# Online Learning Trends: Udemy vs Coursera (2010 - 2025)

Exploring how online education topics evolve and how Google Trends interest reflects real platform growth

# *Overview & Research Focus*

Goal:

- Understand how learning platforms reflect public interest trends

Research Questions:

- What are the most popular and fastest-growing topics?
- How do Coursera and Udemy differ in focus?
- Does Google search activity predict course topic growth?

Scope:

- Udemy (2010 – 2017)
- Coursera (2025 snapshot)
- Google Trends (2010 – 2025)

# Data Sources

| Source | Type | Method | Key Info |
|---|---|---|---|
| Udemy Online Education Dataset | CSV (Kaggle) | Local Import | 3,678 courses, 2011 – 2025 |
| Coursera Courses Dataset | CSV (Kaggle) | Local Import | 3,404 courses, 2025 snapshot |
| Google Trends | API (Pytrends) | Live fetch | Machine learning interest, 2010 – 2025 |

# Pipeline

## Load & clean data (`fp_io.py`, `fp_topics.py`)

Extract year, normalize topics, filter valid years

## Aggregate & compute shares (`Topic_share_by_year`)

Fraction of courses per topic, per year, per platform

## Visualize trends

Matplotlib

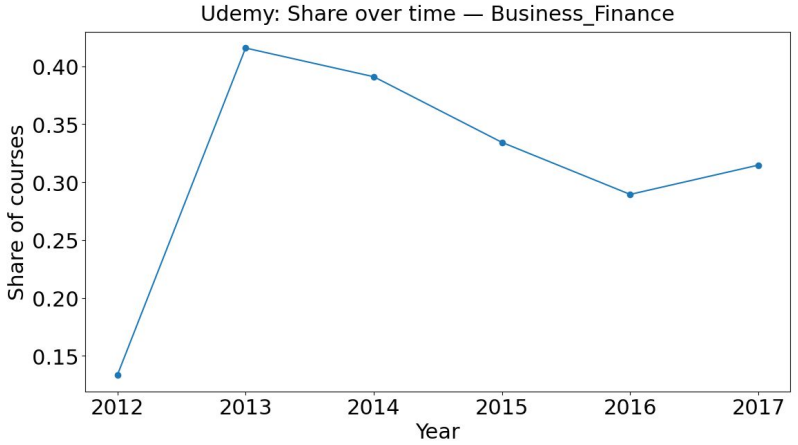
## Pull Google Trends data

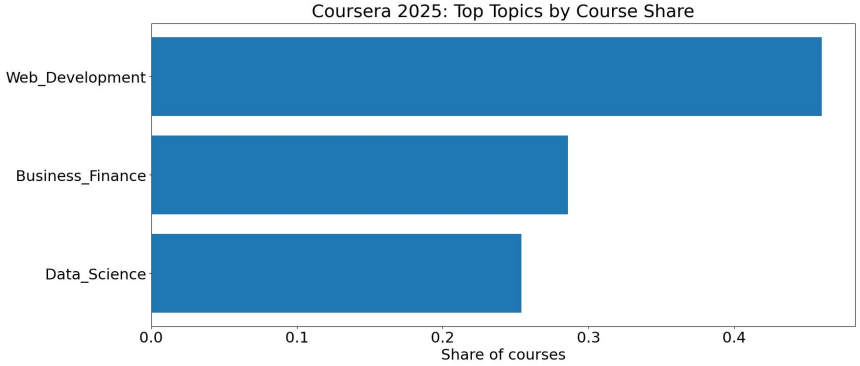
(`fetch_trend_yearly()` from `fp_trends.py`)

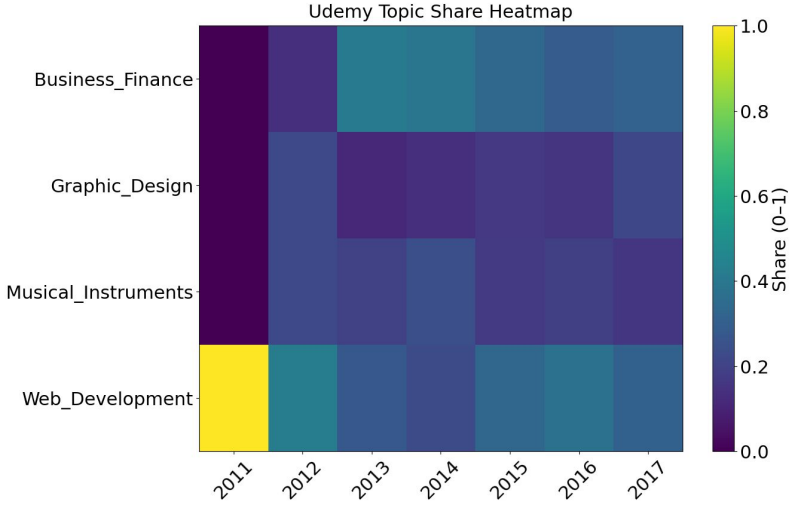
## Regression:

Check if Google interest (t–1) predicts Udemy share change (t)

# Key Visuals



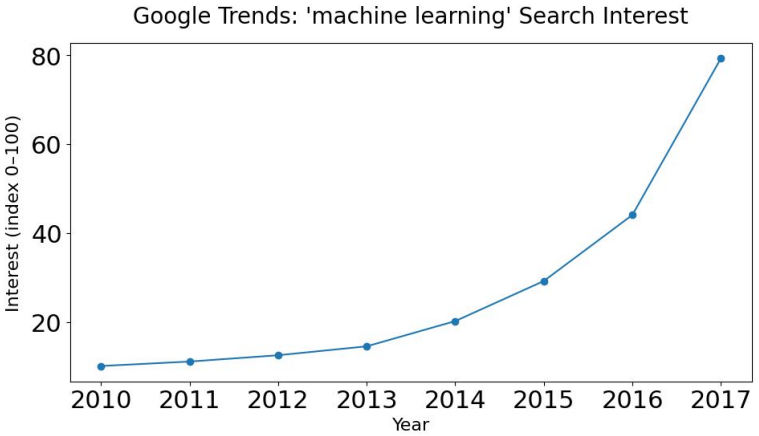




- Udemy Trends: Business_Finance & Web_Development grew consistently, while Graphic_Design & Music fluctuated slightly
- Coursera Snapshot (2025): Data_Science & Business_Finance dominate current catalog
- Combined Trends: Aligns Udemy time series with Coursera snapshot for overlap analysis

# Google Trends Integration

## Pulled from Google Trends using Pytrends API:

- Keyword: *"machine learning"*
- Time frame: *2010 – 2025*
- Aggregated from weekly to yearly interest averages




## Outputs:

- `Trends_machine_learning_yearly.csv`
- `Trends_machine_learning_preview.json`
- Visual: *trends_machine_learning_line.png*

Key observation: Internet spikes after 2017 and remains strong through 2025

- Google Trends reports a normalized search popularity index (0–100), where 100 represents the peak interest for the keyword "machine learning."

# Regression Results

**Model:**

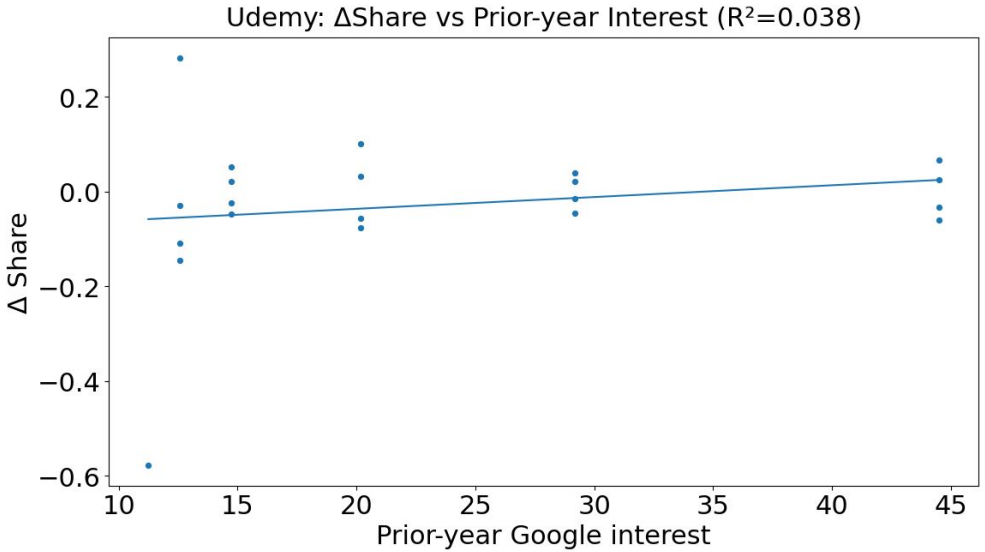
$$\Delta Share(t) = \beta 0 + \beta 1 \times Interest(t-1)$$

$R^2 = 0.0361 \rightarrow 3.6\%$ variance explained

Interpretation:

- Google interest alone is a week predictor of Udemy topic growth
- Suggests platform content expansion is influenced by multiple external factors

*(Figure: udemy_delt_share vs_ interest.png)*



# Summary & Insights

## Findings

- Udemy: rapid growth in tech and business topics
- Coursera: steady dominance in data and IT fields
- Google Trends interest aligns with–but doesn't directly drive course creation

## Implications

- Public curiosity mirrors educational trends
- Useful for identifying emerging learning markets (e.g., AI, data science)

# *Next Steps & Acknowledgment*

## *Future Improvements:*

- Broaden API keywords: “AI”, “data analytics”, “web design”
- Add enrollment or rating data for demand analysis
- Include trend forecasting (ARIMA or Prophet)

## *Acknowledgment:*


- Data sourced from Kaggle and Google Trends (Pytrends API)

# *Thanks!*