high-risk jobs. AI’s influence on the job market is multifaceted. The same skills driving innovation and commanding higher salaries can also face automation. This duality highlights the need for ongoing learning, adaptability, and a blend of technical and soft skills to stay resilient in an AI-transformed workforce.

**Key Takeaway:**

This reveals that while AI offers immense potential for growth and innovation, its impact is not uniform across industries or geographies. Stakeholders must balance the opportunities of AI-driven transformation with the risks of automation, employing targeted reskilling programs, adaptive policy measures, and a continual emphasis on both technical and soft skill development. This balanced and informed approach will be essential for navigating the evolving landscape of the future job market.

**Bibliography:**

Kaggle. (2024). *AI-Powered Job Market Insights*. Retrieved from <https://www.kaggle.com/datasets/uom190346a/ai-powered-job-market-insights>

Brookings Institution. (2025). Retrieved from <https://www.brookings.edu>

International Labour Organization (ILO). (28 January, 2025). *How reskilling for AI could unlock new and better jobs.* Retrieved from <https://www.ilo.org/resource/article/how-reskilling-ai-could-unlock-new-and-better-jobs>