🤖 Understanding AI & ML

🔍 What is Artificial Intelligence?

AI refers to computer systems that are designed to mimic tasks typically requiring human intelligence, such as recognizing speech, making decisions, or translating languages.

📚 What is Machine Learning?

Machine Learning is a branch of AI that focuses on teaching machines to identify patterns and make decisions based on data — all without being explicitly programmed.

✅ Common Use Cases of AI/ML

- Recommendation algorithms (e.g., Netflix, YouTube)
- Facial recognition and biometrics
- Predictive text input on smartphones
- Autonomous driving technology

□ Dataset Analysis with Pandas

We worked with the **Happiness Report Dataset** which includes scores and metrics for various countries. Our hands-on session was conducted using **Python and Pandas** inside a **Google Colab** notebook.

📄 Dataset Features:

Overall_rank
Country_or_region
Year
Score
GDP_per_capita
Social_support
Healthy_life_expectancy
Freedom_to_make_life_choices
Generosity
Perceptions_of_corruption

🛠 Key Data Operations & Commands

✅ 1. Importing Libraries and Loading the Data

python
CopyEdit
import pandas as pd
happiness_df = pd.read_csv("/content/happiness_2018_2019.csv")

✅ 2. Display First Few Records

python
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happiness_df.sample(5)
(Alternative to .head() for random sampling)
✅ **3. Viewing the End of the Dataset**
python
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happiness_df.tail(3)
✅ **4. Checking Basic Structure**
python
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happiness_df.info()
Total entries: **312**
Data types: **float, int, object**
Missing values: **None**
✅ **5. Checking for Missing Data**
python
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happiness_df.isna().sum()
✅ **6. Quick Descriptive Stats**
python
CopyEdit
happiness_df.describe(include='all')
Score Mean: ~5.39
GDP Avg: ~0.89
Score Range: 2.85 – 7.76
✅ **7. Filtering Based on Score**
python
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happy_countries = happiness_df[happiness_df["Score"] >= 5.5]
Shows countries with better overall happiness scores.
✅ **8. Select Specific Rows (Custom Indexing)**
python
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happiness_df.loc[[10, 50, 100]]
✅ **9. Sorting by Rank or Score**
python
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happiness_df.sort_values("Score", ascending=False).head(10)

🌍 **Kaggle: The Data Science Playground**

We also explored Kaggle, which is a go-to platform for learning and competing in data science.

💡 **What We Explored:**

- Public datasets (CSV, JSON, Excel)
- Beginner to advanced competitions
- Community notebooks with code walkthroughs
- Free online courses and tutorials
- Discussion boards and solutions

📱 Tools & Workflow

We used **Google Colab** for code execution and notebook creation. This allowed us to:

- Write and test Python code in the browser
- Import datasets easily
- Perform analysis using Pandas
- Save, download, and share our work in .ipynb format

✅ Skills Practiced Today

- Loading and inspecting datasets using Pandas
- Filtering, sorting, and selecting data
- Checking for nulls and summarizing datasets
- Exploring real-world data on Kaggle
- Understanding AI and ML foundations